

Import Competition and Local Deposits: Transmission of the China Shock

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Abstract

I examine how local deposit outflows in markets affected by import competition constrict bank funding and how banks react to these funding shocks. Utilizing a set of continuous difference-in-differences regressions, I identify shifts in local deposit supply generated by the granting of Permanent Normal Trade Relations with China. I find that local deposit losses generate balance sheet wide funding constraints, especially for banks operating in multiple markets. The banks most constrained by this import competition reallocate their credit portfolios from small business loans to mortgage loans in markets not exposed to import competition. I find that the ability for banks to shift their lending between geographic and lending markets allows them to continue operating after such a shock.

1 Introduction

Trade shocks originate in the real economy, often impacted local labor markets acutely. Though these shocks begin in local labor markets, their effects can spill over into the financial world. One of the key questions is what causes these spillovers. Increased import competition often forces struggling firms to cut wages, lay off employees, and even cease operating, and when many such firms are geographically clustered, the local labor market consequences can be significant. As people and businesses draw down their savings and hold less deposits, local

bank funding is constricted and what began as a trade shock spills over into the financial economy. While bank can borrow additional funds to cover liquidity gaps, any borrowed funds will be more expensive than local deposits. Since the cost of capital is an important determinant of banks' credit decisions, this deposits channel may affect how and where banks lend, and given the important role of local banks in driving economic growth, it is essential to understand this magnitude of this mechanism.

In this paper, I investigate the role of the deposits channel in transmitting exogenous local shocks to banks. I exploit variation in local deposit supply generated by the implementation of Permanent Normal Trade Relations (NTR) with China in 2000, often referred to as the China Shock. The passage of permanent NTR lowered tariffs on Chinese goods and led to both a rapid increase in Chinese imports and a wave of factory closings in the US. While this change in trade policy had far reaching effects, certain manufacturing sectors were more exposed than others based on the difference between tariff rates under NTR and under Column Two status, the alternative to NTR. The China Shock generated large and persistent local labor market shocks in the communities where exposed industries clustered (Pierce and Schott (2016), Pierce and Schott (2020)). I show that these shocks affected banks' local funding, as lowered wages and increased unemployment led people and business to draw down savings and hold less deposits. Retail deposits are often the cheapest source of funding for banks, and a loss of this funding necessitates either a decrease in balance sheet size or a substitution for more expensive funding. I find that rather than attracting more expensive funding, the banks most exposed to import competition dealt with their liquidity shocks by changing their lending patterns. Exposed banks originated fewer small business loans but more mortgage loans, especially in counties not impacted by import competition.

My empirical design relies on measures of local and bank level exposure to increased import competition. Following Pierce and Schott (2016), I use tariff schedules and county labor force compositions from before China was granted permanent NTR to create a measure of each county's exposure to increased import competition¹. The measure takes into account the change in each industry's tariffs and the proportion of each county's workforce employed

¹Others such as Autor et al. (2013) measure exposure to import competition based on increase in imports in each sector. They then use a shift share instrument to control for endogeneity.

in each industry. The measure vary by county but are constant across time. Each bank's exposure to import competition is based on the location of its deposit accepting branches and those counties' exposures to import competition. Similar to county exposure, bank exposure varies across banks and is constant across time.

The focus of this paper is banks that operate branches in multiple county markets. I use a continuous difference-in-difference regression with bank-by-county and bank-by-state-by-year fixed effects to uncover the impact of differential county exposure to import competition on local deposit supply. In my data, banks don't set deposit prices at the branch level, therefore differential movements in the quantity of deposits at branches of the same bank can be attributed to shifts in the local deposit supply curve. Additionally, I aggregate deposits to the bank level and examine whether these local deposit shocks affected funding across banks' full balance sheets. I divide total deposits into core and brokered deposits, where core deposits are deposits sourced from local retail customers and brokered deposits are purchased in external markets.

Results show that exposure to the China Shock reduced banks' funding. The first result finds that deposit shocks began at the county level, where a one standard deviation increase in a county's exposure to the China Shock led to a 1.7 to 4.2% decrease in deposits attributable to supply reductions. At the bank level, the combination of local shocks had significant balance impacts, especially for banks operating in multiple markets. For these multi-market banks, A one standard deviation increase in exposure to the China Shock led to a 2.3% reduction in total deposits. For multi-market banks, a one unit increase in bank exposure led to a 2.2% reduction in core deposits and a 3.5% reduction in brokered deposits.

Once I establish the existence of the deposits channel, I examine the impact it has on local mortgage and small business lending. Similar to the analyses in Khwaja and Mian (2008) and Izadi and Saadi (2023), I use a continuous difference-in-difference regression with bank-by-county and county-by-year fixed effects to isolate changes in each bank's local credit supply caused by bank and county level exposure to increased import competition.

I find that bank level exposure led banks to reallocate lending at the local level from small business credit to mortgage lending, especially in markets not affected by the China Shock. Across the sample of single and multi-market banks, a one standard deviation increase in

bank-level exposure led to a 24% reduction in small business loan origination, a 26% increase in mortgage originations, and a 61% increase in mortgages originated then sold. Examining the interaction between bank and county level exposure to import competition shows that the decreases in small business lending were uniform across county exposures, but the partial effect of county exposure on mortgage lending, holding bank exposure constant, is negative and statistically significant.

Underlying each of these analyses is the identification assumption that in the absence of the China Shock, local trends in deposit and lending growth would have evolved similarly to their pre-period trajectories, and in parallel across counties with varying exposure levels. To provide support for this identification assumption, I provide several event study specifications. For additional robustness, I

These results are significant as they show that banks operating in local markets exposed to increased import competition saw declines in their deposits. With less deposits, the composition of their outstanding credit changed, as they cut back on small business lending and increased mortgage originations in safe markets. The ability to sell mortgages into secondary markets allowed these banks to originate more markets, even though their funding was constrained. In this way, local labor market shocks generated from increased import competition worked through the deposits channel to affect how banks operated.

My paper contributes to a large literature studying the economic impact of China’s reception of permanent NTR. Many papers investigate the harm increased import competition inflicted upon industries and labor markets most exposed to these tariff changes (Autor et al. (2013), Pierce and Schott (2016), Autor et al. (2016)). Autor et al. (2021) find evidence of labor market scarring nearly twenty years after the Shock, and beyond the direct labor market consequences, other studies have found evidence that the Shock reduced the provision of local public goods (Feler and Senses (2017)), led to an increase in “deaths of despair” (Pierce and Schott (2020)), and was amplified by local housing market conditions (Xu et al. (2019)).² The most closely related papers investigate credit market changes following the China’s ascension to the World Trade Organization. Izadi and Saadi (2023) show that small

²Sasahara (2022) provides a more complete overview of the existing literature and methods used in the analysis of the China Shock and other import competition induced shocks.

business lending decreased in counties most exposed to the Chinese import competition, and Federico et al. (2023) and Mayordomo and Rachedi (2022) similarly show that increased this import competition induced credit constrictions in Italy and Spain. I expand on their work by investigating the role of the deposits channel in driving these credit supply responses and by analyzing the substitution between small business and mortgage lending. I show that the deposits channel played an important role in constricting balance sheets, and while banks reduced their small business lending, they increased their mortgage lending.

My paper is also related to research studying the movement of local shocks through bank networks. Internal capital markets allow the easy movement of capital between markets, but how banks use these networks to transmit or insure against local economic shocks often depends on the bank and the structure of the shock. Many investigations into banks' internal capital markets leverage exogenous credit and liquidity shocks from hurricanes (Schüwer et al. (2018)), the shale oil boom (Gilje et al. (2016)), and floods (Rehbein and Ongena (2022)) to understand their functions. Natural disasters are useful for studying the transmission of economic shocks, since many economic shocks originate in the financial system (Clark et al. (2021))³. I complement these papers by isolating a persistent local economic shock originating in the real economy. A persistent shock such as this differs from many of the transitory shocks studied before. While many of the previously mentioned papers show networks being used to transfer liquidity to increase credit supply in affected markets, my analysis shows the opposite, as banks shift credit supply away from impacted markets.

Finally, I contribute to the literature studying the deposits channel of transmission. Many banking models recognize that though demand deposits are a cheap source of funding, their inherent volatility is a fundamental weakness (Diamond and Dybvig (1983)), and this weakness ties bank level outcomes to the real economy (Diamond and Rajan (2006))⁴. Khwaja and Mian (2008) illustrate this principal, examining unexpected liquidity shocks to Pakistani banks, and Karam et al. (2014) similarly investigate the impact of credit rating downgrades

³Lazzaroni and Bergeijk (2014) provide a more extensive summary of studies examining the macroeconomic impact of natural disasters.

