Out of Sight, Out of Mind: Nearby Branch Closures and Small Business Growth*

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Abstract

Since 2010, the total number of commercial bank branches in the United States has fallen by about 20%. Do branch closures meaningfully affect economic activity? We investigate the impact of branch closures on small businesses, whose credit access may be facilitated through local relationships with bankers. We use exogenous variation in branch closures related to mergers and acquisitions to show that closures of nearby branches decrease small business employment growth and entry. Our results are robust to variations in our measure of employment, proximity, and construction of the instrument. Altogether, our analysis highlights the importance of local bank branches to small businesses.

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1 Introduction

According to the U.S. Census Bureau's Business Dynamic Statistics, firms with under 20 employees account for over 20 million jobs in the United States. These small firms rely heavily on relationship lending, which is facilitated by bank branch access (Petersen and Rajan (1995), Berger and Udell (2002)). However, about one third of U.S. commercial bank branches have closed since 2010, with the total number of branches declining by about 20%. The pace of closures was particularly high during and after the Covid-19 pandemic. Could these branch closures have significant consequences for small businesses and the U.S. economy in the coming years?

The answer isn't clear. As an anecdote, consider a bakery with ten employees that is looking to expand to a larger kitchen and acquire a delivery van. The local branch's bankers are familiar with the bakery's cash flow as well as its role and contribution to the local economy. This relationship-based knowledge may give the local bankers the confidence required to make the loan the bakery needs to expand. If that branch were to close, it may take the bakery time to establish adequate rapport with bankers at whichever branch the bakery takes its banking business to next. Consequently, the bakery may see reduced credit availability, which could curtail its growth. On the other hand, the bakery may have sufficiently transparent operations and risks to enable any nearby bank—or even a distant FinTech lender—to evaluate its creditworthiness. Moreover, even if the nearby branch closes, perhaps the loan officer working with the bakery can find employment at another bank and preserve the "soft information" required to continue the lending relationship. In short, it's not obvious that the closing of a nearby branch should have an impact on the bakery.

The existing academic literature also lacks a clear answer. Branch closures could hurt existing lending relationships because of switching costs and therefore constrain firms' access to credit (Bonfim, Nogueira and Ongena (2021)). On the other hand, branch closures could reduce local competition and it has been argued that banking market power might be needed for banks to establish lending relationships with risky firms (Petersen and Rajan (1995)).

We contribute to this literature by empirically assessing the impact of local branch closures using an instrumental variable identification strategy as well as official data from the U.S. Census

Bureau and the Federal Reserve System's National Information Center (NIC) database.[1] In particular, we employ U.S. Census Bureau data from the Longitudinal Business Database (LBD) on small (i.e., 20 or fewer employees) standalone firms in the United States from 1990 to 2020—excluding the finance, insurance, real-estate, and government sectors. And the NIC database contains information on the location of all commercial bank branches in the United States.

Since branch closures are not randomly assigned, we use quasi-random branch closures induced by mergers and acquisitions (M&A) among large banks as an instrument. We model changes in employment at the firm level as a function of the share of branches closing within a certain distance of the firm and a full set of fixed effects. The share of branches closing is instrumented with the share of branches exposed to certain M&A activity.

We find that closures of bank branches within 5 kilometers (3.1 miles) have a significant impact on small business growth. At the extreme, if every branch closed within 5 kilometers, the growth in small firms' employment would fall by approximately 16 percentage points over the subsequent five years. It is, of course, not reasonable to assume that every local branch would close. Indeed, in our sample, around 25% of local branches shut down when there are branch closures. Thus, when the typical share of nearby branches close, the growth in small firms' employment declines by approximately 4 percentage points over five years. Moreover, we find that most of the negative impact of branch closures is concentrated among young firms, which is consistent with the idea that relationship lending plays a large role.

A brief word on the distance. We use 5 kilometers in our baseline model because we hypothesize that a branch's small business customer base is located disproportionately within the local community. As the "correct" distance likely depends on population density, we use 5 kilometers as a compromise between smaller towns—where customers may travel much further—and dense urban areas where even 5 kilometers may cover many possible bank branches.

In addition, we explore the impact of local branch closures on the extensive margin of small

[1] Some of the previous literature on the real effects of lending shocks employed National Establishment Time-Series (NETS) data. We prefer U.S. Census Bureau data as Crane and Decker (2019) show NETS to be inadequate to analyze business dynamics because of the high prevalence of data imputations.

business growth. We estimate the impact of branch closures on the entry and exit rates of small businesses at the zip code level and find a negative and significant impact on the entry rate. Specifically, the entry rate is about 1.3 percentage points lower in the following year, which is approximately 14% of the average entry rate.

Of note, our estimates may fall below the true effects of branch closures. As discussed later, our identification strategy studies outcomes around closing branches that belong to large banks and are proximate to other branches. The literature has emphasized that small banks tend to be more important for small business lending and that distance matters more in relationships with small banks (Berger, Miller, Petersen, Rajan and Stein (2005)). In other words, branch closures may have greater impact where they create "banking deserts," but our estimates do not capture such outcomes.

