Monetary Policy in the Age of Universal Banking

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Abstract

In this paper, we establish that universal banks reduce the efficacy of the monetary policy. The expansion of banks into non-commercial banking activities reduces the sensitivity of their earnings to changes in monetary policy rates for the majority of banks. When the Fed funds rate rises, banks with more stable earnings have more resources to maintain credit supply, which in turn reduces the monetary policy pass-through to the economy. This channel is distinct from existing theories of monetary policy transmission, and the results are robust to monetary policy shocks. The effect of this channel is asymmetrically concentrated in a tightening monetary policy environment, as banks' stream of non-lending earnings is larger in these periods relative to expansionary policy periods. The results shed a new light on the direct implications of the Fed's regulation of bank non-lending activities on the transmission of monetary policy.

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Over the last few decades, universal banking has become more common, with commercial banks expanding into trading, investment banking, and other non-traditional banking activities. So far, the literature has discussed different aspects of the effects of universal banking, such as on securities underwriting, credit supply, bank performance, and productivity (Kroszner and Rajan, 1994; Puri, 1996; Cornett, Ors, and Tehranian, 2002; Drucker and Puri, 2005; Neuhann and Saidi, 2018). In this paper, we study how universal banking alters the efficacy of monetary policy. This question has important implications for the Fed's execution of monetary policy and its effect on the economy, as well as for regulation of banks' non-traditional activities.

We establish that universal banks reduce the efficacy of the monetary policy. The expansion of banks into non-commercial banking activities reduces the sensitivity of their earnings to changes in monetary policy rates for the majority of banks. When the Fed funds rate rises, banks with more stable earnings maintain credit supply, which in turn reduces the monetary policy pass-through to the economy.

This channel provides an explanation for how monetary policy affects the supply of bank lending in the economy. It is distinct from existing theories, as the driving mechanism is the heterogeneity in the composition of the bank's assets. Other theories focus on capital and liabilities: The bank reserve (or lending) channel (e.g., Ben and Blinder, 1988) establishes that interest rate decisions affect required reserves of banks, which in turn changes their credit supply; The deposits channel (Drechsler, Savov, and Schnabl, 2017; Wang, Whited, Wu, and Xiao, 2021) shows that banks' market power over deposits helps explain the transmission of monetary policy to the economy; The balance sheet channel explains the monetary policy transmission through changes in banks' capital.[1] Kashyap and Stein (2000) demonstrate that securities provide a liquid source of funding for banks, thus banks with more securities are less affected by changes in the monetary policy.

Accounting for these theories, it is not obvious that other bank characteristics should change

[1] See Bernanke and Gertler (1989); Kiyotaki and Moore (1997); Gertler and Kiyotaki (2010); He and Krishnamurthy (2013); Brunnermeier and Sannikov (2014).

monetary policy's influence on bank lending. Hence, any additional effect should be considered only after controlling for these other confounding factors. Exploiting the heterogeneity among banks in their engagement with non-lending activities, we show that banks that have more trading activities maintain additional credit supply following monetary policy tightening, while no effect is found among the rest of the banks. Similar results are found for expansion into investment banking.

To further explore the effect of bank engagement with trading and investment banking on the transmission of the monetary policy, we conduct a bank-county level analysis, in which the outcome variable is small business lending (SBL). As this type of lending is reported at a granular county-level, we can better gauge to what extent lending amounts are a result of bank capital supply, and not just variation in loan demand (Khwaja and Mian, 2008). Small business lending is both a point of focus when the Fed engages in monetary policy and tends to remain on bank balance sheets. For mortgages, banks often unload portions of these loans from their balance sheets via securitization, which may influence how banks adjust mortgage lending to changes in the monetary policy. Nevertheless, we also utilize the county-level analysis to investigate the effect on mortgage lending.

We estimate the bank's exposure to trading activity as the amount of its trading assets as a share of total assets. As there is no clean way to assess a bank's investment banking assets, we assess the exposure to investment banking as the number of broker-dealer subsidiaries in the bank's organizational structure (following Gelman, Goldstein, and MacKinlay, 2021). Our main measure of changes in the monetary policy is the one-year lagged change in the Fed funds rate. The principal explanatory variables are the interaction terms of the change in the Fed funds rate with the bank's expansion into either trading or investment banking.

We find an economically and statistically meaningful effect of universal banks on the monetary policy. Focusing on expansion into trading, we find in a given bank-county-year that for a one standard deviation increase in the Fed funds rate, banks with a one standard deviation higher exposure to trading maintain 7.9% higher SBL levels. Analyzing expansion into

investment banking, for a one standard deviation increase in the Fed funds rate, banks with one additional investment banking subsidiary maintain 0.3% higher SBL levels. Positive and significant coefficients are also found when considering mortgage lending.

Our specifications include rigorous fixed effects, such as county by time fixed effects to control for variation in local loan demand. We also account for existing theories by including other bank factors that may influence lending through other means than universal banking. Specifically, we control for the bank's size, structure of funding, market power in deposit markets, net interest margin, equity ratio, profitability, and riskiness. As a further robustness test, we allow these various bank characteristics to have independent effects by interacting each of them with changes in the Fed funds rate. Thus, the interpretation of the observed effect is that the reduced efficacy of monetary policy is due to banks expanding into non-traditional banking activities. This effect exists separately from these other potential influencing factors.

To establish the mechanism behind this channel, we assess the sensitivity of each bank's trading income or investment banking income to changes in the Fed funds rate over a rolling window of 10 years. The idea is to capture the bank's long-term sensitivities, as income may vary following temporary fluctuations in the market, the bank's idiosyncratic factors, or changes in its business model. Then, we split banks into positive and negative income sensitivities. Banks with positive (negative) sensitivities exhibit higher (lower) trading income for a given change in the Fed funds rate. Therefore, their overall earnings are less (more) affected by monetary tightening. Banks with positive sensitivities have more resources to maintain lending, which in turn reduces the transmission of the monetary policy to the economy. For banks with negative sensitivities, the opposite will be the case.

Consistent with this logic, we find for banks with positive sensitivities, higher expansion into trading is associated with maintaining higher levels of SBL following monetary tightening. However, for banks with negative sensitivities, higher exposure into trading is associated with bigger credit supply cuts following monetary tightening, as those banks exhibit lower trading income when Fed funds rates increase. Similar results are found for expansion into investment

banking, and mortgage lending as the outcome variable.

Analyzing the distribution of the trading and investment banking sensitivities across banks, we find that the average trading sensitivity is 0.019, meaning that a one percentage point increase in the Fed funds rate is associated with a 0.019% rise in the bank's trading income as a share of assets. The investment banking average income sensitivity is 0.003, meaning that banks exhibit an average income increase of 0.003% following monetary policy tightening of one percentage point. Additionally, about 58% of the banks have positive trading and investment banking sensitivities.

To show the intuition behind the heterogeneity in the sensitivities among banks, we split trading income into five main segments as detailed in the banks' Call reports: interest rate exposures (debt instruments and interest rate contracts), foreign exchange exposures, commodities, equity securities, and credit exposures. Aggregating them to the U.S. banking system level, we study how each segment correlates with changes in the Fed funds rate. We find a negative correlation of the first three segments with changes in the Fed funds rate, and a positive correlation for the last two segments. Depending on the specific trading activities undertaken by banks, their can be substantial variation in how trading income is affected by changes in the Fed funds rate. This variation manifests in the heterogeneity of estimated trading income sensitivities. Although it is difficult to break down investment banking income into separate components, the heterogeneity of activities across banks exists there as well.

Next, we study the effect of universal banks in a tightening versus easing monetary policy environment. Ex-ante, this channel is expected to affect a bank's credit supply symmetrically in response to changes in the Fed funds rate. However, when we split between positive and negative changes, we find that the effect is concentrated in increases in the Fed funds rate, and the coefficient during monetary easing is not always significant.

To understand this asymmetry, we re-estimate the income sensitivities separating between positive and negative changes in the Fed funds rate. We find that banks' sensitivities to increases in the Fed funds rate are larger. On average, trading income is about 5.6 times more sensitive to

increases in the Fed funds rate than decreases. The higher trading income sensitivity of banks to Fed funds rate hikes increases the stability of their stream of earnings, which translates into a weaker transmission of monetary policy.

One may claim that some of the changes in Fed fund rates are anticipated, thus our results are driven by heterogeneity in banks' expectations rather than by their expansion into non-commercial banking activities. Although this cannot fully explain the results for the interaction term of Fed funds rate changes with exposure to trading or investment banking, we address it directly by performing our main specification with monetary policy shocks as a measure of changes in monetary policy. Specifically, we use a measure of changes in the Fed Funds futures rate around FOMC meetings as in Kuttner (2001) and Gertler and Karadi (2015). We find that in response to an unexpected increase in the Fed funds rate, banks with more trading and investment banking activities maintain higher SBL levels.

The bank-county level analysis enables us to analyze bank credit supply decisions following monetary policy changes, separate from their effect on the demand for bank loans. Aggregating the bank-county level data to the bank level, we find similar results. For a given bank and year, one standard deviation higher expansion into trading assets is associated with 1.5% higher SBL following a one standard deviation increase in the Fed funds rate. Banks with one more investment banking subsidiary maintain 0.23% higher SBL following a one standard deviation increase in the Fed funds rate. These results indicate that the effect of universal banking on the origination of new loans at the aggregate bank level following changes in the monetary policy remains meaningful.