⁴Diamond and Rajan (2006) write that "credit contraction and failure are essentially real phenomena that occur when the bank is squeezed between nonrenegotiable demand deposits and a limited production of consumption goods" (Diamond and Rajan, pp. 39).

on banks' access to deposits. Each shows that when access to deposits is easily lost, credit supply is impacted. Credit contractions created by deposit loss can then lead to a downward feedback loop. Kundu et al. (2021) term this mechanism the "deposits channel of aggregate fluctuations. An important distinction is that the phenomena I investigate is not a sudden run on deposits, rather, a deliberate draw down of deposits commiserate with real economic conditions

In Section 2, I introduce the change in trade policy which created the China Shock. In Section 3, I provide an overview of the data and explain the county and bank level measures I use to quantify exposure to increased import competition. In Section 4, I introduce the empirical strategies and results connecting the China Shock to bank funding, and in Section 5, I explore how these funding shocks affect local lending patterns. In Section 6, I conclude.

2 Background

To understand how changes in trade policy affect local labor market conditions, its important to first give an overview of US trade policy. The US's Harmonized Trade Schedule maintains two tariff schedules for imports– normal trade relations (NTR) and Column Two status⁵. The two schedules outline the tariff rates assessed on different categories of imported goods from a given country, and all tariff rates in the NTR schedule are less than or equal to the Column Two rates. With the passage of the Trade Act of 1974, countries that were currently taxed at the favorable tariff schedule would permanently hold that tariff schedule⁶. Prior to 1974, communist countries, including China, had been excluded from NTR status, and accordingly, their imports had been taxed at Column Two rates.

Section 402 of the Trade Act of 1974 allowed the President to issue annual waivers which would allow imports from a given Column Two to be taxed at NTR rates. In 1980, President Carter granted China one such annual waiver⁷. Opening trade with China was seen as a way to achieve two goals: pushing the Chinese economic model towards a market economy and

⁵Prior to 1998, permanent NTR was referred to as Most Favored Nation status. As of September 2023, Cuba, North Korea, Russia and Belarus are the only countries with Column Two status.

⁶<https://www.govinfo.gov/content/pkg/COMPS-10384/pdf/COMPS-10384.pdf>

⁷<https://www.cartercenter.org/news/features/p/china/40-anniversary-china-relations.html>

maintaining political and security stability in Asia (Alexandroff (1998)). President Carter and succeeding Presidents continued to grant China these annual waivers.

As China's industrial capacity continued to increase, lowered tariffs under the temporary NTR waivers allowed trade between the US and China to grow. Uncertainty in the continued passage of the temporary NTR waiver persisted. On many occasions, Congress threatened to block the President's authority to grant these annual waivers (CITE HERE). CITE write that this uncertainty in the continuance of the waivers shielded many domestic industries from import competition, even those operating at a relative disadvantage compared to their Chinese counterparts. Uncertainty meant that business had to weigh the benefit of shifting production to China under the pretense of preferable tariffs with the risk of those tariffs rapidly increasing.

As time progressed, many global trading partners began to question the consistency of the US's annual waiver process with the rules of the World Trade Organization. By not granting China permanent NTR status, the US functionally locked China out of becoming a full member of the World Trade Organization. In May 15, 2000 Representative William Archer introduced H.R. 4444 which would grant China permanent NTR status upon its ascension to the World Trade Organization. Granting China this status was seen as a way to stimulate US economic growth and promote human rights reforms in China (CITE HERE). Economic growth would come from the outsourcing of labor intensive production processes, the importation of less expensive goods, and the opening of agricultural export markets for US farmers.

The bill was not without controversy, as many unions and labor groups lobbied against its passage⁸. Despite the opposition, the bill successfully passed through Congress on May 24, 2000 and through the Senate on September 19, 2000. President Clinton signed the bill into law on October 10, 2000, and with China's ascension to the World Trade Organization on December 11, 2001 tariff rates on Chinese imports were officially and permanently set to the NTR schedule. An important subtlety in this process is that at no point between 1980 and 2001 were Chinese imports taxed at Column Two rates. The "China Shock," as it has been

⁸See WSJ articles: "Unions Debate How Fiercely To Protest China Legislation"; "Senate Passes Bill to Normalize U.S. Trade Relations With China"

called, was not a sudden lowering of tariffs, rather it was a resolution of the uncertainty that tariffs might suddenly rise if Congress blocked China’s temporary NTR waiver. Resolution of this uncertainty led to a rapid offshoring of labor intensive manufacturing processes.

3 Data and Defining Exposure Measures

3.1 Data I utilize multiple data sources to examine local banking responses to increased import competition. The FDIC’s Quarterly Call Reports offer a comprehensive view of FDIC-insured commercial banks’ balance sheets, spanning from 1994 to the present. These reports provide valuable insights into various bank-level variables, including assets, deposits (core and brokered), equity, and non-performing loans.

To understand the local nature of bank operations, I utilize the FDIC’s Summary of Deposits database. The Summary of Deposits is an annual survey collected in June from 1994 to the present. It meticulously documents all FDIC-insured bank branches and their associated deposits. To align this data with lending data, I aggregate bank deposits at the county-by-year level. Additionally, I classify banks as either single- or multi-market entities based on the geographical spread of their branches across county markets. While my primary focus is on banks operating in multiple markets, I also retain data on single-market banks to conduct robustness checks.

I collect data on each bank’s small business and mortgage loan originations from the Community Reinvestment Act (CRA) and the Home Mortgage Disclosure Act (HMDA) disclosure files. The HMDA data provides details on the size of each originated mortgage, the county of origination, the bank originating the loan, and whether or not the loan is held on the originating bank’s balance sheet or sold within a year. I aggregate the amount of mortgages held on balance sheet and the amount sold to the bank-by-county-by-year level. The CRA data reports number and size of small business loans under \$1 million that each bank originates in each county each year. Greenstone et al. (2020) note that CRA data is fairly representative of all small business lending, as in 2007 it covered 86% of all small business loans under \$1 million. I integrate this data with local lending and deposits information.

I employ annual county-level statistics obtained from the Bureau of Labor Statistics (BLS) to account for local demographic and labor market characteristics. These statistics encompass key economic indicators such as income, population, local college attainment levels, and employment rates. As is typical in analyses such as this, I use averages of each variable from before the granting of permanent NTR as time invariant controls in the county level analyses.

3.2 Defining County Exposure to Import Competition In measuring each county's exposure to increased import competition, I adopt the approach outlined by Pierce and Schott (2020). This method involves analyzing the composition of the labor market in each county before the year 2000 and calculating the difference between Normal Trade Relations (NTR) and Column Two tariff rates for industries operating within that county.⁹. These differences are computed using the 1999 tariff rates provided by Feenstra et al. (2002) for each industry group, and are weighted using industry-specific labor market shares from before the import shock. The resulting measure reflects each county's exposure to increased import competition and is computed as follows:

$$CountyExp_c = \sum_{i \in I} \frac{L_{i,c}}{L_i} (ColumnTwoRate_i - NTRrate_i) \quad (1)$$

I then normalize the measure so that across all counties, the mean and standard deviations of exposure are 0 and 1, respectively.

Despite increasingly flexible capital markets and more complete transportation networks, industries have persistently formed geographic clusters (\cite{Porter1998}). These clusters have exposed local markets to fluctuations within specific industries. Figure 1 illustrates the geographic distribution of CountyExposure. The map reveals significant exposure to increased import competition in some, but not all, counties. Important for my empirical strategy, there appears to be significant intra-state variation, with the exception of several western states.

⁹Of the nearly 10,000 HS8 code items in the 1999 data, nearly 8 percent had NTR gaps of zero. Summary Statistics: Mean NTR Gap = 0.32, sd = 0.23, max = 4.84, min = 0. Example difference between NTR and Column 2 rates: HS code 91069085 (a form of watches) 0.08 vs. 2.52. HS code 22082020 (Pisco and Singani alcohol) 0 vs. 2.13. HS code 28049000 (tellurum and boron) 0 vs. 0.