Our analysis engages with two bodies of literature. First, prior literature has shown that the distance between a firm and its potential lenders matters for the quantity, quality, and price of the loans it receives. See, for example, Petersen and Rajan (2002), Degryse and Ongena (2005), Brevoort and Hannan (2006), Agarwal and Hauswald (2010), Bellucci, Borisov and Zazzaro (2013), Hollander and Verriest (2016), and Adams, Brevoort and Driscoll (2023). Nguyen (2019) shows that branch closures in the United States lead to a persistent decline in lending to local small businesses, and Amberg and Becker (2024) does the same using Swedish data: Such declines in small business lending are likely responsible for the decline in employment growth we estimate in this paper. Second, there is a vast literature on the real effects of shocks to bank credit. Some recent papers include Chodorow-Reich (2014) and Huber (2018) on the consequences of a large bank cutting lending during the Great Recession, Amiti and Weinstein (2018) on the role of bank supply shocks in aggregate investment fluctuations, Berton, Mocetti, Presbitero and Richiardi (2018) on the elasticity of employment to credit supply shocks, Heblich and Trew (2019) on the role of banking access in the spread of the Industrial Revolution, Bottero, Lenzu and Mezzanotti (2020) on the real effects of a credit contraction, Alfaro, García-Santana and Moral-Benito (2021) on the propagation of bank-lending shocks through input-output relationships, and finally Benson, Blattner, Grundl, Kim and Onishi (2024) on the impact of bank mergers of close-proximity banks on consumer credit.

The three papers closest to ours are Greenstone, Mas and Nguyen (2020), who find that shocks to banks' credit supply are transmitted to their small business customers, but with close-to-zero impact on small business employment; Amberg and Becker (2024), who associate shrinkage of branch networks in Sweden with declines in employment and sales and an increase in business exit; and Mann (2022), who focuses on the impact of changes in county-level bank concentration on small business lending and county-level employment. We add to this literature by looking directly at the economic consequences of bank branch closures, which can be easily measured as opposed to banking supply shocks that need to be estimated (often as a residual), and using data on the whole population of small businesses in the United States instead of focusing on a single bank or region.

Finally, we briefly discuss how our study relates to Nguyen (2019), which primarily investigates the impact of branch closures on small business lending. We believe our work offers three key improvements. First, we use Census Bureau data rather than NETS data, which has been shown to be less reliable for studying business dynamics.[2] Second, while Nguyen aggregates employment and establishment counts at the Census tract level, we rely on firm-level data, which we believe is more appropriate for studying firm behavior. In particular, this approach allows us to better control for firm-specific characteristics. Third, our analysis focuses solely on small firms, as our identification strategy—centered on large bank mergers—cannot be considered exogenous to the dynamics of large firms operating nationwide. This narrower focus provides more credible results compared to Nguyen's analysis, which applies a similar strategy but includes all firms. As a result of better data and identification, we find larger effects of branch closures on real outcomes for small businesses.

The rest of our paper is organized as follows: Section 2 provides an overview of the data

[2]Crane and Decker (2019) demonstrate that imputed data in NETS, especially for small firms, makes it less useful for analyzing business dynamics. They find that NETS data produces patterns of firm growth and life cycles that are inconsistent with more reliable sources like the Census data we use in this paper.

used in our empirical analysis. Section 3 details our identification strategy, which is built upon an instrumental variable approach. Sections 4 and 5 present, respectively, the main results and the corresponding robustness checks. Section 6 concludes.

2 Data Description

The Center for Economic Studies at the U.S. Census Bureau created and maintains the Longitudinal Business Database (LBD), a longitudinal establishment-level database that covers private establishments with at least one employee in the United States. The LBD provides the number of employees, zip code, firm ID, and sectoral affiliation (NAICS code) of each establishment.[3] [4]

An LBD establishment is defined as a single physical location where business is conducted. Note that this definition is not equivalent to the IRS Establishment Identification Number (EIN), which might be composed of more than one LBD establishment. The LBD establishment is also not equivalent to a firm, as a firm may own multiple establishments. This distinction matters because multi-establishment firms tend to be large and do not rely on relationship lending. Moreover, they usually pool funding across their establishments and therefore might not be hurt by the closing of a branch close to one of their establishments. In other words, they are less dependent on local economic conditions.

Since we focus on small firms operating from a single location, we include in our sample all stand-alone firms with only one establishment and 20 or fewer employees from 1990 to 2020. We exclude from the analysis the finance, insurance, real-estate, and government sectors.

The banking data employed in this project come from the public Federal Reserve System's National Information Center (NIC) database. NIC contains information from many different regulatory reports, and includes panel data on bank branch locations, ownership, corporate activity, and banking activity and balance sheets. The data we use are merged with the LBD at the zip

[3]For more information on the U.S. Census Bureau's Longitudinal Business Database see Jarmin and Miranda (2002) and Chow, Fort, Goetz, Goldschlag, Lawrence, Perlman, Stinson and White (2021).

