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Going the Extra Mile: Distant Lending and Credit Cycles*

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Abstract

We examine the degree to which competition amongst lenders interacts with the cyclicality in lending standards using a simple measure, the average physical distance of borrowers from banks' branches. We propose that this novel measure captures the extent to which lenders are willing to stretch their lending portfolio. Consistent with this idea, we find a significant cyclical component in the evolution of lending distances. Distances widen considerably when credit conditions are lax and shorten considerably when credit conditions become tighter. Next, we show that a sharp departure from the trend in distance between banks and borrowers is indicative of increased risk taking. Finally, we provide evidence that as competition in banks' local markets increases, their willingness to make loans at greater distance increases. Since average lending distance is easily measurable, it is potentially a useful measure for bank supervisors.

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1. Introduction

Descriptions of financial frenzies suggest lenders abandon caution in the midst of a boom and become more aggressive (or careless) in their lending (see, e.g., Aliber and Kindleberger, 2015; Minsky, 2008). Such descriptions have two distinctive elements. First, credit quality deteriorates in the boom as lenders search for risk and it improves in the subsequent bust. Second, it deteriorates more when there are more lenders competing for business – the proverbial madness of crowds. A number of studies (e.g., Madalloni and Peydro, 2010; Mian and Sufi, 2009; Gianetti and Laeven, 2012; Lisowski, Minnis, and Sutherland, 2017) demonstrate the cyclicality of credit standards. However, the degree to which competition amongst lenders interacts with cyclicality is relatively unexplored. In this paper, we attempt to get at this issue using a novel measure of the extent to which lenders are willing to stretch their lending portfolio – specifically, the average physical distance of their borrowers from their branches.

A large theoretical and empirical literature argues that banks add value through their special ability to screen and monitor loans based on private information they collect about current and prospective clients (e.g., Diamond, 1984; James, 1987; Diamond, 1991). This ability to produce information about hard to evaluate credits has historically been based on close interactions between bankers and potential borrowers (e.g. Petersen and Rajan 1994, Liberti and Petersen, 2017, Stein (2002)). The firmness of a borrower's handshake, the cleanliness of her premises, or her punctuality in meetings might all reveal valuable information about the likelihood of repayment. Petersen and Rajan (2002) showed, however, that the adoption of information and credit scoring technologies in the 80s and 90s brought fundamental changes to the business models of banks. Slowly, but steadily, information technologies allowed lenders to substitute somewhat for local interactions in lending to small businesses. The average distance between banks and their borrowers increased steadily as communication technologies improved.

Yet, at any point in time, available communication technologies determine the limits of the area within which a bank can lend safely. If a bank stretches to lend beyond this, it will screen and monitor the borrower less effectively, thus taking on more credit risk. In other words, a faster-than-trend expansion of the average distance a bank lends at is either evidence of a rapid improvement of information technology or suggestive of increased bank risk taking. It is relatively easy to tell the effects of improvements in technology from increased risk taking when a lending boom is followed by a bust. If it is the former, the average distance of loans made should not differ from trend over the business cycle, even if the trend becomes steeper. If the rapid increase in average distance in the boom reflects risk taking, it should be followed by a rapid drop in average distance in the bust as banks become more conservative in lending. We should also see that the more distant loans are associated with higher default rates, especially during the boom.

If indeed the data suggest excess average distance reflects risk taking, then we can also examine the circumstances in which such risk taking increases. When many banks are competing for business in an area, they may have to look to make yet more loans after all the obviously safe loans are made. It may be difficult for a branch manager to sit on un-lent cash if competitors seem to have no difficulty booking fees by making loans. Herd behavior or other forms of agency problems may therefore lead all banks in such areas to make riskier loans (see Rajan, 1994; Agarwal and Ben-David, 2014). Since competition increases bankers' effective risk tolerance, it should also be reflected in their willingness to make loans at greater distance. Of course, in the bust, the pressure to make risky loans falls as all banks have difficulties. Banks can then go back to lending to local borrowers. Average distance should fall sharply. Areas with many banks and more competition should therefore see more cyclicality in lending distance.

To test these ideas in this paper, we exploit two datasets that, when combined, offer information on the locations of borrowers and respective lenders of most small business loans originated in the U.S. over the last two decades. Specifically, we use the Community Reinvestment Act (CRA) data that stratifies the annual volume of loans originated by banks with total assets above $1 billion by the county of the loan recipient. We combine the CRA dataset with the Summary of Deposits (SOD) dataset that provides information on the branch network of all commercial banks operating in the United States to compute measures of the physical distance between the county of the loan recipient and the closest branch of its bank lender.[1]

We find that the long-run trend toward greater average distances between banks and their borrowers, initially documented by Petersen and Rajan (2002), persists in the past 20 years. Importantly, we also find a significant cyclical component in the evolution of lending distances. Distances widen considerably when credit conditions are lax and also shorten considerably when credit conditions become tighter. Between 2004 and 2007, banks increased their average distances from 175 miles to 350 miles. These distances, however, quickly slipped back to approximately 200 miles following the 2008 financial crisis. This cyclical pattern in lending distances is robust to the inclusion of county-year fixed effects and bank fixed effects suggesting that the results cannot be explained by differences in growth across counties or by changes in the composition of lenders in the economy. This cyclicality also holds when we examine other points of the distribution of distances, such as the median, and lower and upper deciles. We also

[1] Recent papers on lending distance use either cross-sectional surveys (e.g., Petersen and Rajan, 2002; Brevoort and Wolken, 2008) or proprietary datasets obtained from a single financial institution (e.g., Agarwal and Hauswald, 2010; Agarwal and Ben-David, 2014).

confirm that it is not driven by a few large banks but can be seen in different size classes of banks.

One possible concern is that the nature of borrowers or loans changes over the cycle – for example, loans may go to industries that allow for more distance in lending because their loans tend to be unsecured, which dispenses with the need to keep close watch over collateral. To explore this possibility, we exploit that the CRA small business lending dataset contains separate data on small agricultural loans. Agriculture is a monitoring-intensive industry where lenders must at least deploy some resources to check if the farmer is putting the loan to good use. We find that small farm loan data also exhibit cyclicality in lending distances, which suggests that cyclicality in distance is not simply driven by time-varying industry or loan composition.

The next step is to establish that distant lending in the boom is, on average, riskier. Unfortunately, we do not have default data for loans in the CRA dataset. However, we know the overall loan losses for each bank. We determine the average non-performing loan ratio for each bank over the 2007-2009 period. We find that the higher the average non-performing loan ratio of the bank, the more cyclical is its pattern in lending distance, suggesting that it was risky to go the extra mile during the boom. This finding is consistent, for example, with the cyclical pattern in cross-border lending found by Gianetti and Laeven, (2012).

However, it would be even more persuasive to show that more distant loans originated during the credit cycle boom defaulted more often. Towards this end, we use the Small Business Administration (SBA) loan-level dataset of government-guaranteed loans, which contains information on ex-post defaults (also termed charge-offs). We find that distant loans originated in the 2005-2008 period are significantly more likely to be charged-off relative to other loans issued by banks closer to borrowers in the same county during the same years. Also, a one percent increase in lending distance in 2006 and 2007 is associated with an increase in the charge-off probability that is between two and three times larger than that of a similar increase in lending distances in 2003. Furthermore, we find that banks do not obtain compensation through higher interest rates for the additional risks of lending at a greater distance.

Having established a cyclical pattern of risk taking, with distance being a good proxy for that risk, we now turn to the conditions under which risk-taking behavior emerges. We predict that banks whose branches are primarily in competitive banking markets see a more pronounced cyclical pattern in average lending distance. Since such banks likely look for borrowers in less competitive areas, we should find a similar cyclical pattern in average borrowing distance for borrowers located in less competitive areas. Finally, distant loans made from a competitive area to a less competitive area should also have a cyclical pattern. We find evidence consistent with these predictions, when we measure competition as the Herfindahl index for bank loans made in the county of interest.

A bank that has the ability to reallocate resources (and thus lending) within its branch network from areas exposed to significant competitive pressures to areas that are less exposed to fierce competition will be less pressured to take distance risk during the boom. Consistent with this conjecture, we find that the boom-bust cycle in lending distances is less pronounced for banks that have very different degrees of competition within its own branch network. More precisely stated, banks with an above-median coefficient of variance of local market concentration across the counties where their branch network is located have less cyclicality in distance lending than banks with below-median coefficient of variation.

We undertake a number of robustness checks. A voluminous literature argues that high concentration in an industry or region need not mean low competition – it could just mean that a more efficient producer has grabbed more market share. Also, areas with many banks may be naturally more prone to booms and busts in lending because of differences in the nature of demand from borrowers, rather than anything to do with supply. One way of addressing these concerns is to use alternative indicators of bank competition. One is the timing of adoption of interstate banking deregulation. Deregulation occurred over time and was significantly influenced by lobbying and political economy pressures (e.g., Kroszner and Strahan, 1996; Stiroh and Strahan, 2003). If deregulation in a state occurred earlier, competition had more time to establish itself. We use the natural log of the years between 1996 and the year when the loan origination state's banking market was deregulated as a measure of competition. We find that the longer the time elapsed since the adoption of interstate banking deregulation in the home market, the more amplified is the boom bust cycle in lending distance.

An alternative possibility is to look at a large bank's entry into a local market (typically through a merger or acquisition). For a large bank, the conditions in a specific small local market (where a particular branch is located) are unlikely to affect the overarching M&A decision. However, the presence of a large bank, which is able to send significant resources into the local market, is likely to increase the level of local banking competition. We find that counties in which a big bank entered have a more amplified boom bust cycle in lending distance.

Overall, our paper suggests that a sharp departure from the trend in distance between banks and borrowers is indicative of increased risk taking. Since distance is easily measurable, it is something that bank supervisors could keep track of (see Meiselman, Nagel, and Purnanandam, 2018, for another ex-ante measure that might inform supervisors). Of course, the cycle in distance lending, even if risky, may have a silver lining. To the extent that banks push new lending technologies to their limit, it may give them a better understanding of these technologies, and a greater ability to lend at a distance in more normal times. In other words, excess distance lending may expand the normal lending potential of banks, and accelerate the secular trend in lending distance. Until this issue is further explored, any supervisory intervention needs to be measured.

We are obviously not the first to examine distance lending, the cyclicality of risk taking, or the effects of competition on risk taking. We therefore discuss the place of our paper in the literature after presenting the results. In our mind, this paper is the first to tie all three phenomena together.

The rest of the paper proceeds as follows. Section 2 describes the data used in this study. Section 3 describes summary statistics and presents the main empirical results concerning the relationship between lending distance and changes in bank small business lending. Section 4 presents evidence on the default risks of distant loans. Section 5 reports on the role of competition in inducing distant lending, and Section 6 discusses our results in the context of the extant literature and concludes.

2. Data Description

We obtain small business lending data from the Community and Reinvestment Act (CRA) small business loans database provided by the Federal Financial Institutions Examination Council (FFIEC) pursuant to Regulations 12 parts 25, 228, 345, and 195 of the aforementioned Act. This dataset contains information on the total number and volume of small business loans originated by each reporting financial institution in each county of the United States during a calendar year. Between 1996 and 2004, all commercial and savings banks with total assets exceeding $250 million were required to report their originations of small business loans by county of the borrower. Since 2005, the FFIEC raised the mandatory reporting asset size threshold from $250 million to $1 billion. Following this increase in the asset size threshold, the number of banks reporting to the CRA small business lending dataset declined from approximately 2,000 to 1,000. To address potential issues with this sample discontinuity, we ensure that our main results are not sensitive to using a sample of bank-year observations whose asset size exceeds $1 billion. The empirical results are quantitatively and qualitatively similar when we use the entire sample of banks reporting to the CRA small business lending dataset rather than the constant sample of banks with more than $1 billion in assets.

We use the Summary of Deposits (SOD) database provided by the FDIC to obtain information about the geographic characteristics of all branches of depository institutions operating in the United States between 1996 and 2016. This dataset contains information on the geographical coordinates, location, and deposits of each branch in the United States. We complement the SOD dataset by assigning latitudes and longitudes to each branch address whenever geographic coordinate data are missing. We use information on the address, zip code, and county of the branch to retrieve the missing branch latitudes and longitudes via the Google Geocoding Application Programming Interface (API). We also obtain financial characteristics of the commercial and savings banks from the quarterly Reports of Condition and Income (Call Reports) that banks file with the FDIC. Financial information on savings banks prior to 2012 comes from Thrift Financial Reports information available from the SNL Financial dataset.

We combine the SOD dataset with information on the latitudes and longitudes of the geographic centroids of all U.S. counties and we compute the closest geodetic distance, i.e. the length of the shortest curve between the branches of each bank and the center of each US county. We assume, throughout this study, that the distance between the county centroid of the borrower and the closest branch of each bank represents the average distance between lenders and borrowers. We believe that this is a sensible assumption based on existing survey evidence suggesting that 59% of all US small banks receive small business loan applications at any branch, while 30% accept small business loan application at branches with loan offices, and only 11% accept applications online (FDIC, 2017). We compute other measures of geographic distance such as the distance between each borrower county centroid and the headquarters of each bank and an indicator variable that takes the value of one if a bank has at least one branch in the county where it originated the small business loans, essentially coding in- versus out-of-county lending. The main results are not sensitive to these alternative measures of distance between lenders and borrowers.

We also employ government-guaranteed individual loan data reports publicly available from the Small Business Administration (SBA). This dataset contains a list of all SBA-guaranteed loans under the 7(a) program from 2000 to 2016[2]. It also contains loan-level information about the identity, address, city, and zip code of the borrowers and lenders as well as loan characteristics such as total amount, the amount of SBA's loan guarantee, initial interest rate, approval date, industry of the borrower, loan status. The dataset also includes information on the charge-off date and on the amount charged-off by the SBA on its loan guarantee when the loan is charged-off by the bank. Following Brown and Earle (2017), we exclude cancelled loans from the analysis because the cancellation may be at the initiative of the borrower.

Using the University of Chicago Geographic Information Service (GIS), we geocoded the geographic coordinates of approximately 1 million borrowers in the SBA loan level dataset.[3] We were unable to locate the geographic coordinates of approximately 0.6% of the SBA borrowers

[2] The 7(a) program is SBA's primary and most popular general-purpose, government-guaranteed lending program.
[3] We are grateful to Todd Schuble at the Research Computing Center of the University of Chicago for assistance in geocoding the geographic coordinates of the SBA borrowers' addresses

in the dataset and we discarded those observations. The loan-level SBA dataset does not include the regulatory identifiers of the lenders that originated the SBA loans. This omission limits our ability to match named lenders for particular loans to banks in the SOD dataset. We, therefore, compute the distance between borrowers and lenders in the dataset as the geodetic distance between the reported addresses of borrowers and respective lenders in the SBA dataset. In spite of this data limitation, the cyclical properties of the distance between borrowers and lenders in this dataset are similar to those of the CRA Small Business Lending Dataset, which allays concerns about comparability across these two data sources.