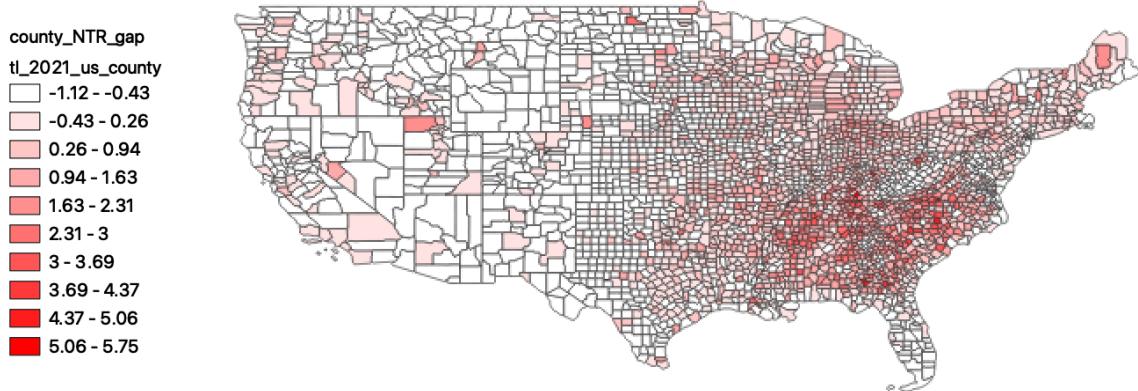


Figure 1: Map of County Exposure (Normalized)

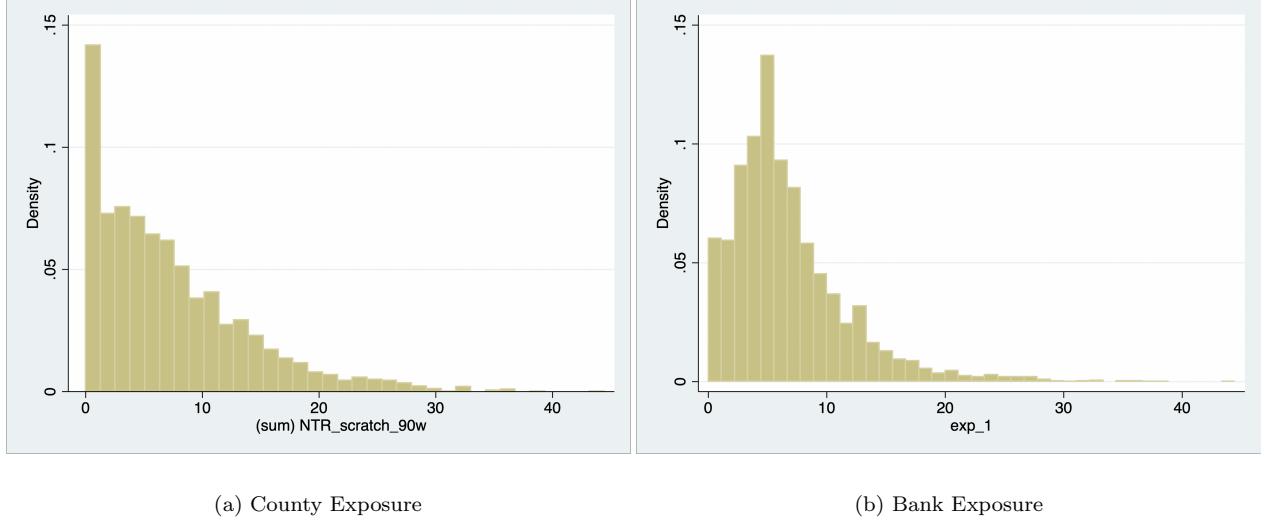
Note: The map shows each county's the normalized County Exposure measure. The measure incorporates the difference between NTR and Column Two tariffs for each industry and the industrial composition of each county's labor market.

3.3 Defining Bank Exposure to Import Competition In theory, a bank's exposure to any economic phenomenon could be perfectly measured if sufficient data on each depositor and borrower were collectible. For instance, business at a bank in an agricultural community is susceptible to factors like drought, while a bank in a manufacturing community may be influenced by import competition since local credit and deposit markets are tied to the customers in those locations.

However, since acquiring such granular data is not feasible, I rely instead on the geographic locations of banks and the inherent exposures associated with those areas. Numerous studies have highlighted the significance of physical banking presence in local communities. For instance, Nguyen (2019) argues that deposit and credit services are not perfect substitutes across geographic markets, emphasizing that the closure of local bank branches results in reduced credit supply for businesses in the vicinity. Similarly, Celerier and Matray (2019) demonstrate that local banks play a crucial role in promoting financial inclusion, as an increased density of bank branches leads to a higher number of households opening bank accounts.

In light of these considerations, I adopt the methodology proposed by Kundu et al. (2021)

Figure 2: County and Bank Exposure to Import Competition



Note: Figures show the distribution of bank and county level exposure to increased import competition.

to create a measure of each bank's exposure to increased import competition. The measure is created using pre-shock deposit shares in each county and the respective exposures of each county:

$$BankExp_i = \sum_{c \in C} \frac{d_{i,c}}{d_i} CountyExp_c \quad (2)$$

where $d_{i,c}$ are bank i 's deposits in county c , d_i is the sum of bank i 's deposits across all counties it operates in, and $CountyExp_c$ is county c 's exposure to the China Shock, as defined above.

Histograms presented in Figure 2 reveal significant variation in exposure levels, both at the county and bank level. Summary statistics in Table 1 provide a detailed view of these variations. On average, the county-level exposure is 7.23, with a median of 5.68. Exposure ranges from a minimum of zero in the least exposed county to a maximum of 44.44 in the most exposed one. When examining bank-level exposure, the average exposure is 6.76 and a median of 5.60. Similar to county exposure, the least exposed bank registers zero exposure, while the most exposed bank reaches 44.44. Since exposure is a unit-less measure, the normalization procedure enables meaningful comparisons of exposure levels between different units.

Table 1: Bank and County Exposure to PNTR

Measure	Mean	Sd.	Median	Min.	Max.
County Exposure [n = xxxx]	7.23	6.47	5.68	0	44.44
County Exposure Normalized	0	1	-0.24	-1.11	5.75
Bank Exposure [n = 10,177]	6.76	4.95	5.60	0	44.44
Normalized Bank Exposure	-0.07	0.76	-0.24	-1.11	5.75

Note: The County Exposure incorporates the difference between NTR and Column Two tariffs for each industry and the industrial composition of each county's labor market. Bank exposure incorporates the location of each bank's deposit collecting branches and those locations County Exposures.

3.4 Balance Tests One concern in studies like this is the potential correlation between exposure to a shock and the characteristics of banks. If banks in exposed counties were fundamentally different from those in unexposed counties, establishing causal relationships would be challenging. While difference-in-means tests are commonly used to examine covariate balance between treated and untreated groups, they are not suitable for continuous exposure measures. To assess the overlap of covariates, I follow XXX's method by conducting a balance test. This test regresses each bank's exposure level on a range of pre-shock balance sheet measures:

$$BankExp_b = \beta_0 + \beta_1 \bar{X}_b + \epsilon_b \quad (3)$$

where \bar{X}_b is the pre-treatment average of a given measure. The coefficient of interest, denoted as β_1 , indicates whether the measure is balanced across bank exposure. A rejection of the null hypothesis $\beta_1 = 0$ suggests an imbalance.

Table 7 presents the results of the balance test. The balance sheet measures examined include assets, deposits, branches, return-on-equity, non-performing loan ratios, and core deposit ratios. While the focus of the analysis is banks that operate branches in multiple markets, I examine the balance across all banks. Panel (A) displays results for the full sample of banks, Panel (B) for multi-market banks, and Panel (C) for single market banks. In the full sample, none of the coefficients are statistically significant at the 10% level, indicating balanced observations on pre-shock balance sheet measures across treatment levels. For

multi-market banks, statistically significant coefficients on assets, deposits, branches, and non-performing loan ratios suggest that larger banks were likely less exposed than smaller banks. This is due to exposure reflecting the extent of each bank’s branch network. Single market banks exhibit a different pattern, with positive and statistically significant coefficients on deposits and branches. While these covariates are not balanced, difference-in-difference regressions can still provide valid inference by controlling for unbalanced covariates.

4 Empirical Strategy and Results

The following analyses aim to uncover the mechanisms that link increased import competition to banking outcomes. My specific focus lies in understanding how bank funding is impacted by shifts in local markets’ exposure to import competition and how these funding constraints subsequently affect credit origination. To achieve this, I analyze the operations of multi-market banks which branches in multiple counties. For these multi-market banks, their branch networks can serve as conduits for transmitting, or as a form of insurance against, local fluctuations in deposits and credit demand.

In the framework employed for this study, banks maintain branches across multiple markets. Deposits are gathered from customers segmented into these local markets, and despite the costs associated with operating deposit-accepting branches, deposits remain a relatively cost-effective form of bank funding (Hanson et al. (2015)). Deposits serve as the primary source of funding for the banks’ lending operations, and banks efficiently allocate funds collected in one market to meet the lending demands of all others. While there are challenges associated with establishing and operating deposit collecting branches, the informational hurdles linked to lending in different markets are comparatively lower.

During this era, mortgage brokers gained prominence, playing a crucial role in connecting potential borrowers with banks eager to extend loans. This arrangement allowed a bank to connect with borrowers located on the opposite side of the country. Additionally, entities like Freddie Mac and other financial corporations began securitizing loans, resulting in the development of a vibrant secondary market for mortgage loans¹⁰.

