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 monetary policy. Expansion of banks into non-commercial banking activities provides them with additional revenue in periods of rising interest rates. This enables universal banks to maintain a higher credit supply, which in turn reduces the monetary policy pass-through to the economy. The higher credit supply in counties with more universal banks leads to lower unemployment rates. This channel is distinct from existing theories of monetary policy transmission, and the results are robust to monetary policy shocks. We find that the effect is asymmetrically concentrated in tightening monetary policy environments. The results shed new light on the implications of the Fed's regulation of universal banks on the transmission of monetary policy.

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The banking system plays a central role in the transmission of monetary policy. Significant changes in the asset composition and income profile of banks affect not only the banks themselves, but also how monetary policy is transmitted to the economy. Over the last few decades, one prominent change in the U.S. is the movement toward universal banking. Commercial banks have increasingly expanded into non-lending activities such as trading, wealth management, and other advisory services. By 2017, 72% of U.S. banks engage in these activities. In this paper, we explore the effect of increased universal banking on monetary policy transmission. This development has implications not only for the Fed's execution of monetary policy, but how the Fed should regulate the banking system.

We establish that universal banks reduce the efficacy of monetary policy. As banks expand into non-commercial banking activities, they gain additional revenues during periods of monetary policy tightening. This enables universal banks to 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, and it is distinct from existing theories of monetary policy transmission.[1]

To explore the effect of bank engagement with trading and advisory services[2] on the transmission of monetary policy, we conduct a bank-county level analysis, in which the outcome variable is small business lending (SBL). As small businesses are both highly bank-dependent and economically important, monetary policy pass-through is particularly salient for these firms. Because this type of lending is reported at a granular county-level, we can better gauge to what extent lending activity is a result of bank capital supply, and not just variation in loan demand (Khwaja and Mian, 2008). To further understand the results, we also utilize bank-county level analysis to investigate mortgage lending.

[1] Other prominent theories include: the bank lending channel (e.g., Bernanke and Blinder, 1988; Kashyap and Stein, 1995, 2000); the deposits channel (Drechsler, Savov, and Schnabl, 2017; Wang, Whited, Wu, and Xiao, 2021); The balance sheet channel (Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997; Gertler and Kiyotaki, 2010; He and Krishnamurthy, 2013; Brunnermeier and Sannikov, 2014); the interest rate risk channel (Gomez, Landier, Sraer, and Thesmar, 2021).

[2] The main services included in this category are: wealth management, advisory and underwriting fees and commissions, and securities brokerage.

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 advisory services assets, we measure the advisory services activity as the number of broker-dealer subsidiaries in the bank's organizational structure (following Gelman, Goldstein, and MacKinlay, 2021). These measures of exposure to banking activity, interacted with changes in the Fed funds rate, are the principal explanatory variables in the analysis.

We find an economically and statistically meaningful effect of universal banks on monetary policy. For expansion into trading, we find 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 advisory services, for a one standard deviation increase in the Fed funds rate, banks with one standard deviation more advisory services subsidiaries maintain 5.9% higher SBL levels. Positive and statistically significant effects are also found when considering mortgage lending.

We verify that the results are not driven by other known channels of monetary policy by adding relevant variables and interactions to our main specification. Further, the specifications include rigorous fixed effects, such as county by time fixed effects to control for variation in local loan demand and bank by county fixed effects to capture persistent differences in a bank's county-specific lending activity not related to monetary policy. We also account for other bank factors that may influence lending through other means than universal banking. 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, separate from other potential influencing factors.

To establish the mechanism behind this channel, we assess the sensitivity of each bank's trading income or advisory services income to changes in the Fed funds rate over a rolling window of ten years. The idea is to capture the bank's long-term sensitivities, as income may vary following temporary fluctuations in the market or other idiosyncratic factors. Banks with more positive sensitivities exhibit higher trading or advisory services income for a given increase in

the Fed funds rate. Across banks, we find meaningful variation in the sensitivity of trading income and advisory services income. These estimates are of a similar order of magnitude as the sensitivity of a bank's net interest margin to changes in the Fed funds rate. This suggests that changes in trading or advisory services income are large enough to affect bank lending decisions.

Indeed, we find that for a one standard deviation increase in the Fed funds rate, banks with a one standard deviation higher trading sensitivity maintain 9.6% higher SBL levels. For the same change in the Fed funds rate, banks with a one standard deviation higher advisory services sensitivity maintain 3.2% higher SBL levels. These banks have more resources to maintain lending, which in turn reduces the transmission of monetary policy to the economy following a rise in the Fed funds rate.

To demonstrate the intuition behind the heterogeneity in the sensitivities among banks, we compare banks with high and low sensitivities based on a variety of bank characteristics. We find little meaningful difference on these observables, except for the degree of the bank's engagement with universal banking. Banks with more trading and advisory services have higher observed income sensitivities in these respective categories. The expansion into trading and advisory services by banks shapes their observed income sensitivities.

To understand this pattern, we first analyze trading income sensitivities by splitting trading income into main segments as detailed in the banks' Call Reports: interest rate exposures (debt instruments and interest rate contracts), foreign exchange exposures, equity securities, commodities, and other exposures. We find that the composition of banks' engagement with those activities changes as they become more universal. Generally, banks start their trading activity with interest-rate-related holdings (mainly government debt) as their main trading activity. As they expand into more trading activities—i.e., become more universal—they increase their activities in the rest of the trading exposure types. Analyzing the income sensitivity of each segment to changes in the Fed funds rate, we find that interest rate exposures are characterized by lower income sensitivities, while other activities (such as commodities and equities) exhibit

higher sensitivities.

Thus, banks with less trading activity engage more with lower sensitivity activities (debt). As they expand more into trading, they increase their exposure to activities with higher income sensitivities (commodities and equities). This makes their overall trading income sensitivities more positive, leading to a higher stream of earnings during monetary policy tightening.

In the Call Report data, advisory services income incorporates a wider umbrella of activities. The main services included in this category are: wealth management, advisory and underwriting fees and commissions, and securities brokerage. Although not as easily subdivided into segments as trading income, when we perform a similar analysis of differences in advisory services income sensitivities, we find the same pattern.

In the current rate environment, we find supportive evidence for the mechanism in banks' financial results. For example, although the recent rise in rates led to market turmoil during the second and third quarters of 2022, trading and advisory services generated higher revenues due to higher volumes.[3]

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.

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 substantially 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 leads to a higher stream of earnings that enables them to maintain lending. This translates into a weaker transmission of monetary policy. When rates are cut, the loss in income and any transmission effects are far more muted.

[3] https://www.wsj.com/articles/market-madness-sets-up-another-strong-quarter-for-banks-trading-desks-11655332894; https://www.wsj.com/articles/bad-time-for-markets-has-been-good-for-brokerages-11664832857

One may claim that as some of the changes in Fed fund rates are anticipated, the results are driven by heterogeneity in banks' expectations rather than by their expansion into non-commercial banking activities. Although this cannot fully explain why differences in lending behavior correlate with exposure to trading or advisory services, we address this concern directly by instead using monetary policy shocks as the 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). Consistent with the previous results, we find that in response to an unexpected increase in the Fed funds rate, banks with more trading and advisory services 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 standard deviation more advisory services subsidiaries maintain 1.3% higher SBL following a one standard deviation increase in the Fed funds rate. We find similar effects for mortgages. These results indicate that the effect of universal banking on the origination of loans at the aggregate bank level following changes in monetary policy remains meaningful.