3. Lending Distances, Bank Lending, and Business Cycles

In this section, we document the main empirical patterns in banks' lending distances with respect to bank lending, and the business cycle using the CRA dataset. We examine the matched CRA and SOD datasets to unearth basic descriptive facts about the evolution of lending distances over the past twenty years. After providing these statistics, we use regressions to more formally evaluate the role of the business cycle in shaping the relation between lending distances and changes in bank lending.

3.1. Summary Statistics

We begin our analysis by presenting basic information about the market for small business loans over the 1996 to 2016 sample period. Panel A of Table 1 shows that small business lending increased substantially over this period: the total volume of small business loans originated by CRA-reporting banks approximately doubled in current dollar terms from $115 billion in 1996 to $227 billion in 2016. The growth in the aggregate amount of small business loans was, however, not always steady over this period. During the 2001-2007 period, small business lending increased substantially to a peak of $324 billion in 2007 and subsequently saw a sharp decline to half of that amount during the Great Recession.

Small business lending is still mostly a local activity. Figure 1 and Panel A of Table 1 show that approximately 80% of all small business loans originated in the United States over the sample period went to borrowers that are less than 50 miles away from the closest branch of their bank lender, whereas only 7.5% of all small business loans went to borrowers that are located more than 1,000 miles away from the closest branch of their lender. The share of small business loans that are allocated toward distant borrowers has nevertheless fluctuated substantially over time. The plots of Figure 1 show that, between 2001 and 2007, distant lending increased at a faster pace than nearby lending and that the share of distant loans in the small business lending market increased substantially. The ensuing contraction in the 2007-2010 period was, however, more pronounced for distant loans and the share of the small business lending market accounted for by distant lending returned to pre-2003 levels in the years that followed the Great Recession.

In Figure 2, we present key statistics about the evolution of lending distances over time. In Figure 2, Panel A, we plot the average distance of all small business loans weighted by their respective dollar amount from 1996 onward. The figure shows that average distances between borrower and lender trended positively over the sample period. From 1996 to 2016, average distance increased from approximately 100 miles to 250 miles. But the evolution of average lending distance did not always follow trend. Between 1996 and 2003, average distances rose steadily except for a decline in 2001. From 2004 until 2008, average-lending distances increased sharply above trend from approximately 175 miles to 350 miles and the Great Recession saw a significant pullback in average distances to pre-2004 levels. This boom-bust pattern in average lending distances is consistent with the idea that a rapid increase in risk-taking in the 2004—

2008 period was followed by a subsequent bust as these risks materialized and banks became more conservative in lending.

The cyclical pattern holds when we compute alternative measures of lending distance between lenders and borrowers. Figure 2, Panel B shows the evolution of an equal-weighted average of the lending distance at the bank level. On average, banks expanded their lending distances over the sample period and such expansion was strongly procyclical. In particular, average bank lending distances increased sharply between 2003 and 2007 and subsequently contracted in the ensuing years. This finding suggests that the previous results are not simply driven by an increase in the sample representation of larger banks that specialize in distant lending. In Panel C of Figure 2, we compute the proportion of all small business loans made to borrowers that are located in counties where lenders do not have a local branch. Similar to the previous results, this fraction increased between 1996 and 2016 and exhibits a strong boom-bust pattern around the events of the 2007-2009 financial crisis.

We also examine the evolution of distance across several points of its distribution. Figure 3 presents the median lending distance (Panel A), the lower decile of lending distance (Panel B), and the upper decile of lending distance (Panel C) over the sample period. Consistent with the notion that small business lending is very local, the median distance in the sample varies from approximately 4 miles in 1996 to a peak of 8 miles in 2007. The evolution of lending distance is, nevertheless, similar across the different points of the distribution: lending distances exhibit an upward trend over the sample period and strong procyclicality with rapid above-the-trend growth in lending distances between 2003 and 2008 and a subsequent sharp decline between 2008 and 2010. These patterns suggest that a shift in the entire distribution of lending distances rather than a few outliers drive the observed changes in average lending distance over time.

3.2. *Empirical Results*

In this section, we formally evaluate how business cycles mediate the relation between lending distance and changes in bank lending. We estimate an ordinary least squares (OLS) model of the change in the volume of small business loans originated by each bank in each county as a function of the distance of the bank to the county and the interaction between this distance and a business cycle indicator. Specifically, we estimate the following specification:

$$\Delta\%\boldsymbol{SBL_{bct}} = \boldsymbol{\alpha_{ct}} + \boldsymbol{\gamma_b} + \boldsymbol{\beta_1 Ln(Dist)_{bct}} + \boldsymbol{\beta_2 Ln(Dist)_{bct}} \times \boldsymbol{Z_t} + \boldsymbol{\theta X_{bt}} + \boldsymbol{\epsilon_{bct}} \quad \mathbf{(1)}$$

where *b* indexes a bank lending to borrowers located in county *c* during year *t*. The dependent variable, $\Delta\%SBL_{bct}$, is the logarithmic change in the volume of small business loans originated by bank *b* in county *c* during year *t*. Our main variable of interest, $Ln(Dist)_{bct} \times Z_t$, is the interaction between lending distance and a business cycle indicator, Z_t, defined either as the detrended change in real gross domestic product (GDP), the log difference in the US annual unemployment rate, or the standardized net percentage of banks increasing spreads of loan rates to small firms.[4] We control for bank-level characteristics such as size and loan composition in X_{bt}. The main coefficient of interest, β_2, captures whether the relation between lending distance and changes in bank lending is more or less pronounced depending on the state of the business cycle and credit conditions. It is essentially a semi-elasticity of lending growth with respect to geographic distance and the state of the economy.

We further include bank fixed effects and county-by-year fixed effects. We include bank fixed effects to ensure that the results exploit variation in lending distance within a bank and not in the composition of lenders in the economy. A potential concern is that banks specializing in

[4] We also employed indicators of business cycle measured at a regional level such as the state-level Real GDP, state-level Personal Income *per capita,* and county-level Income *per capita.* The main results are quantitatively and qualitatively the same when we use these alternative indicators of business cycles

distant lending become a larger share of the sample during expansions and subsequently lose share during recessions. Bank fixed effects ensure that within-bank variation in distant lending rather than shifts in the composition of lenders in the economy drive the results. Another potential concern is that counties receiving a larger share of their small business credit from distant lenders grow relatively more in expansions and relatively less in recessions. To control for this possibility, we include county-by-year fixed effects that absorb time-varying unobserved county characteristics and local demand shocks. The remaining variation comes from differences in lending growth and lending distances across lenders operating within a county during a particular year. We cluster standard errors at the county-level.

Table 2 presents results that are largely consistent with the descriptive statistics of Figures 2 and 3. The main coefficient on distance, β_1, is negative and significant across all three specifications suggesting that when the economy is in a neutral state and credit conditions are normal, greater distance to borrowers is associated with lower lending growth. More importantly, as the interaction term reveals, when the economy is booming, the negative relation between lending distances and changes in bank lending is significantly attenuated and potentially becomes positive provided that economic conditions are sufficiently good. The results of column (1) suggest that when the detrended real GDP series is one standard deviation above the mean, an increase in lending distance is associated with approximately no decline in bank lending. Similarly, the results of columns (2) and (3) suggest that a one-standard deviation decrease in unemployment rates and credit spreads approximately halves the measured negative relation between lending distance and bank loan growth.

To better understand the role that business cycles play in shaping the relation between lending distance and credit supply, we consider an alternative approach in which we allow the effects of lending distance to vary non-parametrically over time. In particular, we implement the following specification:

$$\boldsymbol{\Delta\%SBL_{bct} = \alpha_{ct} + \gamma_b + \sum_t \beta_t \, Ln(Dist)_{bct} \times Year_t + \theta X_{bt} + \epsilon_{bct}} \quad \textbf{(2)}$$

where $Year_t$ is a set of dummy variables that equal to one at time *t* and zero otherwise and all other variables are defined as above. This alternative specification allows us to examine the relation between lending distances and changes in bank lending over the sample period without imposing parametric assumptions about how the relation between lending distances and changes in bank lending evolves over the business cycle.

In Figure 4, we plot the series of estimated coefficients, $\{\beta_t\}$, and corresponding standard errors overlaid on a line representing the detrended GDP growth series. The figure further suggests that recession years coincide with lower coefficients between lending distances and changes in bank lending and boom periods coincide with greater coefficients and even positive associations between lending distances and changes in bank lending. The univariate correlation between the series of year-specific effects of lending distance with the detrended real GDP series is 0.56. We interpret the results of this plot as supplementary evidence that the relation between lending distances and credit supply is strongly procyclical.

Next, we perform a series of robustness checks to confirm the cyclical relation between lending distances and changes in bank lending. We examine whether this cyclical pattern is common across banks of different sizes, rather than limited to a few very large banks. In Table 3, we stratify the sample based on whether banks have less than $10 billion in total assets, between $10 and $50 billion in total assets, and more than $50 billion in total assets. The results reported in this table support the idea that the cyclical relation between lending distances and changes in bank lending is common to all bank sizes. For example, the results of columns (1)-(3) suggest that across all size categories the relation between lending distances and changes in bank lending becomes more positive when the economy is booming and more negative when it is in recession.

Another possible concern is that the composition of borrowers or loans changes over the business cycle – for example, during economic expansions loans may flow to industries that allow for more distance in lending based on differences in collateral type and quality. To examine whether the cyclical variation in distance is likely driven by changes in the pool of borrowers over the cycle rather than by changes in the willingness of lenders to make distant loans, we exploit a separate CRA dataset that only covers small agricultural loans. Agriculture is a monitoring-intensive industry where lenders must at least deploy some resources to check if the farmer is putting the loan to good use. Figure 5 suggests that small farm loan data also exhibit cyclicality in lending distance. While the overall lending distance in the agricultural sector is shorter than for the rest of the economy, consistent with it being more monitoring intensive, the plot shows within-sector, above-trend growth in lending distances during economic expansions and subsequent declines in lending distance following recessions. In Table 4, we further show that the cyclical relation between lending distances and changes in agricultural bank lending holds in an empirical specification similar to that of equation (1). These results suggest that cyclicality is not simply driven by varying industry or loan composition.

Overall, the results in this section strongly support the idea that lenders are more willing to extend credit to distant borrowers during economic expansions and subsequently pull back to safety in the ensuing bust.

4. Lending Distances, Bank Lending, and Credit Cycles: Loan Default Rates

A potential explanation for the pattern we documented in the previous section is that during lending booms, credit standards become lax and lenders are more willing to take risks by originating loans to distant borrowers whose information is relatively harder to collect, evaluate, and monitor. In what follows, we empirically analyze a straightforward implication of this conjecture: that distant loans originated during booms should be relatively more likely to default.

4.1. Lending Distances and Banks' Nonperforming Loan Ratios

The CRA dataset does not report information on the ex-post performance of small business loans. We can, however, obtain information on aggregate loan losses for each bank from Call and Thrift Financial Reports. Thus, we examine whether the relation between lending distances and changes in bank lending is more cyclical and pronounced for banks with larger non-performing loan ratios during the 2007-2009 period.

The idea is to investigate whether lenders that experienced worse outcomes during the 2007-2009 period originated relatively more loans to distant borrowers in the run-up to the 2007-2009 financial crisis and subsequently pulled back to local markets in response to heavy loan losses. This pattern would suggest that lending to distant borrowers carry risks that are difficult to evaluate and quantify and that these lenders later saw these risks materialize into large loan losses. These losses created significant balance-sheet pressures that induced these lenders to de-lever and retreat to the safety of local markets (e.g., DeHaas and Van Horen, 2012; Gianetti and Laeven, 2012; Bord, Ivashina, and Taliaferro, 2017).

We begin this analysis by stratifying banks based on the median of the distribution of nonperforming loan ratio computed over the 2007-2009 period and plotting average distances over the sample period for above- and below-median nonperforming loan ratio banks. The results, shown in the left graph of Figure 6, are striking: above-median banks see a very pronounced boom-bust cycle in the average bank-level lending distances. By contrast, the average bank-level lending distances of below-median banks remain relatively steady over most of the sample and increase slightly following the financial crisis. These results are consistent with the notion that banks that reached farther out experienced larger loan losses.

To formally examine this association, we extend the specification in equation (1) by including a triple interaction between the nonperforming loan (NPL) ratios, lending distance, and the business cycle indicators. Specifically, we estimate the following model:

$$\Delta\%\boldsymbol{SBL_{bct}} = \boldsymbol{\alpha_{ct}} + \boldsymbol{\gamma_b} + \boldsymbol{\beta_1 Ln(Dist)_{bct}} + \boldsymbol{\beta_2 Ln(Dist)_{bct}} \times \boldsymbol{Z_t} \times \boldsymbol{NPL_b} + \boldsymbol{INT} + \boldsymbol{\theta X_{bt}} + \boldsymbol{\epsilon_{bct}} \quad \textbf{(3)}$$

where NPL_b measures each bank's average nonperforming loan ratio between 2007 and 2009 and all other variables are defined similarly to equation (1). We include all two-way interaction terms (*INT*) between the nonperforming loan ratio, lending distance, and business cycle indicators as well as county-by-year and bank fixed-effects in the above specification. We cluster standard errors at the county-level.

We report the results in Table 5. We find that lending distances are more positively (negatively) associated with changes in bank lending during expansionary (recessionary) periods, respectively. More importantly, the triple interaction between the NPL ratios, lending distances, and business cycle indicators reveals that greater loan delinquency amplifies the effect of the business cycle on the relation between distance and changes in bank lending. For example, the results of column (1) of Table 5 suggest that a one-standard deviation increase in the NPL ratio is associated with an increase of the interaction between lending distance and the detrended GDP by approximately 7% (0.002/0.027). These magnitudes indicate that banks experiencing greater loan losses experience more pronounced boom-bust cycle in the relation between lending distances and changes in bank lending. We obtain qualitatively similar inferences with larger economic magnitudes in the other columns of Table 5.