¹⁰A home buyer would go to a broker, the broker would then ”shop” the mortgage around multiple banks,

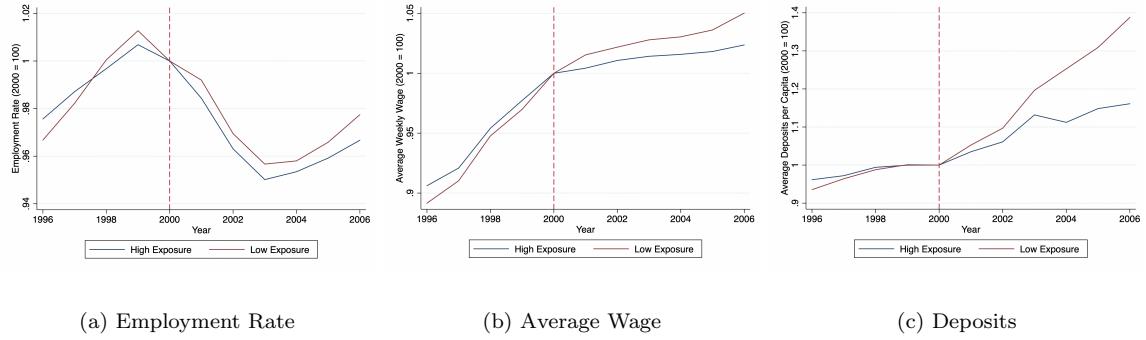
4.1 Import Competition and Local Labor Markets I begin by establishing that the China Shock resulted in local labor market disturbances that had the potential to influence local deposit-holding behaviors. Previous research has clearly demonstrated that the industries most exposed to increased import competition witnessed substantial reductions in labor demand (CITE HERE). Limited migration played a significant role in magnifying the repercussions of job losses. Notably, Autor et al. (2021) find only modest rates of out-migration from the affected counties, with the majority of those leaving being foreign-born workers and individuals aged 25 to 39. The authors concluded that opting out of the labor force was the primary means of adjusting to the shocks in labor demand. Such exits from the labor force, coupled with increased mechanization of labor processes, led to elevated unemployment rates and reduced wages.

Comparing average wage and employment growth across different levels of exposure reveals the impact of import competition on local labor markets in these aspects. The determination of high and low exposure is based on county exposure level relative to the median. Time trends depicted in Figures 3 (A) and (B) illustrate the contrasts in average employment and wages between high and low exposure counties. Divergences emerge after the year 2000, with employment rates and average wages in high exposure counties falling below those in low exposure counties. These employment and wage effects reflect the labor market impact of increased import competition.

Even with government subsidies and other programs designed to support unemployed workers, it would be reasonable to anticipate a decrease in savings and deposits within markets exposed to import competition. Panel (C) of Figure 3 depicts the trends in deposit growth between high and low-exposure counties. A noticeable divergence between these two series becomes apparent in the aftermath of the shock. Deposits in high-exposure counties decline relative to their low-exposure counterparts. The decline is not due to a redistribution of funds but rather to a decrease in incoming wealth for local businesses and customers.

finding the one that would lend the money at the best terms. Banks could then either hold the mortgages on balance sheet or offload them to Freddie Mac. Freddie Mac began using automated underwriting system which streamlined much of this process. See WSJ Article "Why Big Lenders Are So Afraid Of Fannie Mae and Freddie Mac"

Figure 3: County Variables by Exposure to China Shock



Note: The figure presents the average employment rate, weekly wage, and deposits per capita at the county level based on exposure to the China Shock. Counties are divided into high and low based on the value of their exposure relative to the median. Values are then normalized such that 2000 is equal to 100.

This trend aligns with the nature of the local labor market shocks which impact wealth and spending.

4.2 Local Deposit Supply While the previous declines likely reflect the impact of the labor market shock, it is crucial to discern whether import competition operates through deposit supply or deposit demand¹¹. Equilibrium deposit quantities in local markets result from the interaction of banks' demand and customers' supply. Increased import competition could influence both of these curves, as banks in markets with reduced demand for credit products might adjust their size by allowing deposits to flow out. However, the channel of interest here is primarily driven by local customers supplying fewer deposits due to their decreased employment rates and wages. The demand channel implies an endogenous readjustment of optimal deposit levels, while the supply channel suggests an exogenous, first-order spillover from import competition.

To identify the dominant driver, I analyze bank-by-county-by-year data. Evidence indicates that banks typically do not set deposit prices at the individual branch level; instead, they implement uniform pricing strategies across regions or entire markets (Radecki (1998), Edelstein and Morgan (2006), Granja and Paixao (2021), Begenau and Stafford (2022)). This practice enables me to differentiate deposit supply shifts by comparing deposits within

¹¹Following the convention that banks demand deposits while customers supply them.

the same bank and within the same state, but across counties with varying levels of exposure to increased import competition. The specification I employ is designed to isolate changes in deposits resulting from supply shifts, and it accomplishes this by controlling for local demand factors:

$$\ln(D_{bct}) = \beta(Post_t \times NTRGap_c) + \gamma Post_t \times X_{bc} + \delta_{b,s,t} + \delta_{b,c} + \epsilon_{b,c,t} \quad (4)$$

where $D_{b,c,t}$ is the sum of bank b 's deposits in county c in year t and X_{bc} is a vector of bank and county controls interacted with the *post* indicator. The bank-by-county fixed effects, $\delta_{b,c}$ control for potential non-random placement of bank branches and all time-invariant factors that may affect deposit activity for a bank in a given county, and bank-by-year fixed effects, $\delta_{b,s,t}$ control for any shock that hits bank deposits in bank b in year t across all markets in state s . This would include pricing changes set by the bank in order to increase or decrease deposit demand. Including this fixed effect then isolates changes in deposit quantity attributed to deposit supply, and this specification is similar to the within-bank estimator proposed by Khwaja and Mian (2008).

For this specification to accurately identify the causal relationship between local increases in import competition and bank deposits, it is essential that, in the absence of the permanent granting of Normal Trade Relations (NTR), deposit trends would have followed a similar trajectory across counties, regardless of their level of exposure to import competition. In many prior studies, the China Shock is assumed to be exogenous, which simplifies the identification process. However, if banks had strategically selected markets based on the manufacturing composition of those local markets, then the analysis would fail to capture the true causal relationship. The time plot in Figure 3 indicates that before the Shock, deposit trends exhibited similarities across counties. To address the possibility of banks selectively entering and exiting markets in response to the shock, I estimate the desired specification using both the full sample of bank-by-county-by-year observations and a sub-sample that excludes any observations where a bank has only a single branch in that local market. The sub-sample specifically includes markets in which banks have established a presence.

I bolster this analysis with event studies which estimate the coefficients in an equation similar to Equation XXX but where exposure and control variables are interacted with a

Table 2: Effect of CountyExposure on Local Deposit Supply

	Full Sample		Established Markets	
	Dep.	Dep.	Dep.	Dep.
Post x CountyExp	-0.0446*** (0.00869)	-0.0421*** (0.00868)	-0.0188** (0.00884)	-0.0168* (0.0102)
Post x avg_pay	0.159*** (0.0319)	0.182*** (0.0268)	0.185*** (0.0355)	0.240*** (0.0285)
Post x man_share	0.0299 (0.0552)	-0.00769 (0.0542)	-0.118* (0.0609)	-0.182*** (0.0597)
Post x pct_college	0.0129*** (0.000758)	0.0119*** (0.000664)	0.00881*** (0.000724)	0.00760*** (0.000607)
Bank-by-County FE	yes	yes	yes	yes
Bank-by-Year FE	yes		yes	
Bank-by-Year-by-State FE		yes		yes
N	193995	189943	97715	95584
R ²	0.953	0.959	0.971	0.976

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Note: Data are bank-by-county-by year observations. Each regression is a continuous difference-in-difference regression. The fixed effects included in each regression are denoted in the table. The parameter of interest is the coefficient $Post \times NTR_gap$, which signifies the percent change in local deposit supply due to a one standard deviation increase in county level exposure. The Established Markets sub-sample focuses on markets where banks have an established presence by excluding observations where the given bank has only one branch in the local market.

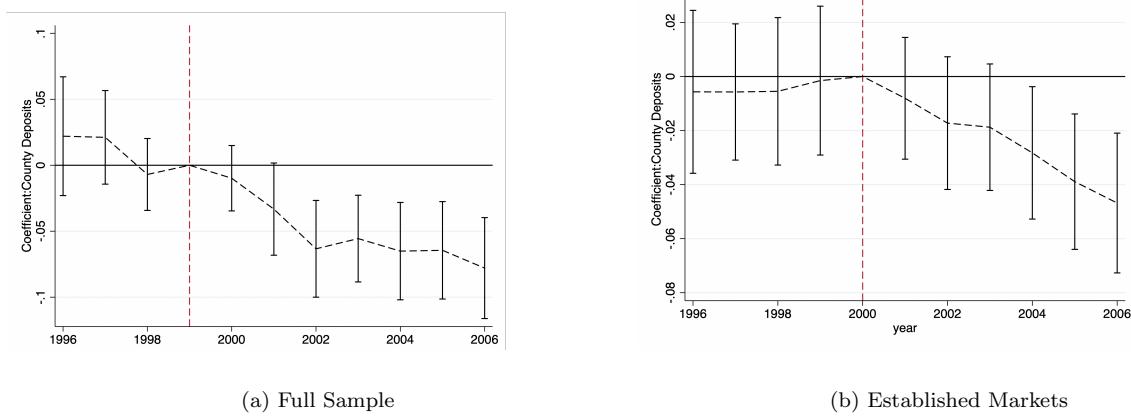
dummy variable for each year. Plotting the coefficients gives a visual representation of the impact of exposure on the desired outcomes at each time period. While a lack of pretrends alone does not validate the causal estimates, it adds to the idea that in the absence of the China Shock, bank level outcomes would have continued in a parallel manner between treated and untreated banks.