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

While banks that are more engaged 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. 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 its execution of monetary policy. There is a long-standing debate in the literature and among policy makers about 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.[4] 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.

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 Riegle-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 regulatory reforms of banks' non-lending activities on the efficacy of the monetary policy pass-through.

We also relate to the literature on the effect of shadow banks on the efficacy of the monetary policy pass-through, and the increasing role of shadow banks in the financial system (Elliott,

[4]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).

Meisenzahl, Peydró, and Turner, 2019; Xiao, 2020). They show that shadow banks weaken monetary policy pass-through. Conceptually, the increased role of shadow banking and the shift toward more universal banking both lessen the importance of traditional commercial banking activity in the financial system. Our mechanism of increased income streams unrelated to traditional commercial banking is a contributing factor for shadow banks as well. Both shadow banks and universal banks lead to reduction in 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 advisory services. Previous studies focused on the implications of this expansion on the banking system, 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). 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.

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 show the channel is distinct from existing theories of monetary policy and is robust to monetary policy shocks. Section IV examines the asymmetry of the effect and its presence in other lending markets. In Section V, we consider the implications of the effects at both the bank level and the county level. Section VI 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.[5]

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.[6] We match and aggregate the small business lending data to the BHC parent level. The data is available 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

[5] 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.

[6] 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.

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.[7] We use HMDA data from 1996 to 2018 to match the CRA data.

BHC 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 on a quarterly basis.[8] 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 advisory services 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 prior day's value. We take the quarterly average of these changes.

[7] 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.

[8] 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.

I.B. Main Explanatory Variables

The analysis focuses on two major of non-traditional activities for commercial banks: trading and advisory services. To measure each bank's exposure to trading activity, we use the size of its trading assets as a share of total assets. For advisory services, there is no clear analogue on the bank's balance sheet. To capture the degree of a bank's exposure to advisory services, 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 advisory services 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 advisory services 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 growth rate 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 divided by 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

We consider whether a bank's non-lending activities affect how its lending activities respond to changes in monetary policy rates. To formally test for this effect, we run the following regression:

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

Here we 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 a sector that is very dependent on bank capital and therefore directly impacted by changes in bank lending behavior.[9] Here we use two measures of non-lending activities (*Non-Lending*): trading assets scaled by total assets and the number of broker-

[9]It has also been a more recent direct focus of the Federal Reserve. 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`.

dealer subsidiaries. Following Gelman, Goldstein, and MacKinlay (2021), the latter measure serves as our proxy for how involved the bank is in advisory services 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 include bank-county fixed effects (λ_{ic}), which control for persistent differences across banks which lend in a given county. We also incorporate either year or county-year fixed effects (μ_{ct}), which remove any time-varying effects at the macro level (for year fixed effects) or time-varying differences in economic conditions in a given county (for county-year fixed effects). With 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. Columns 1–3 use the fraction of trading assets as the measure of non-lending activity. In Column 1, we observe that banks with a higher share of trading assets originate more small business loans for a given change in the Fed funds rate.[10] In Column 2, we include various bank controls that separately influence the bank's lending decisions, such as size, net interest margin, local deposit share, and past loan growth. The interaction term between trading assets and changes in the Fed funds rate remains very similar to the estimate in Column 1 and is still statistically significant at the 1% level. In Column 3, we move from year fixed effects to county-year fixed effects. Here the estimates are interpreted as within a given county and year, and removes differences in demand across counties each year. The estimate remains very similar. 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 3).

In Columns 4–6 of Table II, we repeat the same specifications but instead focus on advisory services activities as the source of non-lending activity. We find that more advisory services

[10]Given the year or county-year fixed effects, the standalone coefficient for the *Chg. FF Rate* is absorbed.

activity is associated with more SBL for a given change in the Fed funds rate. The coefficient estimate for the interaction term (*No. BD Subsids.*$\times$*Chg. FF Rate*) is statistically significant at the 1% level and remains very similar in magnitude across all three specifications. In terms of economic magnitude, a one standard deviation increase in advisory services subsidiaries and a one standard deviation increase in the Feds funds rate is associated with 5.9% more small business lending (based on Column 6).

II.B. Mechanism Behind the Effect on Lending

II.B.1. Income Sensitivities of Universal Banks

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 advisory services 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:

$$\text{Non-Lending Income to Assets}_{it} = \sum_{n=0}^{3} \beta_{it-n} \text{Chg. FF Rate}_{t-n} + \lambda_i + \varepsilon_{it}. \tag{2}$$

Here *Non-Lending Income to Assets* is either the bank's reported trading income or advisory services 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.[11] We sum the coefficients for the current and

[11] 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 β_{it}.

prior three quarters together for each bank to create a single "trading sensitivity" or "advisory services sensitivity" for each bank in each quarter.[12]

The distribution of the estimated sensitivities are presented in Figure 1. The average trading sensitivity in the sample is 0.024, which means that if the Fed funds rate changes by one percentage point, the average bank's trading income is 0.024 percent higher, as a share of total average quarterly bank assets. There is substantial variation in trading income sensitivity across banks: the sample standard deviation is 0.25. As a point of comparison, the average net interest margin sensitivity for banks in the sample is 0.079 with a standard deviation of 0.82.[13] So trading income sensitivities are about 30% as large as overall net interest margin sensitivities. For advisory services, the average income sensitivity is 0.008 with a standard deviation of .098. While not as large as trading income, it is still a similar order of magnitude.

II.B.2. Determinants of Income Sensitivities

The question remains as to what drives the variation in income sensitivities. To understand the heterogeneity in the sensitivities among banks, we first compare banks with high and low sensitivities based on the other bank-level control variables. Splitting the sample into above and below median groups for both trading and advisory services sensitivities, we present the differences in Table A.1. We find very few meaningful differences on these observables. Banks with higher sensitivities tend to be larger and in the case of advisory services income, have lower loan growth. While a few other differences are statistically significant, the economic magnitude is small.

Next, in Figure 2, we plot the relationship between the measures of non-lending exposure and income sensitivities. While the relationship is not strictly linear, we see that both trading income sensitivity and advisory services income sensitivity are increasing in the amount of trading activity and advisory services activity that these banks undertake. For the part of the

[12] We winsorize these sensitivities at the 1% level, although results are similar with a 5% winsorization.

[13] These estimates are found by estimating Equation (2) for the bank's quarterly NIM as a share of average quarterly assets.

sample that has high exposure to these activities, the sensitivities can be more than ten times larger than the sample average.