We also find that the change in the bank's total lending, as well as mortgage lending, is positively affected by monetary policy tightening for banks that are engaged more in trading and investment banking. This means that credit origination is higher than the debt repayments that might also exhibit a response following changes in the monetary policy, and that the observed loan originations are not purely a substitution from other types of lending.

Similar to the bank-county level analysis, we split the interaction term between expansion

into trading and investment banking and the Fed funds rate into separate components for the positive and negative changes in the Fed funds rate. We again find that the effect on SBL is concentrated in increases in the Fed funds rate.

While banks that are engaged more with non-traditional activities maintain higher SBL following monetary tightening, it may not necessarily translate to an overall increase in lending. If this increase is coming entirely at the expense of the lending of other banks, total lending may not be meaningfully affected. To understand the effect on total lending, we aggregate bank activity to the county level and compare lending dynamics across counties.

We find higher SBL levels in counties with more universal banks following a rise in the Fed funds rate. As more banks on average are characterized with positive income sensitivities to changes in monetary policy rates, the effect aggregates and further shows the reduction in the efficacy of the monetary policy transmission to the economy. This implies that universal banks have a meaningful effect on credit cycles following changes in monetary policy. The more stable credit supply after a rise in the Fed funds rate contributes to subsequent lower unemployment rates in these counties relative to other counties.

Our paper sheds new light on the tensions inherent in the Fed's regulation of the banking system and the execution of monetary policy. There is a long-standing debate in the literature and among policy makers how far banks should be permitted to expand (Yellen, 2013). Banks that operate in more areas and across multiple types of assets contribute to the credit supply and the local competition in the credit market, with a positive impact especially on households and small businesses. However, higher interdependence among banks caused by similarity of asset composition may lead to risk contagion and a rise in systemic risk.[2] We add a new dimension to this debate, by showing that universal banks weaken the transmission of monetary policy to the economy. Taken together, the potentially conflicting effects on monetary and macroprudential policy may provide an argument for the Fed to limit bank expansion into non-lending activities.

[2]Ibragimov, Jaffee, and Walden (2011); Wagner (2010); Allen, Babus, and Carletti (2012); Berger, El Ghoul, Guedhami, and Roman (2017); Chu, Deng, and Xia (2019); Goldstein, Kopytov, Shen, and Xiang (2020).

Related, in the United States, there have been many significant regulatory reforms regarding the nature of banks and their activities. Three recent reforms include the Riegel-Neal Interstate Banking and Branching Efficiency Act of 1994, the Gramm–Leach–Bliley Act in 1999, and the Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010. So far, the literature has discussed the optimal combination between macroprudential policy, bank capital regulation, and monetary policy (e.g., Angeloni and Faia, 2013; Repullo and Suarez, 2013; Collard, Dellas, Diba, and Loisel, 2017). In this paper, we present the direct implications of the Fed's regulation of banks' non-lending activities on the efficacy of the monetary policy pass-through.

We contribute to the literature on the expansion of banks into non-lending activities, and specifically into trading and investment banking. Previous studies focused on the implications of this expansion on the banking system and the real economy. Within the non-lending activities, trading is among the riskiest (De Jonghe, 2010), and banks with more exposure to trading securities had higher losses during the 1998 and 2008 crises (Fahlenbrach, Prilmeier, and Stulz, 2012). Gelman, Goldstein, and MacKinlay (2021) show that a more diversified stream of earnings enables banks to better absorb negative shocks, leading to increased and more stable lending, and positive spillovers to the economy. Our results on the effect of universal banks on the transmission of the monetary policy show a new element of how banks' expansion influences the real economy.

We also add to the literature on the increasing role of shadow banks in the financial system, and the shift of credit supply from regulated banks to less regulated, more fragile shadow banks (Elliott, Meisenzahl, Peydró, and Turner, 2019; Xiao, 2020). Conceptually, this shift has a similar underlying mechanism as the one described in this paper, as it occurs between different types of financial institutions, rather than within the banking system but among different activities as in our context. Both lead to reduction in the efficacy of the monetary policy pass-through.

The rest of the paper proceeds as follows. In Section I, we discuss the sources of data and our measures of monetary policy rates and bank expansion into non-lending activities. In Section II, we conduct the main analysis at the bank-county level of the effect on bank expansion into non-

traditional activities on the transmission of monetary policy. In Section III, we consider the implications of the effects at both the bank level and the county level. Section IV concludes.

I Data

Our data cover the universe of U.S. banks from 1997 to 2018 that report either detailed small business lending or mortgage lending activity. Throughout our paper, we consider banks at a bank holding company (BHC) level. We often refer to BHCs as banks for simplicity. This includes financial holding companies (FHCs), which are a classification of BHCs that engage in a broad range of financial activities. Most large BHCs are registered as FHCs (Avraham, Selvaggi, and Vickery, 2012).

I.A Data Sources

We next describe the data sources and variables that we use.

Bank-level data. The Federal Reserve's quarterly Y-9C (consolidated bank holding company data) reports provided by the Federal Reserve. We use data from 1996 to 2018. It contains quarterly data on the income statements, balance sheets, detailed supporting schedules, and off balance-sheet items of all bank holding companies over a certain size threshold.[3]

Small business lending data. The Federal Financial Institutions Examination Council's (FFIEC) Community Reinvestment Act (CRA) small business lending data. All banks over a certain threshold of total assets are required to report this data on an annual basis.[4] We match and aggregate the small business lending data to the BHC parent level. The data is available

[3] In our sample period, the size threshold is $150 million in assets until March 2006, when it increased to $500 million. It increased to $1 billion in March 2015 and $3 billion in September 2018. Certain BHCs below these size thresholds may also be required to file this report if they meet other criteria.

[4] For 2006 and earlier, the threshold is $250 million. Starting in 2007, the FFIEC began annual updates of the asset threshold level required for reporting. For 2007, the asset threshold was increased to $1.033 billion. By 2017, the threshold reached $1.226 billion. See `https://www.ffiec.gov/cra/reporter.htm` for the yearly thresholds.

starting in 1996 and as we rely on lagged lending activity for some of our measures, we begin analysis in 1997.

Mortgage loans. The Home Mortgage Disclosure Act (HMDA) data. The HMDA data provide detailed annual information on the mortgage originations of bank including the geographic location of the borrower. Like other regulatory datasets, it has an asset-size threshold and some other rules based on loan origination activities that determines whether a given bank needs to report the data.[5] We use HMDA data from 1996 to 2018 to match the CRA data.

Quarterly organizational structure. The FFIEC's National Information Center (NIC) data. The data provide the complete subsidiary structure of each bank, including the institution names, Federal Reserve identifiers (RSSD IDs), location, and a categorization of each institution type.[6] We use this data primarily to identify the presence of broker-dealer subsidiaries in the bank's organizational structure, which are the common classification for subsidiaries involved in investment banking activities.

Branch-level deposits. The Federal Deposit Insurance Corporation (FDIC) Summary of Deposits data. The data cover the universe of U.S. bank branches at an annual frequency. The data has information on branch characteristics such as the parent bank, address, and amount of deposits. We aggregate this deposit data to the bank-county level to measure of local deposit market share.

Fed funds data. The effective Fed funds rate is taken from the St. Louis Fed's Federal Reserve Economic Data (FRED). We use the average quarterly rate. Depending on the analysis, we either take the quarterly change in the Fed funds rate or the year-over-year change in the Fed funds rate. For our analysis that uses the unexpected component of the change in the Fed funds rate, we follow Kuttner (2001) and Gertler and Karadi (2015) and use the change in the price for the current Fed funds futures contract between the day of an FOMC announcement and the

[5] In general, these size thresholds are adjusted annually with inflation and are much lower than the CRA thresholds. For example, the threshold for 2018 was $45 million.

[6] The NIC data is generated from FR Y-6 *Annual Report of Bank Holding Companies* and FR Y-10 *Report of Changes in Organizational Structure*. See Avraham, Selvaggi, and Vickery (2012) for an overview of BHC organizational structures and other regulatory details.

prior day's value. We take the quarterly average of these changes.

I.B Main Explanatory Variables

The analysis focuses on two major of non-traditional bank activities for commercial banks: trading and investment banking. To measure each bank's exposure to trading activity, we use the size of its trading assets as a share of total assets. For investment banking, there is no clear analogue on the bank's balance sheet. To capture the degree of a bank's exposure to investment banking, we follow Gelman, Goldstein, and MacKinlay (2021) and use the number of broker-dealer subsidiaries in the bank's organizational structure. For bank holding companies, subsidiaries that engage in typical investment banking activities are reported as securities broker-dealers in the NIC data.

Besides the exposure of banks to these activities in terms of assets or subsidiaries, we also consider their income. Specifically, we use quarterly trading income or quarterly investment banking income scaled by the average bank assets over that quarter. We use these measures to estimate each bank's sensitivity to changes in monetary policy rates.

For monetary policy rates, our main measure is the one-year lagged change in the Fed funds rate. When estimating bank sensitivities to changes in Fed funds rates, we use a series of quarterly changes in the Fed funds rate rather than the one-year change.