Results from the first analysis are shown in Table 2. The coefficient of interest is $Post \times CountyExp$, which signifies the percent change in deposits caused by a 1 standard deviation increase in county exposure to the increased import competition. I estimate the specifications in Columns (1) and (2) using the full sample of observations. Column (1) includes $bank \times county$ and $bank \times year$ fixed effects and time-invariant county level controls, and Column (2) includes $bank \times county$ and $bank \times state \times year$ fixed effects and time-invariant county level controls. The first specification varies slightly from the second, as $bank \times year$ fixed effects are not interacted with the state variable. Results from the first specification show that a 1 standard deviation increase in a county's exposure to import competition led to a 4.46% decrease in deposits, and when controlling for state-level deposit pricing, a 1 standard deviation increase in exposure led to a 4.2% decrease in deposits. The similarity of the two estimates suggests that few bank-level attributes, such as deposit prices, vary across state lines.

I estimate the specifications in Columns (3) and (4) using the sub-sample of bank-by-market observations that are classified as established markets. Using these observations limits the influence of local deposit shifts that may arise from rapid entry and exit into markets. In addition to county level controls, Column (3) includes $bank \times county$ and $bank \times year$ fixed effects and Column (4) includes $bank \times county$ and $bank \times state \times year$ fixed effects. These results indicate that a 1 standard deviation increase in a county's exposure to the China Shock led to a 1.6 to 1.8 percent decrease in deposits that could be attributed to supply.

The coefficients of interest from established markets sample are only half the magnitude of those from the full sample, suggesting that bank branches not in established markets experienced exaggerated dynamics. Event studies of the desired specification for the full sample and the established market sample are shown in Figure 4. For the full sample, there

Figure 4: Effect of China Shock on Deposits at Bank-County Level



Note: The figure present the estimates from the difference-in-difference regression from the panel of bank-county level deposits in FDIC insured banks. The dependent variable is the log of deposits at the bank-county level. Controls are interacted with a post- dummy and include.... Regression includes bank-by-state-by-year and bank-by-county fixed effects. Panel A is estimated using the full sample of bank-by-county-by year observations and Panel B is estimated using the sub-sample that excludes bank-by-county-by-year observations in which only one bank is present.

is a clear downward pre-trend which continues after treatment, but the event study for the sub-sample doesn't have this downward pretrend. This suggests that negative pretrends in the full sample were likely driven by these single-branch observations. These findings suggest that the causal effect of the China Shock on local deposit supply is more accurately estimated in the specifications estimated using observations from established markets.

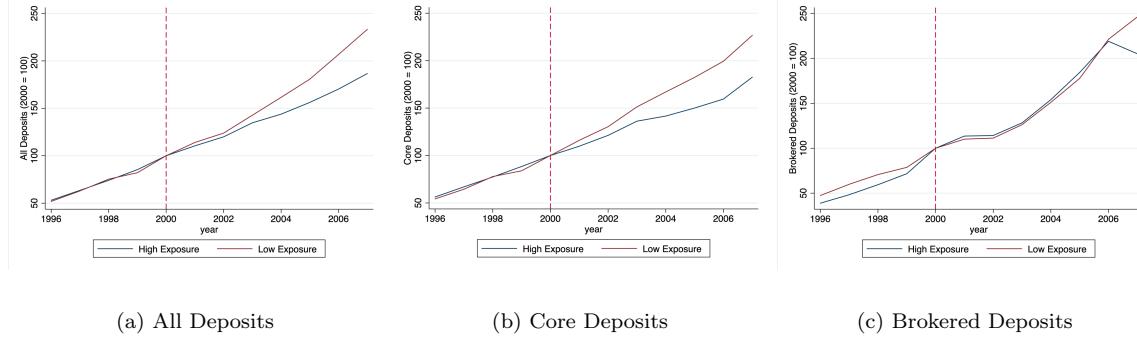
The coefficients of interest in the established markets sample are only half the magnitude of those in the full sample, indicating that bank branches outside established markets experienced more pronounced dynamics. Event studies of the desired specification for both the full sample and the established market sample are displayed in Figure 4. In the full sample, a slight downward pre-trend exists, which continues after the treatment period. Conversely, the event study for the established markets sample lacks this downward pre-trend, suggesting that the negative pre-trends in the full sample were primarily driven by single-branch observations. These findings imply that the causal effect of increased import competition on local deposit supply is more accurately estimated in the specifications derived from the sub-sample, which excludes single-branch observations.

4.3 Core and Brokered Deposits The question arises as to whether deposit outflows in local markets had an impact when aggregated on each bank's balance sheet. If deposits were merely shifting between counties but remaining within the same bank, local deposit changes wouldn't affect the total bank funding. To investigate this, I examined quarterly balance sheets provided by the FDIC. These balance sheets provide insights into total, brokered, and core deposits for each bank at a quarterly frequency.

Deposits can be categorized into core deposits and non-core deposits. For simplicity, I refer to non-core deposits as brokered deposits, even though some non-core deposits may not be brokered. Core deposits are generally a safer, more stable source of funding for banks, encompassing small-denomination time deposits, checking deposits, and other payment accounts of less than \$250,000 for customers in the same geographic region as the branches. On the other hand, banks typically acquire brokered deposits through brokers, who connect large savers with banks. These deposits are typically more expensive and often more volatile as they often exceed the FDIC's insurance limits. Therefore, it is essential to analyze both subsets of deposits, as movements in each may reflect different economic mechanisms.

Figure 5 illustrates the time trend following the granting of permanent NTR with China. Banks more exposed to import competition than the median experienced a decrease in total and core deposits. This indicates that local outflows likely had a significant impact on bank funding.

Figure 5: Deposit Trends by Exposure to Import Competition



Note: The figure presents the average of all deposits, core deposits, and brokered deposits at the bank level based on exposure to the China Shock. Banks are divided into high and low based on the value of their exposure relative to the median. Values are then normalized such that 2000 is equal to 100.

I formally analyze this connection by leveraging differential bank exposure to increased import competition before and after permanent NTR in a difference-in-differences regression with continuous treatment. I estimate the parameters in the following equation:

$$\ln(D_{bt}) = \beta(Post_t \times BankExp_b) + \gamma \times Post_t \times X_{bt} + \epsilon_{bt} \quad (5)$$

where D_{bt} is the sum of deposits at bank b in year t , $BankExp_b$ is bank b 's exposure to increased import competition, and X_{bt} is a vector of time invariant bank level controls interacted with a post-dummy. The controls measure fundamental characteristics of each bank and are 1997 to 1999 averages of the assets, non-performing loan ratio, and equity ratios of each of the banks. Each regression includes time fixed effects which control for quarter specific shocks which affected every bank and bank fixed effects which control for time invariant bank-level factors which drive banks' individual credit and funding decisions. The coefficient of interest is β and it represents the effect of an increase in bank exposure to the China Shock on a given bank's deposits. Identification of a causal relationship hinges on the assumption that in the absence of the China Shock, bank funding would have been similar across banks.

To investigate whether these changes were driven on the intensive margin of deposit collecting, I analyze the number of branches each bank operated and the number of counties in which each bank had branches. I use a similar difference-in-difference regression with bank and year fixed effects. Results for these regressions are shown in the final columns of Table 3. For the number of branches, the coefficient of interest is negative but statistically insignificant, and for the number of markets, the coefficient is positive yet small. A one unit increase in bank exposure led to a 1% increase in the number of markets in which a given bank operated branches. Given the average bank operated branches in 2.6 markets, this increase is economically insignificant, even though it is statistically significant. Together this evidence shows that exposure to increased import competition decreased banks' deposits on the intensive margin, as banks lost deposit in individual markets but did not change the number of markets they operated in.

The results of the regression analysis are displayed in Table 3. The dependent variables considered include the natural logarithm of total deposits, core deposits, and brokered

deposits. A one-unit increase in bank exposure corresponded to a 2.3% decrease in total deposits, a 2.2% decrease in core deposits, and a 3.5% decrease in brokered deposits, with all coefficients attaining statistical significance at the 1% level. These outcomes demonstrate that exposure to import competition had a substantial impact on banks' funding. To examine whether these changes predominantly occurred at the intensive margin of deposit collection, I conducted an analysis of the number of branches operated by each bank and the number of counties in which each bank had branches using the same difference-in-differences regression. The results of these regressions are presented in the final columns of Table 3.