Although the pattern is evident in the data, it is not obvious why such a pattern exists. To better understand this relationship for the case of trading, we turn to the subcomponents of trading income. In the Call Report data, trading income is split into separate components: income from interest rate exposures, equity security exposures, foreign exchange exposures, commodity exposures, and credit exposures.[14] We aggregate the Call Report data to the bank level and for each bank holding company we calculate what share of their trading income comes from these different categories. In Figure 3, we plot the average bank trading income composition as a function of its share of trading assets. We observe that for banks with relatively little trading assets, the majority of its trading income comes from interest rate exposures. This category includes income from trading on debt securities such as U.S. Treasuries or corporate debt in addition to swaps and other derivatives related to interest rates. These areas are close to the bank's core competency and therefore is not too surprising that it would be a major focus of trading activity.

However, as banks become more active in trading, the composition of their trading activities changes. The share of equity, foreign exchange, commodity, and other exposures increase. It appears that as banks become more universal (in the sense of more trading), they broaden the set of activities rather than maintaining a consistent balance of activities. This pattern is important because among the different set of activities, income from interest rate exposures is less positively affected by changes in the Fed funds rate while the other activities have more of a positive relation. In particular, for a one percent increase in the Fed funds rate, the average change for interest rate exposures is -0.02, while it is -0.004 for foreign exchange exposures, 0.003 for equity securities exposures, and 0.006 for commodities and other exposures.[15] Banks

[14]The separate category of credit exposures is only introduced later in the sample period. For comparability over the time series, we combine it with the commodity exposures variable.

[15]We calculate these associations in a manner analogous to Equation (2), but use the specific component of trading income scaled by total assets rather than overall trading income.

systematically shift to activities that are more positively affected by rate changes as they increase trading activity. This shift helps explain why we observe the increasing trading income sensitivity as a function of trading assets in Figure 2.

While as granular a breakdown of bank advisory services activity is not readily available in the bank's filings, we suspect a similar pattern exists. Banks do report two categories of income that fall under the broader category of advisory services income: fees and commissions from securities brokerage activities and investment banking, advisory, and underwriting fees and commissions. This latter category also includes the fee income from asset management and wealth management services. In this case, we again find that as banks have more advisory services subsidiaries, the share of advisory services income shifts from securities brokerage activities to the other advisory services and underwriting activities. Similar to trading, these latter activities are more positively affected by Fed funds rate changes than the brokerage activities. This pattern can help explain the relationship in Figure 2 between the sensitivity of advisory services income and the number of advisory services subsidiaries.

Overall, how banks evolve when they transition to universal banking has important implications for monetary policy. While increased trading and advisory services activities are two main ways in which banks become more universal, it is not obvious that these types of income would systematically have more a positive relation to Fed funds rate changes as banks expand. The shift into different types of activities within each of these categories helps explain this pattern.

II.B.3. Income Sensitivities and Bank Lending

In the previous sections, we showed that as banks become more universal (in terms of trading or advisory services activity), they lend more than other banks when the Fed funds rate increases. We argue the mechanism is that these activities provide positive sources of income that are more positively affected by rate increases, which enable banks to maintain more lending. If this income mechanism is underpinning the effect, the estimated income sensitivities should also be informative about how banks lend. To formally test whether sensitivities predict differences in

lending for banks, we estimate the following specification:

$$\begin{aligned}\text{Log SBL}_{ict} = {} & \gamma_1 \text{Chg. FF Rate}_{t-1} + \gamma_2 \text{Non-Lending Sensitivity}_{it-1} \\ & + \gamma_3 \text{Non-Lending Sensitivity}_{it-1} \times \text{Chg. FF Rate}_{t-1} \\ & + \gamma_4 \text{Bank Controls}_{it-1} + \gamma_5 \text{Bank-County Controls}_{ict-1} + \lambda_{ic} + \mu_{(c)t} + \varepsilon_{ict}. \end{aligned} \quad (3)$$

By design, this specification very similar to Equation (1) but uses the estimated sensitivity for trading income or advisory services income as our measure of *Non-Lending Sensitivity* instead of the exposure measures from Section II.A. As we estimate the sensitivities, we use a block bootstrap procedure to account for the measurement error. For each specification, we resample the the data by bank 100 times and estimate Equations (2) and (3) on each of these samples to calculate the standard errors.

The results are presented in Table III. In Column 1, we find that for a given change in the Fed funds rate, banks with higher trading income sensitivity have higher SBL. This effect remains similar after applying county-year fixed effects (Column 2). In terms of magnitudes, a one standard deviation increase in trading sensitivity and a one standard deviation increase in the Fed funds rate are associated with 9.6% more SBL lending. This is while controlling for the same bank variables as in Table II.

In Columns 3 and 4, we perform a similar analysis for the advisory services income sensitivity. The estimated interaction term between the sensitivity and the Fed funds rate changes are similar across both columns. Using the estimates from Column 4, one standard deviation increases in the sensitivity and Fed funds rate is associated with 3.2% more SBL.

These results are similar to the ones in the previous sections, and provide further evidence that the income sensitivity mechanism helps explain why universal banks are less affected by monetary policy tightening.

III. Alternative Explanations

III.A. Distinction from Other Channels

So far, we have posited that non-traditional commercial banking activities, such as trading and advisory services, alter the transmission of monetary policy by changing the link between the bank's income and monetary policy rates. However, there are already several other channels of monetary policy that are well established. It is possible that our variables are picking up one of these other channels. We do not think such an event is likely, as our results are focused on income from non-lending activity. Prior channels typically focus on how bank capital or liabilities are affected by monetary policy (i.e., the banking lending channel, balance sheet channel, or deposits channel), or how a bank's lending income exposure affects transmission (the interest rate risk channel).

Nevertheless, in Table IV, we attempt to more directly control for these other means of monetary policy transmission. In each column, we repeat our specification based on Equation (1) but introduce a specific variable that past literature has argued is related to these channels and interact it with *Chg. FF Rate* (we add one variable in each column). If our measures of non-lending exposure are simply picking up one of these channels, our main estimates should lose significance.

In Panel A we focus on trading activities. In Column 1, we interact the bank's *Equity to Assets* with changes in the Fed funds rate.[16] This interaction serves as a way to capture differences in the importance of the balance sheet channel of monetary policy transmission across banks (Bernanke and Gertler, 1989; Gertler and Kiyotaki, 2010). We find that the estimate of the effect of trading assets on small business lending remains similar to Column 3 in Table II, which is the equivalent specification from Section II.A. In Column 2, we add the bank's share of liquid assets and interact it with changes in the Fed funds rate. This variable is motivated

[16]The standalone *Equity to Assets* variable is already included in the specification from Table II, so here we just add the interaction term.

by Kashyap and Stein (2000), who find that banks with less liquid assets are more affected by monetary policy changes, and argue these patterns support the existence of a bank lending channel. Again, we find our main estimate remains similar to the baseline specification.

In Column 3, we include the bank's deposit HHI measure and interact it with changes in the Fed funds rate. This variable is motivated by Drechsler, Savov, and Schnabl (2017), who find evidence of a deposits channel of monetary policy, where the bank's market power over deposits affects the transmission of monetary policy. In Column 4, we include the measure of a bank's income gap, defined as the difference in the amount of assets and liabilities that mature or reprice within one year. Gomez, Landier, Sraer, and Thesmar (2021) argue that a bank's exposure to interest rate risk—measured by the bank's income gap—is a significant determinant of monetary policy transmission. In both Columns 3 and 4, our estimate of the effect of *Trading Assets*$\times$*Chg. FF Rate* remains statistically significant and the same magnitude as in Table II.

