"Revitalize or Stabilize": Does Community Development Financing Work?

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Abstract

Banks in the United States originate $100 billion in community development loans every year and hold similar amounts of community development investments on their balance sheets. Using hand collected data from thousands of Community Reinvestment Act performance evaluations, the effect of the supply of this funding on local economic development is estimated. Endogeneity of community development financing to local demand factors is addressed, exploiting the fact that banks exhibit fixed tendencies to engage in community development financing across markets. Estimates suggest $56,000 in community development lending is required to create one job, on net.

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1 Introduction

The economic geography of the United States is marked by persistent differences in outcomes, at both the regional and at more local levels. In response to these disparities, a variety of place-based policies have been implemented to help develop struggling communities. These policies take different forms, but frequently operate by subsidizing or otherwise incentivizing the private provision of investment capital or credit in targeted areas. This is how the federal Empowerment Zone, Enterprise Community and recently enacted Opportunity Zone programs work, for example, as well as the Community Reinvestment Act (CRA). While a rich empirical literature has carefully considered the efficacy of many of these policies, much less work has been done directly assessing the effectiveness of privately provisioned community development financing itself.[1]

Public subsidies are the bait to attract private money, and the latter unsurprisingly dwarfs the former in terms of total dollar volume targeted at community development. The largest place-based subsidy programs—the Low Income Housing Tax Credit (LIHTC) and New Market Tax Credit (NMTC)—involve federal tax expenditures of a few billion dollars per year each.[2] In contrast, banks in the U.S. report about $100 billion in annual community development loan originations, and carry a similar level of community development equity investments on their books.[3] As defined under the CRA, community development is a broad category, covering economic development (particularly the creation of jobs for low- and moderate-income individuals), support of affordable housing, population and employer retention, and (in some cases) the building of essential infrastructure.[4] Understanding where this money is going, and whether it actually leads to measurable development in targeted

[1] See Neumark and Simpson (2015) for an overview of some of the theory and evidence regarding place based policies.

[2] Source: The Department of Housing and Urban Development (`https://www.huduser.gov/portal/datasets/lihtc.html`) and the Community Development Financial Institution Fund (`https://www.cdfifund.gov`).

[3] Source: Federal Financial Institutions Examination Council data, available at `https://www.ffiec.gov/cra/`, and author's calculations.

[4] The CRA community development definitions interact with and support other place-based policies: banks can expect to be credited for their NMTC and LIHTC investments, and for loans approved by the boards of Enterprise Community or Empowerment Zones, for example. More details on the CRA and community development definitions are provided in Section 2.

communities, is therefore an important topic of study. The urgency of gaining this understanding is compounded by recent proposals by the federal banking regulatory agencies to significantly alter the CRA regulations providing incentives for banks to conduct community development financing.[5] However, data limitations have made this market sector largely opaque to researchers.

In this paper, I estimate how increased community development lending affects local economic activity. Using unique, hand-collected data from public CRA performance evaluation documents, this paper is the first that I am aware of to use observations of community development financing activity at the local level. As described in Section 3, comprehensive data on community development lending had previously only been available at the institution level, with no information on location. By reading through thousands for performance evaluation documents, a dataset was assembled that ties community development financing to the local markets receiving the funds.

The amount of lending supplied in a market is likely endogenous to the strength of the local economy, as more loans will be demanded where commerce is thriving. To deal with this issue, the effect of community development lending on local economic activity is estimated using the variation in the supply of this financing generated by changes in banks' deposit market shares. Banks differ considerably in the amount of community development financing they supply, for a number of reasons. For example, some banks' business strategies may more naturally extend to community development financing than others. Banks may also differ in their desire to boost their CRA ratings, either because some value a high rating more than others, or are trying to use community development to offset a poor performance on other aspects of the CRA evaluation. Banks may also value the public relations benefit of community development activities differently. These differences in banks' tendencies to engage in community development financing have consequences for the supply of community development funds at the local level. Banks engage in more lending and investment in areas they operate branches and collect deposits, so the local supply of community development

[5]See Office of the Comptroller of the Currency, Treasury and Federal Deposit Insurance Corporation (2020).

funds depends on the tendencies of the particular banks that operate in that market.

I exploit this tendency for some banks to predictably do more community development financing than others to estimate the effect of increasing the supply of community development funds on local economic conditions. First, banks' idiosyncratic tendencies to do community development lending is estimated based on their activity in large markets, where the presence of other competitor banks allows the identification of a bank community development fixed effect (CDFE) distinct from market fixed effects (which absorb local demand factors). The bank lending fixed effect is then shown to strongly predict the same bank's community development lending in out-of-sample markets. Banks display a consistent propensity to engage in a certain level of community development lending, across markets.

Next, I show that when banks with an idiosyncratically high CDFE for loans gain deposit-market share in a county, the employment and total wage bill there increases in the next several years. There is no evidence of an effect on house price growth or the provision of affordable housing. Taking crowd out of lending by other banks into account, the estimated elasticities imply that an increase of approximately $56,000 in annual community development lending is necessary to create one job.

An increased deposit-market share by high CDFE banks is not correlated with growth in employment, wages, house prices, affordable housing, small business and farm lending or residential mortgage lending in any years prior to the deposit market-share increase. This suggests that high CDFE banks are not disproportionately moving into markets that were already relatively stronger. Exogeneity tests developed by Caetano (2015) find no evidence that CDFEs are endogenous to other determinants of employment and wage levels. Futhermore, total small business and farm lending without a community development purpose increases by at most a small amount, and residential mortgage lending is unchanged, when high CDFE banks gain deposit market share, so the subsequent employment growth may be attributed to the additional community development lending those banks bring.

Community development activities may be financed either by loans or by investments (for example, the purchase of tax credits or an equity stake in a community development financial institution). In contrast to loans, however, banks' tendencies to engage in community devel-

opment *investments* are much less consistent across markets. Calculated separately from the lending CDFEs, bank-specific investment CDFEs are weak predictors of community development investment activity out of sample. This difference between loans and investment may be due to differences in the way the data for the two types of financing are collected (see Section 3.1 for more details), or it may reflect a greater reliance of investments on pre-existing local infrastructure as a target for funding. The estimator used for lending, therefore, has a weak first stage when applied to investments.

Interest in financing the development of struggling communities has grown with the recognition that regional disparities may be becoming more entrenched. Troublingly, the convergence in cross-regional incomes that was apparent through much of the 20th century has slowed or stopped in recent decades (Berry and Glaeser (2005), Moretti (2011), Ganong and Shoag (2017)). Potential explanations for this trend include increased import competition for the manufacturing sector (Autor, Dorn and Hanson (2016) and the faster adoption of technological innovations in better-educated areas (Berndt and Hulten (2009), Bloom et al. (2019)). Moreover, labor mobility has also been on the decline over the same period (Molloy, Smith and Wozniak (2011)). Together, these trends mean that residents in weaker markets are facing diminished prospects for seeing their economic situations improve.

On a theoretical basis, however, it is not *ex ante* clear whether incentivizing more funding to develop struggling communities has benefits that outweigh the costs, either locally or to society in general. One set of justifications for these interventions is based on equity grounds: many households are rooted into declining markets (for example, due to thick social networks) and so investments there are welfare improving, as these households have a high marginal utility of consumption and will not move to areas with higher labor demand. Another points to potential efficiency gains: whether due to bias or information frictions, lenders and investors are avoiding certain markets despite profitable opportunities. Incentivizing more investment corrects this underprovision. Counterarguments stress efficiency concerns. Subsidizing struggling regions encourages households and businesses to remain in low-productivity areas. Distorting the allocation of whatever capital is available locally towards government-approved projects is inefficient, and could be crowding out investments

in projects with a higher return. For a fuller treatment of these arguments, see Kline (2010), Lang and Nakamura (1993), Neumark and Simpson (2015), Austin, Glaeser and Summers (2018), and papers cited therein.

Privately provisioned community development financing interacts with an array of other public policies, so it is informative to compare my findings with some of those from the policy evaluation literature. For example, in the literature on enterprise zones, authors have estimated effect sizes of various incentive programs ranging from the marginal job costing approximately $10,000 in annual tax incentives (Busso, Gregory and Kline (2013)) to finding that enterprise zones are entirely ineffective at increasing employment (Neumark and Kolko (2010)). Freedman (2012) finds small effects of the NMTC program on reducing poverty. Perhaps more encouragingly, Greenstone, Hornbeck and Moretti (2010) find that tax incentives to bring large employers into an area have positive effects on local wages and productivity. Of course, a major difference between private lending and public subsidies is that community development loans will (usually) be paid back, while subsidies count against the government's budget and must be paid for through other sources.

This paper also relates to a broader literature investigating how the availability of credit affects real economic performance. Prominent findings that credit availability is tied to employment and growth include those of Bassett et al. (2014), Chodorow-Reich (2013) and Black and Strahan (2002). Closely related to this paper is Greenstone, Mas and Nguyen (2020), who find no effect on employment when local banks contract their supply of small business loans. The results of the present paper, contrasted with theirs, would suggest that community development lending is therefore well targeted at improving employment outcomes, relative to typical small business loans without a community development purpose.

A further strand of the literature related to this paper is the evaluation of the CRA. The CRA is a multifaceted piece of regulation, and much of the literature focuses on its effects on mortgage lending (see, for example, Bhutta (2011), Avery and Brevoort (2015), Ding and Nakamura (2017), and Ringo (2017)). Some work has also been done on the act's effects on small business lending (Bostic and Lee (2017), Ding, Lee and Bostic (2018), and Lee and Bostic (2019)) and the operation of bank branches in low- and moderate-income

neighborhoods (Ding and Reid (2019)). The community development aspects of the CRA have not received the same treatment by researchers, likely because of the limited available data on these activities.