We also extend the specification of equation (2) and employ a nonparametric approach that traces the marginal effects of lending distance on changes in bank lending over time at different points of the distribution of the nonperforming loan ratio. Specifically, we include a triple-interaction between lending distance, year dummies, and the NPL ratio:

$$\Delta\%\boldsymbol{SBL_{bct}} = \boldsymbol{\alpha_{ct}} + \boldsymbol{\gamma_b} + \sum_{t} \boldsymbol{\delta_t}\, \boldsymbol{Ln(Dist)_{bct}} \times \boldsymbol{Year_t} + \sum_{t} \boldsymbol{\lambda_t}\, \boldsymbol{Ln(Dist)_{bct}} \times \boldsymbol{Year_t} \times \boldsymbol{NPL_b}$$

$$+ \boldsymbol{INT} + \boldsymbol{\theta X_{bt}} + \boldsymbol{\epsilon_{bct}} \quad \mathbf{(4)}$$

where our independent variable of interest is the triple interaction between lending distance, year dummies, and the NPL ratio at the bank level. As in other specifications, we also include two-way interaction terms (*INT*) between these variables as well as county-by-year and bank fixed-effect. Standard errors are clustered at the county level.

To better visualize how NPL ratios mediate the association between lending distance and changes in bank lending over time, we plot the time-series of estimated marginal effects of distance at different levels of the NPL ratio using the estimates from specification (4). We compute these marginal effects as:

$$MFX_t = \hat{\delta}_t + \hat{\lambda}_t \times NPL$$

where $\hat{\delta}_t$ represents the estimated year-specific elasticities of changes in bank lending with respect to distance from estimating specification (4) using OLS, $\hat{\lambda}_t$ the year-specific elasticities of changes in bank lending with respect to distance interacted with NPL. We evaluate and plot these marginal effects for a representative bank with NPL ratios two standard deviations above and below the average NPL ratio.

The right plot of Figure 6 represents the marginal effects of lending distance on changes in bank lending from estimating specification (4). The difference between the green (above-average nonperforming loan ratio) and red (below-average nonperforming loan ratio) suggest that banks that experienced greater nonperforming loan ratios between 2007 and 2009 show greater elasticities of changes in bank lending with respect to lending distances in the run-up to the financial crisis. This pattern suggests that above-average NPL ratio banks were more willing to take risks and increase lending to distant borrowers. We also find that this pattern reverses between 2008 and 2010, a period in which above-average NPL banks show lower elasticities of changes in bank lending with respect to lending distances. These findings are in line with Bord, Ivashina, and Taliaferro (2017) and suggest that banks experiencing greater delinquency ratios were more likely to retreat to their local markets.

Overall, these findings are consistent with the idea that it was risky to go the extra mile during lending booms. Another possibility, however, is that banks with high delinquency ratios increased lending to distant borrowers during the lending boom while lowering lending standards across all distances. Additional information on defaults at the individual loan level would be more persuasive in determining that distant loans are associated with incremental risks.

4.2. Lending Distances and Loan-Level Loan Losses: Evidence from the SBA Loans

To do this, we exploit the Small Business Administration (SBA) loan-level dataset of government guaranteed loans to obtain loan-level information on ex-post defaults (also termed charge-offs). This dataset provides a rich set of information on the identities and addresses of borrowers and lenders, loan amounts, interest rates, and maturities of all government guaranteed loans approved since 2000. We use the listed addresses of the lenders and respective borrowers to compute lending distances for each loan in the dataset and to empirically examine the interplay between the business cycle and geographic distance in shaping the ex-post default of SBA loans.

4.2.1. Cyclical Lending Distance Patterns in the SBA Dataset

Before jumping to an empirical evaluation of the association between lending distances and loan performance over the business cycle, we must investigate whether the cyclical distance patterns in the SBA dataset follow those of the broader CRA dataset. This step is necessary to support the idea that the overarching forces that induce lenders to go the extra mile for regular small business loans also apply in the SBA government-guaranteed lending market.

In Figure 7, Panel A we plot the average lending distance between the borrower and lender addresses of each loan in the SBA 7(a) dataset weighted by respective loan amount. Similar to the analysis of Figure 2, the weighted average lending distance substantially increases between 2003 and 2007 and later declines to the levels seen in the early 2000s following the financial crisis. In Panel B of Figure 7, we plot the average bank-level lending distance. Similar to the cyclical patterns observed for small business loans reported in the CRA sample, we observe that average bank-level weighted lending distance increases until the 2007—2009 financial crisis, subsequently declines as the crisis unfolds and rebounds between 2010 and 2016.

Next, we evaluate the cyclicality of lending distances in a regression analysis that follows the specification of equation (1). To implement this analysis, we aggregate loan amounts at the borrower county-bank-year level and we compute a measure of loan volume at bank-county-year level that is similar to that used in Table 2. We also compute the average lending distance of the bank to the county as the average distance of the bank to its borrowers in each county during that year. Specifically, we estimate the following specification:

$$\Delta\%\boldsymbol{SBA_{bct}} = \boldsymbol{\alpha_{ct}} + \boldsymbol{\gamma_b} + \boldsymbol{\beta_1 Ln(Dist)_{bct}} + \boldsymbol{\beta_2 Ln(Dist)_{bct}} \times \boldsymbol{Z_t} + \boldsymbol{\epsilon_{bct}} \quad \textbf{(5)}$$

where *b* denotes the bank participating in the small business administration program, *c* the county of the borrower and *t* the year in which the loan was originated. The dependent variable, $\Delta\%SBA_{bct}$, is the logarithmic change in the volume of loans originated by bank *b* to borrowers located in county *c* during year *t*. The independent variable of interest, $Ln(Dist)$, is the average distance between bank *b* and its borrowers located in county *c*.[5] The business cycle indicators, Z_t, are those defined in the analysis of Table 2.

We estimate the above specification using OLS and report the results in Table 6. Similar to prior analyses, the main coefficient on the interaction between the business cycle indicators and lending distances suggests that during expansionary periods, the relation between lending distance and changes in bank lending becomes more positive and vice-versa. We also implement and estimate a non-parametric specification akin to that of equation (2) in which we compute the year-specific elasticities of the change in bank lending with respect to lending distance. We plot the estimated coefficients and respective standard errors of this analysis in Figure 8. Similar to the analysis of Figure 4, the positive elasticities of changes in SBA lending with respect to lending distance coincide with expansionary periods and negative elasticities coincide with recessionary periods.

[5] Unlike the measure of distance used in the previous analyses, this measure of distance may vary over time within a county-bank pair because borrowers may be at different places within the same county over time.

Overall, these results show that the evolution of distance in the government-guaranteed small business loan market exhibits cyclical patterns that are similar to those of the broader small business loan market.

4.2.2. Cyclical Lending Distance and Loan Default in the SBA Dataset

Having established that SBA loans behave similarly to regular small business loans, we proceed to exploit loan-level SBA data, which allows us to examine the evolution of the relation between ex-post loan defaults (also termed charge-offs) and lending distance. If distant loans carry additional risks in the form of less effective screening and monitoring, we should see that distance is associated with higher default rates, especially for vintages originated during the boom.[6]

To empirically evaluate this conjecture, we implement the following empirical specification:

$$\mathbf{Pr}\ (\boldsymbol{CO_{ibct}} = \mathbf{1}) = \boldsymbol{\alpha_{ct}} + \boldsymbol{\gamma_b} + \sum_{\boldsymbol{t}} \boldsymbol{\delta_t}\, \boldsymbol{Ln(Dist)_{ibt}} \times \boldsymbol{Year_t} + \boldsymbol{\theta X_i} + \boldsymbol{\epsilon_{ibct}} \quad \mathbf{(6)}$$

where i indexes SBA government-guaranteed loans originated by lender b to small business borrowers located in county c during year t. The main variables of interest, $Ln(Dist)_{ibt} \times Year_t$, are interaction terms of the log-distance between the addresses of the lender and the borrower and a series of year dummies. We further include county-by-year and bank fixed effects as well as additional controls for loan-level characteristics in the vector X_i, such as loan interest rates, loan maturities, and a full set of borrower-industry fixed effects. As before, standard errors are clustered at the county-level.

[6] We confirm that our results are not sensitive to using a sample of SBA loans whose maturity is less than or equal to five years and that were originated prior to 2013 in order to allow for enough time for all loans to be worked-out by the end of the sample period.

The inclusion of county-by-year and bank fixed effects ensure that the results are not driven by unobservable bank characteristics or by changes in local economic conditions that affect the overall likelihood of default of small business loans originated in a county. We are, therefore, comparing the average outcomes of loans originated by nearby lenders relative to the average outcomes of loans to borrowers located in the same county that receive loans from distant lenders.

We present the results of this analysis in Figure 9. The evolution of the main coefficients presents a very clear pattern: over the initial years of the sample period, lending distances are not significantly related to the likelihood of charge-off. However, beginning in 2003 the relation between distance and the likelihood of charge-off becomes positive and statistically significant. The magnitude of the main coefficients increases over time and peaks for loan vintages originated in 2006. After 2006, the relation between lending distances and likelihood of charge-off becomes less pronounced and turns statistically insignificant after 2010.

An important caveat of this analysis is that the government guarantee for SBA loans could intensify incentives to throw caution to the wind relative to other small business loans that do not include a guarantee. Lenders in a SBA guaranteed loan only absorb a predetermined fraction of potential loan losses but earn full interest and fees accruing from the loan. This feature raises concerns about whether the results generalize to the broader lending market. To assess this possibility, we partition the sample based on whether the loan was originated under the regular 7(a) program or under the SBA Express program. The SBA Express program ensures an expedited review of documentation by the SBA (usually less than 24 hours) in exchange for a lower government-guarantee, 50% rather than the usual 75% or 85% guarantee of a regular 7(a) loan. In unreported tests, we find that the relation between distance and charge-off is not significantly different in the subset of SBA Express loans that feature a lower government guarantee, alleviating the concern about the role of guarantees in our result.

4.2.3. Cyclical Lending Distance and Interest Rates on SBA Loans

Next, we investigate if lenders require additional compensation on distant loans originated in the run-up to the financial crisis. One drawback is that interest rates on SBA loans are highly regulated. The SBA sets a maximum rate of the Prime rate + 2.25% for loans with principal amount of more than $50,000 and maturity of less than 7 years and Prime +2.75% for loans with principal amount of more than $50,000 and maturity of 7 years or more. In spite of these interest rate ceilings, there is some variation in the interest rate of loans approved by the SBA even on the same day, suggesting that not all loans are set at the maximum allowed interest rate.

We assess if lenders require additional compensation for distant loans originated in the run-up to the financial crisis using an empirical specification similar to that of equation (6), in which we use the initial interest rate on the SBA loan rather than the likelihood of charge-off as the main dependent variable. We report the results in Figure 10. We do not observe any clear cyclical pattern in the relation between distance and the interest rate charged on these loans, suggesting that lenders do not obtain additional compensation for the incremental ex-post default risk that they incurred in these distant loans.

Overall, the results in this section are consistent with the idea that during expansionary periods, banks lower credit standards and accept the risks of extending credit to distant SBA borrowers who are relatively harder to evaluate and monitor.

5. Lending Distances, Bank Lending, and Credit Cycles: The Role of Competition

Having established that the cyclical pattern in lending distance is a good proxy for risk taking, we turn to the conditions under which risk-taking behavior emerges. Banks whose branches are primarily in competitive banking markets may find lending opportunities scarce and profit margins small within their local areas.[7] Herd behavior or other forms of agency could then induce branch managers to step outside their comfort zones and seek distant borrowers in less competitive areas rather than sitting on un-lent cash. In the next section we examine whether banks whose branches are primarily in competitive banking markets see a more pronounced cyclical pattern in lending distance and whether we find a reciprocal cyclical pattern in average borrowing distance for borrowers located in less competitive areas. We also evaluate whether banks that have the ability to reallocate resources (and thus lending) within their branch network from areas exposed to significant competitive pressures to areas that are less exposed to fierce competition will be less pressured to take distance risk during the boom.

5.1. The Role of Competition at Home and Destination Markets

We begin by asking whether local competitive pressures amplify the cyclical relation between lending distances and changes in bank lending. To test this conjecture, we exploit variation in the intensity of competition at the county-level in the small business lending market. We base our measure of competition on the level of market concentration computed as the Herfindahl-Hirschman Index (HHI) in each county at the beginning of our sample.[8]

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[7] See, for example, Degryse and Ongena (2005) on the role of proximate bank competition on interest rates banks can charge.

[8] We also compute a measure of competition based on the HHI in the deposit market. The results are qualitatively and quantitatively when we use this alternative measure of market concentration. See Drechsler, Savov, and Schnabl (2017) for the use of deposit HHI as a proxy for bank competition.

A simple partition of the raw data in Panel A of Figure 11 suggests that the cyclical variation in the average lending distance at the bank level is more pronounced in banks exposed to greater competition. We group banks based on the average HHI of their home markets, i.e. the HHI of counties where the closest branch to the county of their borrower is located, and on the average HHI at the destination markets, i.e. the average HHI of the counties where borrowers are located. We plot the average lending distances at the bank level for banks below and above the median HHI in their home and destination. The lending distances of banks exposed to below-median concentration in their home markets and above-median concentration in their destinations markets are more cyclical than those of other banks. For example, banks facing stiffer competition in their local branch markets, i.e. those with below-median HHI in their home markets expanded bank-level average lending distances from 80 miles in 2003 to approximately 130 miles in 2006 and saw their lending distances subsequently contract to less than 100 miles by 2010. The group of banks with above-median HHI, i.e. facing lower competition in their home markets, saw no such cyclical pattern and their bank-level average lending distances hovered 40 miles throughout the entire sample period. These figures suggest that banks exposed to greater competition see a more pronounced boom-bust cycle in lending distances.

One potential problem with the analysis above is that above- and below-median HHI banks could be systematically different in ways that affect the relation between lending distance and changes in bank lending but are not necessarily related with the local competitive pressures. To formally examine whether exposure to greater competition amplifies the cyclical relation between distance and changes in bank lending, we implement a specification similar to that of equation (3) and include a triple interaction between the level of market concentration, lending distance, and the business cycle indicators. Specifically, we estimate the following model:

$$\Delta\%SBL_{bct} = \alpha_{ct} + \gamma_b + \beta_1 Ln(Dist)_{bct} + \beta_2 Ln(Dist)_{bct} \times Z_t \times HHI_{bc} + INT + \theta X_{bt} + \epsilon_{bct} \quad (7)$$

where HHI_{bc} measures the county-level HHI of the small business lending market at the beginning of the sample period. We compute HHI_{bc} in the home market, destination market, and as the difference in HHI between the destination and home market. We include all two-way interaction terms (*INT*) between the HHI terms, lending distance, and business cycle. We cluster standard errors at the county-level.

Table 7 reports the results. We find that interbank competition is associated with greater cyclicality between lending distance and changes in bank lending. The interaction term between lending distances and business cycle indicators suggest that distance is more positively associated with changes in bank lending in expansionary periods and vice-versa. But more importantly, the triple interaction between the HHI measures, lending distances, and business cycle indicators support the notion that competitive pressures amplify the business cycle effects. For example, the results of column (3) of Table 3 suggest that a one-standard deviation increase in the difference between the HHI of the destination and home markets raises the marginal effect of the interaction between lending distance and the detrended GDP by approximately 25% (0.008/0.035). These magnitudes indicate that when the difference in HHI between destination and home markets is large, lending distances and changes in bank lending are even more positively associated in expansionary periods and more negatively associated in recessionary periods. We obtain similar qualitative inferences with slight differences in economic magnitudes in other columns of Table 7.