I.C Other Bank and County Variables

Our main dependent variable is small business lending estimated as the total volume originated by a bank in a year. Small-business loans are those loans whose original amounts are $1 million or less and fall into either the "Loans secured by nonfarm or nonresidential real estate" or "Commercial and industrial loans" categories on a bank's balance sheet. Importantly for our purposes, this small business lending data is reported at a county-level, which allows us to more robustly control for economic conditions in the specific area. For some of the later analysis, we

aggregate this data to either the bank level or aggregate county level.

Some analysis uses mortgage lending data. Like the small business lending data, these are the total amount of loans originated by banks as reported in HMDA data on an annual basis. We focus on the data at a county level. We also calculate the change in the bank's total lending as the one-year change in total loans as reported on the bank's balance sheet.

Apart from lending data, we include other common bank-level variables such as the natural logarithm of total assets, equity to assets, and deposits to assets. As a measure of bank profitability, we calculate the bank's average quarterly ROA over the past three years, and the bank's Z-Score as a measure of the total risk of the bank. We also use the bank's average annual loan growth over the past three years and its net interest margin. We calculate the bank's deposit share in each county it lends as its reported deposits from the prior year as a fraction of the total deposits in a county. We also use the reported average unemployment rate in a year for each county. The summary statistics for these variables are reported in Table I.

II Effects on Lending

II.A Non-Lending Activities and Small Business Lending

In our setting, the null hypothesis is that a bank's non-lending activities should not affect how its lending activities respond to changes in monetary policy rates, since we control for other bank characteristics that have been shown to influence the transmission of monetary policy. To formally test this hypothesis, we run the following regression:

$$\begin{aligned}\text{Log SBL}_{ict} = {} & \gamma_1 \text{Chg. FF Rate}_{t-1} + \gamma_2 \text{Non-Lending}_{it-1} + \gamma_3 \text{Non-Lending}_{it-1} \times \text{Chg. FF Rate}_{t-1} \\ & + \gamma_4 \text{Bank Controls}_{it-1} + \gamma_5 \text{Bank-County Controls}_{ict-1} + \lambda_{ic} + \mu_{ct} + \varepsilon_{ict} \qquad (1)\end{aligned}$$

Here we choose to focus on small business lending for bank i in county c in year t. We begin the analysis with small business lending as it is sector that is very dependent on bank capital and is a focus of the Federal Reserve during its monetary policy interventions.[7] Here we use two measures of non-lending activities (*Non-Lending*): trading assets scaled by total assets and the number of broker-dealer subsidiaries. Following Gelman, Goldstein, and MacKinlay (2021), the latter measure serves as our proxy for how involved the bank is in investment banking type activities. We also include both bank-level and bank-county-level controls, including the bank's size, net interest margin (NIM), loan growth, Z-score, ROA, equity and deposit ratios, and its share of deposits in county c. We also include bank-county fixed effects (λ_{ic}) and county-year fixed effects (μ_{ct}). These control for persistent differences across banks which lend in a given county and for any time-varying effects in economic conditions in a given county, respectively. Given the application of county-year fixed effects, we can interpret differences in bank lending decisions within a county to be attributable to differences in bank supply decisions rather than county-level demand factors. Standard errors are clustered at the bank level.

The results are presented in Table II. Panel A presents the results for trading activities and and Panel B presents the results for investment banking activities. Dividing the sample into terciles by trading assets, Columns 1 and 2 of Panel A present the results for the highest tercile and lowest tercile of banks. For Column 1, which includes banks with trading assets of approximately 1% of total assets or larger, we see that these banks increase small business lending when the Fed funds rate increases. For Column 2, which is comprised banks with no trading assets, we see there is no statistically significant effect of the Fed funds rate on small business lending. These estimates are while controlling separately for the bank's size, net interest margin, county-level deposit share, and any persistent differences across banks in a county using bank-county level fixed effects. Heterogeneity in banks' non-lending activities is associated with a differential response to changes in monetary rates.

[7] One example is the implementation of the Main Street Lending Program to support small and medium-sized businesses during the initial impact of the COVID-19 pandemic. See `https://www.federalreserve.gov/monetarypolicy/mainstreetlending.htm`.

To more formally test this heterogeneity, in Columns 3 and 4 we run Equation (1) for the full sample and include an interaction term for trading assets and changes in the Fed funds rate. Here we find a consistent positive effect of more trading assets on the relationship between lending and the Fed funds rate. This interaction remains highly significant when we introduce county-year fixed effects to rule out any time-varying demand factors driving the county lending results (Column 4). In terms of economic magnitude, for a one standard deviation positive change in the Fed funds rate, banks with one higher standard deviation in trading assets are associated with 7.9% more small business lending (using the estimates from Column 4).

In Panel B of Table II, we repeat the same specifications but instead focus on investment banking activities as the source of non-lending activity. In Columns 1 and 2, we split the sample into the highest tercile by investment banking activity (4 or more broker-dealer subsidiaries) and the lowest tercile (no broker-dealer subsidiaries), respectively. Again, we find that the banks with the most investment banking activity increase lending when Fed funds rate change in a positive direction. There is no statistically significant effect for the banks with little or no investment banking activity. In Columns 3 and 4, we instead interact the number of broker-dealer subsidiaries with the change in Fed funds rates over the full sample. We again find that more investment banking activity is associated with a statistically significant increase in lending. The result continues to hold when we introduce county-year fixed effects in Column 4. In terms of economic magnitude, an additional investment banking subsidiary and a one standard deviation change in the Feds funds rate is associated with 0.3% more small business lending (based on Column 4).

II.B Mechanism Behind the Effect on Lending

In Table II, we find that the more non-lending activities a bank engages in, the more small business lending it provides for a given change in the Fed funds rate. We note that this effect is found while controlling for the bank's size, NIM, and county-level deposit share among other

characteristics. Trading and investment banking activities appear to affect the transmission of monetary policy through the bank's small business lending.

To better understand the mechanism behind the results, we next look at how the bank's trading income relates to Fed fund rates. To measure how sensitive a bank's trading income is the Fed funds rate, we take an approach similar to Drechsler, Savov, and Schnabl (2021). Specifically, we run the following specification:

$$\text{Non-Lending Income to Assets}_{it} = \sum_{n=0}^{4} \beta_{it-n} \text{Chg. FF Rate}_{t-n} + \lambda_i + \varepsilon_{it} \tag{2}$$

Here *Non-Lending Income to Assets* is either the bank's reported trading income or investment banking income and is measured at the bank-quarter level. For each bank, we estimate the β_{it} for the change in the Fed funds rate for the current and past three quarters. We perform the specification in rolling ten-year windows.[8] We sum the betas for the current and prior three quarters together for each bank to create a single "trading sensitivity" or "investment banking sensitivity" for each bank in each quarter.

The distribution of the estimated sensitivities are presented in Figures 1 and 2. The average trading sensitivity in the sample is 0.019, which means that if the Fed funds rate changes by one percentage point, the average bank's trading income is 0.019 percent higher, as a share of total average quarterly bank assets. As the sample standard deviation for trading income is 0.13 as a percent of average quarterly assets, this change equates to about 14.6% of the sample standard deviation. Similarly, the average investment banking sensitivity is 0.003. For a one percentage point change in the Fed funds rate, the average bank's investment banking income increases by 2.1%, as a percentage of the sample standard deviation of investment banking income as a percent of average quarterly assets.

The fact that the average bank's trading and investment banking incomes are higher when

[8]Following Drechsler, Savov, and Schnabl (2021), we use the bank's reported average quarterly assets as our scaling variable. We also require at least ten observations within each ten-year window to include the estimated beta. The betas are winsorized at the 5% level.

the Fed funds rate increases helps explain the positive coefficients for *Trading Assets* $\times$ *Chg. FF Rate* and *No. BD Subsids.* $\times$ *Chg. FF Rate* in Table II. Banks with more exposure to these activities on average benefit with higher non-lending income. This increased income any negative effect from increases on the Fed funds rate on their overall earnings. They continue to lend more than other banks as a result.

While the average bank's trading income is predicted to be higher when the Fed funds rate increases, Figures 1 and 2 show there is significant heterogeneity. Indeed, about 42% of estimated trading sensitivities are negative, meaning that these banks are expected to have a decline in trading income when Fed funds rates go higher. Similarly, 42% of estimated investment banking sensitivities are negative. For these banks, we might expect the opposite effect of Table II. Banks with negative sensitivities and more trading or investment banking activity experience more losses and therefore have a more negative effect on overall earnings.

To see if this is the case, in Table III, we split the sample of bank-county observations into two groups according to their sensitivities. Columns 1 and 2 look at positive and negative trading sensitivities, respectively, and Columns 3 and 4 look at positive and negative investment banking sensitivities, respectively.[9] Comparing Columns 1 and 2, we see that more trading assets have opposite effects when there is a change in the Fed funds rate. Both estimates are statistically significant at the one percent level. For Column 1, the effect is positive and economically meaningful. As a marginal effect, for banks with one standard deviation higher trading assets, a one standard deviation change in the Fed funds rate is associated with 9.4% more lending. Column 2 shows the opposite: the marginal effect on lending is -3.7%, when the coefficients are scaled by their in-sample standard deviations. Consistent with the argument that the correlation between interest rates and trading income plays a role on the bank's lending decisions, we see that banks behave differently depending on whether changes in the Fed funds rate improves or harms their trading income.