The community development data used in this paper were put together by hand collection from publicly available performance evaluations of individual banks. In a similar effort, Reid (2019) used data hand collected from CRA performance evaluations to investigate how banks' CRA ratings were determined.

The rest of the paper is organized as follows. Section 2 provides some institutional background on community development financing and the CRA. Section 3 describes the process of data collection from the performance evaluations and summarizes the data collected in this way as well as data from additional sources used in the analysis. Section 4 describes the estimator, including how the approach deals with both endogeneity of the local level of community development financing and some limitations inherent in the data. Section 5 presents the results of the analysis and Section 6 concludes.

2 Community Development and the Community Reinvestment Act

The CRA was passed in 1977 to encourage banks to meet the credit needs of the entire community they serve, including residents and neighborhoods of low and moderate incomes. In the 1990s significant regulatory changes were implemented. Bank examiners began to look at quantitative measures of bank lending in various categories, and judge how well the bank was responding to local demand and opportunities. Some further refinements to evaluation procedures were made in 2004.

Banks undergo CRA evaluations periodically—generally once every three to five years, depending on bank size and past performance. The evaluation reviews a period of years prior to the exam start date. Ratings on the evaluations are determined by performance on a number of tests, depending on bank size. The bank size categories—which also determine

the mandatory data reporting the bank is subject to— are Large banks (those with assets of approximately $1.3 billion in 2019 dollars or more), Intermediate Small banks (assets between approximately $320 million and $1.3 billion in 2019 dollars), and Small banks (assets less than approximately $320 million in 2019 dollars). A small number of banks with non-standard business models are evaluated under a different set of procedures.

The basic building block of the performance evaluation is the assessment area. Banks choose their assessment areas—subject to the approval of their examiners—as the geographic areas in which they operate a branch, headquarters or deposit-taking automated teller machine. Assessment areas must generally conform to the boundaries of a political unit, and often take the form of a single county or collection of contiguous counties, either wholly in a metropolitan statistical area (MSA) or wholly in the non-metro portion of a single state. Within each assessment area, the examiner draws conclusions as to how well the bank provided credit, investments and services to its community. These conclusions then feed into institution-level ratings on the various tests and an overall CRA rating.

Banks' incentives to do well on their CRA evaluations are twofold. First, ratings are taken into account when banks apply for a merger, acquisition or new branch opening. A poor performance can block the approval. Second, ratings are publicly disclosed. Banks that regularly achieve the highest possible rating ("Outstanding") can advertise this fact to customers. A poor CRA rating provides local community groups grounds to demand redress. To assist in this public disclosure function, the detailed results of every performance evaluation is posted on the regulators' websites for download as a PDF file. In these performance evaluations, examiners describe the bank's record of lending, investing and providing services, as well as other information they used to draw conclusions and determine final ratings, assessment area by assessment area.

2.1 Defining Community Development

Community development activities are an important part of CRA evaluations, particularly for Large and Intermediate Small banks. Small banks are not expected to engage in com-

munity development, but they may ask that any such activity be considered as a path for the bank to achieve an "Outstanding" rating.

The full definition of community development activities under the CRA is rather involved.[6] A loan or investment can be considered if it is for the purpose of revitalizing or stabilizing disadvantaged areas, supporting economic development, or affordable housing. Each of these terms is further defined under the regulation.

An activity is considered to "revitalize or stabilize" if it helps to attract businesses or residents to, or retain them in, a low- or moderate-income area, or a rural middle-income area with a high rate of poverty, unemployment or population loss ("distressed"). In remote rural middle-income ("underserved") areas, these same activities, as well as those that provide essential community infrastructure or facilities, are also considered. Economic development is generally restricted to the financing of small businesses and farms for the purpose of permanent job creation, retention or improvement for low- or moderate-income people or areas, although financing government job development initiatives targeted to low- or moderate-income persons also counts. Affordable housing is housing intended for low- and moderate-income families and individuals.

Community development services covers a very wide scope of activities that benefit low- and moderate-income persons. They range from the operation of a homeless shelter, to offering financial literacy seminars, to serving on the board of directors of a community development financial institution. However, measurement of the provision of these services is very difficult. Grants and donations for the purpose of providing these services are somewhat more legible, but are treated as community development investments. Consequently, this paper will focus on the analysis of lending and investments.

3 Data

Every year, Large banks are required by the CRA to report the number and dollar amount of community development loans they (and their affiliates) originated or purchased over the

[6] See Federal Deposit Insurance Corporation (2019) for a fuller description of what constitutes a qualifying community development activity.

prior year (a few smaller banks report voluntarily). This information is released to the public for download from the Federal Financial Financial Institutions Examination (FFIEC) website. Recently, the annual dollars of community development loans reported have exceeded $100 billion—see Figure 1.

However, the community development lending data has significant deficits for research purposes. One major issue is that loans are reported only at the institution level, without regard to where the money went. This deficit stands in contrast to the CRA small business and small farm data. Collected under a separate reporting requirement, those data include the number, amount and location of the small business and small farm loans Large banks originate or purchase each year, and are popular among researchers investigating the patterns, determinants and consequences of bank lending.[7] If a loan qualifies as a community development loan, on the other hand, reporting instructions direct the bank not to include it in the small business or small farm data, as retail lending and community development lending are treated differently under the CRA. Location data is therefore not available for any community development lending.[8] Of course, banks may not be certain which category a loan belongs to until the examiner makes that determination during the evaluation, so some community development loans likely get inappropriately reported as small business and small farm loans.

A second issue is that only data on loans are reported. There is no reporting of community development investments (or services, for that matter). To overcome these issues, I turn to an alternative source for data.

As discussed in Section 2, examiners describe the activities they base their assessment area-level conclusions on in the performance evaluation documents. For each assessment area, it is standard procedure for examiners to record the number and dollar amount of community development loans originated or purchased during the evaluation period that

[7]Examples include Petersen and Rajan (2002), Brevoort and Hannan (2006), Smolyansky (2019), Nguyen (2019), and Greenstone, Mas and Nguyen (2020).

[8]A partial exception to this rule is multifamily residential loans. If such a loan has a function or purpose of providing affordable housing, it may count as a community development loan, and could also be reported under the Home Mortgage Disclosure Act (HMDA). However, the HMDA data do not, historically, indicate whether a given multifamily loan was designated as community development.

had the primary purpose of benefiting that assessment area. The dollar amount of new community development investments is also recorded, along with investments made or bought in a prior evaluation period if they were still held on the bank's balance sheet at the end of the period under review. Thus, each performance evaluation contains a record of the bank's community development activities at the local level over a period of a few years.[9]

Several issues complicate the extraction of this local-level data from the performance evaluation documents, however. While there are certain regularities across evaluations, the format differs somewhat by regulator, exam type, and over time. While the data on community development activities are reported clearly in tables in some evaluations, particularly those for larger banks and in more recent years, for many evaluations the data are only available embedded in a narrative description. The performance evaluations can be quite daunting to wade through as well—the largest banks have hundreds of assessment areas and their evaluations can run over 1,000 pages.

3.1 Collection

Data was hand-collected from a sample of performance evaluations with exam start dates running from 2005 through 2017. The full set of available evaluations from those years were stratified by year, regulator,[10] and each of the three bank size categories. Performance evaluations were randomly sampled from within each strata, with an oversampling of banks receiving a poor CRA rating. In all, approximately 6,300 of the available 22,000 performance evaluations recorded during this time period were sampled.

For each assessment area, the number and dollar amounts of community development lending, and the dollars of community development investments were recorded. Geographic data on the boundaries of the assessment area were also recorded. For Small and Intermediate Small banks, this meant collecting the full set of counties that were partially or wholly contained in each assessment area. Large banks are required to report the Census tracts in

[9]Unfortunately, the specific purpose of those loans and investments are not recorded in a consistent manner. Neither are banks' community development services.

[10]Office of the Comptroller of the Currency (OCC), Federal Deposit Insurance Corporation (FDIC), and the Federal Reserve System (FRS).

their assessment areas to their regulator every year, so the FIPS code of only a single county in each assessment area was recorded from the performance evaluations of large banks. This county was then used to match the community development activity to the full set of census tracts that the assessment area comprises. Finally, the years that made up the evaluation period were recorded.

While the data only covers approximately one quarter of all performance evaluations, the cross sectional coverage of the market is much better. Among banks in the Large bank category, 79 percent appear in the data at least once. Weighting by year 2017 assets, representation increases to 89 percent. Coverage of Small and Intermediate Small banks is poorer, but these banks hold a much smaller market share, particularly in community development financing, than the Large banks do. In total, the data samples 13,995 evaluations of individual assessment areas with records of community development lending and investment, including noting when no community development financing took place.

Of these assessment areas, 11,270 had the necessary information to match them to a county or set of counties that constituted the assessment area. The matched data covers 89 percent and 93 percent of the recorded community development loan and investment dollars in the full data set, respectively.