Table 3: Effect of Import Competition on Deposits (Balance Sheet Level)

Dep Var:	All Dep.	Core Dep.	Brokered Dep.	Branches	Markets
Post x BankExp	-0.0234*** (0.00908)	-0.0223** (0.00895)	-0.0351*** (0.0131)	-0.00360 (0.00680)	0.0106* (0.00583)
Post x NPR	-0.00301*** (0.000811)	-0.00284*** (0.000782)	-0.00377*** (0.000953)	-0.00160*** (0.000474)	-0.00118*** (0.000362)
Post x NPR	0.00984 (0.0108)	0.00465 (0.0110)	0.0100 (0.0128)	0.0411*** (0.00848)	0.0519*** (0.00775)
Post x EQR	-65.18 (52.98)	-65.37 (51.63)	-32.88 (54.14)	-43.19* (23.35)	-36.60* (19.18)
N	154465	154465	154465	153226	153226
R ²	0.967	0.966	0.946	0.963	0.928

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Note: Data come from FDIC Quarterly Call Reports. The regression is a continuous difference-in-difference, and dependent variables include the log of total deposits, core deposits, and brokered deposits. Variables include an indicator *Post* which is equal to 1 for observations after the year 2000; *Exp*, which is each bank's exposure to the China Shock based on its deposit collecting locations; the average non-performing loan ratio, log of assets, and equity-to-assets ratio for each bank in the years prior to 2000. Each regression includes time period and bank fixed effects.

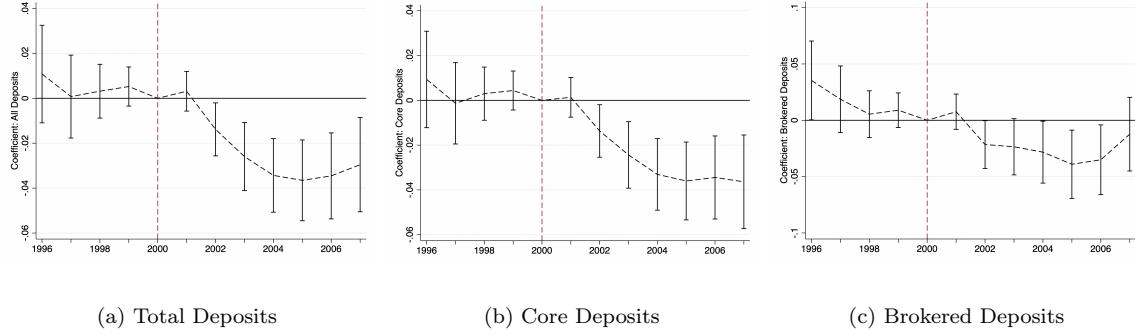
For the number of branches each bank operated, the coefficient of interest is negative but lacks statistical significance. For the number of markets a bank operated branches in, the

coefficient is positive but quite small. A one-unit increase in bank exposure resulted in a 1.1% increase in the number of markets where a given bank operated branches. Given that, on average, banks operated in 2.6 markets, this increase is economically insignificant, even though it is statistically significant.

Event studies for the deposit regressions are shown in Figure 6. The plots show that prior to permanent NTR, the coefficients of interest were identical to zero, and only after the year 2000 do the coefficients become negative. This pattern supports the assertion of parallel pretrends and the causal interpretation of the results. Together, the evidence supports the fact that the local deposit caused by increased import competition impacted bank's balance sheets, especially for banks operating in multiple markets.

Collectively, this evidence suggests that exposure to increased import competition primarily led to a reduction in banks' deposits at the intensive margin. Banks didn't alter the number of branches they operated or the number of markets they participated in. Instead, the exogenous decrease in employment and wages in the markets most exposed to import competition led to reduced deposit holdings by local customers. These results are significant as they underscore the link between bank funding and the local economic conditions of the markets where they operate branches. This deposits mechanism plays a vital role in transmitting local economic shocks to the financial system

Figure 6: Effect of China Shock on Deposits at Bank Level



Note: The figure present the estimates from the difference-in-difference regression from the panel of bank level deposits for FDIC insured banks. The dependent variable is the log of deposits, core deposits, and brokered deposits at the bank-by-year level. Controls are interacted with a post- dummy and include.... Regression includes bank and time fixed effects.

5 Changes in Credit Origination

Thus far, the results have indicated that bank funding was influenced by exposure to increased import competition. It is crucial to delve into how this phenomenon impacted individual banks' lending behavior. Funding constraints can have a multifaceted effect on bank lending, including the amount they lend, the markets in which they choose to lend, and the recipients to whom they extend credit. In building on the insights of Izadi and Saadi (2023), this examination encompasses not only small business lending but also home mortgage originations. These two lending markets differ significantly, with small business loans being information-intensive and often reliant on relational capital, while mortgage loans tend to be more standardized, as they involve collateral that is easier to value and borrower creditworthiness that can be readily assessed. Furthermore, a liquid secondary market exists for mortgages, whereas no such market exists for small business loans. The analysis begins with an assessment of changes in lending at the bank level and subsequently explores decisions related to local credit supply.

5.1 Bank Level Aggregating the credit origination data at the bank level allows for a comprehensive examination of each bank's credit origination decisions. This approach essentially assesses the pass-through rate, which indicates how lending changes in response to shifts in funding. It is expected that reduced funding would result in fewer loan originations. To empirically test this, I estimate parameters from Equation XXX using the natural logarithm of each bank's small business and mortgage loan originations as dependent variables. Within each lending category, I analyze not only the dollar amount of loans but also the number of loans. This dual analysis helps mitigate potential impacts of endogenous pricing responses in affected counties. The key parameter of interest is the coefficient on the variable Post x BankExp, which represents the percentage change in lending due to a one-unit increase in bank exposure.

The results are presented in Table 4. Surprisingly, the coefficient of interest does not attain statistical significance in any of the specifications. This suggests that exposure to import competition had limited influence on the total amount of small business and mortgage

Table 4: Impact of Exposure to Import Competition on Lending (Bank Level)

	Small Business Loans		Mortgage Loans	
	Number	Amount	Number	Amount
Post x BankExp	-0.00346 (0.0451)	-0.0586 (0.0720)	0.0370 (0.0281)	0.0195 (0.0376)
Post x Asset	0.687*** (0.0317)	1.029*** (0.0498)	-0.0276 (0.0226)	-0.0844** (0.0336)
Post x NPR	-12.50*** (2.897)	-15.13*** (5.248)	-1.862 (2.339)	-2.164 (3.611)
Post x EQR	-2.576*** (0.775)	-3.339** (1.315)	-0.0615 (0.500)	-0.428 (0.681)
<i>N</i>	30173	30173	30173	30173
<i>R</i> ²	0.758	0.754	0.834	0.829

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Note: The table presents the results of the continuous difference-in-difference regression using bank-by-year observations. Each regression includes bank and county fixed effects. Dependent variables include the log of small business lending, home mortgage originations.

loans originated by banks. This finding may appear somewhat perplexing, considering the established connections between exposure to import competition and reductions in bank funding, as well as the relationship between import competition and local demand for credit. One might naturally assume that these funding changes would be reflected in lending, but such an association does not appear.

Additionally, I investigate the number of markets in which banks operate branches and originate small business and mortgage loans using a similar difference-in-differences regression. The results are presented in Table 5, and once again, the coefficient of interest fails to attain statistical significance for either of the dependent variables. Import competition did not appear to affect the number of markets in which banks originated either type loans.

Clearly, there must be underlying mechanisms at play that enable banks to sustain their lending levels even when their funding is constrained.

5.2 Reallocation and Securitization

Findings in the previous section suggest that there is little connection between increased import competition and credit originations, but analysis at the bank level can mask underlying changes in credit supply. To investigate if aggregate measures of credit supply masked underlying changes, I turn to more granular bank-by-county-by-year data to estimate the coefficients in a model which examines local credit decisions. Analyzing credit decisions at the local level can uncover patterns of redistribution of credit supply between markets.