In Panel B, we turn to advisory services activities. Here we introduce the same variables and interactions as in Panel A. Across all four columns, we find that the estimated effect of the number of advisory services subsidiaries when the Fed funds rate changes remains statistically significant and the magnitudes remain similar to Column 6 of Table II. It does not appear that universal banking only captures one of the other commonly considered channels of the monetary policy transmission, but has a meaningful effect beyond them.

III.B. Monetary Policy Surprises

Another potential 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. Thus, we verify that the results are not driven solely by heterogeneity in banks' expectations rather than by universal banking, and that universal banks do not change their lending differentially for reasons not related their non-lending activities. In Table V, 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 changes in Fed funds futures prices around FOMC announcements

as in Kuttner (2001) and Gertler and Karadi (2015).

In Columns 1 and 2, we look at how a bank's exposure to trading assets affects its lending activity following suprise changes in the monetary policy rate. We find a positive and statistically significant result, both with year fixed effects (Column 1) or county-year fixed effects (Column 2). In Columns 3 and 4, we consider the measure of advisory services activity. Again, we find a positive and statistically significant effect of the surprise changes for banks with more broker-dealer subsidiaries. It does not appear that the main findings are driven by some anticipated change in economic conditions that correlates with rate changes.

IV. Additional Analysis

IV.A. 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 VI, 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 advisory services 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 Sec-

tion 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 advisory services sensitivities to be about 9.5 times larger in magnitude than the negative rate advisory services sensitivities.[17] It appears that trading and advisory services income are more sensitive to increases rather than decreases in the Fed funds rate.

IV.B. 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 advisory services activities are presented in Table VII.

Columns 1 and 2 present the effect of changes in the Fed funds rate and the bank's trading activity. Like with small business loans, we find a positive and statistically significant effect on overall mortgage lending. The effect is statistically significant at the 10% level both with year fixed effects (Column 1) and county-year fixed effects (Column 2). As a marginal effect, one standard deviation more trading assets lead to a bank to originate 5.5% more mortgages for a one standard deviation change in the Fed funds rate (using estimates from Column 2). While

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

not as large as the 7.9% effect for small business lending (Column 3 of Table II), it appears that the weaker transmission of monetary policy for universal banks also applies to mortgage lending.

In Columns 3 and 4, we consider the number of broker-dealer subsidiaries as a measure of advisory services activity. We again find that more advisory services activities are associated with more mortgage lending when the Fed funds rate increases. In terms of economic magnitude, a one standard deviation increase in the number of advisory services subsidiaries is associated with 7.5% more mortgage lending for a one standard deviation increase in the Fed funds rate. This effect is a little larger in magnitude to the 5.9% effect of advisory services on small business lending (Column 6 of Table II). Although a different market than small business lending, we find economically similar effects for mortgage lending.

V. Aggregate Effects

In the previous sections, we presented the results of the bank-county level analysis. This granularity enabled us to separate the bank's credit supply from the demand fluctuations for bank loans following changes in monetary policy. Now we turn to analyze the aggregate effects. In Section V.A, we investigate whether the effects also hold at the BHC level. In Section V.B, we study aggregate SBL at the county level and any corresponding real effects.

V.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. Table VIII presents the results. Columns 1–3 present the results for the trading exposure measure, while Columns 4–6 present results for the advisory services exposure measure.

The results at the bank level are consistent with the bank-county level results, indicating that universal banks meaningfully weaken the transmission of monetary policy by maintaining loan

originations at the aggregate bank level. In Column 1, the coefficient of the interaction between the bank's trading assets and the change in the Fed funds rate is 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 SBL following a one standard deviation increase in the Fed funds rate. In Column 2, we find similar effects for the banks overall mortgage origination activity. In this case, the marginal effect is about 3% more lending for the more universal banks (assuming one standard deviation increases in trading assets and the Fed Funds rate).

In Column 3, instead of aggregating county-level loan originations, we calculate the one year loan growth from the bank's overall balance sheet. In this case, the measure captures all types of lending that it chooses to keep on its balance sheet. As changes in monetary policy may also affect debt repayment activity, the net change in bank lending is less clear. Nonetheless, we find a positive and statistically significant effect: banks with one standard deviation higher trading assets maintain 0.34% higher loan growth for a one standard deviation change in the Fed funds rate.

For advisory services, the effects are similar to the ones for trading. A one standard deviation increase in the advisory services subsidiary measure following a one standard deviation increase in the Fed funds rate is associated with 1.3% higher SBL originations (Column 4), 2.9% higher mortgage originations (Column 5), and 0.18% higher total loan growth (Column 6). Even at the aggregate level, the credit supply of more universal banks is less sensitive to changes in monetary policy than other banks.

V.B. Aggregate SBL and Real Effects

Now we turn to study overall SBL at the county level and any corresponding real effects. While universal banks maintain higher SBL following monetary tightening, this may 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 credit may not be meaningfully affected. To understand the effect of universal banks on county-level lending following changes in monetary policy, we

aggregate bank activity to the county level and compare lending dynamics by performing the following specification:

$$\begin{aligned}\text{Log SBL}_{ct} =& \gamma_1 \text{Chg. FF Rate}_{t-1} \times \text{Non-Lending}_{ct-1} + \gamma_2 \text{Bank Controls}_{ct-1} \\ &+ \alpha_{LMA} + \mu_t + \varepsilon_{ct}. \end{aligned} \tag{4}$$

Here the outcome variable is the aggregate small business lending for county c in year t. All the explanatory variables are calculated by weighting each bank by its share of lagged deposits in the county. We use 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).[18] 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 IX presents the results for the county level. Columns 1 and 3 present the results for the aggregate 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 advisory services.

We find higher SBL levels in counties with more banks that expand into both trading and advisory services following a rise in the Fed funds rate. Counties with more trading asset exposure and advisory services exposure maintain SBL when the Fed funds rate increases, compared to other counties. The effect of universal banks aggregates and is further evidence of a 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

[18] 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.

rates.