3.2 Additional Data

In addition to the bank and location specific information sourced from the performance evaluations, I use a variety of other sources of bank and local economic data. Annual bank assets are retrieved from Call reports. From the FDIC's Summary of Deposit (SoD) data, I collect the annual deposits banks assign to each branch, and the branch's location. County level economic information includes total annual employment and wages paid from the Quarterly Census of Employment and Wages (limited to employers who pay into unemployment insurance). A house price index for the median value homes in each county comes from Zillow. Property level data on federal affordable housing subsidies come from the National Housing Preservation Database, which combines data from the US Departments of Housing

and Urban Development and Agriculture. Annual county level aggregates of small farm and small business lending are reported by Large banks under the CRA as described above, and residential mortgage loans are reported under the Home Mortgage Disclosure Act (HMDA).

Summary statistics of the relevant variables are shown in Table 1 at the bank, assessment area, and county levels. Community development lending data is presented at an annualized rate—the total dollars of lending recorded over an evaluation period are divided by the number of years in that evaluation period. Investments, which are recorded including all qualifiying activities held on balance sheet at the end of the evaluation period, are presented without this adjustment.

4 Estimation

The purpose of this paper is to test whether supplying more community development financing causes communities to exhibit measurable development. Development is measured in several ways. Economic development is measured as the growth in the number of employed persons and total county wage bill (the creation or retention of permanent jobs). These outcomes measure both whether the borrowing firm actually uses the funds to support a position (that they would not have kept open, in the counterfactual absence of the lending), and whether labor supply is elastic enough that the employees weren't simply poached from other firms. If the increased production and income allowed by community development lending has knock-on effects stimulating further expansion of local employment, these effects would also be captured. Any effects on the provision of new affordable housing are measured by the counts of properties receiving active federal subsidies for affordable housing. Finally, house price growth is intended to capture the capitalized amenity value of any essential infrastructure or facilities that community development financing may be supporting.

The effect of community development financing on these outcomes is modeled at the county level. For county i in year t,

$$\Delta Y_{i,t+k} = \beta_k \Delta \ln CD_{i,t} + \gamma_k \Delta \ln D_{i,t} + \epsilon_{i,t,k} \tag{1}$$

where ΔY is the year-over-year growth in the log of total employment, wages, affordable housing properties, or median house prices for county i from year $t+k-1$ to $t+k$. The term $\Delta \ln CD$ is the year-over-year change in the log of community development dollars lent. The change in the log of total dollars of deposits assigned to branches in that county, $\Delta \ln D$, is included as a control. This term is included because the identification strategy I employ, explained below, is based on shifts in deposit market share. My preferred specification additionally controls for both county-level and state-by-year fixed effects.

Estimation of equation 1 is complicated by two issues. First, the annual amount of community development financing in a county, $CD_{i,t}$, is endogenous to local demand factors that could be correlated with labor and housing markets. Estimation of equation 1 via OLS would therefore be biased. Second, I do not actually observe $CD_{i,t}$. Instead, the available data is limited to the total community development lending or investing a bank did in all the counties contained in each assessment area, over all the years of its evaluation period, for the subset of banks and evaluation periods from which data was collected.

To overcome these issues, I need to construct a proxy for annual changes in $CD_{i,t}$ that is uncorrelated with time-varying demand factors. To this end, I take advantage of two facts about bank community development financing. First, the amount of community development financing a bank does in a given market is highly correlated with the deposits it holds in that market. This may simply be a function of banks having a greater physical presence in markets from which they collect a large amount of deposits, and hence have the connections necessary to do community development lending and investment. It may also be encouraged by the CRA, as examiners may view a bank's obligation to its community to scale with its size and local presence.

The second fact is that banks vary considerably in their propensity to engage in community development lending and investment, even conditional on their deposit base. This propensity is highly correlated within banks across their various assessment areas—at least for lending. See Section 5 for more details. Combining these two facts implies that when a bank with a high propensity to do community development lending (a high CDFE, in the terminology from the introduction) gains deposit market share in a given county, the

supply of community development loans available to that county should increase. I use this to construct a proxy for CD_{it}.

The full estimation procedure is as follows: I divide the sample of community development loans and investments by market and era. Markets are defined as MSAs; eras divide the sample into the boom, bust and recovery.[11] Using this sample, I calculate each bank's ratio of (annualized) community development dollars to deposits, divided by the market/era average community development dollars-to-deposits ratio.[12] The average of this ratio is the bank CDFE (a bank that was exactly average in all its markets would have a CDFE of 1).

With the CDFEs in hand, I next predict the amount of community development lending and investment each bank would do in a given market as a function of its deposit base there and the estimated CDFE. Taking the full sample of assessment areas from the performance evaluations, I estimate

$$CD^b_{a,\tau} = \alpha \widehat{CDFE}^b \times D^b_{a,\tau} + \mu \tag{2}$$

where $CD^b_{a,\tau}$ is the amount of community development lending or investment bank b did in assessment area a during the years covered in evaluation period τ. $\widehat{CDFE}^b$ is the estimated bank-specific propensity, and $D^b_{a,\tau}$ is the total amount of deposits b assigned to branches in the counties in a as of the last year in τ.

Based on the estimate of α, each $\widehat{CDFE}^b$, and the deposit data $D_{i,t}$, I calculate a predicted $CD^b_{i,t}$ for each bank/county/year triple. For banks that did not appear in the sample of performance evaluations, I assume $CDFE = 1$; that is, I assume that they do the average amount of community development financing expected given their deposit base. Summing across banks produces a predicted $\widehat{CD}_{i,t}$ for each county and year. The functional form of equation 2—linear, with no constant—was chosen so that the predicted total amount of community development financing in a county (the sum across all individual banks) would

[11] The cutoffs used to define these eras are evaluations with exam dates from 2005-2009, 2010-2013, and 2014-2017. Recall that evaluations generally cover activity from a period of several years prior to the actual examination date. MSAs provide a coherent set of market definitions within which to compare banks to a market average. Non-MSA assessment areas, which consist of idiosyncratic collections of counties specific to each bank, are not used to calculate CDFEs, but will be included in the samples used to cross validate their out-of-sample consistency, as well as the main estimation sample.

[12] I drop 24 observations in which ratios were greater than 100. Results are robust to including these outliers.

not depend on market concentration or the number of banks operating in that county. Instead, it is purely a function of the total dollars of deposits drawn from that county, and the deposit market share weighted average of CDFEs. Formally,

$$\widehat{CD}_{i,t} = \sum_{b \in B} \hat{\alpha} \widehat{CDFE}^{b} \times D^{b}_{i,t} \tag{3}$$

where B is the set of all FDIC insured depository institutions.

In summary, $\widehat{CD}_{i,t}$ is the expected amount of community development financing a county receives in a year, given the propensities of the banks operating branches in that county, weighted by their deposit market shares. Variation across time in $\widehat{CD}_{i,t}$ is driven by idiosyncratic bank decisions about expansions, mergers and branch closures, or by the efforts exerted to attract or retain deposit market customers. Changes in the size of the deposit market are captured by $D_{i,t}$.

Equation 1 is estimated, substituting $\widehat{CD}_{i,t}$ for the unobserved $CD_{i,t}$. Total deposits, $D_{i,t}$, is the sum of the deposits across all banks in the county, $D^{b}_{i,t}$. By controlling for deposits in this way, the effect of community development financing is identified entirely through shifts in the *share* of the deposit market held by banks with greater or lesser propensity to do said financing. Thus, estimates of β would be biased by unobservable demand factors only if they cause changes in the deposit market share of local banks in a way correlated with bank CDFE. Later in section 5 I will attempt to test for such correlations. In Section 5.1.1 I describe how estimates are adjusted for crowd out—that is, failure of the assumption of additive separability implicit in equation 3.

The use of this generated regressor, $\widehat{CD}_{i,t}$, introduces additional variance in the estimator (Pagan (1984)). To calculate appropriate standard errors, I bootstrap over the entire estimation procedure. To account for potential correlation of errors within both banks and counties, I sample performance evaluation observations at the bank level and economic outcomes at the county level.

5 Results

The first stage of the estimator is to estimate equation 2 via OLS. A strong correlation at this step is necessary to detect an effect in the second stage. In other words, if individual banks' propensities to engage in community development financing are only weakly correlated across markets, then shifts in their deposit market share will not generate much variation in the supply of this financing. The results of this regression are shown in Table 2, for loans and investments separately in columns 1 and 3. The product of the bank CDFE and its local deposits is highly predictive of the amount of community development financing, for both loans and investments.[13]

Statistically significant estimates in columns 1 and 3 do not by themselves demonstrate that banks have a consistent propensity to engage in community development activities across markets, however. Columns 2 and 4 show an alternative specification, including a constant term and $D^b_{a,\tau}$ as additional regressors. These regressions test whether the calculated CDFEs are driving the strength of the relationships estimated in columns 1 and 3, or if all the variance is simply being explained by the deposits term. As can be seen, total deposits have at best a weak partial correlation with community development lending dollars when the product of those deposits and CDFE is included (column 2). The CDFE is clearly an important independent predictor of a bank's community development lending. In contrast, the investment CDFE is not significantly partially correlated with the amount of community development investment once the level of deposits is controlled for.