We further investigate the role of market concentration by using a non-parametric approach similar to that of specification (4). Specifically, we estimate the following model:

$$\Delta\%\boldsymbol{SBL_{bct}} = \boldsymbol{\alpha_{ct}} + \boldsymbol{\gamma_b} + \sum_t \boldsymbol{\delta_t\, Ln(Dist)_{bct}}\times\boldsymbol{Year_t} + \sum_t \boldsymbol{\lambda_t\, Ln(Dist)_{bct}}\times\boldsymbol{Year_t}\times\boldsymbol{HHI_{bc}} + \boldsymbol{INT} + \boldsymbol{\theta X_{bt}} + \boldsymbol{\epsilon_{bct}} \quad (\mathbf{8})$$

where our independent variable of interest is the triple interaction between the lending distance, year dummies, and the level of market concentration at home and destination markets. As in other specifications, we also include main effects and interactions *(INT)* between these variables as well as county-by-year and bank fixed-effect. As in previous specifications standard errors are clustered at the county level.

Similar to the approach of Figure 6, we compute and plot the marginal effects of lending distance on changes in bank lending using estimates obtained from an OLS regression of specification (4) and setting the levels of market concentration at two standard deviations above- and below-average. The results presented in Panel B of Figure 11, reinforce the idea that the boom-bust cycle in the marginal effects of lending distance is more pronounced when local branch markets are more competitive and less concentrated and when destination markets are less competitive and more concentrated. For instance, the plot on the left indicates that the marginal effects of lending distances on bank lending are significantly larger during 2006 and 2007 when the home market is exposed to greater competitive pressures.

Overall, our findings suggest that interbank competition is a catalyst of cyclical risk-taking by banks. When lenders face fierce competition in their local branch markets and economic conditions are expansionary, they are more likely to step outside their local areas and make distant loans. The flip side of such expansion is that when economic and credit conditions take a turn for the worse, these lenders become more conservative and focus on their core markets by disproportionately cutting lending to distant borrowers.

5.2. *The Role of Internal Capital Markets*

Next, we examine whether banks that have the ability to redeploy resources from branches facing significant competitive pressures to branches that are less exposed to fierce competition are less inclined to lend to distant borrowers.

A simple measure of dispersion of lending opportunities within a bank's branch network is the coefficient of variation of the HHI in the branch network of each bank. A large coefficient of variation of the level of market concentration within a branch network indicates significant dispersion of market concentration relative to the average level of market concentration that the bank. We use this dispersion (relative to the mean) as a proxy for a bank's ability to use their branch network to reallocate resources from areas with significant competitive pressures where lending opportunities are scarce and profit margins small to areas where they face lower competitive pressures.

We begin to examine this conjecture by partitioning banks based on the coefficient of variation of the HHI of their local branch markets at the beginning of the sample period. The left plot of Figure 12 stratifies the evolution of average bank-level lending distances based on above- and below-median coefficient of variation of HHI. The plot suggests that the boom-bust cycle in lending distances only exists in the subset of banks whose HHI dispersion relative to the mean is low. In this group, average bank lending distances approximately double between 2003 and 2007 and subsequently decline between 2008 and 2012.[9]

[9] In unreported analyses, we further split the group with low HHI coefficient of variation between those banks with uniformly low HHI across its branches and those with uniformly high HHI across its branches. Confirming our expectations, we find that the boom-bust cycle in lending distances is more pronounced in the subset of banks with low coefficient of variation that are exposed to uniformly low market concentration.

To further examine the role of internal capital markets in shaping the cyclical relation between lending distance and changes in bank lending, we also implement a specification similar to equation (7) in which we use the triple interaction between lending distances, business cycle indicators, and the coefficient of variation of HHI as the main independent variable of interest.

We report these results in Table 8. We use the detrended change in real GDP, change in the logarithm of the unemployment rate, and interest rate spreads on small business loans as our business and credit cycle indicators in columns (1), (2), and (3), respectively. The main coefficients suggest that the effect of the business cycle on the relation between lending distance and changes in bank lending is more pronounced when the standard deviation of the HHI is small. This result indicates that the relation between lending distance and changes in bank lending is incrementally more positive in expansionary periods for banks with low dispersion in the level of market concentration in their branch network relative to its mean.

We also employ a non-parametric approach similar to that of equation (8) in which we interact lending distances, year dummies, and the coefficient of HHI. We plot the marginal effects of distance on changes in bank lending over time in the right plot of Figure 12. The estimated marginal effects support the idea that the effect of lending distance on changes in bank lending during the run up to the financial crisis was more pronounced for banks with fewer opportunities to reallocate resources within their branch network.

Overall, the results in this section suggest that when they have lending opportunities in core markets, banks are less inclined to extend credit to distant borrowers. This result is in line with Cetorelli and Goldberg (2012), Gilje, Loutskina, and Strahan (2016) and especially Cortés and Strahan (2017) who provide solid evidence that commercial banks actively redeploy resources within their areas of operation in response to external shocks but show a preference for their core markets in doing so.

5.3. Robustness: The Role of Competition at Home and Destination Markets

A significant literature argues that high concentration in an industry or region need not mean low competition – it could just mean that a more efficient producer has grabbed more market share. Also, areas with many banks may be naturally more prone to booms and busts in lending because of differences in the nature of demand from borrowers, rather than anything to do with supply.

We try to address these concerns using two alternative indicators of bank competition: the timing of adoption of interstate banking deregulation and the entry of large bank in a local banking market. Deregulation occurred over time and was significantly influenced by lobbying and political economy pressures (e.g. Kroszner and Strahan, 1996; Stiroh and Strahan, 2003). More efficient out-of-state banks had more time to enter, ramp up competition, and drive out inefficient banks in states where deregulation occurred earlier. Another possibility is to explore a large bank's entry into a local market (typically through merger). For a large bank, the conditions in a specific small local market are unlikely to affect its merger decision. But at the county-level, the entry of a large bank with a different business model and deep pockets is likely to disrupt local bank competition.

We use the natural log of the years between 1996 and the year when the loan origination state's banking market was deregulated as an additional measure of competition. We report these results in Table 9. Overall, the shorter the time elapsed since the adoption of interstate banking deregulation in the *destination* market, the more amplified the cyclical pattern in lending distance. Similarly, the result of columns (2) and (4) suggest that the longer the time elapsed since the adoption of interstate banking deregulation in the *home* market, the more amplified the boom bust cycle in lending distance. The result of column (6) also has a significant effect, albeit with the incorrect sign. Because the credit cycle indicator (Spreads) in this specification loads strongly on 2008 and 2009, we suspect that this opposite sign effect may be related to specific effect of one of these years.

We also create an indicator that takes the value of one if a county saw a 5 percentage points increase in the deposit market share held by a large banking organization in the prior year. Such a large increase suggests that a large banking organization either acquired another bank with local operations or significantly grew their operations in that county suggesting a more aggressive competitive environment. This idea is in line with the work of Claessens, Demirgüc-Kunt and Huizinga (2001) who find that foreign presence in the banking industry of a developing country is associated with lower net interest margins and more aggressive competition.

We report these results in Table 10. The results of columns (2), (4), and (6) show that when a large banking organization substantially increases its presence in the home market of a bank, the cyclical pattern in lending distance is substantially amplified as local banks react to intensifying competitive pressures in their home markets from large banking organizations by going the extra mile and increasing their distant lending during expansionary periods. Similarly, the results in columns (1) and (3) suggest that distant lending increases less during expansionary periods in counties of borrowers where large banking organizations significantly increase their presence, consistent with the idea that lenders avoid going the extra mile to counties that are experiencing increasing competitive pressures. Against this backdrop, however, the results in column (5) are statistically insignificant. Overall, the results in these columns support the idea that competitive pressures in local lending markets during expansionary periods induce banks to lend to borrowers that are farther away.

6. Discussion of Results and their Relation to the Literature

Our paper unearths new empirical facts and patterns that speak to three important literatures. First, we contribute to the literature on the role of soft information in lending and, specifically, on the role that physical distance plays in shaping lending transactions. Berger and Udell (1995) and Petersen and Rajan (1994) offer initial evidence that close relationships with local firms allow banks to collect information about the competence and trustworthiness of loan applicants thereby facilitating the process of lending. Petersen and Rajan (2002) document, nevertheless, that advances in information technology are behind a long-run trend toward less local lending. A series of papers show, however, that geographic distance still plays a major role in lending decisions. For instance, Agarwal and Hauswald (2010) show that physical distance improves the ability of lenders to produce soft information and extend credit to small businesses and Granja, Matvos, and Seru (2017) show that geographic distance is a significant determinant of the reallocation of failed banks in the economy. We contribute to this literature by providing large sample facts on the evolution of lending distances over the past twenty years. We find that secular trend toward greater lending distances persists but we also uncover a new and significant cyclical component to such distances.

Second, we also speak to studies that examine the cyclicality of risk taking in the economy. Ruckes (2004) and Dell'Aricia and Marquez (2006) study how cyclical lending standards can emerge in equilibrium in the economy. A series of papers (e.g. Madalloni and Peydro (2010), Mian and Sufi (2009), Gianetti and Laeven (2012), Dell'Aricia, Igan, and Laeven (2012), Jimenez, Ongena, Peydro, and Saurina (2014), Ioannidou, Ongena, and Peydro (2015), and

Lisowsky, Minnis, and Sutherland (2017)) provide empirical evidence of the cyclicality of credit standards. We contribute to this literature by suggesting that a sharp departure from trend distance between banks and borrowers is indicative of increased risk taking and by documenting strong cyclicality of lending standards in the small business lending market.

Finally, our paper is also related to a contentious theoretical literature that examines the role of competition in shaping bank activity. Hellmann, Murdock, and Stiglitz (2000) suggest that bank competition can undermine prudent bank behavior and induce banks to take excessive risks. Boyd and De Nicoló (2005) argue that concentration in banking markets could encourage higher interest rates, which, in turn, could heighten moral hazard concerns with bank borrowers. Morgan, Rime, and Strahan (2004) find that greater banking integration spurred by interstate banking deregulation in the United States reduced business cycle volatility at the state-level. On the other hand, Rajan and Ramcharan (2015) suggest that the interplay of interbank competition and credit availability exacerbated the boom-bust cycle in land prices in the run-up to the Great Depression. Dreschler, Savov, and Schnabl (2017) show that greater bank competition at the local level facilitates the pass-through of monetary policy to interest rates. Our findings add to this literature by suggesting that banks exposed to greater competitive pressures seem to go out on a limb to make distant loans that pose additional risks.

To the best of our knowledge this paper is the first to tie these three literatures together. We find that bank that interbank competition between lenders in good economic times can lead to deterioration in lending standards measured by a faster-than-trend expansion of the average distance between lenders and borrowers in an economy. We believe that the findings could be useful to bank regulators. Our findings suggest that sharp departure from trend distance between banks and borrowers is indicative of increased risk taking. Since distance is easily measurable, it is a metric that bank supervisors could easily track as they monitor lending standards in the economy.

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Figure 1: Time Series of Small Business Loan Originations by Distance Bin

Figure 1 shows the total amounts of small business loan origination and corresponding shares of the total small business loans originated in each of four bins representing the minimum distance between the borrower's county centroid location and the closest branch of the lender. The first bin represents distances between 0 and 50 miles, the second bin represents distances between 50 and 250 miles, the third bin represents distances between 250 and 1,000 miles, and the fourth bin represents borrowers and lenders that are more 1,000 miles apart. Data for this figure is computed using the CRA Small Business Lending and the SOD datasets.

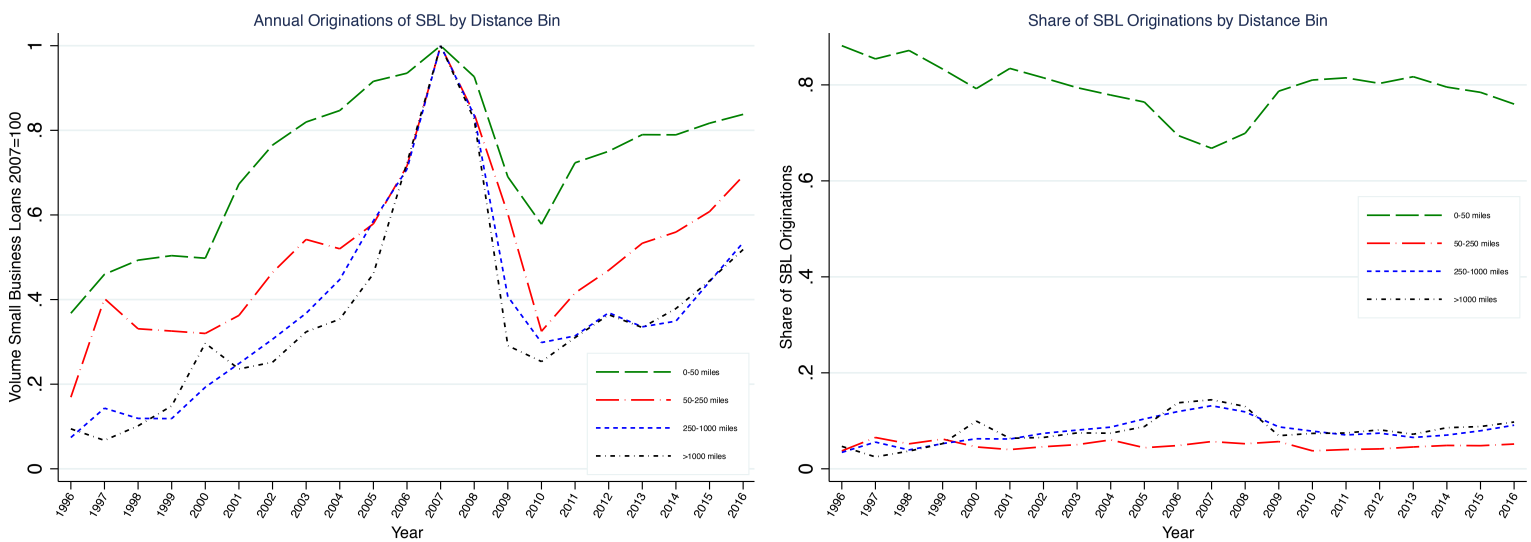
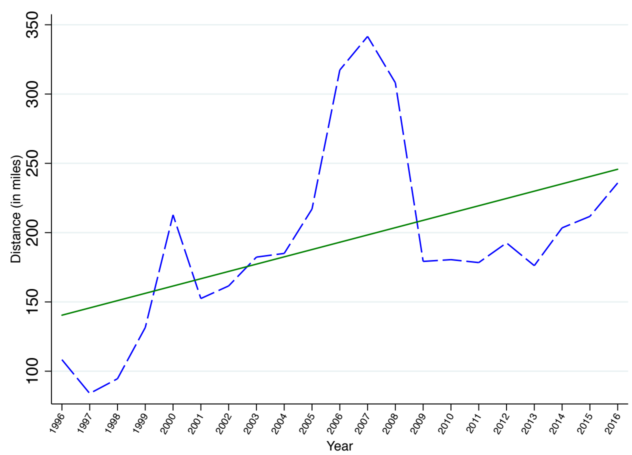