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

VI. 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 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 new light on the implications for the Fed's execution of monetary policy and its effect on the economy, as well as for the 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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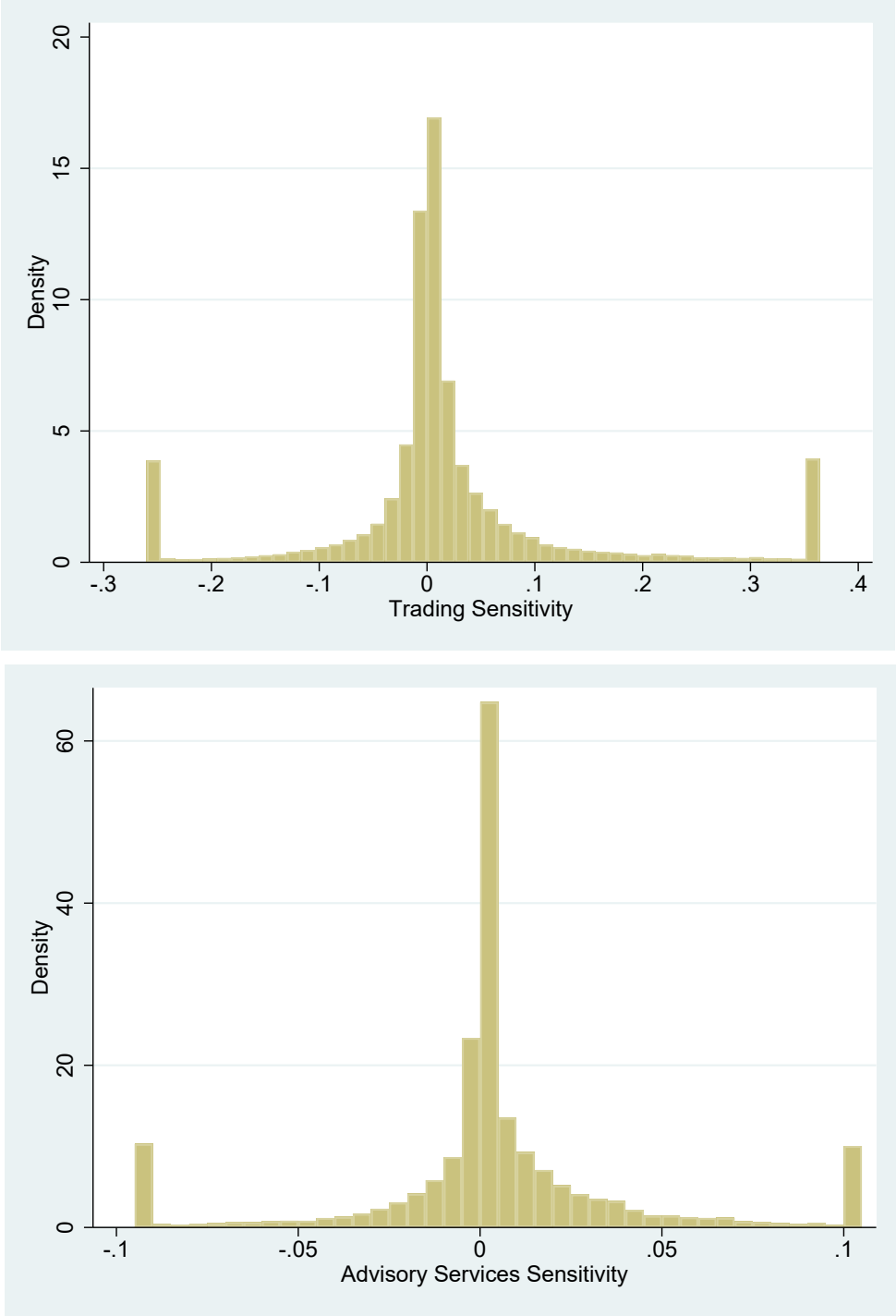

Figure 1: Distribution of Income Sensitivities

The top figure presents the distribution of estimated bank trading income sensitivities. The bottom figure presents presents the distribution of estimated bank advisory services income sensitivities. Both distributions are winsorized at the 5% level.

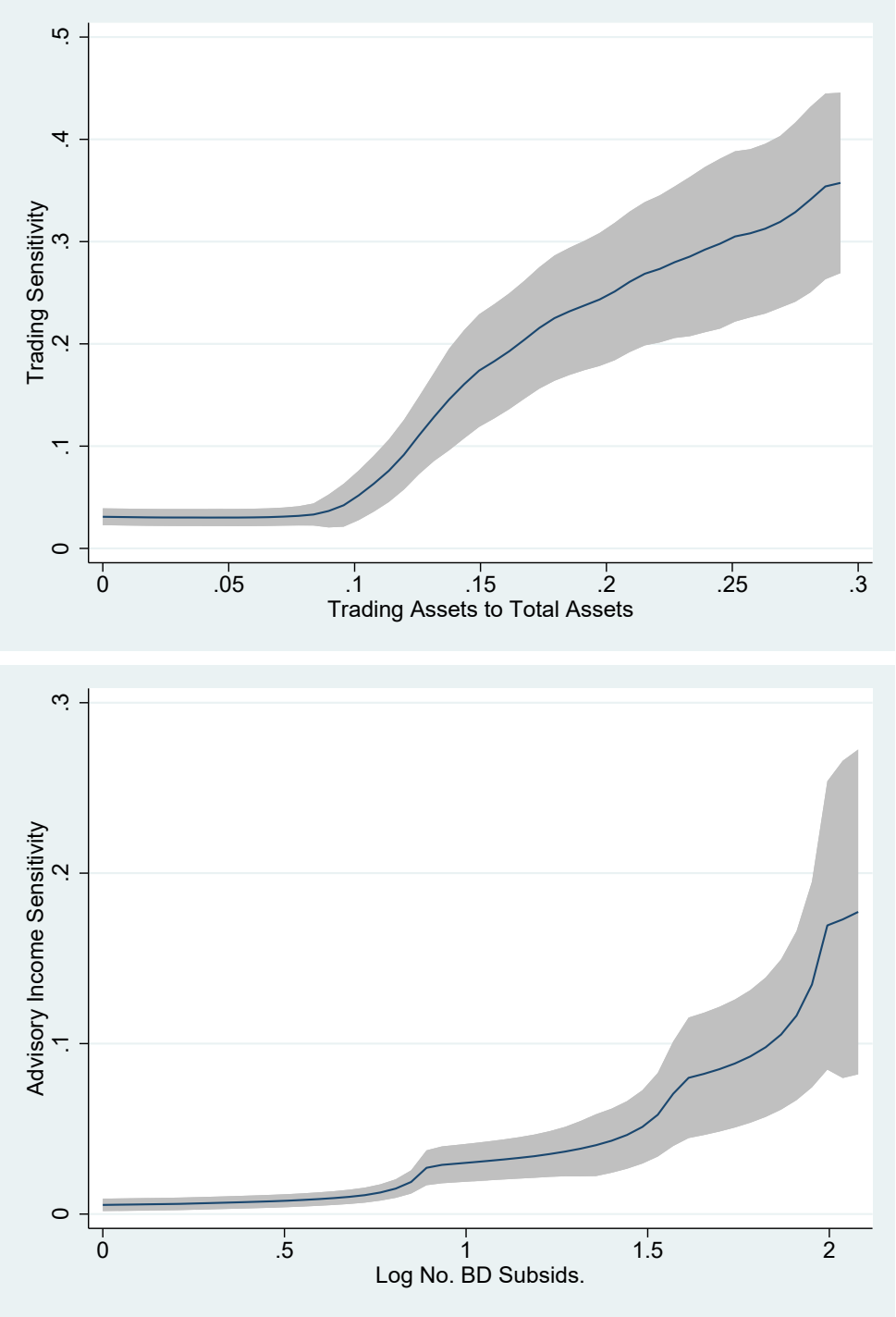

Figure 2: Income Sensitivity and Non-Lending Activity

The top figure presents the relationship between bank trading income sensitivities and trading assets using a local polynomial regression. The bottom figure presents the relationship between bank advisory services income sensitivities and the log number of broker-dealer subsidiaries using a local polynomial regression.