I estimate a model similar to Equation XXX, however, I now include bank-by-county and county-by-year fixed effects. The bank-by-county fixed effects control for potential non-random placement of bank branches and all time-invariant factors that may affect lending activity for a bank in a given county, and the county-by-year fixed effects control for any shock that hits counties in year t , including county specific credit demand shocks. This within county estimator leverages banks' differential exposures to import competition to uncover local credit supply shifts. The primary explanatory variable in each of the specifications is BankExposure, and the coefficient of interest for that variable represents the percent change in local credit supply from a given bank due to a one standard deviation increase in BankExposure. Additionally, I interact BankExposure with CountyExposure to explore

Table 5: Number of Markets Operating in Bank-Level

	Deposit Markets	Small Business Markets	Mortgage Markets
Post x BankExp	0.00259 (0.0202)	-0.0303 (0.0257)	0.0151 (0.0215)
Post x Asset	0.0425*** (0.0162)	-0.0111 (0.0199)	0.0722*** (0.0135)
Post x NPR	1.938* (1.137)	-4.278** (1.757)	-1.827 (1.551)
Post x EQR	-1.242 (0.913)	1.529* (0.863)	-0.835** (0.388)
<i>N</i>	4377	6810	28961
<i>R</i> ²	0.942	0.871	0.801

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Note: Data come from FDIC's Summary of Deposits, HMDA, and CRA. The regression is a continuous difference-in-difference, and dependent variables including the log of the number of counties a bank has branches in and the number of counties it originates small business and mortgage loans in. Variables include an indicator *Post* which is equal to 1 for observations after the year 2000; *BankExp*, which is each bank's exposure to the China Shock based on its deposit collecting locations; the average non-performing loan ratio, log of assets, and equity-to-assets ratio for each bank in the years prior to 2000. Each regression includes time period and bank fixed effects.

heterogeneous changes in lending across different levels of bank and county exposure.

The results are presented in Table 6. For small business lending, the coefficient on bank exposure is negative for both the number and amount of loans, but it is statistically significant only for the number of small business loans. Specifically, a one-unit increase in bank exposure to increased import competition resulted in a 3.6% decrease in the number of small business loans. The coefficients on the interaction between bank and county exposure are statistically insignificant for both the number and amount of small business loans. This suggests that any decreases in the supply of these loans were consistent across markets, regardless of their levels of exposure.

For mortgage originations, the coefficient on bank exposure is positive for both the number and amount of mortgage originations, and both coefficients are statistically significant at the 1% level. Specifically, a one-unit increase in bank exposure resulted in a 5% increase in the number of mortgages and a 13.5% increase in the total amount of mortgages originated. Furthermore, the coefficients on the interaction terms are also both negative and statistically significant. Combined, these results indicate that increased exposure to import competition prompted banks to reallocate their lending toward mortgage originations but only in markets that were not subject to increased import competition.

Finally, I explore an additional mechanism that may have hampered the transmission of funding shocks to credit originations—namely, the securitization of mortgage loans. As previously mentioned, when a bank originates a mortgage loan, it has the option to either retain the loan on its balance sheet or sell it to another financial institution, a process commonly referred to as securitization. While keeping a mortgage on the balance sheet can yield higher profits, it exposes the bank to default risk and ties up its lending capital. In contrast, selling the mortgage can still generate profits and replenish the bank’s lending capital. For banks exposed to funding shocks, this mechanism could play a vital role in their ability to continue originating loans.

To examine this mechanism, I regress the amount of loans that each bank securitized in each county market on measures of bank and county exposure within the same difference-in-differences framework. The results are presented in the final column of Table 6. Notably, the coefficient on bank exposure is positive and statistically significant. A one-unit increase

Table 6: Credit Supply at Bank-by-County Level (in text)

	Small Business Loans		Mortgage Loans		
	Number	Amount	Number	Amount	Securitized
Post x BankExp	-0.0359*** (0.0137)	-0.0418 (0.0311)	0.0500*** (0.00554)	0.135*** (0.00900)	0.330*** (0.0156)
Post x BankExp x CountyExp	0.00942 (0.0123)	0.00899 (0.0257)	-0.0126*** (0.00482)	-0.0441*** (0.00771)	-0.0610*** (0.0139)
Post x Asset	0.0317*** (0.00598)	0.0435*** (0.0122)	0.0682*** (0.00288)	0.0283*** (0.00405)	0.148*** (0.00756)
Post x NPR	-4.840*** (1.394)	-9.207*** (3.215)	4.148*** (0.532)	8.813*** (0.803)	23.62*** (1.518)
Post x EQR	-0.694** (0.332)	-0.112 (0.792)	-1.879*** (0.0862)	-3.099*** (0.133)	-6.266*** (0.258)
<i>N</i>	125920	125920	350546	350546	350545
<i>R</i> ²	0.900	0.794	0.868	0.826	0.730

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Note: The table presents the results of the continuous difference-in-difference regression using bank-by-county-by-year observations. Each regression includes bank-by-county and county-by-year fixed effects. Dependent variables include the log of small business lending, home mortgage originations, and home mortgage originated then sold within a year.

in bank exposure leads to a 33% increase in securitization. Additionally, the coefficient on the interaction between bank and county exposure is negative and statistically significant, consistent with the earlier pattern that fewer loans were securitized in higher-exposure counties. The magnitude and significance of these coefficients underscore the significance of this mechanism.

In summary, increased import competition led to reduced small business lending but increased mortgage lending and securitization, primarily in less exposed counties. These findings suggest that highly exposed banks managed funding shocks by shifting their lending to safer, less exposed markets and selling loans in secondary markets. Drechsler et al. (2017)

write that small business loans are risky, illiquid, and rarely securitized. Mortgages, on the other hand, are frequently sold off balance sheet and have large secondary markets backed by other banks, financial institutions, and government sponsored enterprises. This geographic and market reallocation is similar to what some coined a flight to quality (Bernanke et al. (1996)) whereby external factors nudge banks to lend to only the safest customers when there is increased uncertainty.

6 Summary and Concluding Remarks

In this paper, I show that the local labor market shock generated by the granting of Permanent Normal Trade Relations with China in 2000 had implications beyond the labor market consequences of decreased employment and wages. Banks rely on cheap funding from customer deposits in local markets, and when those local markets experience increased unemployment and decreased wages, deposit supply is constrained. I show that banks saw statistically significant declines in deposit supply in markets exposed to the China Shock, and these local deposit declines aggregated up to the balance sheet level.

These funding constraints had far-reaching implications for how and where banks extended credit. While the impact of exposure to import competition was relatively modest when viewed at the level of banks' balance sheets, the banks achieved this limited pass-through of funding shocks by strategically shifting their lending focus. Specifically, they reallocated their lending from small business loans to mortgage loans in markets that were less exposed to increased import competition. The ability to securitize these mortgage loans played a crucial role in this reallocation process, as it allowed banks to fill funding gaps by moving mortgages off their balance sheets, thus freeing up lending capital. With any analysis like this, caution must be taken when assigning causality. Violations of the identification assumption can limit the ability for a causal interpretation of reduced form parameters. I support identification in many of my analyses by showing parallel pretrends and event study plots

The results of this study provide valuable insights into our understanding of how local shocks impact the financial system. While previous research has often emphasized the role

of non-performing loans in influencing credit supply, it's crucial to recognize that funding constraints play an equally significant role. The deposits channel reveals that local exogenous shocks can result in tightened bank funding.

When banks face funding limitations, they adapt by altering both the nature and geographic distribution of the credit they provide. Instead of reallocating to safer assets, they tend to pivot towards more liquid assets that can be easily sold off their balance sheets. However, as demonstrated by the events of the Great Financial Crisis just eight years after the granting of Permanent Normal Trade Relations, a flight to the most liquid assets may not be the most prudent approach for overall financial stability.

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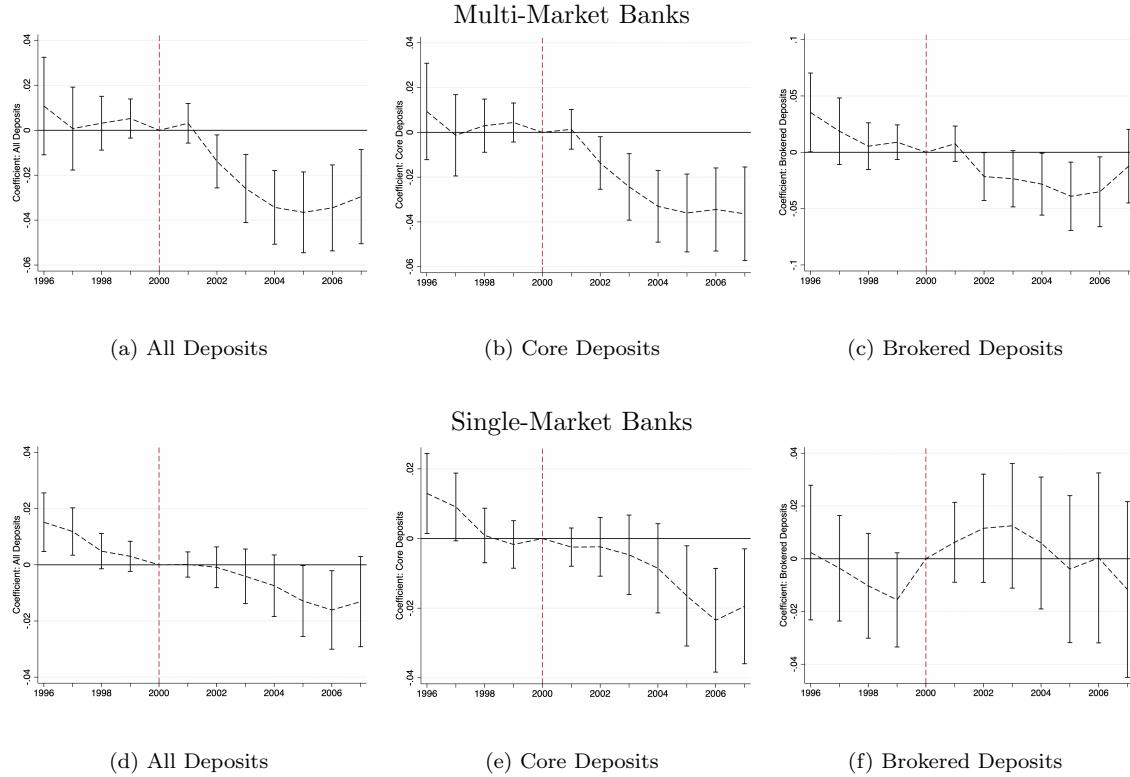
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8 Appendix Figures and Tables

Figure 7: Deposit Reaction to China Shock



Note: The figure presents the event studies of the reaction of all deposits, core deposits, and brokered deposits to exposure to the China Shock. Regressions are continuous difference-in-difference regressions with bank and period fixed effects. Standard errors are clustered at the bank level, and the coefficient for year 2000 is standardized to zero.