[4]The zip code information in the LBD is not cleaned to be longitudinally consistent. As a consequence, there might be spurious switches in zip codes causing measurement error in our data.

code level. To assess proximity between branches and establishments or other branches, we use Euclidean distances measured between zip code centroids from the NBER's ZIP Code Distance Database.

3 Empirical Model

We model changes in employment at the firm level as a linear function of the share of branches closing within 5 kilometers. We believe that branch closures mainly impact small business employment by disrupting lending relationships. Previous studies show that it is costly for small businesses to establish new lending relationships. When a small business loses its lender due to a branch closure, it may suffer even if new branches open nearby. Therefore, we focus on the total number of branch closures rather than the net change in branches. Our regression equation is as follows:

$$g_{i,t,t+h} = \xi_i + \kappa_{s,t} + \gamma_{l,t} + \beta ShareClose_{i,t} + \delta X_{i,t} + \varepsilon_{i,t} \tag{1}$$

where $g_{i,t,t+h}$ is the growth in employment for firm i in four-digit NAICS sector s in county l from year t to year $t+h$ winsorized at the 1st and 99th percentiles, $ShareClose_{i,t}$ is the share of bank branches closing between year $t-1$ and t within a distance of 5 kilometers from firm i, ξ_i represents firm fixed effects, $\kappa_{s,t}$ are four-digit NAICS sector by year fixed effects to control for sectoral trends, $\gamma_{l,t}$ are county by year fixed effects to control for regional trends, and $X_{i,t}$ is a vector of controls for recent neighborhood trends and firm life-cycle effects. These controls include the average employment growth rate in the zip code in the previous three years, the average entry rate in the zip code in the previous three years, the average exit rate in the zip code in the previous three years, and a dummy equal to 1 if the firm is 10-year old or younger.[5]

We include these variables to control for zip-code level characteristics and firm characteristics

[5] The average zip-code-level employment growth rate, entry rate and exit rate in the previous three years are computed using all establishments, not only single-unit small firms.

that might correlate with firm and branch dynamics. To be sure, additional controls that have significant explanatory power for employment growth—such as past local employment dynamics and firm age—should not materially affect our estimated branch closure effect if our identifying assumptions are valid. Conversely, if these controls do have a significant impact on the results, our identification assumptions may be questionable as it implies a significant relationship between the exogenous branch closures and other predictors of growth. Therefore, we find it prudent to run the regression both with and without these controls, and we find that their introduction has little impact, as shown below.

For reasons discussed further below, our controls also include three lags of the share of branches within 5 kilometers that are involved in any M&A event. As is commonly done in studying firm dynamics, we estimate all of our regressions using employment at year t as a weight. Thus, results represent the perspective of the representative small firms' employee and are not as heavily driven by volatility associated with the very smallest firms. Finally, we estimate the model following Correia (2016).

Since branch closures are not random, we use mergers and acquisitions ("M&A") of the parent companies as a source of exogenous variation in branch closures.[6] M&A activity among banks disproportionately leads to the closure of bank branches that are located close to each other and were competing before the parent companies merged. Benson et al. (2024) find that banks involved in a close-proximity M&A event are 40 percentage points more likely to shut down branches and that total branches in the affected markets are 17 percentage points more likely to decrease. We consider only M&A activity between banks in the top percentile by number of branches to remove the possibility that the M&A activity is associated with hyper-local economic conditions. Even if M&A activity among large banks can be plausibly considered exogenous to the local economic conditions faced by the small firms in our data, the choice of which branches are shut down after an M&A event is not random. Therefore, our identification relies on the exposure of local branches to M&A activity among large banks. To be more precise, our instrument is the share of bank

[6]We do not include internal reorganizations in our definition of M&A activity.

branches within 5 kilometers of a firm that are exposed to the possibility of M&A induced branch consolidation. We consider a branch of bank A to be exposed to possible consolidation if it is within 5 kilometers of a branch of bank B, and banks A and B are both large and involved in the same M&A event.

Why must both be large banks? We want to avoid including an acquisition that is occurring because of local economic conditions. If we allowed one of the two banks to be small, the acquisition by the large bank might be happening because the area is depressed and the local banks are struggling. In that case, the M&A activity would not be exogenous to local conditions and would therefore not provide a valid instrument. In that situation, exposure to M&A activity wouldn't be causing branch closures, but rather the other way around.

We take two further steps in our approach to bolster the validity of the instrument. First, M&A activity may be associated with significant changes in management practices, including lending decisions. For example, if M&A activity is more common with economically stressed banks, we might expect that credit availability near any branch of the merging banks would be reduced. To address this concern, we include in all regressions as a control three lags of the share of branches within 5 kilometers whose parent bank is involved in any type of M&A activity. This step is important because M&A activity may be associated with changes in bank-level objectives or management practices. As a consequence, banks involved in M&A transactions might systematically change their small business lending supply or policies. If true, this would violate the exogeneity assumption for our instrument. However, such bank-wide changes in policy would presumably affect small business customers of all branches—not just those that happen to be proximate to branches of the banks' merger partner. Thus, we can rule out the possibility that our results are driven by M&A-related changes in the bank, and restore our instrument's exogeneity, by including controls for local branches' exposure to any M&A activity.