Next, I confirm the relevance of the lending CDFEs by showing that they do a good job predicting a bank's community development lending out of sample. In contrast, the investment CDFEs remain weak predictors. To demonstrate this, I randomly divide the assessment area level data into two equally sized samples: a training and a test sample. CDFEs are re-calculated solely from the training data using the same procedure outlined in Section 4. Using these, the regressions from columns 2 and 4 are then rerun on the test subsample. This procedure is repeated 500 times, taking a new random draw to split the data

[13]Throughout this section, community development loans and investments are reported in dollars while deposits are reported in $1,000s for readability.

into training and test samples each time. The distribution of the estimated coefficients on the term $\widehat{CDFE} \times D$ are plotted in Figures 2a and 2b for loans and investments, respectively. As can be seen, the lending CDFEs are strong predictors of community development lending even outside of the markets used to calculate them, indicating that the bank fixed propensity to do community development lending is indeed highly correlated across markets. The average out-of-sample estimated coefficient for loans is 0.8 (compared to 1.1 for the in-sample estimates) and all 500 estimates are greater than zero. The investment CDFE remains a poor predictor, however. While the mean value of the estimated out-of-sample coefficients is 0.57, the standard deviation is 1.04, and over 30 percent of the estimates are less than or equal to zero.

These results suggest that banks have a consistent, institution wide propensity to engage in a certain level of community development lending, but investment activity does not show the same consistency across markets within bank. What causes this difference? One possible explanation is that the difference is due to the way community development investments are recorded in CRA performance evaluations. As described in Section 3, investments originated or purchased in prior evaluation periods are still recorded if they remained on the bank's balance sheet at the end of the current evaluation period. Loans, on the other hand, are only recorded if they were originated or purchased in the current period. This quirk of data recording may introduce considerable additional variance in the recorded amount of community development investment dollars that has little to do with a bank's overall strategy. The heterogeneous nature of community development investments may also not lend themselves to a consistent level of supply across markets. Investments may, for example, be more dependent than loans on the presence of qualifying projects to invest in, or a strong local community development financial institution network.

5.1 Effects of Community Development Lending

Turning now to the main results, estimates of β_k from equation 1 are plotted in Figure 3 for the effect of community development lending on employment, total wage bills, affordable

housing, and house prices. Results are shown for four years leading and lagged around year t. Across any of the four outcomes, there is no evidence of growth in any year from $t-4$ to $t-1$ predicting the change in average CDFE in the deposit market in year t. This finding of no pre-trend suggests that high-CDFE banks do not disproportionately enter markets that are experiencing stronger or weaker economic growth relative to other banks. While labor or housing demand may be endogenous to the actual amount of community development loans supplied, they do not appear to be endogenous to changes in the average local CDFE.

Once the change in CDFE occurs, however, there does appear to be some response in the labor market. Employment and total wage bill growth is significantly higher two years after the deposit market shifts toward high CDFE banks. The estimated elasticities of employment and wages to the supply of community development lending are 0.008 and 0.012. The delay between the expansion of the high CDFE banks' deposit market share (in year t) and labor market outcomes (in year $t+2$) may be due to banks with an expanding footprint taking some time to find new customers with community development projects to fund. The borrowers may also require some time to effect hiring once the funding is secured. Because equation 1 describes the *growth rate* of the outcome variables between years $t+k-1$ and $t+k$, and there is no evidence of a reversal of this growth through the rest of the estimation window, this finding suggests that the *level* of employment and wages remained higher in years 3 and 4 as well. There is no evidence of an effect on affordable housing or house prices, however.[14]

Nationwide, in 2018, there were approximately 150 million jobs and $100 billion in community development loan originations. These numbers and the estimated elasticities suggest that the supply of community development lending would have to increase by about $80,000 to increase net local employment by one job, in expectation. In addition to direct job creation by the borrower, this estimate includes any knock-on effects the lending might have on stimulating additional local economic activity and labor demand.

[14]This null result may be due in part to banks' preference to support affordable housing through investments rather than loans. Purchases of tax credits through the LIHTC program are a major fraction of many banks' community development activities, and fall under the investment test. Baum-Snow and Marion (2009) finds the LIHTC program was effective at increasing the provision of affordable housing, although as Eriksen and Rosenthal (2010) points out, the program may have effected the location more than the overall level of affordable housing.

Results are quite robust to the choice of specification or additional controls. In Tables 3, 4, 5 and 6, I show the results of estimating different versions of equation 1 for employment, wages, permits, and house prices, respectively. Column 1 in these tables shows the estimates without any fixed effects. In columns 2 through 5, I variously add combinations of year, county, and state-by-year fixed effects. The estimates are quite consistent across columns.

The identifying assumption behind these estimates is that the change in deposit-share weighted average CDFE affects labor market outcomes only through the supply of community development loans, conditional on the size of the total deposit base. A competing explanation could be that counties experiencing changes in bank market structure are likely to exhibit labor market expansion regardless of community development lending. For example, banks may begin to enter a market when it shows signs of potential growth. To test this alternative explanation, I include a number of control variables measuring changes in the local banking sector in equation 1 and reestimate it. These controls are the annual change in the Herfindahl-Hirschman Index for the deposit market in the county, the number of bank branches opened, the number of bank branches closed, the number of banks acquired by another entity, and the sum across all banks of the absolute value of the change in their local deposit market share. Results are presented in column 6 of Tables 3, 4, 5, and 6. As can be seen, the inclusion of these controls for turmoil in the banking sector have little effect on the estimates. This suggests that changes to the average CDFE are indeed affecting labor market outcomes through the supply of loans, rather than simply serving as a proxy for changeover in banking markets. See 5.1.3 for further tests of the endogeneity of $CD_{i,t}$.

5.1.1 Crowd Out

As described in equation 3, the expected amount of total community development lending in county i and year t, $CD_{i,t}$, is modeled as the sum of each bank's expected amount of lending, $\hat{\alpha}\widehat{CDFE}^{b} \times D^{b}_{i,t}$. This linear combination across banks doesn't allow for market interactions such as crowd out. If the demand for community development loans is not perfectly elastic, then when a high CDFE bank enters a market, other banks will end up doing less lending than their CDFEs and deposit base would predict. There is also the possibility of crowd-in

effects, if banks learn about community development lending opportunities from each other.

To test for such interactions, I estimate the elasticity of a bank's local community development lending to the aggregate expected community development lending in that county, $\widehat{CD}_{i,t}$. Since assessment areas (the geographic unit at which I observe individual bank lending) are made up of multiple counties, I infer each bank's county-level lending by apportioning its assessment area-level lending to counties in proportion to the deposits a bank holds there. I then regress the log of the bank's annualized community development lending on the logs of $\widehat{CD}_{i,t}$, the deposits the bank holds in that county, $D^b_{i,t}$, and the total deposits held in the county by all banks, $D_{i,t}$. I additionally control for fixed effects at the bank and county level, and for the years the bank's evaluation period began and ended. The estimating equation is:

$$\ln CD^b_{i,t} = \delta_1 \ln \widehat{CD}_{i,t} + \delta_2 \ln D^b_{i,t} + \delta_3 \ln D_{i,t} + \theta_b + \phi_i + \omega^{begin}_{b,\tau} + \psi^{end}_{b,\tau} + \epsilon \tag{4}$$

The parameter of interest, δ_1, measures how responsive an individual bank's lending is to lending by all other in-market competitors. For every 1 percent increase in expected lending by all banks in a county according to equation 3, each individual bank changes its actual lending by δ_1 percent, relative to expections given bank, county and time fixed effects and its deposit base. A finding of $\delta_1 = 0$ would imply no crowd out. A finding of $\delta_1 = -1$ would imply perfect crowd out—that is, increasing the average CDFE in a county would have no effect on the *net* supply of community development loans.

Results of estimating equation 4 are presented in column 1 of Table 7. As a robustness check, in column 2 the logs of each variable X are replaced with the logs of $X + 1$, to avoid dropping all zero values. In both cases crowd out is estimated to be about 30 percent, although estimates are imprecise. This finding suggests that the actual $CD_{i,t}$ only varies by about 70 log points for every 100 log point change in $\widehat{CD}_{i,t}$, and the magnitudes of the estimated effects of community development lending should be adjusted accordingly. Assuming 30 percent crowd out, the results in Section 5.1 suggest that only $\$56,000$ in community development lending is necessary to create one net job.

5.1.2 Other Forms of Lending

Banks with different CDFEs may also differ in other ways. In particular, CDFE may be correlated with the tendency to provide other forms of credit at the local level, not just the tendency to provide community development loans. If so, some of the labor market effects estimated in Section 5.1 may be attributable to changes in the supply of these other forms of lending. To test for such effects, I estimate the effect of $\widehat{CD}_{i,t}$ on the county-level volume of small business and small farm lending, as well as the effect on residential mortgage lending. I re-estimate equation 1, taking annual growth in the log dollar volume of small business and farm loans reported under the CRA, and of HMDA reported mortgage loans, as the outcome variables at the county/year level.

Results are shown in Figure 4. A higher $\widehat{CD}_{i,t}$ does appear to be associated with an increase in the amount of small business and farm lending in the year deposit market shares changed. The estimated elasticity of small business and farm lending to (predicted) community development lending is 0.06. There does not appear to be a measurable effect on mortgage lending.

Banks reported about $250 billion in small business and farm lending in 2018. Taking the crowd out of community development lending estimated in Section 5.1.1 into account, this implies small business and farm lending increased by 21 cents for every dollar of additional community development lending caused by shifting deposit market shares. Note that this may be an overestimate, as the correct categorization for some loans is ambiguous. Banks may initially report a loan as a small business or farm loan, but during the evaluation the examiner could correct the classification to a community development loan. Such loans would thus appear in both the reported small business and farm loan data, as well as appearing in performance evaluations under community development. Regardless, given the smaller estimated dollar volume and less employment-focused nature of generic small business and farm loans, it seems reasonable to attribute the labor market responses estimated in Section 5.1 primarily to community development lending.