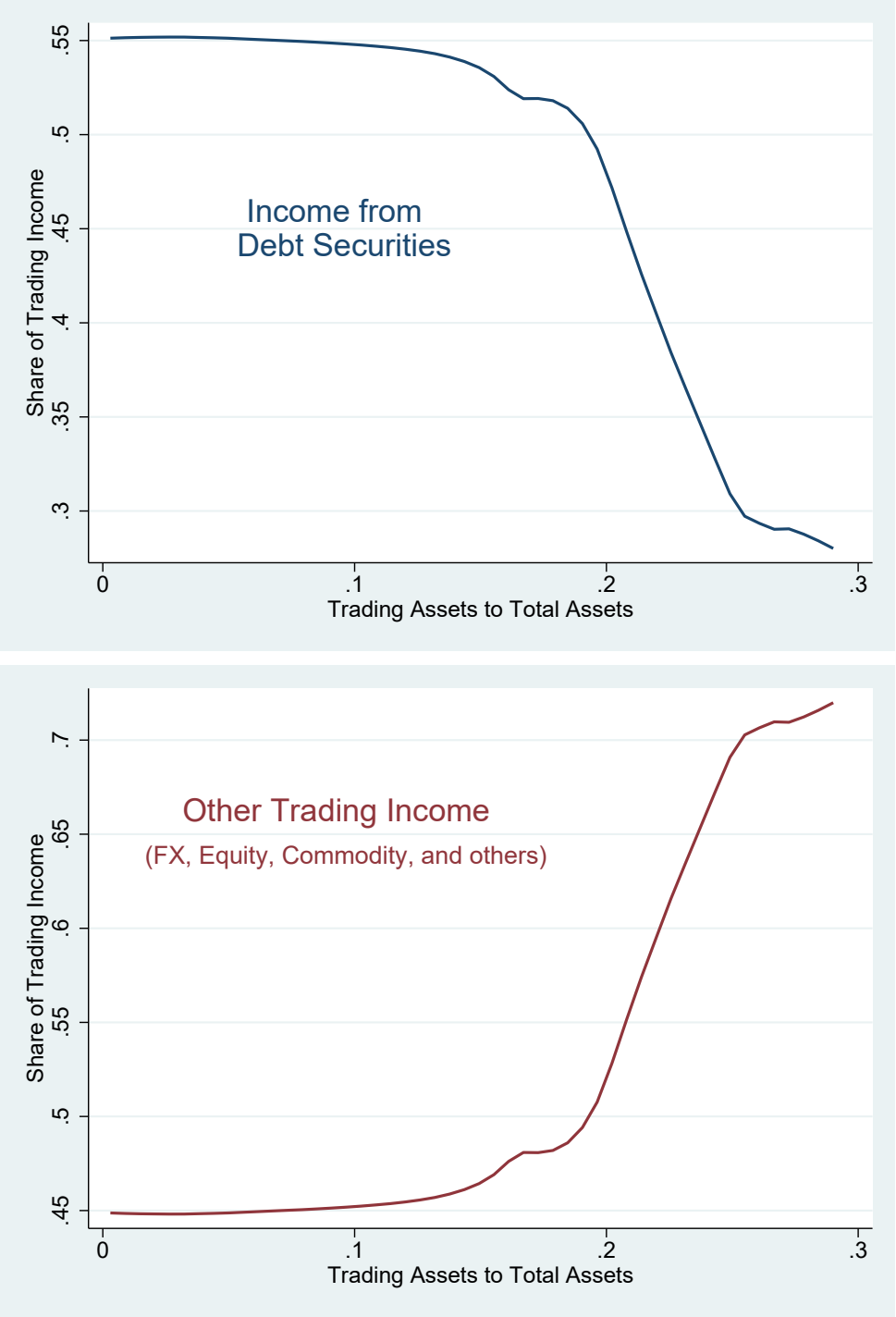

Figure 3: Composition of Trading Income

The top figure presents the relationship between a bank's share of trading income coming from interest rate related exposures (e.g., debt securities) as a function of its trading assets. The bottom figure presents the relationship between a bank's share of trading income coming from other exposures (foreign exchange, equity and index securities, commodities and other credit exposures) as a function of its trading assets.

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	446127.0	1828411.2	41561	87955	200490.5	5,936
Mortgage Loans	1148223.8	10644817.1	6639.5	52118.5	165645.5	5,936
Trading Assets	0.0028	0.018	0	0	0	5,836
Trading Income to Assets	-0.000090	0.0058	-0.00011	0	0.00010	5,764
Trading Income Sensitivity	0.024	0.25	-0.010	0.0032	0.029	3,242
No. BD Subsids.	0.81	5.37	0	0	0	5,496
Advisory Income to Assets	0.00071	0.0044	0	0.00020	0.00057	4,815
Advisory Income Sensitivity	0.0075	0.098	-0.0025	0.00031	0.015	1,859
NIM Sensitivity	0.079	0.82	-0.21	0.062	0.37	5,787
Bank Size	14.4	1.53	13.3	14.1	15.0	5,936
Bank NIM	0.035	0.0069	0.030	0.034	0.039	5,936
Bank Loan Growth	0.29	0.29	0.12	0.26	0.44	5,936
Bank Z-Score	63.1	28.7	46.8	61.6	77.3	5,936
Bank ROA	0.0036	0.0024	0.0027	0.0038	0.0048	5,936
Bank Equity to Assets	0.093	0.027	0.076	0.091	0.11	5,936
Bank Deposits to Assets	0.79	0.089	0.74	0.80	0.85	5,936
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

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 advisory services from 1997–2018 at the bank-county level. *Log SBL* is the logarithm of the total amount of small business loans originated by a bank in a given county and year. Columns 1–3 use the bank's share of trading assets to total assets as its measure of non-lending activity (*Trading Assets*). Columns 4–6 use the number of broker-dealer subsidiaries in the bank's organizational structure as a measure of non-lending activity (*No. BD Subsids.*). Standard errors are clustered by bank.

	Log SBL					
	(1)	(2)	(3)	(4)	(5)	(6)
Trading Assets	2.736***	3.382*	2.898			
	(1.010)	(2.022)	(2.011)			
Trading Assets × Chg. FF Rate	0.772***	0.835***	0.826***			
	(0.0917)	(0.0573)	(0.0596)			
No. BD Subsids.				0.0169	0.00581	0.00485
				(0.0117)	(0.00901)	(0.00811)
No. BD Subsids. × Chg. FF Rate				0.00191***	0.00193***	0.00189***
				(0.000261)	(0.000349)	(0.000373)
Bank Size		0.799***	0.853***		0.796***	0.865***
		(0.117)	(0.114)		(0.120)	(0.124)
Bank NIM		17.37***	17.58***		11.28*	11.72*
		(6.543)	(6.792)		(6.319)	(6.420)
Bank Loan Growth		0.294**	0.254**		0.296**	0.257*
		(0.128)	(0.128)		(0.145)	(0.143)
Bank Z-Score		-0.00252*	-0.00229		-0.00257**	-0.00224*
		(0.00150)	(0.00143)		(0.00130)	(0.00122)
Bank ROA		22.43	22.69		18.49	19.60
		(21.84)	(22.38)		(29.17)	(29.22)
Bank Equity to Assets		-0.284	-0.507		0.816	0.699
		(2.569)	(2.603)		(2.797)	(2.802)
Bank Deposits to Assets		0.284	0.403		0.272	0.372
		(0.657)	(0.715)		(0.501)	(0.584)
County Deposit Share		1.336***	1.286***		1.360***	1.304***
		(0.121)	(0.103)		(0.121)	(0.106)
Bank-County Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	Yes	Yes	No
County-Year Fixed Effects	No	No	Yes	No	No	Yes
Observations	899,631	899,631	899,631	830,669	830,669	830,669
Adjusted R^2	0.775	0.786	0.789	0.776	0.785	0.789

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

Table III: Non-Lending Sensitivities 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 advisory services from 1997–2018 at the bank-county level. *Trading Income Sensitivity* and *Advisory Income Sensitivity* are the estimated sensitivity of the bank's trading or advisory services income to changes in the Fed funds rate. *Additional Controls* includes the same set of control variables as in Table II. Standard errors are block-bootstrapped by bank.