Second, by construction, exposure to possible M&A induced branch closure is only possible where branches of at least two large banks are near each other. Areas with fewer large banks are lower density, and could have different firm dynamics. Therefore, we restrict our sample to zip codes that satisfy two conditions: (a) the zip code had at least one branch of a large bank within 5 kilometers and (b) that branch was within 5 kilometers of another branch of a large bank between $t-3$ and t. These excluded zip codes account for about 20% of bank branches and small firms in recent years.

With all of that in mind, our first-stage regression is:

$$ShareClose_{i,t} = \xi_i^{FS} + \kappa_{s,t}^{FS} + \gamma_{l,t}^{FS} + \delta^{FS} X_{i,t} + \theta Z_{i,t} + \nu_{i,t} \tag{2}$$

where the superscript ^{FS} denotes the first-stage estimates of the parameters and fixed effects included in the second-stage equation, and $Z_{i,t}$ is the vector of instruments. These include the share of branches that are exposed to the possibility of M&A induced branch closure in each of the three previous years. More precisely, we first determine for each firm which branches are within 5 kilometers and belong to a large bank undergoing M&A activity between $t-1$ and t. Among those branches, we count which are within 5 kilometers of a branch that belongs to a different large bank that is party to the same M&A activity. We then divide this count by the total number of branches in the zip code. We repeat for the periods between $t-2$ and $t-1$, and between $t-3$ and $t-2$, for a total of three instrumental variables.

The regression model in (1) estimates the effect of branch closures on the intensive margin of employment growth but is silent on the firm entrance and exit, that is, the extensive margin of growth. To investigate the latter, we estimate equation (1) replacing as outcome the intensive margin growth with a dummy equal to 1 if the firm exits in the next year. Such model will tell us the impact of branch closures on the probability that firms would exit the market. Since at the firm-level we can only measure the propensity to exit but not enter, we also aggregate the data to the zip code level and model the entry rate and exit rate as linear functions of the share of branches closing within 5 kilometers of the zip code:

$$y_{zip,t,t+1} = \gamma_{l,t}^{y} + \beta^{y} ShareClose_{zip,t} + \delta^{y} X_{zip,t} + \varepsilon_{zip,t}^{y} \tag{3}$$

where $y_{zip,t,t+1}$ is either the entry rate or the exit rate in zip code zip from year t to year $t+1$, $ShareClose_{zip,t}$ is the share of bank branches closing between year $t-1$ and t within a distance of 5 kilometers from zip code zip, $\gamma^{y}_{l,t}$ are county by year fixed effects, and $X_{zip,t}$ is a vector of controls, which includes the same zip code level controls from (1) as well as the share of small firms in the zip code that are 10 years old or younger, and the share of small firm employment in the zip code in each 2-digit NAICS sector. Entry and exit rates are computed as in the Business Dynamic Statistics, that is the number of firms that enter or exit at time t divided by the average number of firms at t and $t-1$. Using the same instruments as before, the first-stage regression is:

$$ShareClose_{zip,t} = \gamma^{FS,y}_{l,t} + \delta^{FS,y} X_{zip,t} + \theta^{y} Z_{zip,t} + \nu^{y}_{zip,t} \quad (4)$$

Table 1: Summary Statistics of Benchmark and Excluded Samples

	Benchmark Sample		Excluded Sample	
	Mean	SD	Mean	SD
Bank Branch Characteristics				
Total branches	35.85	64.00	4.462	6.627
Share of closures	0.030	0.051	0.015	0.083
Share exposed to any merger	0.342	0.233	0.226	0.318
Instrument	0.018	0.069		
Firm Characteristics				
Employment growth	-0.015	0.343	-0.020	0.357
Employment	9.373	5.310	9.035	5.267
Young	0.425	0.494	0.414	0.493
Entry rate	0.093	0.034	0.096	0.071
Exit rate	0.083	0.016	0.081	0.025

Notes: The sample period is 1990-2020. The benchmark sample includes all firm-year observations in the main regression in Table A1. The excluded sample consists of firm-year observations not included in the main regression as they do not satisfy conditions (a) and (b) in the main text. "Young" refers to a dummy that equals 1 if the firm is 10 years old or younger. The entry and exit rates are the average entry and exit rates in the zip code during the previous three years. These summary statistics are weighted by firm employment. See text for details.