[9]We classify banks using their first estimated beta during the first ten years of data in the rolling estimation. Results are similar if we exclude these years or if we use a single full-sample beta instead of the rolling window approach.

Columns 3 and 4 repeat the exercise for investment banking with similar results. We find that for banks with positive investment banking sensitivities, more investment banking activity is associated with higher levels of small business lending when Fed funds rates increase (Column 3). For negative investment banking sensitivities, we find the opposite effect (Column 4). The average marginal effect for Column 3 is a 0.3% increase in small business lending. The average marginal effect for Column 4 is a 1.5% decrease in small business lending. These estimates are found by scaling the variables by their sample standard deviations.

The question remains of why there is such heterogeneity in bank's sensitivity to changes in the Fed funds rate. Figure 3 plots the aggregate trading income as a share of total assets in the U.S. banking sector and the change in the Fed funds rate. The two series are weakly positively correlated. However, this masks a fair amount of heterogeneity in trading income. In Figure 4, trading income is split into five separate components: income from interest rate exposures, equity security exposures, foreign exchange exposures, commodity exposures, and credit exposures. Even in the aggregate, the incomes vary dramatically depending on its source. For example, income from interest rate exposures and foreign exchange exposures have a significantly negative correlation. More generally, some exposures have statistically significant positive correlation with changes in the Fed funds rate (equity and credit exposures) while others are slightly negatively correlated with changes in the Fed funds rate (interest rate, foreign exchange, and commodity exposures). Depending the specific types of trading activities undertaken by different banks, it is plausible that there can be substantial variation in how banks' trading income responds to changes to the Fed funds rate. Although similarly granular data on the types of investment banking income is not as readily available, it is likely that similar heterogeneity exists in that case as well.

II.C Distinction from Other Channels

So far, we have posited that non-traditional commercial banking activities, such as trading and investment banking, alter the transmission of monetary policy by changing the link between the bank's income and monetary policy rates. However, two alternative explanations are possible. First, the monetary policy transmission might be affected by factors that are correlated with these activities but are distinct from them. For example, if the size of the bank or its amount of liquid securities are the primary reasons for the differences in monetary policy (Kashyap and Stein, 2000). As larger banks with more liquid securities are potentially more likely to engage in trading or investment banking, these factors could be partially picked up by our main specification.

Therefore, in Column 1 of Panel A of Table IV, we interact all the included bank control variables in Table II with the change in the Fed funds rate. This approach allows other variables, such as size, NIM, or deposit share, to have a distinct effect on lending when interest rates change. In this case, we find our main effect remains, and if anything, is stronger compared to the main specification results in Column 4 of Panel A of Table II. Likewise, we find the same result for investment banking activities, presented in Column 1 of Panel B of Table IV.

The second issue is that as some changes in the Fed funds rate are anticipated, banks may adjust their lending to the anticipated change in economic conditions. If banks that are involved in more non-lending activities change their lending differentially in response for reasons not related their non-lending activities, it could contribute to your results. To see if this is the case, in Column 2 of Panel A of Table IV, we replace the total change in the Fed funds rate with the unanticipated change in the Fed funds rate. We use the unanticipated change in the Fed funds rate based on current future rates as in Kuttner (2001) and Gertler and Karadi (2015). We find a positive and statistically significant result for unanticipated changes in the Fed funds rate. In Column 3, we add interactions between surprise changes and the other bank control variables. The effect of the interaction between trading assets and surprise changes remains. In Panel

B, we repeat the specifications for the investment banking variable. In Columns 2 and 3, we find that surprise changes have a positive and statistically significant effect for banks with more investment banking activities.

II.D Asymmetric Effects of Monetary Rate Changes

Given the very different economic conditions that exist when central banks seek to implement contractionary or expansionary monetary policy, it is not obvious that banks will react in a symmetric manner to increases and decreases in the monetary rates. To investigate this issue, in Table V, we split the changes in the Fed funds rate into positive and negative components. While we find that separately the positive and negative changes have the same sign and are highly significant—for both trading activity (Panel A) and investment banking activity (Panel B)—in both cases the magnitudes differ markedly. In Panel A, the effect associated with positive changes in the Fed funds rate is about 3.8 times larger than the effect associated with negative changes (comparing Columns 1 and 2). The difference in Panel B is even more, where the coefficient associated with positive rate changes is about 6.5 times larger than the negative rate changes. Further, in specifications that include both positive and negative rate changes as separate controls, we find that the negative rate changes lose statistical significance.

Overall, these results suggest that banks are much more responsive to increases in the Fed funds rate when it comes to non-traditional commercial lending activities and their effect on lending. In unreported analysis, we find an explanation in line with our discussion in Section II.B. We re-estimate the sensitivities of the non-lending activities following Equation (2) but instead allow for separate beta estimates for positive and negative changes in the Fed funds rate. When comparing these two sensitivities within the same bank, on average we find the magnitude of the positive rate trading sensitivities to be about 5.6 times larger than the negative rate trading sensitivities. Similarly, we find the positive rate investment banking sensitivities to

be about 9.5 times larger in magnitude than the negative rate investment banking sensitivities.[10] It appears that trading and investment banking income are more sensitive to increases rather than decreases in the Fed funds rate.

II.E Other Types of Lending

So far, we have focused on the role of banks' commercial lending activities—and small business lending in particular—where we are able to clearly identify the location of the borrower. While an important contributor to economic activity, it is not the only type of lending that the Federal Reserve would hope to influence when implementing monetary policy. In this section, we consider another major source of bank lending, mortgages. Here we use the HMDA dataset as it also allows us to identify the location of the borrower at the county level.

We therefore run the specification in Equation (1) but instead consider the log of the total amount of mortgages originated by bank i in county c in year t. The results for trading activities and investment banking activities are presented as Panels A and B of Table VI.

Column 1 of Panel A presents the effect of changes in the Fed funds rate and the bank's trading activity over the full sample. Like with small business loans, we find a positive and statistically significant effect on overall mortgage lending. As a marginal effect, one standard deviation more trading assets lead to a bank to originate 3.8% more mortgages for a one standard deviation change in the Fed funds rate. While not as large as the 7.9% effect for small business lending (Column 4 of Panel A of Table II), it appears that the weakening effect of universal banks on the transmission of the monetary policy also applies to mortgage lending.

In Columns 2 and 3, we next split the sample into those banks with positive or negative trading sensitivities, respectively. Here we find that the effect is concentrated in those banks with positive trading sensitivities. For the banks that have trading incomes that drop when Fed funds rates increase, we find a negative but statistically insignificant effect. Finally, in Column

[10] Specifically, we take the absolute value of the positive beta divided by the negative beta for each bank-quarter. The ratio between the sensitivities are winsorized at the 1% level.

4, we split the changes in the Fed funds rate into positive and negative components. Similar to Panel A of Table V, we find the effect is stronger for positive changes in the Fed funds rate.

Panel B repeats the analysis for investment banking. We again find that more investment banking activities are associated with more mortgage lending when the Fed funds rate increases (Column 1). In terms of economic magnitude, each additional investment banking subsidiary is associated with 0.3% more mortgage lending for a one standard deviation increase in the Fed funds rate. This effect is quite similar in magnitude to the effect of investment banking on small business lending (Column 4 of Panel B of Table II).

Columns 2 and 3 of Panel B split the sample into banks with positive or negative investment banking income sensitivities. Similar to the trading income sensitivities, the positive and statistically significant result is found in those banks with a positive investment banking beta. Column 4 splits Fed funds changes into positive and negative components; the result is concentrated in rate increases rather than rate decreases. Overall, there appears to be similar effects at work for mortgage lending as small business lending.

III Aggregate Effects

In the previous sections we presented the results of the bank-county level analysis. This granular level enabled us to separate the bank's credit supply from the demand fluctuations for bank loans following changes in the monetary policy as a function of its expansion into trading and investment banking. Now we turn to analyze the aggregate effects. In Section III.A, we investigate whether the effects also hold at the BHC level. In Section III.B, we study the aggregate SBL at the county-level, and the corresponding real effects.

III.A Bank-Level Analysis

In this section we investigate whether the effects also hold at the BHC level by aggregating the bank-county data to the bank level. Panel A in Table VII presents the results of the analysis at the bank level for expansion into trading and Panel B for investment banking. Columns 1 and 3 in each panel present the results for all the changes in the Fed funds rate, while in Columns 2 and 4, we split between monetary tightening and easing. We show the results for our baseline specification for SBL (Columns 1-2 in each panel), and for mortgage lending (Columns 3-4).

The results at the bank level are consistent with the bank-county level results, indicating that universal banks meaningfully weaken the transmission of the monetary policy by maintaining the origination of new loans at the aggregate bank level. In Column 1 of Panel A, the coefficient of the interaction between trading assets share and the change in the Fed funds rate is significantly positive. The magnitude is also economically significant. For a given bank and year, a one standard deviation higher exposure to trading, is associated with 1.5% more stable SBL following a one standard deviation increase in the Fed funds rate. Thus, credit supply of banks engaged more with trading is less sensitive to changes in the monetary policy.