	Log SBL			
	(1)	(2)	(3)	(4)
Trading Income Sensitivity	-0.297***	-0.266***		
	(0.0233)	(0.0229)		
Trading Income Sensitivity × Chg. FF Rate	0.189***	0.188***		
	(0.0250)	(0.0282)		
Advisory Income Sensitivity			-0.0166	0.0896
			(0.163)	(0.173)
Advisory Inc. Sensitivity × Chg. FF Rate			0.195***	0.205***
			(0.0520)	(0.0496)
Additional Controls	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No
County-Year Fixed Effects	No	Yes	No	Yes
Observations	851,102	849,196	725,256	724,781
Adjusted R^2	0.784	0.788	0.800	0.802

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

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

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 diversification from 1997–2018 at the bank-county level. *Additional Controls* includes the same set of control variables as in Table II. Panel A focuses on bank trading activities and Panel B focuses on bank advisory services activities. For both panels, Column 1 includes an interaction term *Bank Equity to Assets* $\times$ *Chg. FF Rate*. Column 2 includes a measure of liquid assets and its interaction with changes in the Fed funds rate. Column 3 includes the bank's deposit HHI and its interaction with changes in the Fed funds rate. Column 4 includes a measure of the bank's income gap and its interaction with changes in the Fed funds rate. Standard errors are clustered by bank.

	Panel A: Trading Activities			
	Log SBL			
	(1)	(2)	(3)	(4)
Trading Assets	3.058	3.483	3.064	2.769
	(2.002)	(2.200)	(2.013)	(1.966)
Trading Assets $\times$ Chg. FF Rate	0.871***	0.917***	0.812***	0.823***
	(0.0604)	(0.105)	(0.0610)	(0.0635)
Balance Sheet Channel	Yes			
Bank Lending Channel		Yes		
Deposits Channel			Yes	
Interest Rate Risk Channel				Yes
Additional Controls	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	899,631	759,589	899,631	899,610
Adjusted R^2	0.789	0.814	0.789	0.790
	Panel B: Advisory Services Activities			
	Log SBL			
	(1)	(2)	(3)	(4)
No. BD Subsids.	0.00551	0.0110	0.00538	0.00535
	(0.00801)	(0.00955)	(0.00801)	(0.00818)
No. BD Subsids. $\times$ Chg. FF Rate	0.00199***	0.00237***	0.00185***	0.00186***
	(0.000429)	(0.000500)	(0.000380)	(0.000398)
Balance Sheet Channel	Yes			
Bank Lending Channel		Yes		
Deposits Channel			Yes	
Interest Rate Risk Channel				Yes
Additional Controls	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	830,669	691,048	830,669	830,648
Adjusted R^2	0.789	0.816	0.789	0.789

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

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

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 diversification from 1997–2018 at the bank-county level. *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.

	Log SBL			
	(1)	(2)	(3)	(4)
Trading Assets	2.801*	2.273		
	(1.668)	(1.584)		
Trading Assets × Surprise Chg.	0.461***	0.474***		
	(0.123)	(0.115)		
No. BD Subsids.			0.00343	0.00252
			(0.00712)	(0.00606)
No. BD Subsids. × Surprise Chg.			0.00144*	0.00154**
			(0.000733)	(0.000778)
Additional Controls	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No
County-Year Fixed Effects	No	Yes	No	Yes
Observations	844,822	844,822	830,669	830,669
Adjusted R^2	0.785	0.788	0.785	0.788

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

Table VI: 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 advisory services from 1997–2018 at the bank-county level. Panel A focuses on bank trading activities and Panel B focuses on bank advisory services 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: Advisory Services 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 VII: 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 advisory services from 1997–2018 at the bank-county level. Panel A focuses on bank trading activities and Panel B focuses on bank advisory services activities. *Additional Controls* includes the same set of control variables as in Table II. Standard errors are clustered by bank.

	Log HMDA			
	(1)	(2)	(3)	(4)
Trading Assets	0.943	0.555		
	(3.001)	(2.743)		
Trading Assets × Chg. FF Rate	0.428*	0.451*		
	(0.254)	(0.247)		
No. BD Subsids.			-0.0187**	-0.0210***
			(0.00878)	(0.00797)
No. BD Subsids. × Chg. FF Rate			0.00211***	0.00227***
			(0.000338)	(0.000274)
Additional Controls	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No
County-Year Fixed Effects	No	Yes	No	Yes
Observations	414,924	414,924	476,111	476,111
Adjusted R^2	0.789	0.791	0.753	0.759

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

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

This table measures the sensitivity of a bank's aggregate small business, mortgage lending, or total loan growth to changes in the Fed funds rate and the bank's degree of expansion into trading or advisory services from 1997–2018. *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.

	Log SBL	Log HMDA	Total Loan Growth	Log SBL	Log HMDA	Total Loan Growth
	(1)	(2)	(3)	(4)	(5)	(6)
Trading Assets	2.123*	0.472	0.546**			
	(1.191)	(2.107)	(0.271)			
Trading Assets × Chg. FF Rate	0.522***	0.980**	0.119***			
	(0.0729)	(0.456)	(0.0366)			
No. BD Subsids.				0.00614	-0.0103	0.000557
				(0.00867)	(0.0189)	(0.000991)
No. BD Subsids. × Chg. FF Rate				0.00158***	0.00315***	0.000211***
				(0.000245)	(0.000460)	(0.0000706)
Additional Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,569	4,495	5,520	5,241	4,358	5,219
Adjusted R^2	0.933	0.847	0.357	0.934	0.848	0.355

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

Table IX: 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 advisory services 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

Table A.1: Income Sensitivity Differences

This table compares the difference in bank characteristics depending on the bank's estimated income senstivity. In Panel A, the sample is divided into two groups using the median trading income sensitivity. In Panel B, the sample is divided into two groups using the median advisory services income sensitivity. Observations are at a bank-quarter level.