5.1.3 Endogeneity Test

A further potential concern with my interpretation of the coefficient on $\Delta \ln \widehat{CD}$ as the supply effect of community development lending is that bank CDFEs may be correlated with other qualitative features of banks that could influence labor market outcomes. For example, banks with higher CDFEs may have more effective strategies for picking productive projects to fund. In that case, the observed labor market response to an increase in $\widehat{CD}$ could be due to an increase in the local efficiency of capital allocation, rather than an increase in community development funding *per se*.

I test for the endogeneity of CDFEs to labor market outcomes using the method developed by Caetano (2015). The basic idea is that when a potentially endogenous variable is continuously distributed but exhibits bunching, observations at the bunching points will have discontinuously different unobservables than those with values of the endogenous variable in the near neighborhood. Bunching often occurs when a variable is naturally forced to be weakly positive.[15]

The essence of the test is to estimate the limit of the outcome variable as the potentially endogenous variable approaches the bunching point using a local linear estimator, then test whether the actual values there are different from that limit. In my setup, CDFEs have a natural bunching point at zero. These banks include those on the margin of making a small amount of community development loans, and those who are very far from marginal, as it is not possible for banks to do negative amounts of community development lending. If the unobservables that determine CDFE also affect labor markets through channels other than actual community development lending, we might expect to see a discontinuity in employment and wages in markets served by banks whose CDFE approaches zero.

[15]Caetano (2015) gives the illustrative example of maternal smoking and infant birth weight: expectant mothers who smoke zero cigarettes per day while pregnant are qualitatively different from those who smoke 1 cigarette per day, but 1-per-day smokers are only marginally different from those who smoke 2, 3, etc. There is a clear discontinuity in the birth weight of infants born to mothers at the zero-cigarettes-per-day cutoff, as the observations bunched at zero include mothers who are on the margin between smoking zero and 1 per day, but also includes those who are nowhere near the margin—those who would in some sense like to smoke large *negative* numbers of cigarettes, if that were a logical possibility. The discontinuity in the outcome variable (birth weight) where the unobservable determinants of smoking behavior would also be expected to be discontinuous suggests that simple regressions of birth weight on cigarettes smoked per day will therefore be biased by omitted unobservables (e.g. mother's nutrition, education etc.).

In the top two panels of Figure 5, I plot the logs of employment and total wages for each county-year in my sample against the CDFE of the largest bank (by deposit share) in that county at the time. A local polynomial function is fit over the data for values of CDFE strictly greater than zero, and the average outcome variable at $CDFE = 0$ is plotted separately. There is no evidence that counties served by $CDFE = 0$ banks have discontinuously lower levels of employment or wages. To ensure that the running variable (the CDFE of the largest local bank by deposit share) has a substantial impact on local credit supply, I next restrict the sample to counties where the largest bank holds an outright majority of all local deposits. I plot the same data and trend lines in the bottom two panels of Figure 5. Again, there is no visual evidence of a discontinuity.

The formal results of the Caetano (2015) test are presented in Table 8 for both of these samples. I show results for a variety of bandwidths, from 0.05 to 2, all using a triangular weighting kernel. Across samples and choice of bandwidth, the tests do not support the contention that local labor market outcomes are discontinuously worse when communities are served by banks that provide exactly zero community development loans. This suggests that unobservable determinants of bank CDFE do not have a measurable effect on labor market outcomes, and $\widehat{CD}$ may be treated as exogenous.

5.2 Effects of Community Development Investment

Unlike community development lending, community development investment fixed effects show a weak first stage as predictors of the local provision of investment funds. Given this, we should not expect to be able to find much of an effect of community development investment on real economic outcomes. Banks do not appear to have a consistent propensity to engage in investment activity across markets, so when a high CDFE bank gains deposit market share in a given market, the supply of investment funds may not increase much. Unsurprisingly, estimating equation 1 using the CDFEs calculated for investment reveals a different picture than the estimates for lending. Results are presented in Figure 6. As with lending, there is no evidence of pre-trends in employment, wage, affordable housing or house

price growth predicting changes in average CDFE. However, there also does not appear to be any effect of an increasing supply of community development investment on the subsequent growth of these outcomes, either.

6 Conclusion

Understanding how the development of communities can be effectively supported is of interest to policy makers, community groups and civic institutions such as chambers of commerce. Despite the massive outlays of credit and investment falling into categories deemed to support community development by federal regulators, and the considerable evaluation and compliance apparatuses regulators and banks operate, little is known about whether encouraging community development financing fulfills its intended purpose. This paper represents the first attempt, to my knowledge, to evaluate the effectiveness of increasing the supply of community development financing in general on the actual development of communities in the United States.

The results indicate that when banks with a high idiosyncratic tendency to engage in community development lending gain deposit market share in a county, employment and total wages paid subsequently rise. The entry of a bank with a high tendency to engage in community development *investment*, however, is not associated with any significant growth in employment, wages, affordable housing or house prices. This may be because banks' propensities to engage in community development investment, unlike lending, are not highly correlated across markets.

The results of this study suggest that encouraging community development lending could be quite an effective way to improve economic conditions for struggling populations. However, the partial-equilibrium nature of this analysis also needs to be taken into consideration. The opportunity cost of a bank engaging in community development lending could be quite high. For example, banks may forgo loans or investments whose returns accrue outside of their assessment area in favor of local community development loans. Even if those outside opportunities had a higher social return, the estimator used in this paper would not pick up

the net losses in those more distant areas that could have counterfactually gotten the funds.

7 Bibliography

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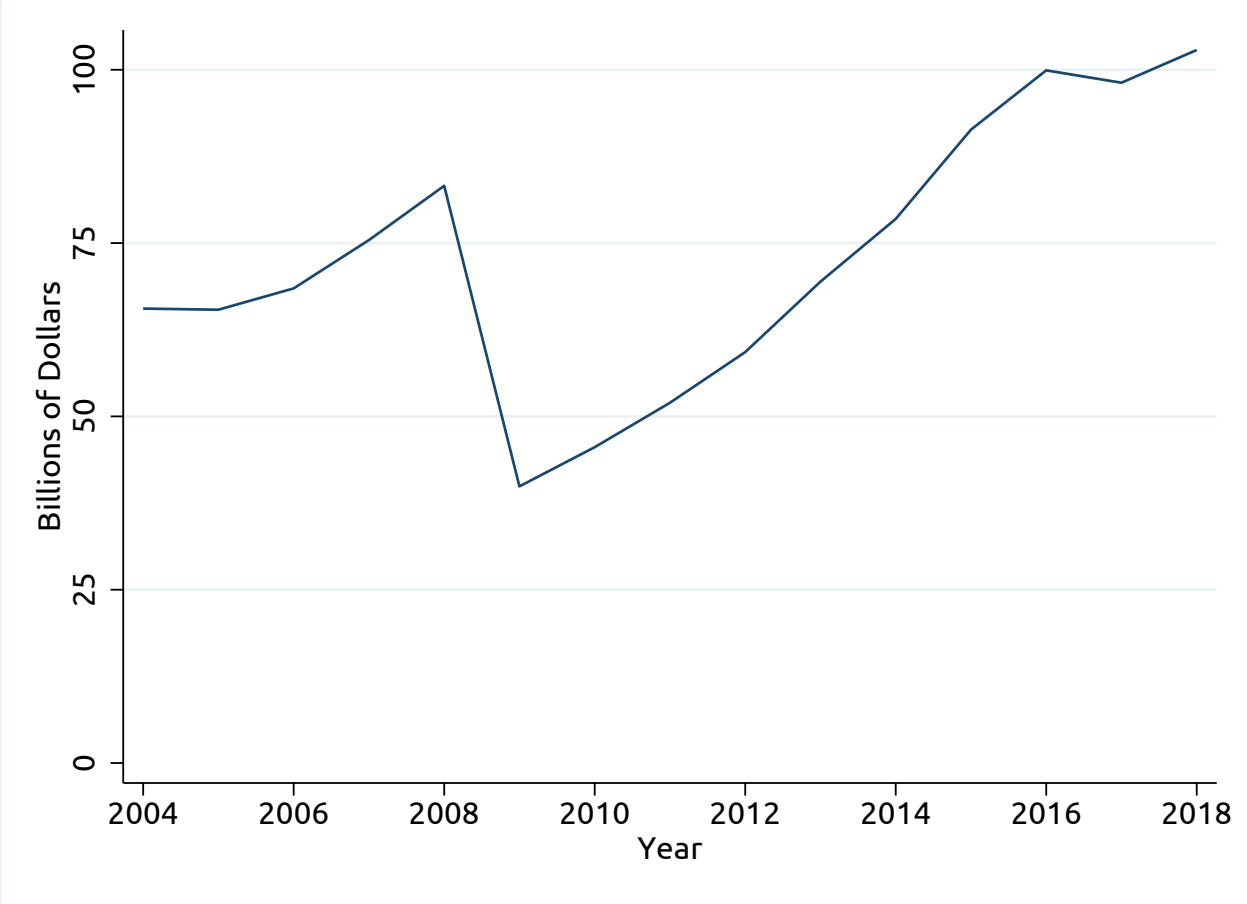
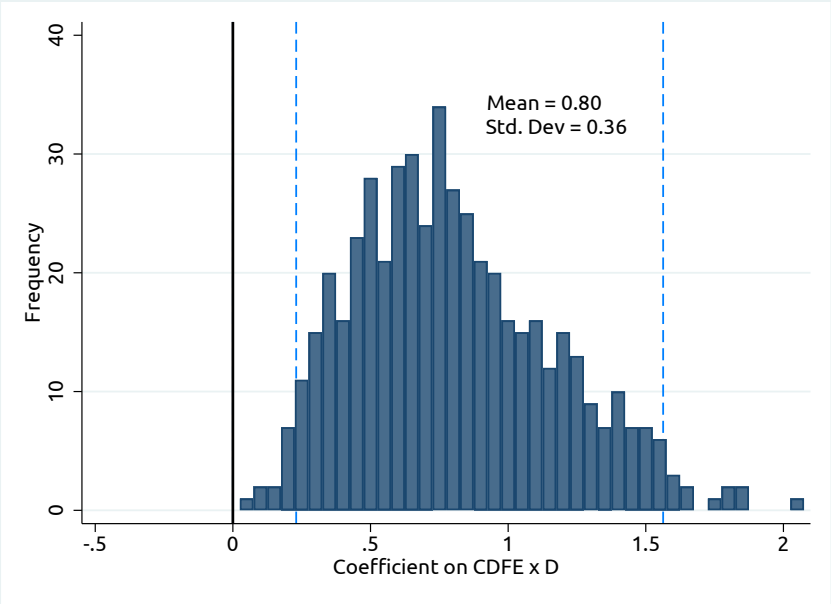
Figure 1: Total Reported Community Development Loan Originations, by Year