Table 7: Correlation Between Bank Exposure and Pre-Shock Measures

$BankExp_b = \beta_0 + \beta_1 \bar{X}_b + \epsilon_b$						
Explanatory Variable:						
	Assets	Deposits	Branches	ROE	NPL Ratio	Core Dep. Ratio
Pan. (A)						
Est.	-0.00703	0.00133	-0.000489	0.00106	-0.000479	0.0744
SE	(0.00499)	(0.00481)	(0.000138)	(0.000709)	(0.000422)	(0.0665)
N	9307	9306	9202	9290	9290	9301
Pan. (B)						
Est.	-0.0187***	-0.0123*	-0.000451***	0.000941	-0.00156**	-0.0317
SE	(0.00655)	(0.00650)	(0.000134)	(0.00131)	(0.000758)	(0.128)
N	2793	2792	2688	2793	2793	2787
Pan. (C)						
Est.	0.0133	0.0268***	0.0218***	0.00114	0.000132	0.107
SE	(0.00864)	(0.00822)	(0.00486)	(0.000842)	(0.000518)	(0.0769)
N	6514	6514	6514	6497	6497	6514

Note: Data from FDIC Quarterly call reports. The balance tests regress each bank's exposure, Exp_b , on a pre-Shock average of a given balance sheet item. Each column presents the estimated coefficient, β_1 and its heteroskedasticity robust standard error. Panel (A) includes the full sample of banks and Panel (B) includes only banks operating in multiple markets, and Panel (C) includes only banks operating in a single market.

Table 8: Bank Deposit Levels (Appendix)

	Full Sample				Multi-Market				Single-Market	
	ldep	coredep	brokdep	ldep	coredep	brokdep	ldep	coredep	brokdep	brokdep
Post x BankExp	-0.0217*** (0.00487)	-0.0198*** (0.00530)	-0.00962 (0.00864)	-0.0234*** (0.00908)	-0.0223** (0.00895)	-0.0351*** (0.0131)	-0.0135*** (0.00477)	-0.0120** (0.00588)	0.0105 (0.0108)	0.0105
Post x NPR	-0.00295*** (0.000404)	-0.00269*** (0.000472)	-0.00328*** (0.000819)	-0.00301*** (0.000811)	-0.00284*** (0.000782)	-0.00377*** (0.000953)	-0.00272*** (0.000458)	-0.00250*** (0.000566)	-0.00299*** (0.00114)	
Post x Asset	0.000778 (0.00804)	0.0184** (0.00829)	-0.0320** (0.0144)	0.00984 (0.0108)	0.00465 (0.0110)	0.0100 (0.0128)	-0.0151 (0.0126)	0.00479 (0.0132)	-0.0766*** (0.0293)	
Post x EQR	25.31 (28.65)	-62.38* (33.52)	41.91 (44.12)	-65.18 (52.98)	-65.37 (51.63)	-32.88 (54.14)	65.12** (27.03)	-27.99 (38.86)	60.80 (52.87)	
N	376831	376830	376831	154465	154465	154465	222131	222130	222131	
R ²	0.947	0.942	0.907	0.967	0.966	0.946	0.934	0.923	0.874	

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Note: Data come from FDIC Quarterly Call Reports. The regression is a continuous difference-in-difference, and dependent variables include the log of total deposits, core deposits, and brokered deposits. Variables include an indicator Post which is equal to 1 for observations after the year 2000; Exp, which is each bank's exposure to the China Shock based on its deposit collecting locations; the average non-performing loan ratio, log of assets, and equity-to-assets ratio for each bank in the years prior to 2000. Each regression includes time period and bank fixed effects. The first panel includes all banks, the second includes only banks operating branches in more than one local market, and the final includes only banks operating branches in a single market.

Table 9: Bank Level Lending Changes (Appendix)

	Full Sample				Multi-Market				Single Market	
	amt cra	amt hmnda	hmnda sold	amt cra	amt hmnda	hmnda sold	amt cra	amt hmnda	hmnda sold	
Post x BankExp	-0.0430 (0.0716)	0.0403 (0.0380)	0.117 (0.0760)	-0.0325 (0.0708)	0.0147 (0.0369)	0.0893 (0.0799)	0.0633 (0.0770)	0.195* (0.114)	0.385** (0.182)	
Post x Asset	0.924*** (0.0484)	-0.106*** (0.0330)	0.0505 (0.0464)	1.033*** (0.0498)	-0.0875*** (0.0337)	0.0708 (0.0487)	-0.435*** (0.108)	-0.1111 (0.149)	0.134 (0.139)	
Post x NPR	-14.11*** (5.251)	-2.242 (3.560)	-6.649 (4.817)	-14.54*** (5.219)	-1.926 (3.627)	-8.297* (4.807)	-9.351 (14.86)	5.116 (15.82)	30.17 (19.89)	
Post x EQR	-2.825** (1.388)	-0.730 (0.707)	1.457 (1.309)	-2.959** (1.326)	-0.437 (0.672)	1.196 (1.354)	-4.278* (2.428)	-1.663 (3.015)	4.521 (3.914)	
N	32877	32877	32877	30123	30123	30123	2558	2558	2558	
R ²	0.755	0.839	0.726	0.756	0.828	0.730	0.809	0.907	0.808	

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Note: The table presents the results of the continuous difference-in-difference regression using bank-by-year observations. Each regression includes bank and county. Dependent variables include the log of small business lending, home mortgage originations, and home mortgages that were originated and sold within a year. The first panel includes all banks, the second includes only banks operating branches in more than one local market, and the final includes only banks operating branches in a single market.

Table 10: Credit Supply at Bank-by-County Level (Appendix)

	Full Sample				Multi-Market				Single Market		
	amt_cra	amt_hmda	sold_hmda	amt_cra	amt_hmda	sold_hmda	amt_cra	amt_hmda	amt_cra	amt_hmda	sold_hmda
Post x BankExp	-0.242* (0.144)	0.259* (0.137)	0.607*** (0.193)	-0.0300 (0.0422)	0.101 (0.0956)	0.349*** (0.113)	-0.463*** (0.221)	0.531*** (0.200)	0.903** (0.399)		
Post x BankExp x Exp	0.0416 (0.0404)	-0.120*** (0.0376)	-0.161*** (0.0492)	0.00717 (0.0317)	-0.00636*** (0.0301)	-0.0524 (0.0352)	-0.000451 (0.0550)	-0.113 (0.0920)	-0.173 (0.132)		
Post x Asset	-0.206*** (0.0545)	-0.0449 (0.0285)	0.0290 (0.0508)	0.0156 (0.0239)	-0.00756 (0.0254)	0.129*** (0.0429)	-0.304*** (0.0771)	-0.203*** (0.0893)	-0.385* (0.197)		
Post x NPR	-6.802 (10.42)	1.306 (5.546)	20.10** (9.741)	-9.855 (7.213)	2.591 (5.417)	20.34** (9.613)	9.392 (18.00)	8.350 (14.04)	40.77 (27.12)		
Post x EQR	0.708 (1.973)	0.581 (1.506)	2.509 (3.073)	0.140 (1.315)	0.00632 (1.760)	0.973 (3.834)	0.662 (3.479)	3.669 (2.284)	13.88*** (5.695)		
N	341291	381808	381807	125920	350546	350545	204135	16351	16351		
R ²	0.786	0.818	0.716	0.794	0.826	0.728	0.827	0.884	0.819		

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Note: The table presents the results of the continuous difference-in-difference regression using bank-by-county-by-year observations. Each regression includes bank-by-county and county-by-year fixed effects. Dependent variables include the log of small business lending, home mortgage originations, and home mortgage originated then sold within a year. The first panel includes all banks, the second includes only banks operating branches in more than one local market, and the final includes only banks operating branches in a single market.