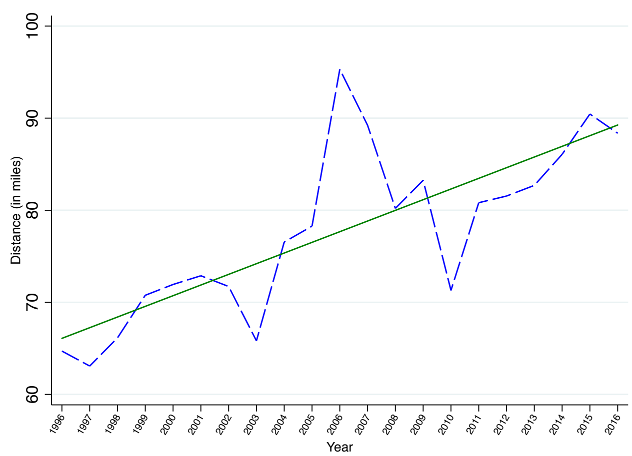
Figure 2: Evolution of Lending Distances

Figure 2 shows three plots. Panel A plots the average weighted distance of all small business loans over time. Lending Distance for each loan is computed as the geodetic distance between the borrowers' county centroid and the banks' closest branch. Panel B plots the bank equal-weighted lending distance over time. To compute the bank equal-weighted lending distance, we initially compute the average lending distance for each bank-year combination and then average across all banks in each year. Panel C plots the percentage of loans that are originated to borrowers that are located in counties where the lender does not have a branch. Data for all figures is obtained from the combination of the CRA and SOD datasets.

Panel A: Average Lending Distance (Volume-Weighted)



Panel B: Average Lending Distance (Equal-Weighted across Banks)



Panel C: Proportion of Lending to Counties outside Branch Network (Volume-Weighted)

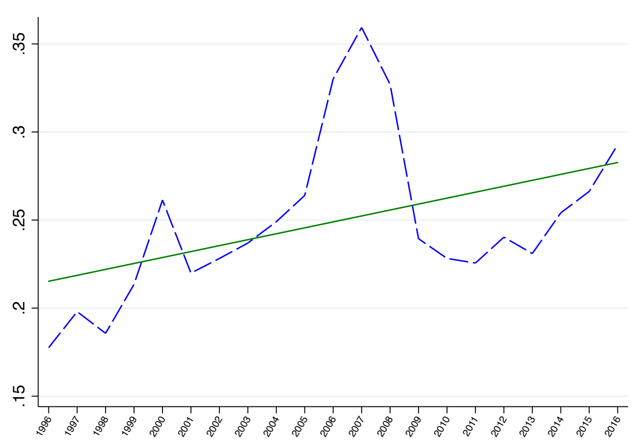
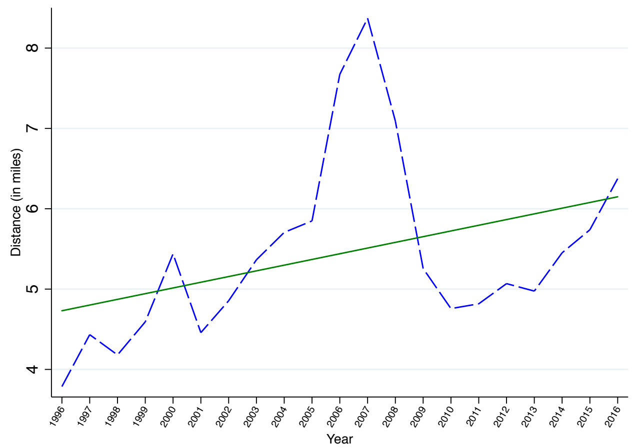


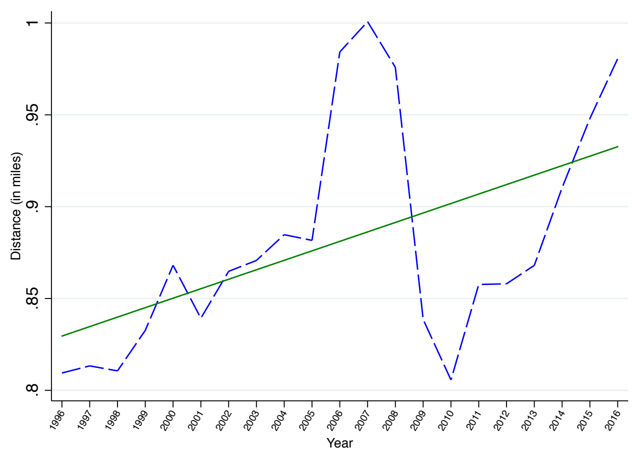
Figure 3: Evolution of Lending Distances: Other Points of the Distribution

Figure 3 shows three plots. Panel A plots the median of the weighted distance of all small business loans over time. Lending Distance for each loan is computed as the geodetic distance between the borrowers' county centroid and the banks' closest branch. Panel B plots the lower decile of the weighted distance of all small business loans over time. Lending Distance for each loan is computed as the geodetic distance between the borrowers' county centroid and the banks' closest branch. Panel C plots the upper decile of the weighted distance of all small business loans over time. Lending Distance for each loan is computed as the geodetic distance between the borrowers' county centroid and the banks' closest branch. Data for all figures is obtained from the combination of the CRA and SOD datasets.

Panel A: Median of Lending Distance (Volume-Weighted)



Panel B: Lower Decile of Lending Distance (Volume-Weighted)



Panel C: Upper Decile (Volume-Weighted)

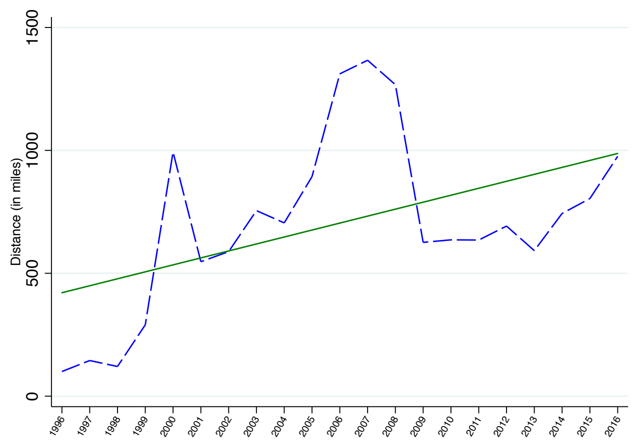


Figure 4: Distance and Lending Growth over the Business Cycle

Figure 4 plots the estimated coefficients from a regression of the log change in the volume of small business loans by a lender to borrowers located in a county on a series of interactions between lending distance and a set of dummy variable representing each year in the sample. Specifically, we plot the series of estimated coefficients β_t and associated 99% confidence intervals estimated from OLS regression of the following empirical specification: $\%\Delta SBL_{bct} = \theta_{ct} + \omega_b + \sum_t \beta_t Distance_{bct} \times Year_t + \Gamma X_{bt} + \epsilon_{bct}$. The shallow triangles connected by the dashed line represent the detrended GDP growth series (HP-filtered). Data for this figure is computed using the CRA Small Business Lending and the SOD datasets.

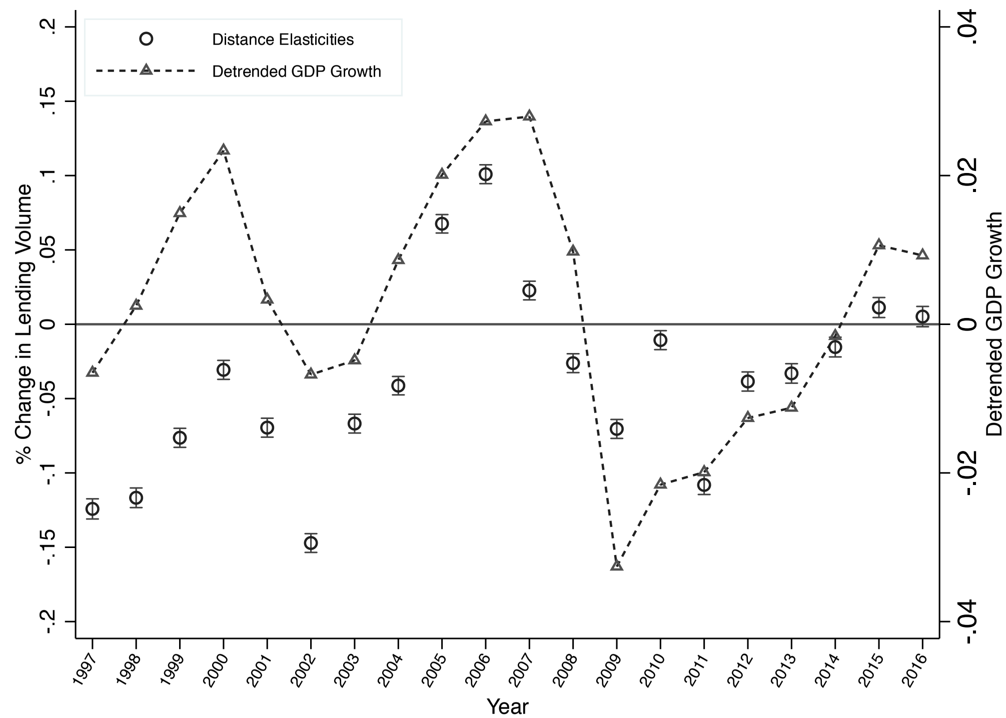


Figure 5: Evolution of Lending Distance: Small Farm Lending Dataset

Figure 5 plots the average weighted distance of all small farm loans over time. Lending Distance for each loan is computed as the geodetic distance between the farms' county centroid and the banks' closest branch.

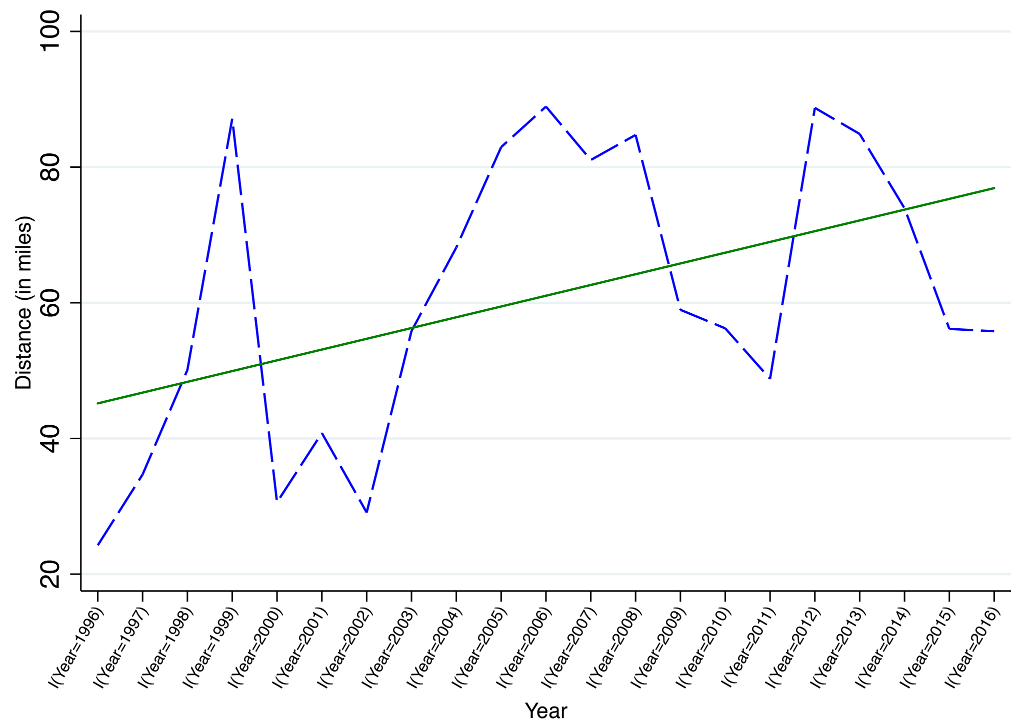


Figure 6: Lending Distances and NonPerforming Loan Ratios

Figure 6 plots the average lending distance over time after stratifying the sample of banks based on the average nonperforming loan ratio of banks over the 2007–2009 period. The figure on the left plots the equal-weighted bank distance for banks with above-median and below-median nonperforming loan ratio during the 2007–2009 period. The figure on the right plots the incremental contribution of the nonperforming loan ratio on the estimated marginal effect of distance on the log change in volume of loans. We compute the marginal effects of distance over time using estimates from the following empirical specification: $\Delta\%SBL_{bct} = \theta_{ct} + \omega_b + \sum_t \gamma_t(Distance \times Year)_{bct} + \sum_t \lambda_t(Distance \times Year \times NPL_{bt} + \Gamma X_{bt} + \epsilon_{bct}$. The marginal effects are computed using the year-specific elasticities of loan volume with respect to distance ($\hat{\gamma}_t$) and the year-specific elasticities of loan volume with respect to distance interacted with NPL ($\hat{\lambda}_t$). Specifically, we plot $\hat{\gamma}_t + \hat{\lambda}_t \times NPL$, where $t = 1996, ...2016$, and NPL takes values $\{\mu - 2\sigma, \mu + 2\sigma\}$, where μ is the mean value of NPL over the entire sample and σ is the standard deviation of NPL. The green dashed line is the elasticity of the volume of loans over time for a representative bank with $NPLs$ two standard deviations above the mean. The solid red line is the elasticity of the volume of loans over time for a representative bank with $NPLs$ two standard deviations below the mean. Data for this figure is computed using the CRA Small Business Lending and the SOD datasets.