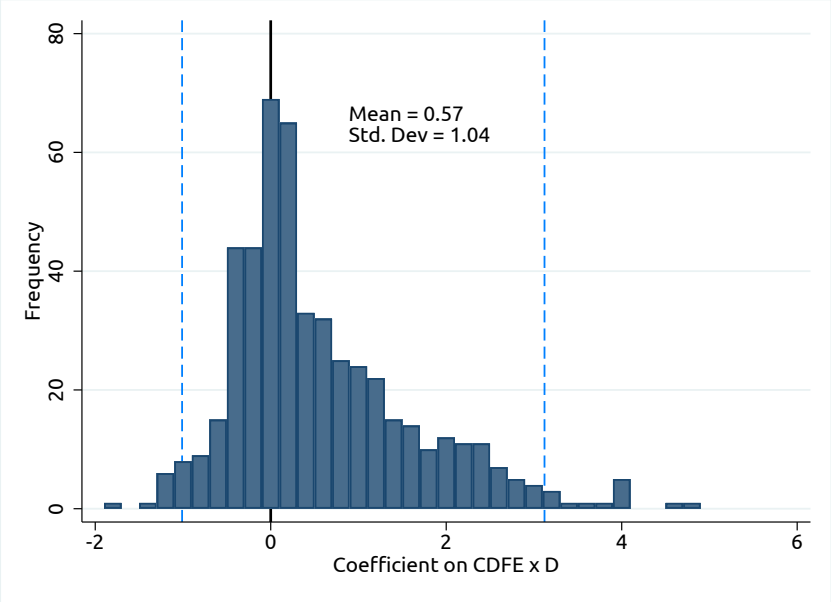
Note: Figure shows the total dollar amount of reported community development lending by banks, in year 2018 dollars. Source: Federal Financial Institutions Examination Council data, available at `https://www.ffiec.gov/cra/`.

Figure 2: Out of Sample Cross Validation of Bank Propensity to Finance Community Development

(a) Loans

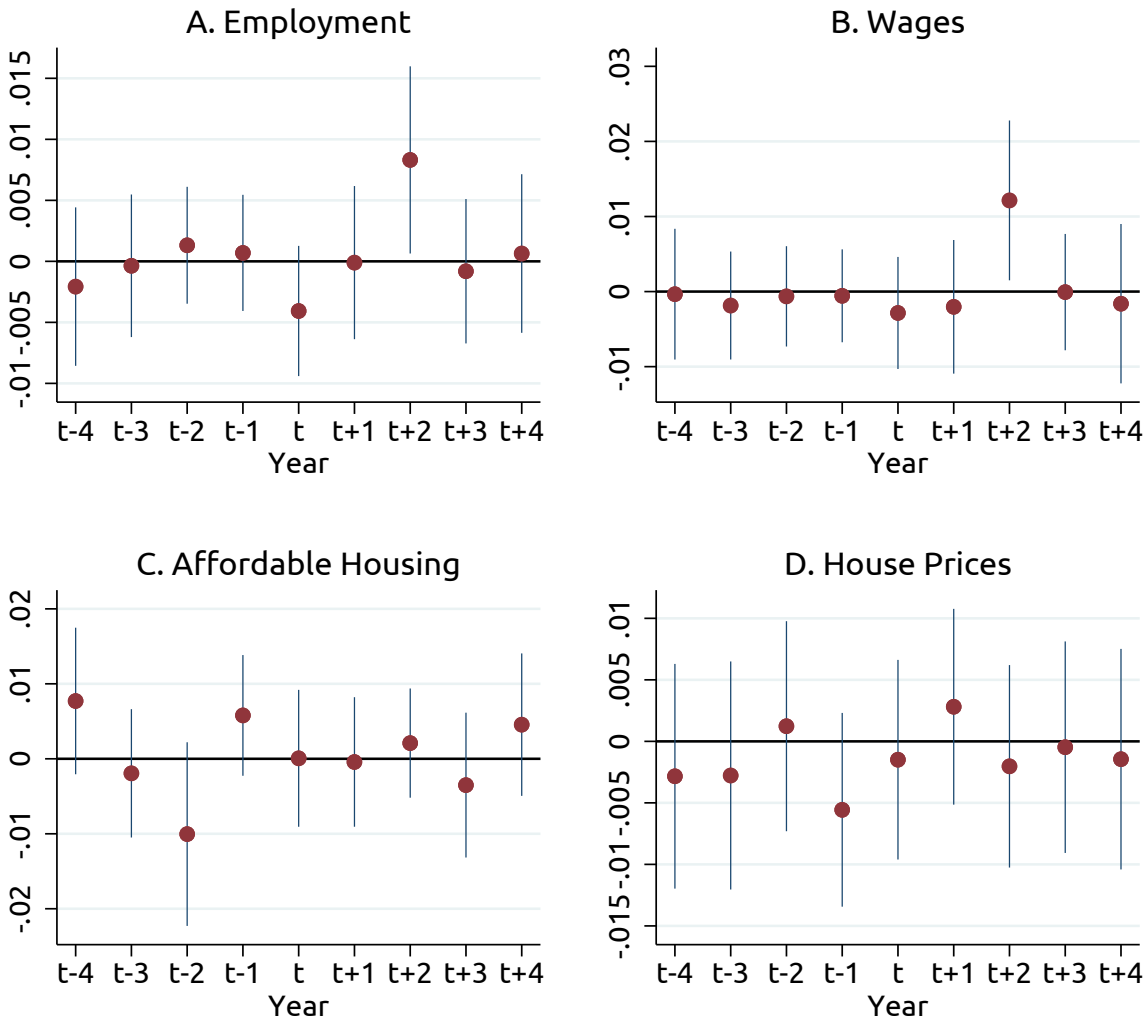


(b) Investments



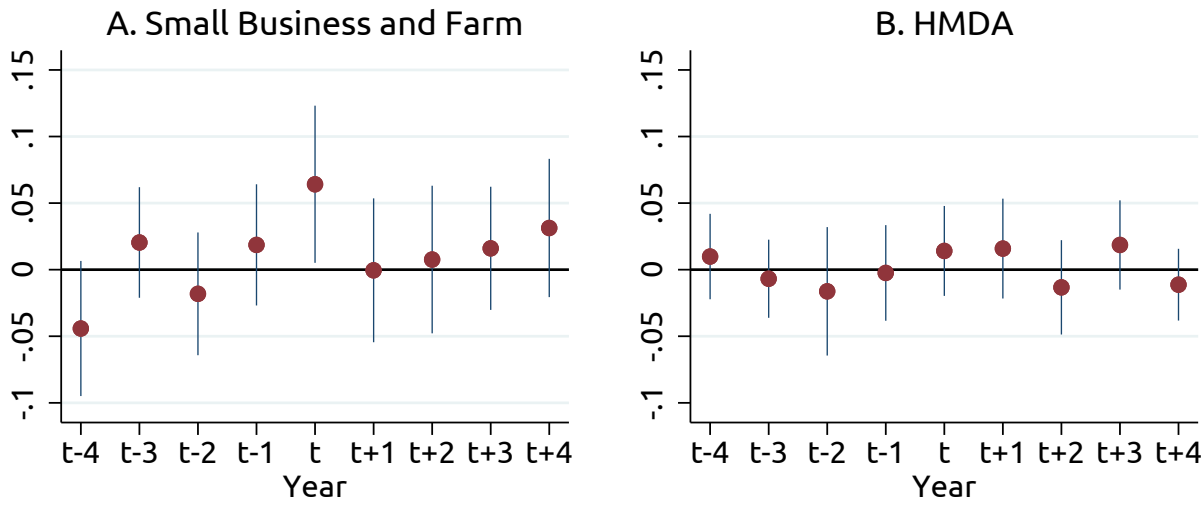
Note: Figure shows the distribution of estimated coefficients on $CDFE \times D$, from a regression of banks' community development loans or investments at the assessment area level on $CDFE \times D$, D (deposits) and a constant term, where $CDFE$ (the bank fixed propensity to do community development financing) is calculated from a randomly chosen training sample, and the regressions are run on a complementary test sample. Distributions produced from 500 independent splits of the data into training and test samples. Panel (a) shows the distributions for community development loans, Panel (b) shows the distribution for investments. Dashed vertical lines represent the 2.5^{th} and 97.5^{th} percentiles of the distributions.