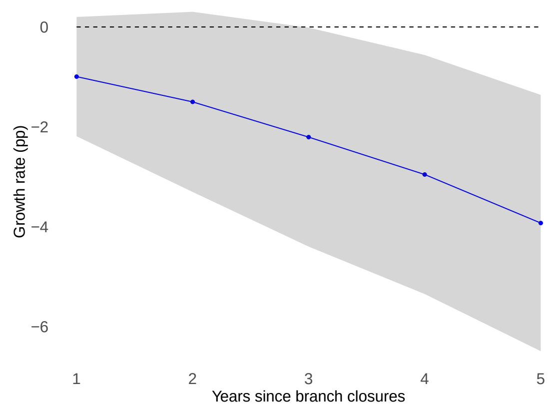
Table 1 provides summary statistics for the benchmark sample and the excluded sample—that is, where there is at most only one large bank and thus no possibility of M&A induced branch closure. The unit of observation is at the firm-year level, and the summary statistics are weighted by firm employment like the regressions. Almost by definition, the bank branch network is far less extensive in the excluded sample–with an average of 4.5 nearby branches (versus 36 in the benchmark sample). Perhaps reflecting the already sparser network, the average share of branches closing in the excluded sample is also lower at 1.5% (versus 3.0%). Despite these differences in the local bank branch network, the representative small firm employee in both samples has about eight coworkers, with almost 60% working at firms that are more than ten years old. Employment growth, on average, is negative. But this is balanced by an average firm entry rate that exceeds the average exit rate. In the excluded sample, the intensive margin employment growth is a bit lower, but the gap between entry and exit rate is also a bit larger.

4 Impact of Branch Closures on Small Business Employment Growth

Figure 1 depicts the estimated cumulative effect of closing 25% of branches within 5 kilometers of the small businesses in our sample.[7] The initial impact is small and statistically insignificant, but it slowly grows to a statistically significant 2 percentage points after three years and to 4 percentage points after five years. The persistence emerging from Figure 1 is consistent with the finding by Nguyen (2019) that branch closures lead to persistent declines in loan originations for up to six years. Moreover, it is likely that employment decisions by small businesses react to branch closures with a lag as credit needs gradually arise and remain unmet.

[7] We estimated equation (1) varying the horizon h from 1 to 5 years.

Figure 1: Employment Growth After Branch Closures



Notes: The figure shows the cumulative impact on employment growth after 25% of nearby branches shut down. The gray shaded area corresponds to 95% confidence intervals. See text for details.

Table 2: BRANCH CLOSURES AND SMALL BUSINESS GROWTH

Dependent variable:	5-year ahead Firm Employment growth		
	(1) All Sample	(2) Young	(3) Old
Share branches closed	-0.157 (0.052)	-0.192 (0.078)	0.01 (0.065)
First-stage effective F-stat	112.5	83.4	109.5
Num observations	41,260,000	19,900,000	21,100,000

NOTES: All regressions include the share of branches exposed to any merger during the past three years; the average employment growth rate in the zip code over the previous three years; the average entry rate in the zip code in the previous three years; the average exit rate in the zip code during the previous three years; a dummy equal to one if the firm is at most 10 years old; as well as fixed effects for each firm and year by four-digit sector and county by year. Robust standard errors are clustered at the zip code level and reported in parentheses. Figures are computed using employment weights. *Sample:* all stand-alone firms with 20 or fewer employees in years 1990-2020, excluding the finance, insurance, real-estate, and government sectors. Source: LBD and NIC database. The effective F-stat is from Montiel Olea and Pflueger (2013).

Table 2 shows more details regarding the effect on the cumulative 5-year intensive-margin growth rate. The coefficient of -0.157 implies that, if *all* of the branches shut down within 5 kilometers, firms' employment growth would decrease by almost 16 percentage points over the next five years. Moreover, the first-stage F statistic is well above 100, which speaks to the strength of the instruments.[8] We interpret the results in Figure 1 and Table 2 as evidence that lending relationships with local bank branches significantly impact real outcomes. While we lack data on the financial situation of the firms in our sample, we do know their *ages*. Younger firms, defined as those no older than 10 years, are likely to depend more on relationship lending due to the limited information available about their business prospects. In Table 2, columns (2) and (3) speak to whether branch closures affect younger firms more. For younger firms, the coefficient associated with branch closures is negative, large, and statistically significant. In comparison, the coefficient associated with older firms is close to zero and not statistically significant. In other words, we find that the impact of branch closures is concentrated among young firms, as predicted by the theory on relationship lending.

Our estimates are, however, identified from closures of branches of large banks that are near other bank branches. Closures of branches that create "banking deserts" may be more detrimental. Indeed, the previous literature has emphasized that small banks tend to be more important for small business lending (Berger, Bouwman and Kim (2017)) and that distance matters more in relationships with small banks (Brevoort and Hannan (2006)). In our data, approximately 67% of closing branches are branches of large banks; and of these closures, about 85% are proximate to branches of other large banks. While the set of closures potentially used for our identification represents over half of all closures, the remaining closures of primarily small bank branches could potentially be more impactful to local small businesses. Therefore, our estimates may be a lower bound on the "true" effect of branch closures on real activity.