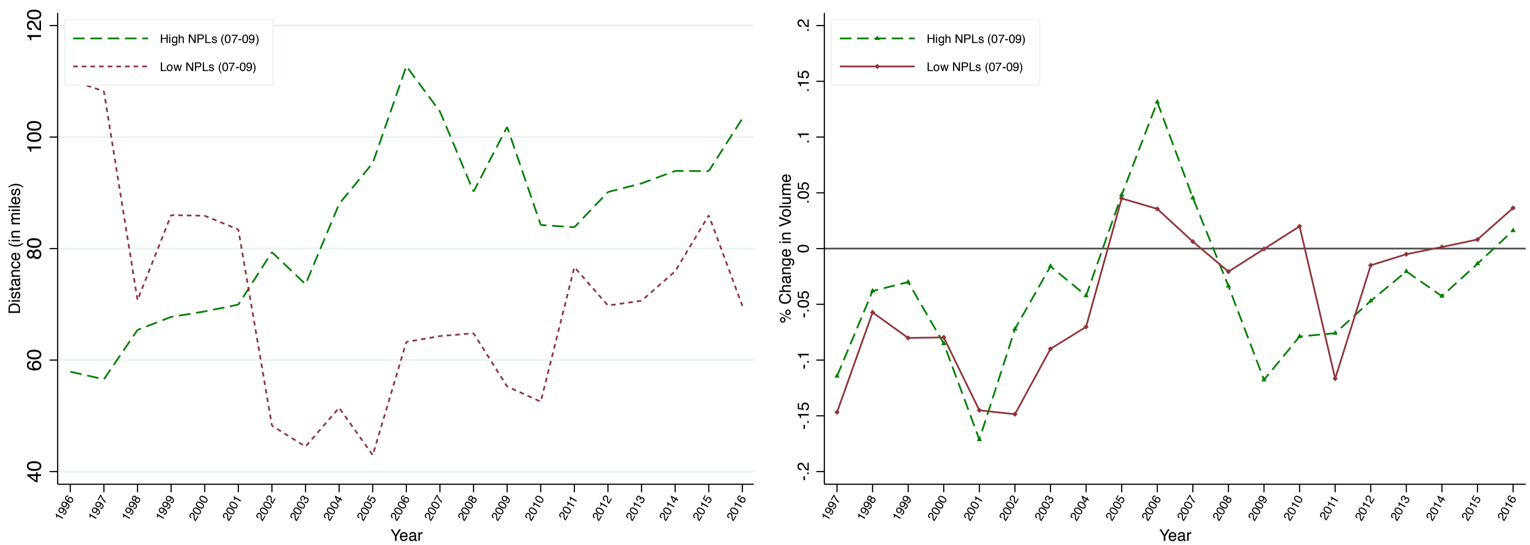
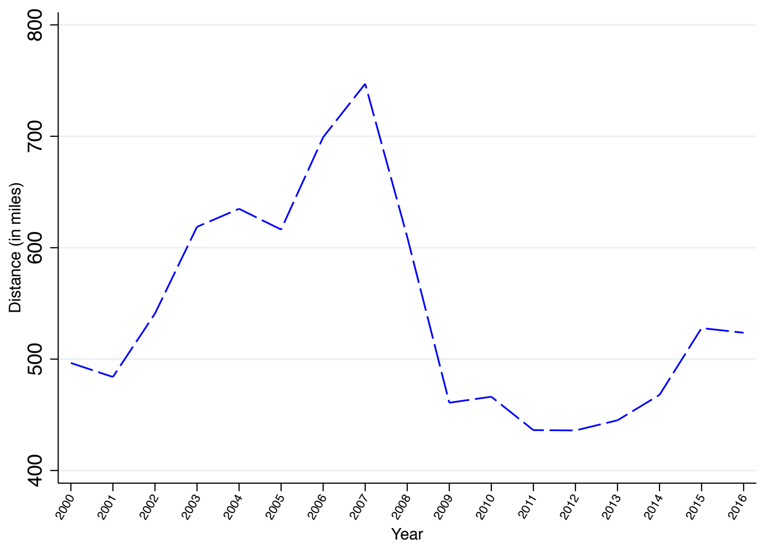


Figure 7: Evolution of Lending Distances in the Small Business Administration Dataset

Figure 7 shows two plots. Panel A plots the average distance of all small business administration loans over time. Lending Distance for each loan is computed as the geodetic distance between the lender and borrower addresses listed on the SBA dataset. Panel B plots the bank equal-weighted lending distance over time. To compute the bank equal-weighted lending distance, we initially compute the average lending distance for each bank-year combination and then average across all banks in each year. Data for all figures is obtained from the Small Business Administration

Panel A: Average Lending Distance (Volume-Weighted)



Panel B: Average Lending Distance (Equal-Weighted across Banks)

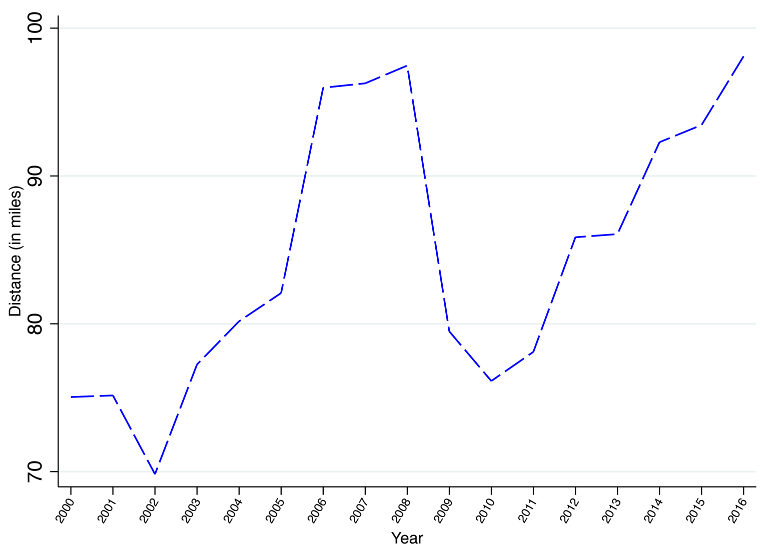


Figure 8: Distance and Lending Growth in the SBA Dataset

Figure 8 plots the estimated coefficients from a regression of the log change in the volume of SBA lending of a bank to a county on a series of interactions between lending distance and a set of dummy variable representing each year in the sample. Specifically, we plot the series of estimated coefficients β_t and associated 99% confidence intervals estimated from OLS regression of the following empirical specification: $\%\Delta SBA_{bct} = \theta_{ct} + \omega_b + \sum_t \beta_t Distance_{bct} \times Year_t + \Gamma X_{bt} + \epsilon_{bct}$, where $\%\Delta SBA_{bct}$ is the log change in the total amount of small business administration loans originated by lender b in county c and $Distance_{bct}$ is the logarithm of the average distance between the headquarters of the lender and its borrowers in the county. The shallow triangles connected by the dashed line represent the detrended GDP growth series (HP-filtered) Data for this figure is computed using the SBA dataset.

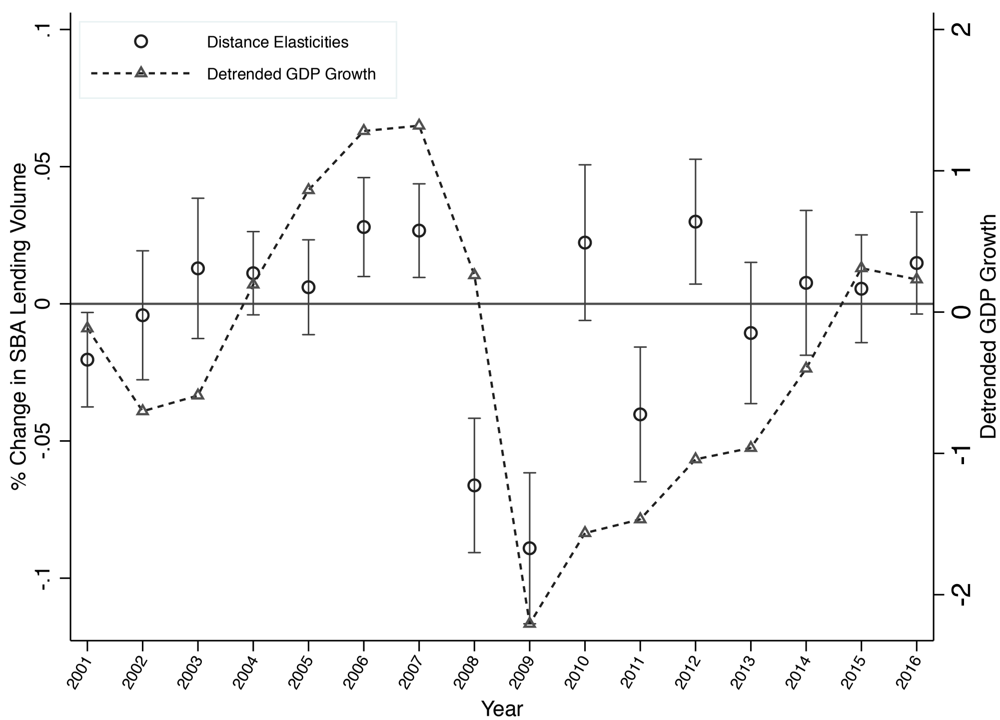


Figure 9: Distance and Likelihood of Charge-Off over the Business Cycle

Figure 9 plots the estimated coefficients from a regression of a dummy variable that takes the value of one if loan was charged-off on a series of interactions between lending distance and a set of dummy variable representing each year in the sample. Specifically, we plot the series of estimated coefficients β_t and associated 99% confidence intervals estimated from OLS regression of the following empirical specification: $CO_{bcti} = \theta_{ct} + \omega_b + \theta_i + \sum_t \beta_t Distance_{bcti} \times Year_t + \epsilon_{bcti}$, where CO_{bcti} is a dummy variable that takes the value of one if the loan was charged-off and $Distance_{bcti}$ is the logarithm of the distance between the address of the borrower and the headquarters of the lender. Data for this figure is computed using the SBA dataset.

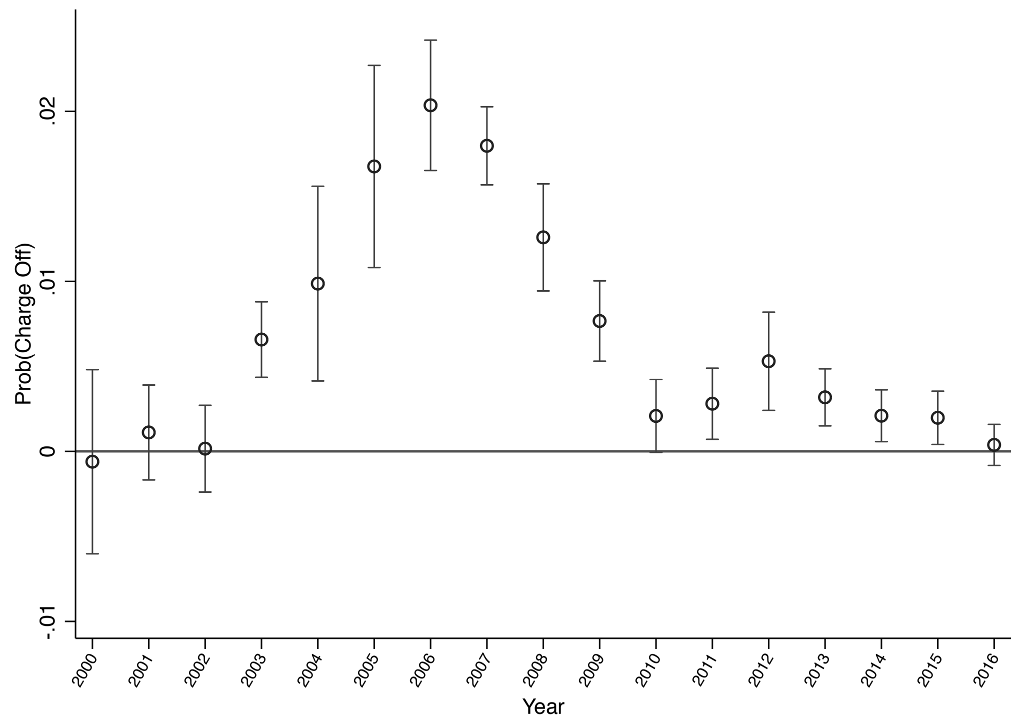


Figure 10: Distance and SBA Interest Rates over the Business Cycle

Figure 10 plots the estimated coefficients from a regression of the interest rate charged on the SBA loan on a series of interactions between lending distance and a set of dummy variables representing each year in the sample. Specifically, we plot the series of estimated coefficients β_t and associated 99% confidence intervals estimated from OLS regression of the following empirical specification: $\%IntRate_{bcti} = \theta_{ct} + \omega_b + \theta_i + \sum_t \beta_t Distance_{bcti} \times Year_t + \epsilon_{bcti}$, where $\%IntRate_{bcti}$ is the interest rate on the SBA loan and $Distance_{bcti}$ is the logarithm of the distance between the address of the borrower and the headquarters of the lender. Data for this figure is computed using the SBA dataset.