Figure 3: Effects of Community Development Lending



Note: Figures show estimated elasticities of county level employment, wages, affordable housing properties, and house prices, by year, to the year t supply of community development lending. 95% confidence intervals, obtained via bootstrap as described in Section 4 and robust to two-way clustering at the bank and county levels, are displayed as vertical lines.

Figure 4: Elasticity of Other Lending to Community Development Lending Supply

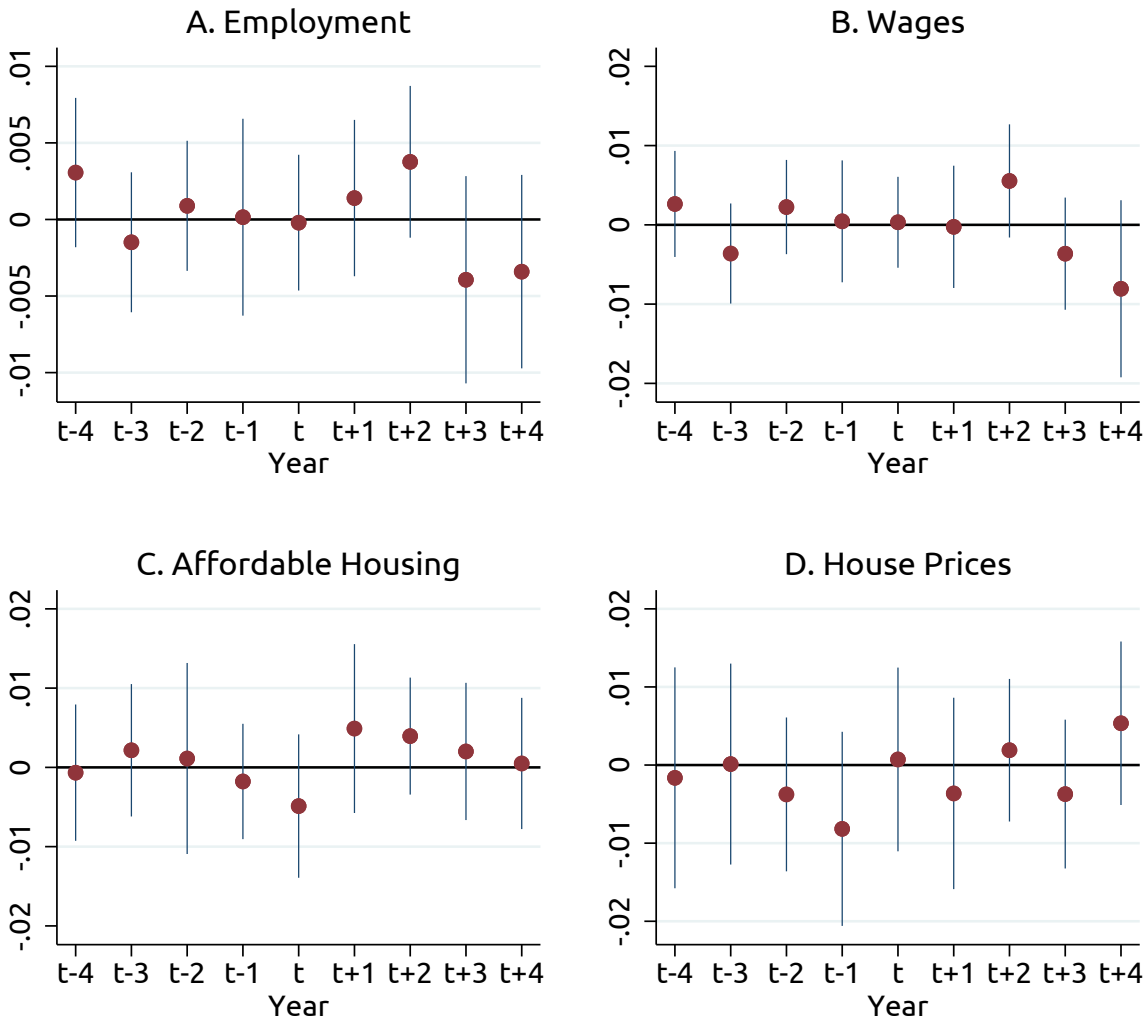


Note: Figures show estimated elasticities of county level small business and farm lending, and residential mortgage lending, by year, to the year t supply of community development lending. 95% confidence intervals, obtained via bootstrap as described in Section 4 and robust to two-way clustering at the bank and county levels, are displayed as vertical lines.

Figure 5: Labor Market Outcomes by CDFE of Largest Local Bank

Note: Figures show the logs of total employment and wages at the county/year level against the calculated CDFE of the largest bank, by deposit share, in the county. Markers denote average levels across bins with widths of 0.05. Counties in which the lead bank had a CDFE equal to exactly zero are displayed as diamonds, all other counties as hollow circles. A local polynomial curve is fitted over all observations with CDFE > 0. The Single Bank Majority Sample restricts the estimation sample to county/years in which the largest bank holds an outright majority of local deposits.

Figure 6: Effects of Community Development Investment



Note: Figures show estimated elasticities of county level employment, wages, affordable housing properties, and house prices, by year, to the year t supply of community development investment. 95% confidence intervals, obtained via bootstrap as described in Section 4 and robust to two-way clustering at the bank and county levels, are displayed as vertical lines.

Table 1: Summary Statistics

Unit of Observation	Variable	N	Mean	Std. Dev.
Bank				
	Evaluations	1,646	1.8	(1.07)
Evaluation				
	Assessment Areas	2,411	5.0	(37.2)
	Assets	2,411	$10,200,000	(87,500,000)
Assessment Area				
	Loans	11,059	$7,350	(30,272)
	Number of Loans	10,923	3.5	(12.1)
	Investments	11,139	$21,645	(507,872)
	Deposits	11,579	$1,099,534	(5,571,911)
	Loan-to-Deposits Ratio	11,036	0.040	(1.220)
	Investments-to-Deposits Ratio	11,116	0.196	(11.89)
County				
	Employment	43,575	41,932	(147,663)
	Wages	40,460	$2,207,133	(9,859,065)
	Affordable Housing Properties	39,547	24.4	(60.3)
	House Prices	27,498	$164.2	(111.5)
	Small Business and Farm Loans	44,771	$78,368	(278,162)
	HMDA Loans	44,771	$657,101	(3,249,338)

Note: This table reports summary statistics for the banks, evaluations, and assessment areas included in the data collection from performance evaluation, as well as additional county-level data. All dollar amounts are reported in 1,000s of real 2018 dollars. Bank assets recorded at the year-end of the evaluation year. Deposits are the dollars of deposits assigned to branches located in the assessment area, recorded in the year of the evaluation. Loans refers to the annualized rate of community development loan originations over the evaluation period. Investments refers to all new investment originations and purchases throughout the evaluation period, as well as any investments held on the banks balance sheet from a prior evaluation period.

Table 2: Consistency of Bank Propensity to Finance Community Development Across Markets

	Lending		Investment	
Variable	(1)	(2)	(3)	(4)
$\widehat{CDFE} \times D$	1.304**	1.108*	1.743**	0.999
	(0.341)	(0.431)	(0.582)	(1.215)
D		0.205		1.822
		(0.361)		(2.932)
Constant		X		X
R^2	0.161	0.140	0.003	0.003
N	10,949	10,949	11,028	11,028

Note: This table reports the estimated relationship between the predicted level of community development financing, described in Section 4, and the bank's actual community development lending and investments at the assessment area level. Predicted levels of financing are the product of a bank-specific community development fixed effect (CDFE) and the bank's deposit base in an assessment area, D. Loans and investments are reported in dollars, deposits in \$1,000s for readability. Columns 1 and 2 show results for lending, columns 3 and 4 show results for investments. Columns 2 and 4 additionally control separately for D and a constant term. Standard errors, robust to clustering at the bank level, are reported in parentheses. * $p < .05$, ** $p < .01$.

Table 3: Elasticity of Employment to Community Development Lending

Year	(1)	(2)	(3)	(4)	(5)	(6)
t-4	-0.0068	-0.0060	-0.0044	-0.0031	-0.0020	-0.0020
	(0.0038)	(0.0035)	(0.0031)	(0.0035)	(0.0033)	(0.0035)
t-3	-0.0068*	-0.0031	-0.0020	-0.0013	-0.0004	-0.0004
	(0.0031)	(0.0026)	(0.0027)	(0.0027)	(0.003)	(0.0029)
t-2	-0.0035	-0.0012	-0.0005	0.0004	0.0013	0.0009
	(0.0027)	(0.0024)	(0.0026)	(0.0023)	(0.0024)	(0.0024)
t-1	-0.0018	-0.0011	-0.0007	0.0001	0.0007	0.0005
	(0.0041)	(0.0026)	(0.0024)	(0.0026)	(0.0024)	(0.0024)
t	-0.0031	-0.0038	-0.0041	-0.0041	-0.0041	-0.0043
	(0.0029)	(0.0027)	(0.0024)	(0.0027)	(0.0027)	(0.0024)
t+1	0.0012	0.0008	0.0003	-0.001	-0.0001	-0.0002
	(0.0041)	(0.0033)	(0.0035)	(0.0033)	(0.0031)	(0.0031)
t+2	0.0085	0.0088*	0.0082*	0.0082*	0.0082*	0.0085*
	(0.0046)	(0.0038)	(0.0040)	(0.0037)	(0.0038)	(0.0037)
t+3	-0.0002	0.0008	-0.0001	-0.0005	-0.0008	-0.0008
	(0.0034)	(0.0029)	(0.0027)	(0.003)	(0.003)	(0.003)
t+4	0.0015	0.0029	0.0020	0.0009	0.0006	0.0007
	(0.0044)	(0.0033)	(0.0034)	(0.0033)	(0.0033)	(0.0033)
Year FE		X	X			
County FE			X		X	X
State-by-Year FE				X	X	X
Banking Sector Controls						X

Note: This table reports estimated elasticities of county-level annual employment, by year, to year t community development lending. All columns control for the annual growth in log deposits in the county in year t. Columns 1 through 5 control for various combinations of fixed effects. Column 6 additionally controls for the annual change in the Herfindahl-Hirschman Index for the deposit market in the county, the number of bank branches opened, the number of bank branches closed, the number of banks acquired by another entity, and the sum across all banks of the absolute value of the change in their deposit market share. Standard errors, obtained via bootstrap as described in Section 4 and robust to two-way clustering at the bank and county levels, are reported in parentheses. * $p < .05$, ** $p < .01$.