	Panel A: Trading Sensitivities			
	Above Median	Below Median		
	Mean	Mean	Diff.	Obs.
Bank Size	15.11	14.58	0.536***	3,239
	(0.0434)	(0.0295)	(0.0527)	
Bank NIM	0.0327	0.0330	-0.000272	3,239
	(0.000157)	(0.000168)	(0.000230)	
Bank Loan Growth	0.222	0.231	-0.00931	3,239
	(0.00712)	(0.00727)	(0.0102)	
Bank Z-Score	61.73	66.58	-4.849***	3,239
	(0.800)	(0.851)	(1.167)	
Bank ROA	0.00290	0.00302	-0.000123	3,239
	(0.0000719)	(0.0000635)	(0.0000961)	
Bank Equity to Assets	0.0972	0.0941	0.00310***	3,239
	(0.000696)	(0.000695)	(0.000984)	
Bank Deposits to Assets	0.773	0.788	-0.0146***	3,239
	(0.00231)	(0.00204)	(0.00309)	
	Panel B: Advisory Services Sensitivities			
	Above Median	Below Median		
	Mean	Mean	Diff.	Obs.
Bank Size	15.14	14.80	0.345***	1,559
	(0.0557)	(0.0535)	(0.0785)	
Bank NIM	0.0322	0.0326	-0.000432	1,559
	(0.000208)	(0.000250)	(0.000323)	
Bank Loan Growth	0.0967	0.155	-0.0584***	1,559
	(0.00958)	(0.0108)	(0.0144)	
Bank Z-Score	62.59	67.68	-5.082***	1,559
	(1.282)	(1.484)	(1.954)	
Bank ROA	0.00193	0.00229	-0.000359**	1,559
	(0.000109)	(0.000113)	(0.000158)	
Bank Equity to Assets	0.0977	0.100	-0.00266*	1,559
	(0.000934)	(0.00118)	(0.00149)	
Bank Deposits to Assets	0.794	0.800	-0.00621	1,559
	(0.00279)	(0.00328)	(0.00428)	

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

Table A.2: 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 advisory services from 1997–2018 at the bank-county level. *Log SBL* is the logarithm of the total amount of small business loans originated by a bank in a given county and year. Columns 1–4 use the bank's share of trading assets to total assets as its measure of non-lending activity (*Trading Assets*). Columns 5–8 use the number of broker-dealer subsidiaries in the bank's organizational structure as a measure of non-lending activity (*No. BD Subsids.*). Standard errors are clustered by bank.

	Log SBL							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Chg. FF Rate	-0.0215				-0.0236*			
	(0.0207)				(0.0138)			
Trading Assets	4.093***	2.325***	3.036*	2.348				
	(0.809)	(0.888)	(1.590)	(1.535)				
Trading Assets × Chg. FF Rate	0.827***	0.807***	0.858***	0.854***				
	(0.101)	(0.0963)	(0.0693)	(0.0683)				
No. BD Subsids.					0.0185*	0.0181*	0.00861	0.00712
					(0.0107)	(0.0105)	(0.00902)	(0.00827)
No. BD Subsids. × Chg. FF Rate					0.00226***	0.00198***	0.00199***	0.00196***
					(0.000259)	(0.000268)	(0.000342)	(0.000377)
Bank Size			0.778***	0.823***			0.753***	0.806***
			(0.0912)	(0.0869)			(0.0870)	(0.0893)
Bank NIM			17.12***	16.98***			12.70***	13.15***
			(4.738)	(4.971)			(4.302)	(4.659)
Bank Loan Growth			0.840**	0.720**			0.841**	0.730*
			(0.347)	(0.348)			(0.406)	(0.401)
Bank Z-Score			0.00715	0.00825			0.00506	0.00660
			(0.0129)	(0.0134)			(0.0114)	(0.0122)
Bank ROA			0.251	0.258			0.155	0.176
			(0.281)	(0.284)			(0.351)	(0.346)
Bank Equity to Assets			-1.556	-1.787			-1.222	-1.439
			(2.289)	(2.329)			(2.248)	(2.278)
Bank Deposits to Assets			0.327	0.462			0.527	0.656
			(0.618)	(0.651)			(0.428)	(0.481)
County Deposit Share			1.369***	1.315***			1.380***	1.321***
			(0.122)	(0.101)			(0.122)	(0.0988)
Macro Variables	Yes	No	No	No	Yes	No	No	No
Bank-County Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	No	Yes	Yes	No
County-Year Fixed Effects	No	No	No	Yes	No	No	No	Yes
Observations	882,837	1,032,799	1,032,799	1,032,799	867,307	1,013,617	1,013,617	1,013,617
Adjusted R^2	0.791	0.775	0.785	0.789	0.791	0.775	0.784	0.789

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

Table A.3: How Universal Banks Benefit from Monetary Policy Tightening

The table presents the effect of the interaction between the universality of the bank and different market activity measures affected by changes in the fed funds rate. Panel A considers trading activities and the outcome variables are *Trading Income* (Columns 1,2) and *Log SBL* (Columns 3,4). As the market activity measure, we use *Trading Vol. Growth*, estimated as the annual growth in S&P 500 trading volume. To capture the changes in the measure explained by variation in the fed funds rate, we also use *Trading Vol. Growth, Fed Funds Related*. Panel B considers advisory services activities and the outcome variables are *Advisory Services Income* (Columns 1,2) and *Log SBL* (Columns 3,4). As the market activity measure, we use *Money-Market and Mutual Fund Inflows*, estimated as the annual inflows in money market and mutual funds. To capture the changes in the measure explained by variation in the fed funds rate, we also use *MM and MF Inflows, Fed Funds Related*. In both panels, *Additional Controls* include the bank-level control variables as in Table II. Standard errors are clustered by bank.

	Panel A: Trading Activities			
	Trading Income		Log SBL	
	(1)	(2)	(3)	(4)
Trading Assets	-0.00207	-0.00141	1.913	1.945
	(0.00251)	(0.00238)	(1.302)	(1.459)
Trading Assets × Trading Vol. Growth	0.00583***		1.456***	
	(0.000844)		(0.235)	
Trading Assets × Trading Vol. Growth, Fed Funds Related		0.00971***		4.909***
		(0.00205)		(0.413)
Additional Controls	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	No	No
Year Fixed Effects	Yes	Yes	No	No
Bank-County Fixed Effects	No	No	Yes	Yes
County-Year Fixed Effects	No	No	Yes	Yes
Observations	4,674	4,674	1,017,063	1,017,063
Adjusted R^2	0.841	0.842	0.791	0.792
	Panel B: Advisory Services Activities			
	Advisory Serv. Income		Log SBL	
	(1)	(2)	(3)	(4)
No. BD Subsids.	0.0105***	0.0100***	0.00458	0.00203
	(0.00294)	(0.00254)	(0.00709)	(0.00890)
No. BD Subsids. × Money-Market and Mutual Fund Inflows	0.00310***		0.0248***	
	(0.00108)		(0.00422)	
No. BD Subsids. × MM and MF Inflows, Fed Funds Related		0.0102**		0.0572***
		(0.00457)		(0.0115)
Additional Controls	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	No	No
Year Fixed Effects	Yes	Yes	No	No
Bank-County Fixed Effects	No	No	Yes	Yes
County-Year Fixed Effects	No	No	Yes	Yes
Observations	4,683	4,683	1,013,617	1,013,617
Adjusted R^2	0.803	0.803	0.788	0.789

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