Splitting the interaction term into positive and negative changes in the Fed Funds rate, we find in Column 2 that the effect in SBL is concentrated in increases in the Fed Funds rate. The effect of one standard deviation more trading assets is 1.8% higher SBL following a one standard deviation increase in the Fed funds rate. As at the bank-county level, we do not find a consistently significant relationship between the reductions in the Fed funds rate and the transmission of the monetary policy. Our results are similar for mortgage lending.

For investment banking, the effects are similar to the ones for trading. An additional investment banking subsidiary is associated with 0.23% higher SBL following a one standard deviation increase in the Fed funds rate. As with trading, the effect is concentrated in increases in the Fed Funds rate.

The analysis at the bank level enables us to also explore total lending, and not only for spe-

cific segments of lending. As changes in the monetary policy may also affect debt repayments, the net change in bank lending is not clear. Therefore, we perform a similar analysis, changing the outcome variable to the change in the bank's total credit supply. Panel C presents Table VII the results both for trading and investment banking. Consistent with the previous results, we find that the change in the bank's total lending is positively affected by monetary policy tightening in universal banks. This means that loan originations are higher than the debt repayments, and that they are not purely a substitution from other types of lending.

III.B Aggregate SBL and Real Effects

Now we turn to study the aggregate SBL at the county-level, and the corresponding real effects. While universal banks maintain higher SBL following monetary tightening, it does not necessarily translate to an aggregate increase in lending. If this increase is coming entirely at the expense of the lending of other banks, total lending may not be meaningfully affected. To understand the effect of universal banks on county-level lending following changes in the monetary policy, we aggregate banks to a county level and compare lending dynamics across counties by performing the following county-level specification:

$$\begin{aligned}\text{Log SBL}_{ct} =& \gamma_1 \text{Chg. FF Rate}_{t-1} \times \text{Non-Lending}_{ct-1} + \gamma_2 \text{Bank Controls}_{ct-1} \\ &+ \alpha_{LMA} + \mu_t + \varepsilon_{ct} \end{aligned} \tag{3}$$

Where the outcome variable is the aggregated small business lending for county c in year t. All the explanatory variables are calculated by weighting each bank by its small business loans. We use similar two measures of non-lending activities (*Non-Lending*): the county-average ratio of trading to total assets among banks that operate in the county, and the county-average number of broker-dealer subsidiaries. We include labor market area (LMA) fixed effects (α_{LMA}) and

year fixed effects (μ_t).[11] Standard errors are clustered by county.

To study the real effects, we conduct the same county-level specification, changing the outcome variable to the unemployment rate of county c in year t.

Table VIII presents the results for the county level. Columns 1 and 3 present the results for the aggregated county SBL, Columns 2 and 4 for the county unemployment. In Columns 1-2 we study the aggregate effect of expansion into trading, and in Columns 3-4 we study the aggregate effect of engagement with investment banking.

We find higher county-level SBL levels in counties with more banks that expand into both trading and investment banking following a rise in the Fed funds rate. As more banks on average are characterized with positive income sensitivities to changes in the monetary policy, the effect is aggregated and further shows the reduction in the efficacy of the monetary policy transmission to the economy. This more stable credit supply following a rise in the Fed funds rate contributes in turn to lower unemployment rates.

Taken together, expansion of banks into trading and investment banking reduces the transmission of the monetary policy, but maintains lending and reduces unemployment following increases in the Fed funds rate. Thus, universal banks have also a meaningful effect on credit cycles.

IV Conclusions

We establish that universal banks reduce the efficacy of the monetary policy. The expansion of banks into non-commercial banking activities reduces the sensitivity of their earnings to changes in monetary policy rates for the majority of banks. When the Fed funds rate rises, banks with more stable earnings have more resources to maintain credit supply, which in turn

[11] A LMA—defined by the BLS—is an economically-integrated area within which individuals can reside and find employment within a reasonable distance or can readily change jobs without changing their place of residence. We use LMA fixed effects to control for persistent differences in labor market areas that might affect county-level lending.

reduces the monetary policy pass-through to the economy. This channel is distinct from existing theories of monetary policy transmission, and the results are robust to monetary policy shocks. The effect of this channel is asymmetrically concentrated in a tightening monetary policy environment, as banks' stream of non-lending earnings is larger in these periods relative to expansionary policy periods.

The effect of universal banks on the transmission of the monetary policy is a new element of how the expansion of banking activities affects the real economy. The results shed a new light on the implications for the Fed's execution of monetary policy and its effect on the economy, as well as for regulation of banks' non-traditional activities. The potentially conflicting effects on monetary and macroprudential policy may provide an argument for the Fed to limit bank expansion into non-lending activities.

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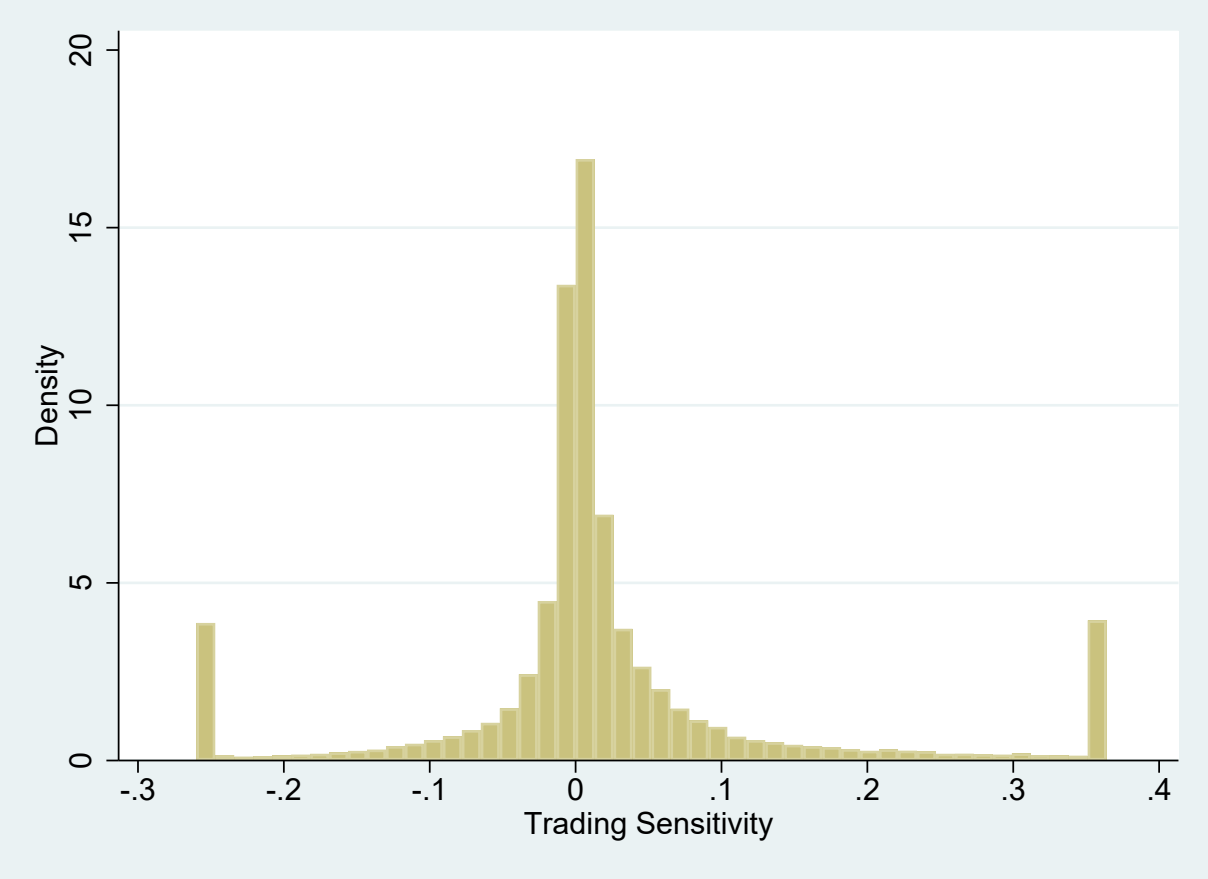

Figure 1: Distribution of Trading Sensitivities

The trading sensitivities are estimated by regressing the bank's quarterly trading income on the contemporaneous and prior three quarterly changes in the Fed funds rate. Sensitivities are winsorized at the 5% level.