Table 3 describes the impact of branch closures on the extensive margin of firm growth. Panel A shows the results of the firm-level regression with an exit dummy as the outcome variable. As shown in (1), branch closures lead to an increase in the probability of exit one year ahead. The propensity to exit after branch closures is much higher with young firms, column (2), than old firms, column (3), confirming the results in Table 2. Panel B shows the estimates from equation (3), with the entry and exit rates of small business at the zip code level as outcomes. The effect

[8] Table A1 in the Online Appendix shows the OLS coefficient and the first-stage estimates.

is both economically and statistically significant for the entry rate and null on the exit rate. More precisely, if 25% of branches shut down, the entry rate is about 1.3% lower the following year, which is approximately 14% of the average entry rate, using the relevant statistic from Table 1.[9]

Table 3: BRANCH CLOSURES AND SMALL BUSINESS GROWTH: EXTENSIVE MARGIN

Panel A: Firm-level			
Dependent variable:	Exit dummy		
	(1) All Sample	(2) Young	(3) Old
Share branches closed	0.107	0.089	0.034
	(0.016)	(0.023)	(0.015)
Num observations	88,600,000	51,800,000	36,400,000
Panel B: Zip Code level			
	(1)		(2)
Dependent variable:	Entry rate		Exit rate
Share branches closed	-0.051		-0.005
	(0.021)		(0.015)
Num observations	197,000		197,000

NOTES: All regressions include the share of branches exposed to any merger in the past three years, the average employment growth rate in the zip code in the previous three years, the average entry rate in the zip code in the previous three years, the average exit rate in the zip code in the previous three years. The firm-level regressions also include fixed effects for each firm and year by four-digit sector and county by year. The Zip Code-level regressions also include the share of employment in the zip code in each two-digit NAICS sector, the share of employment in the zip code in firms that are at most 10 years old, fixed effects county by year. Young refers to firms that are at most 10 years old. Robust standard error are clustered at the zip-code level and reported in parentheses. Figures are computed using employment weights. *Sample:* 1990-2020. Source: LBD and NIC database.

Combining the coefficients on the entry and exit rates, we can speak to the impact of branch closures on the growth of the number of firms.[10] Greenstone et al. (2020), for instance, find little evidence of an impact of lending shocks on establishment growth rates. In contrast, we find that

[9] We explored the effect on entry and exit rates after the first year since branch closure and do not find significant effects in years two through five. The LBD does not include the self employed, thus entry and exit could reflect transitions from and to firms owned and operated by their sole employee.

[10] Following a simple accounting identity, the number of firms in period $t+1$ must be equal to the number of firms in period t plus entry between t and $t-1$ minus exit between t and $t-1$. If we define the growth in the number of firms as $2\frac{\text{num firm}_{t+1} - \text{num firm}_{t+1}}{\text{num firm}_{t+1} + \text{num firm}_t}$, since $\text{num firm}_{t+1} - \text{num firm}_{t+1} = \text{entry} - \text{exit}$, then $2\frac{\text{num firm}_{t+1} - \text{num firm}_{t+1}}{\text{num firm}_{t+1} + \text{num firm}_t} = \text{entry rate} - \text{exit rate}$.

branch closures depress net business formation: since we did not find any effect of branch closures on the exit rate, the impact on the entry rate can be also seen as the impact on the growth of the number of small businesses.

Our evidence on intensive and extensive margin small firm employment growth combined imply that branch closures are related to a decline in small business employment. While we use merger activity as an instrument, our results do not, however, directly imply that bank mergers hamper small business growth. Indeed, mergers may lead to a reallocation of branches. The NIC data show that about half of the time, the merging banks grow their combined number of branches faster than that of other banks over the following three years. Thus, it might be possible that new branches created by a merger might positively affect small firm formation and growth.

Our findings contrast with Greenstone et al. (2020), who show that a negative lending shock translates to reduced lending to small businesses but close-to-zero changes in employment.[11] We believe that our identification is cleaner as branch closures are easier to measure than lending shocks, and relying on the quasi-exogeneous nature of branch closures induced by M&A activity is preferable to a shift-share identification strategy that requires independence of banks' small business lending strategy and their regional presence. Moreover, our analysis covers a longer time-period and our unit of analysis is at the firm level.

5 Robustness

In this section, we explore different regression specifications to test the robustness of the results in Table 2 and 3. These specifications examine how effects relate to, *inter alia*, the size of the firms, the size of the merging banks, and our measure of proximity between firms and branches.

Starting with the firm-level intensive margin regressions, we first ask whether our conclusions about small firm growth depend on the size of the small business in question. So, we run the regression using the sample of firms with 10 or fewer employees and again with 30 or fewer

[11] In results available from the authors upon request, we find that our instrumentation approach also finds a link between branch closures and nearby small business lending.

Table 4: ROBUSTNESS

Dependent variable:	Firm Employment growth	Entry rate	Exit rate
Baseline	*-0.157*	*-0.051*	*-0.005*
	(0.052)	*(0.021)*	*(0.015)*
(1) <10 employee firms	-0.123	-0.061	-0.009
	(0.050)	(0.023)	(0.017)
(2) <30 employee firms	-0.134	-0.062	-0.012
	(0.053)	(0.022)	(0.015)
(3) Asset-based bank size	-0.131	-0.045	-0.011
	(0.052)	(0.021)	(0.015)
(4) Branches within 10 kilometers	-0.267	0.008	0.031
	(0.076)	(0.032)	(0.021)
(5) No controls and no firm FE	-0.161		
	(0.052)		

NOTES: The figures refer to the estimated coefficient on the share of branches closed. The regression specifications are described in the main text. Robust standard errors are clustered at the zip code level and reported in parentheses. Figures are computed using employment weights. *Sample:* 1990-2020. Source: LBD and NIC databases.

employees, respectively. The new estimates in rows (1) and (2) of Table 4 suggest that the exact firm size threshold does not matter.