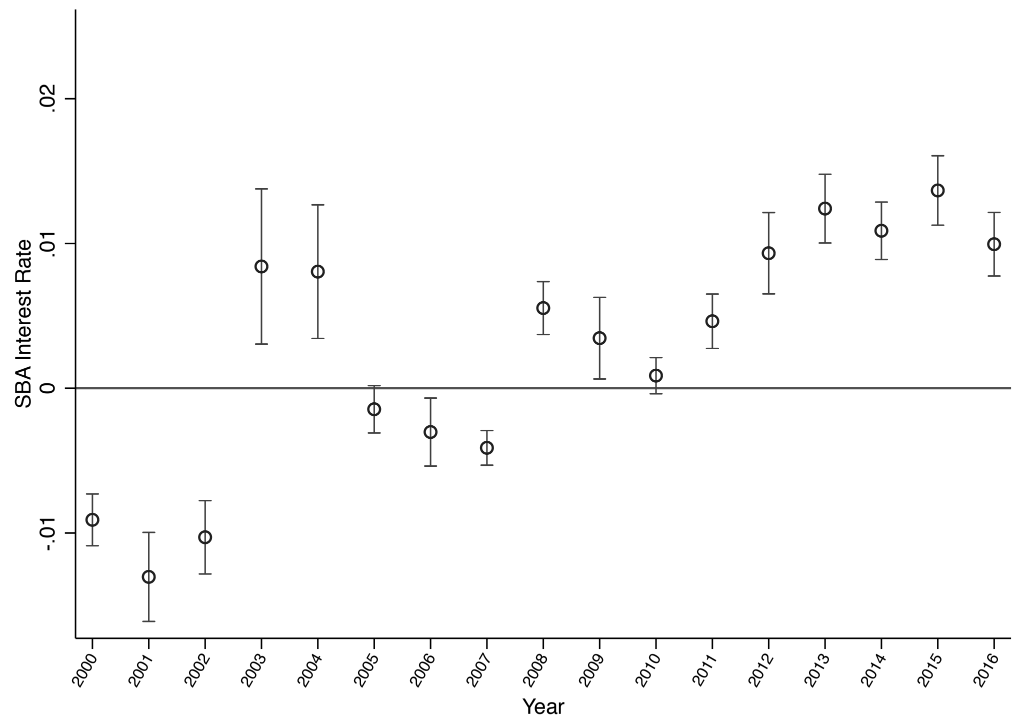
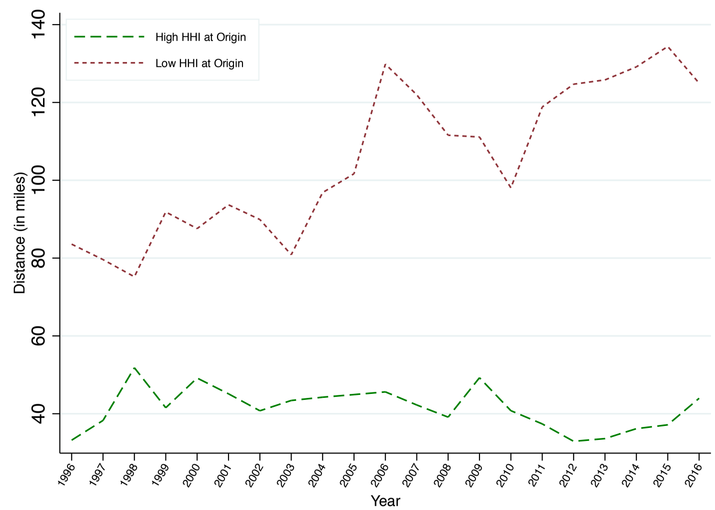


Figure 11: Lending Distances and Market Concentration

Panel A of Figure 11 plots the average lending distance over time after stratifying the sample of banks based on their level of concentration in their home and destination markets. The left figure plots the bank equal-weighted lending distance for the groups of banks with above- and below-median concentration in their home markets. The right figure plots the bank equal-weighted lending distance for the groups of banks with above- and below-median concentration in their destination markets. Local market concentration is measured as the HHI of the small business lending market as of 1996. Panel B represents the evolution over time of estimated marginal effect of distance on changes in bank lending measured at different points of the distribution of HHI. We compute the marginal effects of distance over time using estimates from the following empirical specification: $\Delta\%SBL_{bct} = \theta_{ct} + \omega_b + \sum_t \gamma_t(Distance \times Year)_{bct} + \sum_t \lambda_t(Distance \times Year \times HHI_{bct} + \Gamma X_{bt} + \epsilon_{bct}$. The marginal effects are computed using the year-specific elasticities of loan volume with respect to distance ($\hat{\gamma}_t$) and the year-specific elasticities of loan volume with respect to distance interacted with HHI ($\hat{\lambda}_t$). Specifically, we plot $\hat{\gamma}_t + \hat{\lambda}_t \times HHI$, where $t = 1996, ...2016$, and HHI takes values $\{\mu - 2\sigma, \mu + 2\sigma\}$, where μ is the average of HHI over the entire sample and σ is the standard deviation of HHI over the entire sample. The green dashed line is the elasticity of the volume of loans over time for a representative bank-county pair whose value of HHI is two standard deviations above the mean. The solid red line is the elasticity of the volume of loans over time for a representative bank-county pair whose value of HHI is two standard deviations below the mean. Concentration is measured as the Herfindahl-Hirschmann Index in the small business lending market as of 1996. The specification includes county-by-year and bank fixed-effects as well as baseline controls for natural logarithm of Total Assets, Share of Commercial & Real Estate Loans, Share of Residential Loans, and Share of Commercial & Industrial Loans. Data for this figure is computed using the CRA Small Business Lending and the SOD datasets.

Panel A: Average Distance over Time: Market Concentration



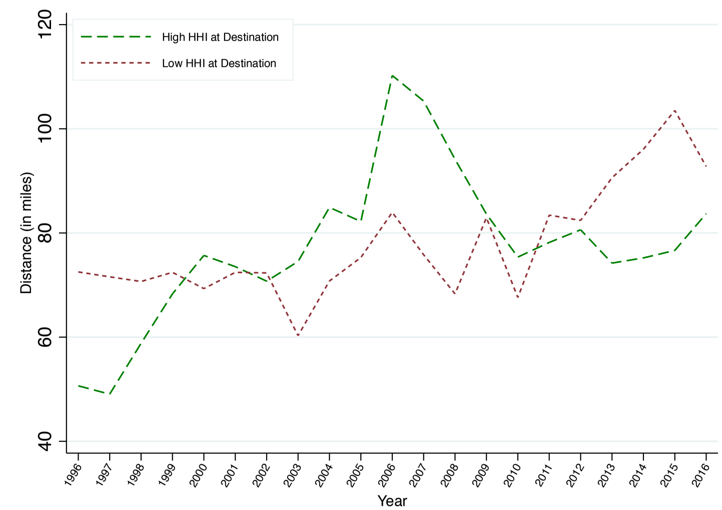
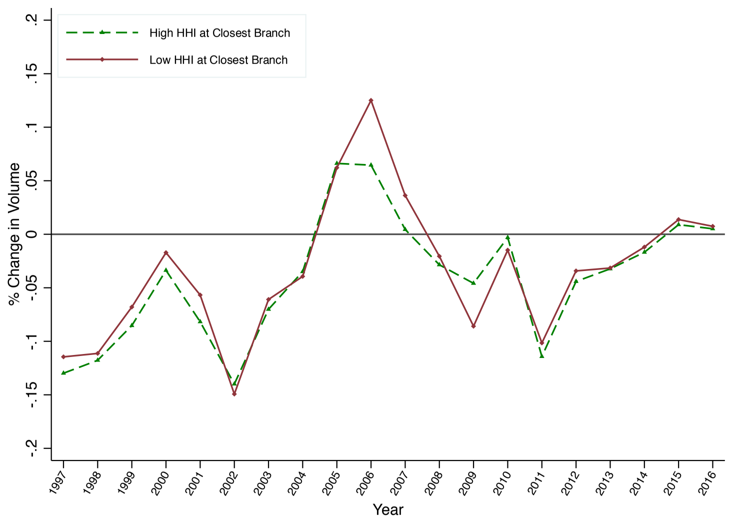


Figure 11: Lending Distances and Market Concentration (cont'd)

Panel B: Marginal Effects of Lending Distance: The Role of Market Concentration



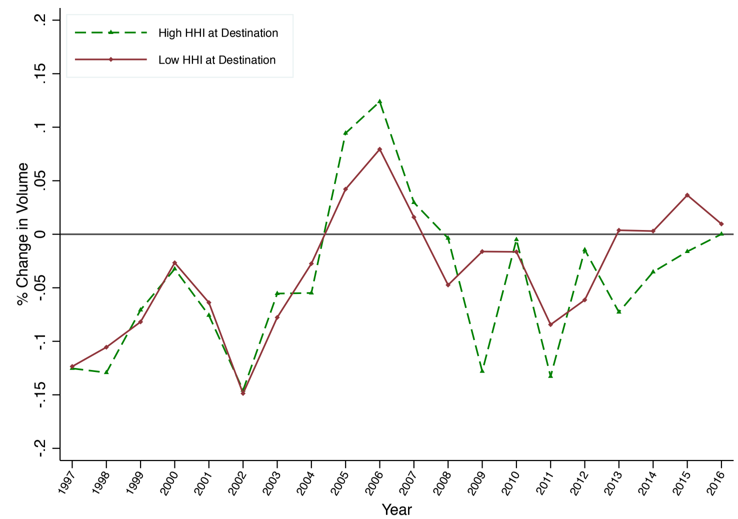


Figure 12: Bank Internal Capital Markets: Coefficient of Variation of HHI within Branch Network

Figure 12 plots the average lending distance over time after stratifying banks based on the coefficient of variation of the market concentration in counties where banks have a branch presence. The left plots the equal-weighted bank distance for the group of banks with above- and below-median coefficient of variation in market concentration. Local market concentration is measured as the HHI of the small business lending market as of 1996. The figure on the right represents the evolution over time of the estimated marginal effect of distance on changes in bank lending measured measured at different points of the distribution of the HHI coefficient of variation of banks. We compute the marginal effects of distance over time using estimates from the following empirical specification: $\Delta\%SBL_{bct} = \theta_{ct} + \omega_b + \sum_t \gamma_t (Distance \times Year)_{bct} + \sum_t \lambda_t (Distance \times Year \times \sigma HHI_{bct} + \Gamma X_{bt} + \epsilon_{bct}$, where σHHI_{bct} is the coefficient of variation of the HHI in the branch network of the bank. The marginal effects are computed using the year-specific elasticities of loan volume with respect to distance ($\hat{\gamma}_t$) and the year-specific elasticities of loan volume with respect to distance interacted with σHHI ($\hat{\lambda}_t$). Specifically, we plot $\hat{\gamma}_t + \hat{\lambda}_t \times \sigma HHI$, where $t = 1996, ...2016$, and σHHI takes values $\{\mu - 2\sigma, \mu + 2\sigma\}$, where μ is the mean value of σHHI over the entire sample and σ is the standard deviation of σHHI over the entire sample. The green dashed line is the elasticity of the volume of loans over time for a representative bank-county pair whose value of σHHI is two standard deviations above the mean. The solid red line is the elasticity of the volume of loans over time for a representative bank-county pair whose value of σHHI is two standard deviations below the mean. Data for this figure is computed using the CRA Small Business Lending and the SOD datasets.

Table 1: Descriptive Statistics

Panel A of Table 1 reports the total amount of small business loans originations reported in the Community Reinvestment Act (CRA) data by year in each bin representing the distance between the centroid of the borrower's county and the closest branch of the lender. The first bin represents distances between 0 and 50 miles, the second bin represents distances between 50 and 250 miles, the third bin represents distances between 250 and 1,000 miles, and the fourth bin represents borrowers and lenders that are more 1,000 miles apart. Panel B of Table 1 reports the total amount of small business administration (SBA) loans originated in each year in each bin representing the distance between the main address of the borrowerand the closest branch of the lender. The first bin represents distances between 0 and 50 miles, the second bin represents distances between 50 and 250 miles, the third bin represents distances between 250 and 1,000 miles, and the fourth bin represents borrowers and lenders that are more 1,000 miles apart.

Panel A: Volume of Small Business Loans Originations (CRA Data)

Year	TotalAmount0-50	TotalAmount50-250	TotalAmount250-1000	TotalAmount1000+	Total
1996	102,810,187	4,207,821	3,382,060	4,521,376	114,921,440
1997	130,541,771	9,011,385	7,294,432	3,658,818	150,506,400
1998	134,040,900	7,586,946	5,523,642	5,249,394	152,400,880
1999	142,967,977	9,776,986	7,919,726	7,711,816	168,376,512
2000	137,800,645	7,804,078	10,084,909	15,700,647	171,390,272
2001	182,673,269	8,627,703	12,624,184	13,999,950	217,925,104
2002	204,409,403	11,214,714	16,732,366	15,231,616	247,588,096
2003	219,894,320	13,455,397	18,986,276	16,893,891	269,229,888
2004	228,972,188	16,170,460	21,081,718	18,245,999	284,470,368
2005	207,047,621	11,563,120	25,801,432	21,508,697	265,920,864
2006	211,827,508	14,268,358	33,756,442	38,557,316	298,409,632
2007	220,991,082	18,161,007	40,876,932	44,251,324	324,280,352
2008	201,959,841	14,706,960	31,980,520	34,918,256	283,565,568
2009	151,126,509	10,545,131	15,644,679	12,350,881	189,667,200
2010	125,778,600	5,774,139	11,491,502	10,745,321	153,789,568
2011	156,682,966	7,658,716	12,984,423	13,663,029	190,989,136
2012	159,458,555	8,155,063	14,136,942	15,392,479	197,143,040
2013	166,528,022	9,207,467	12,861,050	14,120,501	202,717,040
2014	164,842,998	9,961,296	14,175,761	17,229,328	206,209,376
2015	171,910,621	10,476,532	17,022,217	18,846,757	218,256,128
2016	173,466,401	11,689,602	20,434,227	21,895,135	227,485,360

Panel B: Volume of Small Business Administration (SBA) Loans

Year	TotalAmount0-50	TotalAmount50-250	TotalAmount250-1000	TotalAmount1000+	Total
2000	3,633,314	1,466,684	1,512,078	1,218,696	7,830,772
2001	4,348,972	1,482,019	1,494,748	758,103	8,083,842
2002	5,543,095	1,847,157	1,410,184	818,440	9,618,876
2003	6,229,700	1,814,495	1,432,844	620,479	10,097,518
2004	7,305,278	2,051,545	1,707,656	701,895	11,766,374
2005	8,384,658	2,287,541	1,633,246	698,314	13,003,759
2006	7,931,796	2,007,424	1,771,869	725,878	12,436,969
2007	7,635,504	1,784,334	2,071,926	764,074	12,255,839
2008	6,365,222	1,300,046	1,529,026	723,373	9,917,666
2009	7,203,718	1,446,433	1,105,832	552,657	10,308,640
2010	12,114,943	2,045,745	1,645,449	773,776	16,579,913
2011	10,351,332	1,423,625	1,049,662	519,079	13,343,698
2012	11,202,360	1,707,601	1,479,282	791,290	15,180,532
2013	12,148,418	1,986,845	1,778,846	926,175	16,840,286
2014	13,429,151	2,176,809	2,284,627	1,294,142	19,184,728
2015	15,269,572	2,347,196	3,055,948	1,865,911	22,538,628
2016	15,273,487	2,553,234	3,515,459	1,916,885	23,259,064

Table 2: Distance and Small Business Lending: Business Cycle Indicators

Table 3 reports the coefficients of OLS regressions investigating the effect of distance on small business loan originations. Δ *Volume Loans* is the log change in the volume of loans originated by a bank in a county. *HP-Filtered Real GDP* is the standardize HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* is the natural logarithm of the minimum distance between the bank's branches and the county centroid. The specification includes county-by-year and bank fixed-effects as well as baseline controls for natural logarithm of Total Assets, Share of Commercial & Real Estate Loans, Share of Residential Loans, and Share of Commercial & Industrial Loans. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Δ Volume Loans		
Ln(Distance)	-0.038***	-0.038***	-0.038***
	(0.001)	(0.001)	(0.001)
Ln(Distance) × HP-Filtered Real GDP	0.035***		
	(0.001)		
Ln(Distance) × Δ Ln(Unempld Rate)		-0.018***	
		(0.000)	
Ln(Distance) × Spreads			-0.017***
			(0.000)
Observations	5234549	5234549	5234549
Adjusted R^2	0.017	0.017	0.017
Baseline Controls	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes