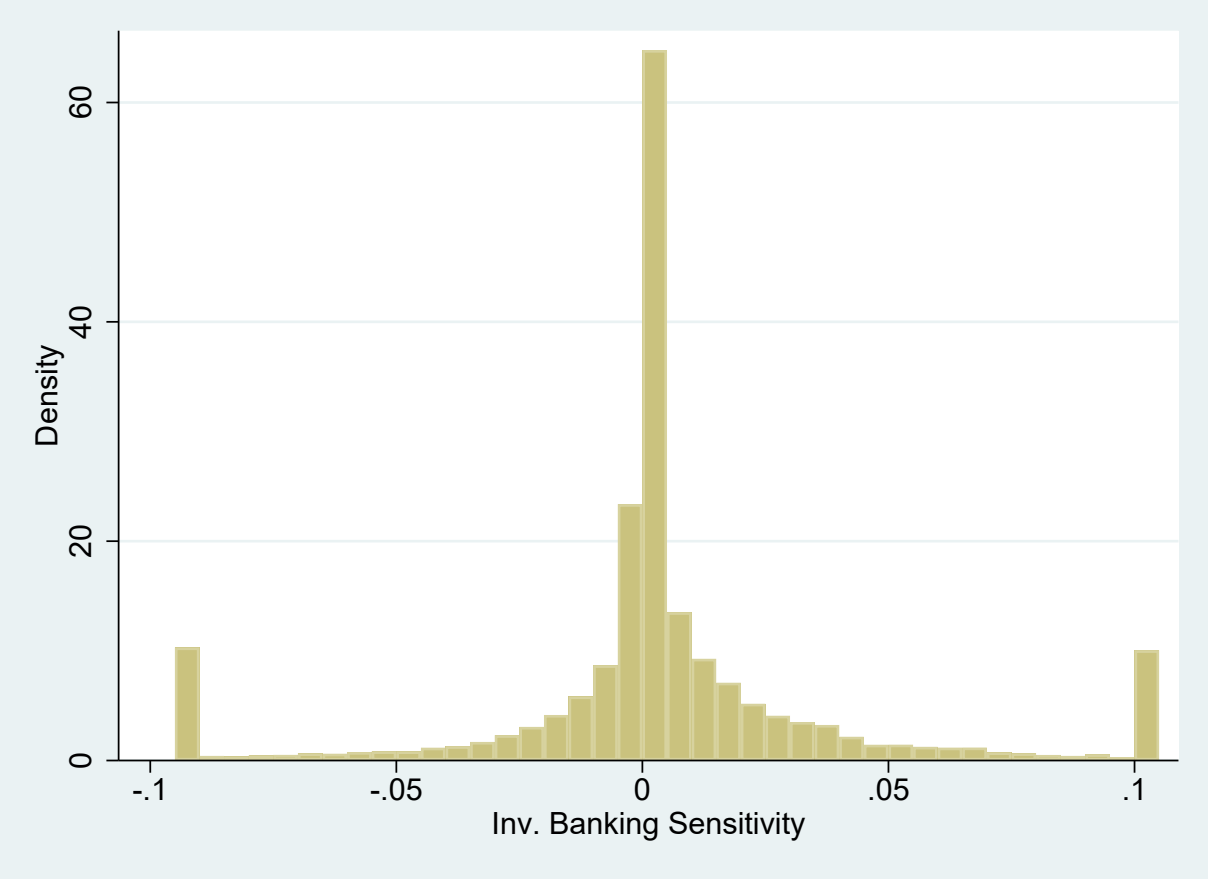

Figure 2: Distribution of Investment Banking Sensitivities

The investment banking sensitivities are estimated by regressing the bank's quarterly investment banking income on the contemporaneous and prior three quarterly changes in the Fed funds rate. Sensitivities are winsorized at the 5% level.

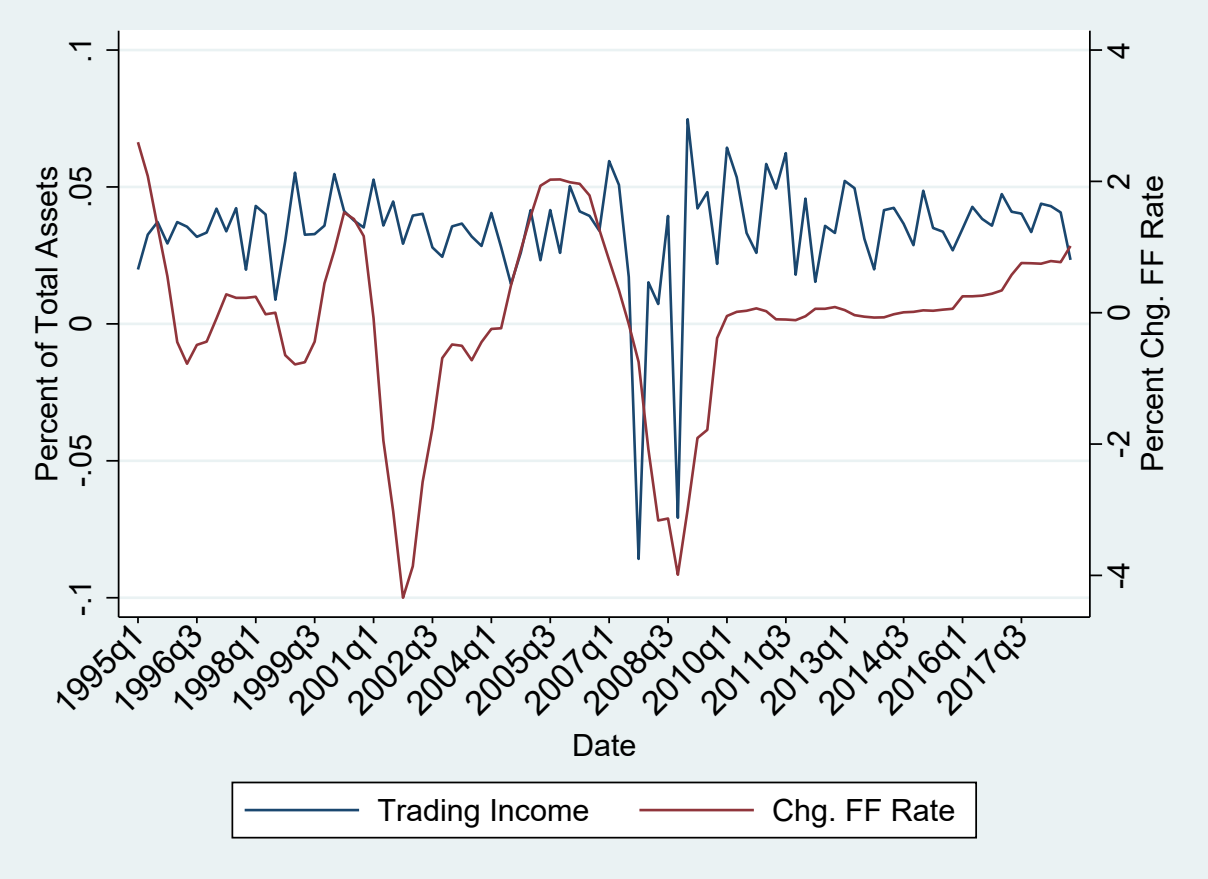

Figure 3: Aggregate Trading Income and the Fed Funds Rate

The figure presents the aggregate banking-sector trading income scaled by the aggregate total assets for each quarter from from 1995q1 to 2018q4. It also plots the year-over-year change in the Fed funds rate for each quarter.

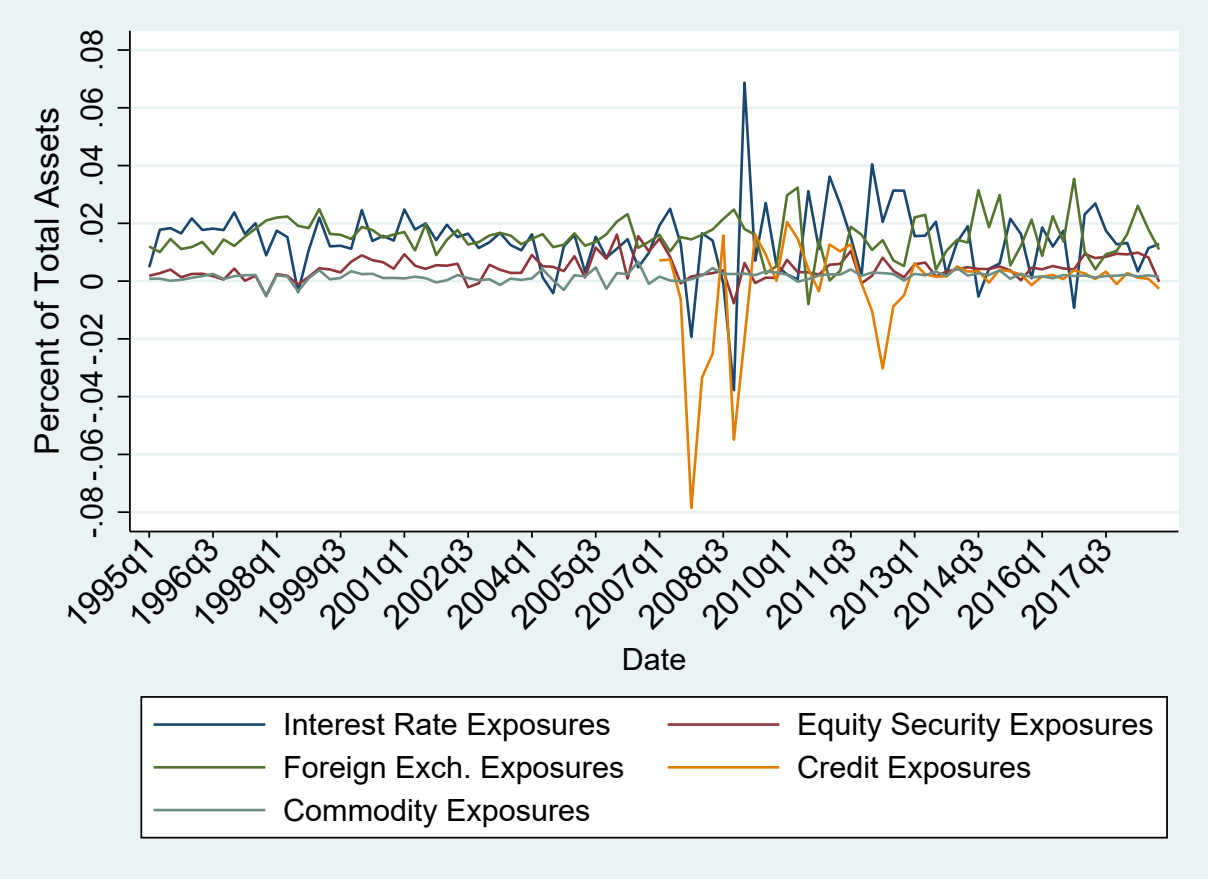

Figure 4: Aggregate Trading Income Exposures

The figure presents five components of the aggregate banking-sector trading income scaled by the aggregate total assets for each quarter from 1995q1 to 2018q4.