Next, we experiment with our definition of a large bank. To be maximally assured of our instrument's validity, we want to focus on mergers of banks with a geographically dispersed small business customer base. The clearest simple measure of this is the number of branches the bank has. The share of branches in banks at the 99th "size" percentile (and thus the reliance of our instrument on particular time periods) is more stable over time when size is determined by number of branches. For these reasons, we prefer branch count as our measure of size, but we still check for robustness. Thus, in row (3), we present regression results when defining large banks as those above the 99th percentile in assets, as opposed to by number of branches. This definition affects the set of mergers our instrument is based on, and only slightly weakens our results.

In row (4), we define branches as nearby small firms if their zip codes are within 10 kilometers instead of 5 kilometers. We find a stronger impact of branch closures if we consider a wider radius. Finally, in row (5), we present results of the regression when dropping controls and firm fixed effects. Our results are essentially unchanged. The fact that our controls have little impact on the coefficient of interest can be seen as validating the exogeneity of our instrument. If our instrument and outcome were both driven by X, we would expect the inclusion of controls to affect the coefficient as long as some of those controls were also correlated with X.

We next apply the same methodological variations to our zip code level extensive margin regressions in the last two columns of Table 4. The firm and bank size thresholds have little impact on our estimated firm entrance and exit rate effects. However, entrance and exit rate effects are statistically insignificant when considering nearby branches as those up to 10 kilometers from the small firms.

6 Conclusion

Our analysis suggests that bank branch closures have a significant effect on local economic activity through small business credit access. Using data from the U.S. Census Bureau and the Federal Reserve System's National Information Center database, we show that small business employment grows more slowly in the five years following nearby branch closures and that the entry rate of small businesses declines. This suggests that there are limits to the extent that small businesses can substitute for broken relationship-based lending opportunities by going to another bank or a non-bank lender.

To be sure, our analysis does not speak directly to the recent rise of FinTech lenders. Indeed, in recent years, billions of dollars have been invested in online financial services, while in-branch visits now account for only a fraction of banking transactions. This development could have reduced the role of branches. Variation in our instruments occurs mostly in the early to middle part of our panel, which limits our ability to draw inferences about recent years. Nevertheless, we still believe our results are informative. Adams et al. (2023) show that, while average distance has increased, banks themselves have not materially increased their lending distances. Outside of a very small subset of specialized loans, small businesses remain dependent on local banks. Thus, there is reason to believe that nearby branch closures still matter in an age of FinTech lenders.

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Online Appendix

"Out of Sight, Out of Mind: Nearby Branch Closures and Small Business Growth"

A1 Additional results

Table A1 shows more details regarding the effect on the cumulative 5-year intensive-margin growth rate. The first-stage estimates speak to the strength of the instruments, as the coefficients are highly statistically significant and the F statistic is above 100. The coefficients imply that the closure rate of branches exposed to possible M&A induced closure is several times (or about 5 percentage points) higher than for other branches. In comparing columns (1) and (2), we see that the impact of branch closures is basically null in the OLS specification and negative in the IV specification. However, downward bias in our OLS estimates associated with error in our measure of branch closure rates should be mitigated by the instrumental variable approach. Focusing on (2), the coefficient of -0.157 implies that, if *all* of the branches shut down within 5 kilometers, firms' employment growth would decrease by almost 16 percentage points over the next five years.

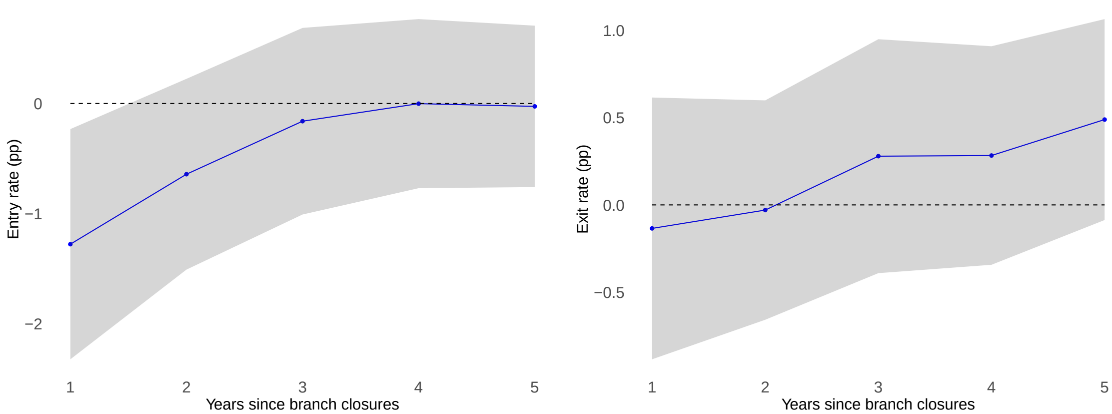
Table A2 shows the impact of branch closures on the entry and exit rates of small business at the zip code level. The effect is both economically and statistically significant for the entry rate and null on the exit rate. More precisely, if 25% of branches shut down, the entry rate is about 1.3% lower the following year, which is approximately 14% of the average entry rate, using the relevant statistic from Table 1. As shown in Figure A1, we explored the effect on entry and exit rates after the first year since branch closure and do not find significant effects in years two through five. The LBD does not include the self employed, thus entry and exit could reflect transitions from and to firms owned and operated by their sole employee.