Table 3: Distance and Small Business Lending: Size Categories

Table 3 reports the coefficients of OLS regressions investigating the effect of distance on small business loan originations on three partitions of bank size. Δ *Volume Loans* is the log change in the volume of loans originated by a bank in a county. *HP-Filtered Real GDP* is the standardize HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* is the natural logarithm of the minimum distance between the bank's branches and the county centroid. The specification includes county-by-year and bank fixed-effects as well as baseline controls for natural logarithm of Total Assets, Share of Commercial & Real Estate Loans, Share of Residential Loans, and Share of Commercial & Industrial Loans. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δ Volume Loans								
	≤ \$10bi	[\$10bi,\$50bi]	>\$50bi	≤ \$10bi	[\$10bi,\$50bi]	>\$50bi	≤ \$10bi	[\$10bi,\$50bi]	>\$50bi
Ln(Distance)	-0.048***	-0.053***	-0.011***	-0.046***	-0.050***	-0.012***	-0.046***	-0.050***	-0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Distance) × HP-Filtered Real GDP	0.041***	0.043***	0.021***						
	(0.001)	(0.001)	(0.001)						
Ln(Distance) × Δ Ln(Unempld Rate)				-0.032***	-0.024***	-0.004***			
				(0.001)	(0.001)	(0.001)			
Ln(Distance) × Spreads							-0.033***	-0.008***	-0.004***
							(0.001)	(0.001)	(0.001)
Observations	3211384	1000682	1022464	3211384	1000682	1022464	3211384	1000682	1022464
Adjusted R^2	0.021	0.017	0.028	0.020	0.017	0.027	0.020	0.017	0.027
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4: Distance and Small Business Lending: Small Agricultural Loans

Table 4 reports the coefficients of OLS regressions investigating the effect of distance on small farm loan originations. The dependent variable, Δ *Volume Farm Loans*, is the log change in the volume of small farm loans originated by a bank to farmers in each county. *HP-Filtered Real GDP* is the standardized HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* is the natural logarithm of the minimum distance between the bank's branches and the county centroid. The specification includes county-by-year and bank fixed-effects as well as baseline controls for natural logarithm of Total Assets, Share of Commercial & Real Estate Loans, Share of Residential Loans, and Share of Commercial & Industrial Loans. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Δ Volume Farm Loans		
Ln(Distance)	-0.018***	-0.018***	-0.018***
	(0.001)	(0.001)	(0.001)
Ln(Distance) × HP-Filtered Real GDP	0.019***		
	(0.001)		
Ln(Distance) × Δ Ln(Unempld Rate)		-0.004***	
		(0.001)	
Ln(Distance) × Spreads			-0.009***
			(0.001)
Observations	1563898	1563898	1563898
Adjusted R^2	0.011	0.011	0.011
Baseline Controls	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes

Table 5: Distance and Small Business Lending: NonPerforming Loan Ratio

Table 5 reports the coefficients of OLS regressions investigating whether the relation between lending distance and the business cycle is more or less pronounced for lenders that experienced greater loan delinquency ratios during the financial crisis (07–09). The dependent variable,Δ *Volume Loans*, is the log change in the volume of loans originated by a bank in a county. *HP-Filtered Real GDP* is the standardize HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* is the natural logarithm of the minimum distance between the bank's branches and the county centroid. *NPL Ratio* is the nonperforming loan ratio of the bank during the 2007–2009 period. The specification includes county-by-year and bank fixed-effects as well as baseline controls for natural logarithm of Total Assets, Share of Commercial & Real Estate Loans, Share of Residential Loans, and Share of Commercial & Industrial Loans. The specification also conditions on the interactions between NPL Ratio and the business cycle indicators, and NPL Ratio and Distance. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Δ Volume Loans		
Ln(Distance)	-0.035***	-0.035***	-0.036***
	(0.000)	(0.001)	(0.001)
Ln(Distance) × HP-Filtered Real GDP	0.027***		
	(0.001)		
Ln(Distance) × HP-Filtered Real GDP × NPL Ratio (07-09)	0.002***		
	(0.001)		
Ln(Distance) × Δ Ln(Unempld Rate)		-0.019***	
		(0.001)	
Ln(Distance) × Δ Ln(Unempld Rate) × NPL Ratio (07-09)		-0.002***	
		(0.001)	
Ln(Distance) × Spreads			-0.019***
			(0.000)
Ln(Distance) × Spreads × NPL Ratio (07-09)			-0.004***
			(0.001)
Observations	4235461	4235461	4235461
Adjusted R^2	0.011	0.011	0.011
Baseline Controls	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes

Table 6: Distance and Small Business Administration Lending: Business Cycle Indicators

Table 6 reports the coefficients of OLS regressions investigating the effect of distance on originations of small business administration guaranteed loans. The dependent variable, Δ *Volume Loans*, is the log change in the volume of SBA loans originated by a bank in a county. *HP-Filtered Real GDP* is the standardize HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* represents the logarithm of the average distance between the headquarters of a bank and its borrowers in the county. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Δ Volume Loans		
Ln(Distance)	-0.000	-0.001	-0.002
	(0.003)	(0.003)	(0.003)
Ln(Distance) × HP-Filtered Real GDP	0.016***		
	(0.002)		
Ln(Distance) × Δ Ln(Unempld Rate)		-0.023***	
		(0.002)	
Ln(Distance) × Spreads			-0.022***
			(0.002)
Observations	104742	104742	104742
Adjusted R^2	0.021	0.022	0.022
Baseline Controls	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes

Table 7: Distance and Small Business Lending: The Role of Market Concentration

Table 7 reports the coefficients of OLS regressions investigating the role that market concentration plays in the relation between lending distance and the business cycle. The dependent variable, Δ *Volume Loans*, is the log change in the volume of loans originated by a bank in a county. *HP-Filtered Real GDP* is the standardize HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* is the natural logarithm of the minimum distance between the bank's branches and the county centroid. *HHI Difference* is the difference in SBL market concentration between destination (host) market and the closest branch (home) market. *HHI Origin* is the SBL market concentration in the closest branch (home) market. *HHI Destination* is the SBL market concentration in the destination (host) market. Local market concentration is measured as the HHI of the small business lending market in each county measured in 1996. The specification includes county-by-year and bank fixed-effects as well as baseline controls for natural logarithm of Total Assets, Share of Commercial & Real Estate Loans, Share of Residential Loans, and Share of Commercial & Industrial Loans. The specification also conditions on the interactions between HHI and the business cycle indicators, and HHI and Distance. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δ Volume Loans								
Ln(Distance)	-0.038***	-0.037***	-0.038***	-0.038***	-0.037***	-0.037***	-0.038***	-0.038***	-0.038***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Distance) × HP-Filtered Real GDP	0.036***	0.035***	0.035***						
	(0.001)	(0.001)	(0.001)						
Ln(Distance) × HP-Filtered Real GDP × HHI Destination	0.006***								
	(0.001)								
Ln(Distance) × HP-Filtered Real GDP × HHI Origin		-0.007***							
		(0.001)							
Ln(Distance) × HP-Filtered Real GDP × HHI Difference			0.008***						
			(0.001)						
Ln(Distance) × Δ Ln(Unempld Rate)				-0.018***	-0.018***	-0.018***			
				(0.000)	(0.000)	(0.000)			
Ln(Distance) × Δ Ln(Unempld Rate) × HHI Destination				-0.002***					
				(0.000)					
Ln(Distance) × Δ Ln(Unempld Rate) × HHI Origin					0.006***				
					(0.001)				
Ln(Distance) × Δ Ln(Unempld Rate) × HHI Difference						-0.005***			
						(0.001)			
Ln(Distance) × Spreads							-0.017***	-0.016***	-0.016***
							(0.000)	(0.000)	(0.000)
Ln(Distance) × Spreads × HHI Destination							-0.001**		
							(0.000)		
Ln(Distance) × Spreads × HHI Origin								0.001***	
								(0.000)	
Ln(Distance) × Spreads × HHI Difference									-0.001*
									(0.000)
Observations	5220264	5132929	5119738	5220264	5132929	5119738	5220264	5132929	5119738
Adjusted R^2	0.017	0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8: Distance and Small Business Lending: The Role of Internal Capital Markets

Table 8 reports the coefficients of OLS regressions investigating the role that internal capital markets play in the relation between lending distance and the business cycle. The dependent variable, Δ *Volume Loans*, is the log change in the volume of loans originated by a bank in a county. *HP-Filtered Real GDP* is the standardize HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* is the natural logarithm of the minimum distance between the bank's branches and the county centroid. *Coefficient Variation HHI* is the coefficient of variation of the market concentration in counties where banks have a branch presence. Local market concentration is measured as the HHI of the small business lending market as of 1996. The specification includes county-by-year and bank fixed-effects as well as baseline controls for natural logarithm of Total Assets, Share of Commercial & Real Estate Loans, Share of Residential Loans, and Share of Commercial & Industrial Loans. The specification also conditions on the interactions between Std. Dev. HHI and the business cycle indicators, and Std. Dev. HHI and Distance. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Δ Volume Loans		
Ln(Distance)	-0.042***	-0.041***	-0.041***
	(0.001)	(0.001)	(0.001)
Ln(Distance) × HP-Filtered Real GDP	0.018***		
	(0.001)		
Ln(Distance) × HP-Filtered Real GDP × Coefficient Variation HHI	-0.026***		
	(0.001)		
Ln(Distance) × Δ Ln(Unempld Rate)		-0.005***	
		(0.001)	
Ln(Distance) × Δ Ln(Unempld Rate) × Coefficient Variation HHI		0.026***	
		(0.001)	
Ln(Distance) × Spreads			-0.015***
			(0.001)
Ln(Distance) × Spreads × Coefficient Variation HHI			0.025***
			(0.001)
Observations	3763276	3763276	3763276
Adjusted R^2	0.019	0.019	0.019
Baseline Controls	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes

Table 9: Robustness: Interstate Banking Deregulation

Table 9 reports the coefficients of OLS regressions investigating how the time elapsed since the interstate banking deregulation mediates the relation between lending distance and the business cycle. Δ *Volume Loans* is the log change in the volume of loans originated by a bank in a county. *HP-Filtered Real GDP* is the standardized HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* is the natural logarithm of the minimum distance between the bank's branches and the county centroid. *Yrs. since M&A Dereg. Destination* is the natural logarithm of the difference between 1996 and the year of adoption of interstate banking deregulation in each state where the borrower is located. *Yrs. since M&A Dereg. Origin* is the natural logarithm of the difference between 1996 and the year of adoption of interstate banking deregulation in the state where the closest branch (home) market is located. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Volume Loans					
Ln(Distance)	-0.044***	-0.012***	-0.043***	-0.014***	-0.044***	-0.015***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Ln(Distance) × HP-Filtered Real GDP	0.084***	0.015***				
	(0.005)	(0.004)				
Ln(Distance) × HP-Filtered Real GDP × Yrs. since M&A Dereg. Destination	-0.022***					
	(0.002)					
Ln(Distance) × HP-Filtered Real GDP × Yrs. since M&A Dereg. Origin		0.009***				
		(0.002)				
Ln(Distance) × Δ Ln(Unempld Rate)			-0.031***	0.005		
			(0.004)	(0.004)		
Ln(Distance) × Δ Ln(Unempld Rate) × Yrs. since M&A Dereg. Destination			0.006***			
			(0.002)			
Ln(Distance) × Δ Ln(Unempld Rate) × Yrs. since M&A Dereg. Origin				-0.010***		
				(0.002)		
Ln(Distance) × Spreads					-0.027***	-0.024***
					(0.004)	(0.004)
Ln(Distance) × Spreads × Yrs. since M&A Dereg. Destination					0.005***	
					(0.002)	
Ln(Distance) × Spreads × Yrs. since M&A Dereg. Origin						0.003**
						(0.002)
Observations	5217323	5231569	5217323	5231569	5217323	5231569
Adjusted R^2	0.018	0.018	0.017	0.017	0.017	0.017
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 10: Robustness: Large Bank Penetration in the County

Table 10 reports the coefficients of OLS regressions investigating the role that an increase in the presence by a large bank in a county plays in the relation between lending distance and the business cycle. Δ *Volume Loans* is the log change in the volume of loans originated by a bank in a county. *HP-Filtered Real GDP* is the standardized HP-filtered percent change in the real GDP. Real GDP series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. Δ *Ln(Unempld Rate)* is standardized log difference in the US annual unemployment rate. The unemployment rate series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Spreads* is the standardized net percentage of domestic banks increasing spreads of loan rates over banks' cost of funds to small firms. The series is obtained from the Federal Reserve Economic Data (FRED) website of the Federal Reserve of St. Louis. *Ln(Distance)* is the natural logarithm of the minimum distance between the bank's branches and the county centroid. Δ *Share Large Banks > 5% (Destination)* is an indicator variable that takes the value of one if a large banking organization (bank whose total assets exceed $50 billion) increases its share of deposits in the destination county by more than 5% in the preceding year. Δ *Share Large Banks > 5% (Origin)* is an indicator variable that takes the value of one if a large banking organization (bank whose total assets exceed $50 billion) increases its share of deposits in the home (origin) county by more than 5% in the preceding year. We excluded the large bank observations that originated the shock. Therefore, we exclude the lending in the county by the large bank itself. Standard errors are presented in parentheses, and are clustered at the level of the county. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Volume Loans					
Ln(Distance)	-0.040***	-0.043***	-0.040***	-0.044***	-0.040***	-0.045***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Distance) × HP-Filtered Real GDP	0.038***	0.019***				
	(0.001)	(0.001)				
Ln(Distance) × HP-Filtered Real GDP × Δ Share Large Banks > 5% (Destination)	-0.019***					
	(0.003)					
Ln(Distance) × HP-Filtered Real GDP × Δ Share Large Banks > 5% (Origin)		0.059***				
		(0.002)				
Ln(Distance) × Δ Ln(Unempld Rate)			-0.019***	-0.012***		
			(0.001)	(0.001)		
Ln(Distance) × Δ Ln(Unempld Rate) × Δ Share Large Banks > 5% (Destination)			0.008***			
			(0.003)			
Ln(Distance) × Δ Ln(Unempld Rate) × Δ Share Large Banks > 5% (Origin)				-0.032***		
				(0.002)		
Ln(Distance) × Spreads					-0.017***	-0.016***
					(0.000)	(0.001)
Ln(Distance) × Spreads × Δ Share Large Banks > 5% (Destination)					-0.002	
					(0.003)	
Ln(Distance) × Spreads × Δ Share Large Banks > 5% (Origin)						-0.012***
						(0.002)
Observations	5173063	5197133	5173063	5197133	5173063	5197133
Adjusted R^2	0.018	0.019	0.017	0.017	0.017	0.017
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

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