Table I: Summary Statistics

This table presents the summary statistics for our main variables. Our sample is from 1997-2018. *Bank Variables* are constructed at a BHC-level. *Bank-County Variables* are reported at a county-level for each BHC, *County Variables* are at an aggregate county level, and *Macroeconomic Variable* is reported at a national level.

	Mean	Std Dev	25th Pctile	Median	75th Pctile	# Obs.
Bank Variables						
Small Business Loans	468441.1	1874970.7	41501	87217.5	202896	5,896
Mortgage Loans	1218631.7	10976524.9	6813	52596.5	163760.5	5,896
Trading Assets	0.0028	0.018	0	0	0	5,807
Trading Income to Assets	-0.00012	0.0029	-0.00010	0	0.00010	5,738
Trading Sensitivity	0.021	0.11	-0.0093	0.0038	0.031	3,234
No. BD Subsids.	0.82	5.40	0	0	0	5,486
Investment Banking Inc. to Assets	0.00078	0.0053	0	0.00020	0.00057	4,837
Investment Banking Sensitivity	0.0059	0.037	-0.0026	0.00057	0.016	1,848
Bank Size	14.4	1.55	13.3	14.1	15.0	5,896
Bank NIM	0.035	0.0070	0.030	0.034	0.039	5,896
Bank Loan Growth	0.29	0.29	0.12	0.27	0.44	5,896
Bank Z-Score	63.1	28.4	46.9	61.2	77.3	5,896
Bank ROA	0.0036	0.0023	0.0028	0.0038	0.0048	5,896
Bank Equity to Assets	0.094	0.028	0.077	0.091	0.11	5,896
Bank Deposits to Assets	0.78	0.090	0.74	0.80	0.85	5,896
Bank-County Variables						
Small Business Loans	5882.8	25312.8	128	650	3037	532,986
Mortgage Loans	16412.0	130080.8	232	1113	5736	532,986
County Deposit Share	0.083	0.20	0	0	0.040	532,986
County Variables						
Small Business Loans	59110.7	205593.2	2689	9601.5	35898	67,430
Unemployment Rate	6.29	3.10	4.20	5.60	7.60	67,430
Macroeconomic Variables						
Chg. FF Rate	-0.21	1.45	-0.45	0.037	0.45	22
Pos. Chg. FF Rate	0.33	0.55	0	0.037	0.45	22
Neg. Chg. FF Rate	-0.54	1.20	-0.45	0	0	22
Surprise Chg.	-0.44	0.80	-0.76	-0.39	-0.0079	22
Surprise Pos. Chg.	0.10	0.38	0	0	0	22
Surprise Neg. Chg.	-0.55	0.62	-0.76	-0.39	-0.0079	22

Table II: Non-Lending Activities and Monetary Policy Pass-through

This table measures the sensitivity of annual bank small business lending (SBL) on changes in the Fed funds rate and the bank's degree of expansion into trading or investment banking from 1997–2018 at the bank-county level. Panel A considers bank trading activities. Column 1 is the lowest tercile of banks by share of trading assets, Column 2 is the highest tercile of banks by share of trading assets, and Columns 3 and 4 use the full sample. Panel B considers bank investment banking activities. Column 1 is the lowest tercile of banks by number of broker-dealer subsidiaries, Column 2 is the highest tercile of banks by by number of broker-dealer subsidiaries, and Columns 3 and 4 use the full sample. Standard errors are clustered by bank.

	Panel A: Trading Activities			
	Log SBL			
	High Trading Assets	Low Trading Assets	Full Sample	
	(1)	(2)	(3)	(4)
Chg. FF Rate	0.0892***	0.00776	-0.00575	
	(0.0300)	(0.00952)	(0.00695)	
Trading Assets			5.674**	3.080
			(2.317)	(2.011)
Trading Assets × Chg. FF Rate			0.980***	0.826***
			(0.0750)	(0.0596)
Bank Size	0.582***	0.709***	0.786***	0.853***
	(0.139)	(0.0667)	(0.0686)	(0.114)
Bank NIM	-12.59	10.39***	17.22***	17.58***
	(15.28)	(3.301)	(4.925)	(6.792)
Bank Loan Growth	0.0840	0.200***	0.175	0.254**
	(0.364)	(0.0729)	(0.175)	(0.128)
Bank Z-Score	-0.00650***	0.000574	-0.00311**	-0.00229
	(0.000811)	(0.00103)	(0.00131)	(0.00143)
Bank ROA	153.6**	27.11***	66.87***	22.69
	(61.09)	(9.926)	(24.99)	(22.38)
Bank Equity to Assets	5.837	3.739	-0.461	-0.507
	(7.338)	(4.265)	(3.312)	(2.603)
Bank Deposits to Assets	-4.001***	0.325	-0.675	0.403
	(1.207)	(0.428)	(0.638)	(0.715)
County Deposit Share	1.724***	0.750***	1.337***	1.286***
	(0.355)	(0.0868)	(0.137)	(0.103)
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
County-Year Fixed Effects	No	No	No	Yes
Observations	300,224	288,660	900,998	899,631
Adjusted R^2	0.789	0.771	0.780	0.789

Standard errors in parentheses. * p<.10, ** p<.05, *** p<.01

Table II: Non-Lending Activities and Monetary Policy Pass-through—*Continued*

	Panel B: Investment Banking Activities			
	Log SBL			
	High No. BD Subsids.	Low No. BD Subsids.	Full Sample	
	(1)	(2)	(3)	(4)
Chg. FF Rate	0.0834**	0.0106	0.00973	
	(0.0381)	(0.00990)	(0.0101)	
No. BD Subsids			0.00505	0.00538
			(0.0112)	(0.00802)
No. BD Subsids × Chg. FF Rate			0.00218***	0.00189***
			(0.000473)	(0.000373)
Bank Size	0.650***	0.711***	0.747***	0.865***
	(0.142)	(0.0563)	(0.0630)	(0.124)
Bank NIM	-4.630	14.82***	8.054	11.72*
	(18.02)	(3.694)	(6.451)	(6.420)
Bank Loan Growth	0.0948	0.279***	0.176	0.257*
	(0.360)	(0.0927)	(0.201)	(0.143)
Bank Z-Score	-0.00719***	-0.0000427	-0.00369***	-0.00224*
	(0.00190)	(0.000975)	(0.00136)	(0.00122)
Bank ROA	187.3***	23.07**	70.09**	19.60
	(64.51)	(8.974)	(31.45)	(29.22)
Bank Equity to Assets	9.360	5.287	0.519	0.699
	(8.735)	(3.857)	(3.570)	(2.802)
Bank Deposits to Assets	-4.040***	0.446	-1.200	0.372
	(1.310)	(0.547)	(0.769)	(0.584)
County Deposit Share	2.006***	0.780***	1.364***	1.304***
	(0.408)	(0.0942)	(0.131)	(0.106)
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
County-Year Fixed Effects	No	No	No	Yes
Observations	261,278	289,942	832,027	830,669
Adjusted R^2	0.786	0.793	0.778	0.789

Standard errors in parentheses. * p<.10, ** p<.05, *** p<.01

Table III: Non-Lending Betas and Monetary Policy Pass-through

This table measures the sensitivity of annual bank small business lending (SBL) on changes in the Fed funds rate and the bank's degree of expansion into trading or investment banking from 1997–2018 at the bank-county level. Columns 1 and 3 only use the sample of bank observations with non-negative trading or investment banking sensitivities. Columns 2 and 4 only use the sample of banks with negative trading or investment banking sensitivities. *Additional Controls* includes the same set of control variables as in Table II. Standard errors are clustered by bank.