Table A1: Branch closures and small business growth: Intensive margin

Dependent variable:	5-year ahead Firm Employment growth	
	(1) OLS	(2) IV
Share branches closed	0.001	-0.157
	(0.003)	(0.052)
Num observations	41,260,000	41,260,000
IV First stage		
	Dependent variable: Share branches closed	
Share branches exposed$_{t,t-1}$	0.042	
	(0.004)	
Share branches exposed$_{t-1,t-2}$	0.056	
	(0.004)	
Share branches exposed$_{t-2,t-3}$	0.032	
	(0.004)	
Effective F-stat	112.5	

Notes: All regressions include the share of branches exposed to any merger during the past three years; the average employment growth rate in the zip code over the previous three years; the average entry rate in the zip code in the previous three years; the average exit rate in the zip code during the previous three years; a dummy equal to one if the firm is at most 10 years old; as well as fixed effects for each firm and year by four-digit sector and county by year. Robust standard errors are clustered at the zip code level and reported in parentheses. Figures are computed using employment weights. *Sample:* all stand-alone firms with 20 or fewer employees in years 1990-2020, excluding the finance, insurance, real-estate, and government sectors. Source: LBD and NIC database. The effective F-stat is from Montiel Olea and Pflueger (2013).

Figure A1: Entry and Exit After Branch Closures



(a) Entry rate

(b) Exit rate

Table A2: BRANCH CLOSURES AND SMALL BUSINESS GROWTH: EXTENSIVE MARGIN

Dependent variable:	Entry rate		Exit rate	
	(1) OLS	(2) IV	(3) OLS	(4) IV
Share branches closed	-0.001	-0.051	0.003	-0.005
	(0.001)	(0.021)	(0.001)	(0.015)
Num observations	197,000	197,000	197,000	197,000

IV First stage	Dependent variable: Share branches closed
Share branches exposed$_{t,t-1}$	0.044
	(0.004)
Share branches exposed$_{t-1,t-2}$	0.057
	(0.004)
Share branches exposed$_{t-2,t-3}$	0.034
	(0.004)
Effective F-stat	125.0

NOTES: All regressions include the share of branches exposed to any merger in the past three years, the average employment growth rate in the zip code in the previous three years, the average entry rate in the zip code in the previous three years, the average exit rate in the zip code in the previous three years, the share of employment in the zip code in each two-digit NAICS sector, the share of employment in the zip code in firms that are at most 10 years old, fixed effects county by year. Robust standard error are clustered at the zip-code level and reported in parentheses. Figures are computed using employment weights. *Sample:* 1990-2020. Source: LBD and NIC database.

Table A3: ROBUSTNESS: INTENSIVE MARGIN

Dependent variable:	Firm Employment growth	
	Coefficient	Effective F-stat
Baseline	*-0.157*	*112.5*
	(0.052)	
(1) <10 employee firms	-0.123	118.7
	(0.050)	
(2) <30 employee firms	-0.134	112.2
	(0.053)	
(3) Asset-based bank size	-0.131	117.9
	(0.052)	
(4) Branches within 10 kilometers	-0.267	116.9
	(0.076)	
(5) No controls and no firm FE	-0.161	238.1
	(0.052)	

NOTES: "Coefficient" refers to the estimated coefficient on the share of branches closed. The regression specifications are described in the main text. The effective F-stat for the entry rate and exit rate regressions is the same and shown in the last column of the table. Robust standard errors are clustered at the zip code level and reported in parentheses. Figures are computed using employment weights. *Sample:* 1990-2020. Source: LBD and NIC databases.

Table A4: ROBUSTNESS: EXTENSIVE MARGIN

Dependent variable:	Entry rate	Exit rate	
	Coefficient	Coefficient	Effective F-stat
Baseline	*-0.051*	*-0.005*	*125.0*
	(0.021)	*(0.015)*	
(1) <10 employee firms	-0.061	-0.009	131.5
	(0.023)	(0.017)	
(2) <30 employee firms	-0.062	-0.012	124.7
	(0.022)	(0.015)	
(3) Asset-based bank size	-0.045	-0.011	136.2
	(0.021)	(0.015)	
(4) Branches within 10 kilometers	0.008	0.031	124.1
	(0.032)	(0.021)	

NOTES: Same as Table 4.