	Log SBL			
	$\beta_{trad} >= 0$	$\beta_{trad} < 0$	$\beta_{ibank} >= 0$	$\beta_{ibank} < 0$
	(1)	(2)	(3)	(4)
Trading Assets	2.488	-1.279		
	(2.159)	(3.164)		
Trading Assets × Chg. FF Rate	0.849***	-1.368***		
	(0.0613)	(0.501)		
No. BD Subsids.			0.00415	-0.0704***
			(0.0104)	(0.0130)
No. BD Subsids. × Chg. FF Rate			0.00187***	-0.0111***
			(0.000401)	(0.00341)
Additional Controls	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	584,498	220,851	450,105	175,690
Adjusted R^2	0.791	0.809	0.815	0.810

Standard errors in parentheses. * p<.10, ** p<.05, *** p<.01

Table IV: Non-Lending Activities and Monetary Policy Pass-through, Robustness

This table measures the sensitivity of annual bank small business lending (SBL) on changes in the Fed funds rate and the bank's degree of expansion into trading or investment banking from 1997–2018 at the bank-county level. Panel A focuses on bank trading activities and Panel B focuses on bank investment banking activities. *Surprise Chg.* is the unexpected change in the Fed funds rate from the end of the prior year. *Additional Controls* includes the same set of control variables as in Table II. Standard errors are clustered by bank.

	Panel A: Trading Activities		
		Log SBL	
	(1)	(2)	(3)
Trading Assets	3.156*	2.446	2.787*
	(1.807)	(1.666)	(1.493)
Trading Assets × Chg. FF Rate	1.246***		
	(0.121)		
Trading Assets × Surprise Chg.		0.474***	0.963***
		(0.119)	(0.259)
Additional Controls	Yes	Yes	Yes
Additional Interactions	Yes	No	Yes
Bank-County Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes
Observations	899,631	844,822	844,822
Adjusted R^2	0.790	0.788	0.789
	Panel B: Investment Banking Activities		
		Log SBL	
	(1)	(2)	(3)
No. BD Subsids.	0.00450	0.00309	0.00360
	(0.00752)	(0.00632)	(0.00631)
No. BD Subsids. × Chg. FF Rate	0.00198***		
	(0.000540)		
No. BD Subsids. × Surprise Chg.		0.00154*	0.00223***
		(0.000810)	(0.000788)
Additional Controls	Yes	Yes	Yes
Additional Interactions	Yes	No	Yes
Bank-County Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes
Observations	830,669	830,669	830,669
Adjusted R^2	0.789	0.788	0.788

Standard errors in parentheses. * p<.10, ** p<.05, *** p<.01

Table V: Non-Lending Activities and Monetary Policy Pass-through, Asymmetry

This table measures the sensitivity of annual bank small business lending (SBL) on changes in the Fed funds rate and the bank's degree of expansion into trading or investment banking from 1997–2018 at the bank-county level. Panel A focuses on bank trading activities and Panel B focuses on bank investment banking activities. Changes in the Fed funds rate are split into positive changes *Pos. Chg. FF Rate* and negative changes *Neg. Chg. FF Rate*. *Pos. Chg. FF Rate* takes a value of zero if there is a negative rate change and *Neg. Chg. FF Rate* takes a value of zero if there is a positive rate change. *Additional Controls* includes the same set of control variables as in Table II. Standard errors are clustered by bank.

	Panel A: Trading Activities		
	Log SBL		
	(1)	(2)	(3)
Trading Assets	1.225	3.396*	1.633
	(2.028)	(1.955)	(2.280)
Trading Assets × Pos. Chg. FF Rate	2.609***		2.408***
	(0.387)		(0.524)
Trading Assets × Neg. Chg. FF Rate		0.681***	0.286
		(0.122)	(0.207)
Additional Controls	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes
Observations	899,631	899,631	899,631
Adjusted R^2	0.790	0.789	0.790
	Panel B: Investment Banking Activities		
	Log SBL		
	(1)	(2)	(3)
No. BD Subsids.	-0.000152	0.00504	0.0000387
	(0.00789)	(0.00719)	(0.00757)
No. BD Subsids. × Pos. Chg. FF Rate	0.00843***		0.00836***
	(0.00125)		(0.00153)
No. BD Subsids. × Neg. Chg. FF Rate		0.00130***	0.0000953
		(0.000422)	(0.000523)
Additional Controls	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes
Observations	830,669	830,669	830,669
Adjusted R^2	0.790	0.788	0.790

Standard errors in parentheses. * p<.10, ** p<.05, *** p<.01

Table VI: Non-Lending Activities and Monetary Policy Pass-through, Mortgages

This table measures the sensitivity of annual mortgage lending (HMDA) on changes in the Fed funds rate and the bank's degree of expansion into trading or investment banking from 1997–2018 at the bank-county level. Panel A focuses on bank trading activities and Panel B focuses on bank investment banking activities. *Additional Controls* includes the same set of control variables as in Table II. Standard errors are clustered by bank.

	Panel A: Trading Activities			
	Log HMDA			
		$\beta_{trad} >= 0$	$\beta_{trad} < 0$	
	(1)	(2)	(3)	(4)
Trading Assets	0.861	1.586	12.58**	-0.222
	(2.659)	(2.718)	(6.246)	(2.395)
Trading Assets × Chg. FF Rate	0.397**	0.390**	-0.302	
	(0.201)	(0.184)	(0.804)	
Trading Assets × Pos. Chg. FF Rate				1.426**
				(0.627)
Trading Assets × Neg. Chg. FF Rate				0.0109
				(0.265)
Additional Controls	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	481,611	363,262	74,580	481,611
Adjusted R^2	0.756	0.775	0.751	0.757
	Panel B: Investment Banking Activities			
	Log HMDA			
		$\beta_{ibank} >= 0$	$\beta_{ibank} < 0$	
	(1)	(2)	(3)	(4)
No. BD Subsids.	-0.0204**	-0.0329***	-0.0892***	-0.0235***
	(0.00851)	(0.0109)	(0.0186)	(0.00628)
No. BD Subsids. × Chg. FF Rate	0.00227***	0.00257***	0.00236	
	(0.000291)	(0.000341)	(0.00485)	
No. BD Subsids. × Pos. Chg. FF Rate				0.00586**
				(0.00291)
No. BD Subsids. × Neg. Chg. FF Rate				0.000917
				(0.000891)
Additional Controls	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	476,111	283,241	78,283	476,111
Adjusted R^2	0.759	0.781	0.798	0.759

Standard errors in parentheses. * p<.10, ** p<.05, *** p<.01

Table VII: Bank-Level Diversification and Monetary Pass-Through

This table measures the sensitivity of a bank's aggregate small business or mortgage lending to changes in the Fed funds rate and the bank's degree of expansion into trading or investment banking from 1997–2018. Panel A focuses on bank trading activities and Panel B focuses on bank investment banking activities. *Additional Controls* includes the same set of control variables as in Table II. Analysis is conducted at the bank level and standard errors are clustered by bank.

	Panel A: Trading, Bank Level			
	Log SBL		Log HMDA	
	(1)	(2)	(3)	(4)
Trading Assets	1.799	0.782	0.464	-0.364
	(1.441)	(1.679)	(2.940)	(2.943)
Trading Assets × Chg. FF Rate	0.505***		0.946	
	(0.0950)		(0.612)	
Trading Assets × Pos. Chg. FF Rate		1.640***		1.824***
		(0.553)		(0.506)
Trading Assets × Neg. Chg. FF Rate		0.0639		0.606
		(0.196)		(0.987)
Controls	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	5,581	5,581	4,511	4,511
Adjusted R^2	0.930	0.930	0.857	0.857
	Panel B: Investment Banking, Bank Level			
	Log SBL		Log HMDA	
	(1)	(2)	(3)	(4)
No. BD Subsids.	0.00311	-0.000170	-0.0111	-0.0136
	(0.00965)	(0.00695)	(0.0159)	(0.0160)
No. BD Subsids. × Chg. FF Rate	0.00146***		0.00284***	
	(0.000272)		(0.000916)	
No. BD Subsids. × Pos. Chg. FF Rate		0.00617***		0.00642***
		(0.00140)		(0.000925)
No. BD Subsids. × Neg. Chg. FF Rate		0.0000460		0.00176
		(0.000334)		(0.00138)
Controls	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	5,270	5,270	4,386	4,386
Adjusted R^2	0.931	0.931	0.860	0.860

Standard errors in parentheses. * p<.10, ** p<.05, *** p<.01

Table VIII: Non-Lending Activities and Real Effects

This table measures the sensitivity of annual county-level small business lending (SBL) and county-level unemployment on changes in the Fed funds rate and the bank's degree of expansion into trading or investment banking from 1997–2018 at the county level. *Additional Controls* includes the same set of control variables as in Table II, but aggregated to the county level using each bank's lagged county deposit share as weights. Standard errors are clustered by county.

	Log SBL, County Level	County Unemployment	Log SBL, County Level	County Unemployment
	(1)	(2)	(3)	(4)
Trading Assets	7.066***	-2.748***		
	(1.025)	(0.848)		
Trading Assets × Chg. FF Rate	0.220**	-0.686***		
	(0.0886)	(0.167)		
No. BD Subsids.			0.0158***	-0.00252
			(0.00308)	(0.00274)
No. BD Subsids. × Chg. FF Rate			0.000600*	-0.00136**
			(0.000321)	(0.000630)
Additional Controls	Yes	Yes	Yes	Yes
LMA Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	71,883	71,883	71,883	71,883
Adjusted R^2	0.648	0.592	0.646	0.592

Standard errors in parentheses. * p<.10, ** p<.05, *** p<.01