Table 4: Elasticity of Wages to Community Development Lending

Year	(1)	(2)	(3)	(4)	(5)	(6)
t-4	-0.0059	-0.0073	-0.0041	-0.0019	-0.0003	-0.0003
	(0.0051)	(0.0048)	(0.0043)	(0.0046)	(0.0044)	(0.0046)
t-3	-0.0094*	-0.0057	-0.0041	-0.003	-0.0019	-0.0019
	(0.0043)	(0.0035)	(0.0035)	(0.0034)	(0.0037)	(0.0035)
t-2	-0.0049	-0.0035	-0.0020	-0.0020	-0.0006	-0.0014
	(0.0038)	(0.0035)	(0.0035)	(0.0033)	(0.0034)	(0.0035)
t-1	-0.0027	-0.0029	-0.0020	-0.0015	-0.0006	-0.0009
	(0.0057)	(0.0035)	(0.0034)	(0.0033)	(0.0031)	(0.0031)
t	-0.0035	-0.0044	-0.0041	-0.0031	-0.0027	-0.0031
	(0.0043)	(0.0041)	(0.0040)	(0.0038)	(0.0038)	(0.0038)
t+1	0.0008	-0.0005	-0.0005	-0.0022	-0.0020	-0.0026
	(0.0057)	(0.0048)	(0.0049)	(0.0044)	(0.0044)	(0.0046)
t+2	0.0126	0.0125*	0.0122*	0.0115*	0.0120*	0.0129*
	(0.0068)	(0.0054)	(0.0055)	(0.0052)	(0.0054)	(0.0051)
t+3	-0.0009	0.001	0.0004	-0.001	-0.0001	-0.001
	(0.0043)	(0.0035)	(0.0037)	(0.0035)	(0.0040)	(0.0038)
t+4	-0.0027	0.0008	-0.0001	-0.0012	-0.0016	-0.0020
	(0.0070)	(0.0055)	(0.0059)	(0.0052)	(0.0054)	(0.0055)
Year FE		X	X			
County FE			X		X	X
State-by-Year FE				X	X	X
Banking Sector Controls						X

Note: This table reports estimated elasticities of county-level total annual wages, by year, to year t community development lending. All columns control for the annual growth in log deposits in the county in year t. Columns 1 through 5 control for various combinations of fixed effects. Column 6 additionally controls for the annual change in the Herfindahl-Hirschman Index for the deposit market in the county, the number of bank branches opened, the number of bank branches closed, the number of banks acquired by another entity, and the sum across all banks of the absolute value of the change in their deposit market share. Standard errors, obtained via bootstrap as described in Section 4 and robust to two-way clustering at the bank and county levels, are reported in parentheses. * $p < .05$, ** $p < .01$.

Table 5: Elasticity of Affordable Housing to Community Development Lending

Year	(1)	(2)	(3)	(4)	(5)	(6)
t-4	-0.1133*	-0.0639	-0.0610	-0.0248	-0.0261	-0.0285
	(0.0452)	(0.0350)	(0.0355)	(0.0353)	(0.0364)	(0.0395)
t-3	-0.0983*	-0.0434	-0.0399	-0.0187	-0.0197	-0.0201
	(0.0447)	(0.0366)	(0.0401)	(0.0366)	(0.0401)	(0.0397)
t-2	-0.0143	0.0187	0.0291	0.0239	0.0322	0.0285
	(0.0439)	(0.0322)	(0.0337)	(0.0326)	(0.0322)	(0.0342)
t-1	-0.0640	-0.0417	-0.0408	-0.0395	-0.0417	-0.0423
	(0.0379)	(0.0313)	(0.0335)	(0.0320)	(0.0324)	(0.0340)
t	0.0439	0.0406	0.0434	0.0313	0.0333	0.0315
	(0.0324)	(0.0306)	(0.0333)	(0.0340)	(0.0333)	(0.0353)
t+1	-0.0026	0.0074	0.0115	0.0038	0.0077	0.0071
	(0.0394)	(0.0340)	(0.0353)	(0.0337)	(0.0366)	(0.0392)
t+2	0.0016	0.0205	0.0199	0.0121	0.0115	0.0127
	(0.0390)	(0.0373)	(0.0394)	(0.0381)	(0.0372)	(0.0401)
t+3	0.0208	0.0242	0.0212	0.0263	0.0252	0.0252
	(0.0441)	(0.0326)	(0.0335)	(0.0320)	(0.0331)	(0.0331)
t+4	0.0232	-0.0119	-0.0124	-0.0219	-0.023	-0.0234
	(0.0419)	(0.0331)	(0.0357)	(0.0366)	(0.0372)	(0.0377)
Year FE		X	X			
County FE			X		X	X
State-by-Year FE				X	X	X
Banking Sector Controls						X

Note: This table reports estimated elasticities of the county-level number of affordable housing properties, by year, to year t community development lending. All columns control for the annual growth in log deposits in the county in year t. Columns 1 through 5 control for various combinations of fixed effects. Column 6 additionally controls for the annual change in the Herfindahl-Hirschman Index for the deposit market in the county, the number of bank branches opened, the number of bank branches closed, the number of banks acquired by another entity, and the sum across all banks of the absolute value of the change in their deposit market share. Standard errors, obtained via bootstrap as described in Section 4 and robust to two-way clustering at the bank and county levels, are reported in parentheses. * $p < .05$, ** $p < .01$.

Table 6: Elasticity of House Prices to Community Development Lending

Year	(1)	(2)	(3)	(4)	(5)	(6)
t-4	0.0033	-0.0024	-0.0024	-0.0029	-0.0027	-0.0029
	(0.0086)	(0.0063)	(0.0059)	(0.0043)	(0.0046)	(0.0046)
t-3	-0.0120	-0.0060	-0.0060	-0.003	-0.0027	-0.003
	(0.0091)	(0.0057)	(0.0059)	(0.0040)	(0.0046)	(0.0044)
t-2	-0.0100	-0.0040	-0.0044	0.001	0.0012	0.0014
	(0.0099)	(0.0062)	(0.0063)	(0.0038)	(0.0044)	(0.0043)
t-1	-0.0081	-0.0055	-0.0074	-0.0052	-0.0055	-0.0059
	(0.0107)	(0.0057)	(0.0062)	(0.0038)	(0.0040)	(0.0040)
t	-0.0068	-0.0071	-0.0083	-0.0012	-0.0015	-0.0015
	(0.0083)	(0.0060)	(0.0060)	(0.0041)	(0.0041)	(0.0041)
t+1	0.0003	0.0019	0.0019	0.0024	0.0027	0.0027
	(0.0098)	(0.0059)	(0.0060)	(0.0038)	(0.0041)	(0.0041)
t+2	-0.0013	-0.0008	-0.0014	-0.0023	-0.0020	-0.0020
	(0.0089)	(0.0055)	(0.0057)	(0.0041)	(0.0041)	(0.0040)
t+3	0.0122	0.0035	0.0035	-0.0011	-0.0005	-0.0008
	(0.0114)	(0.0057)	(0.0057)	(0.0041)	(0.0044)	(0.0046)
t+4	0.0216	0.003	0.0035	-0.0024	-0.0014	-0.0013
	(0.0114)	(0.0066)	(0.0068)	(0.0044)	(0.0046)	(0.0046)
Year FE		X	X			
County FE			X		X	X
State-by-Year FE				X	X	X
Banking Sector Controls						X

Note: This table reports estimated elasticities of the Zillow county house price index, by year, to year t community development lending. All columns control for the annual growth in log deposits in the county in year t. Columns 1 through 5 control for various combinations of fixed effects. Column 6 additionally controls for the annual change in the Herfindahl-Hirschman Index for the deposit market in the county, the number of bank branches opened, the number of bank branches closed, the number of banks acquired by another entity, and the sum across all banks of the absolute value of the change in their deposit market share. Standard errors, obtained via bootstrap as described in Section 4 and robust to two-way clustering at the bank and county levels, are reported in parentheses. * $p < .05$, ** $p < .01$.

Table 7: Estimates of Crowd Out by Other Banks' Lending

	$\ln CD^b_{i,t}$	
Variable	(1)	(2)
$\ln \widehat{CD}_{i,t}$	-0.282	-0.318
	(0.150)	(0.361)
$\ln D^b_{i,t}$	0.760**	0.927**
	(0.016)	(0.038)
$\ln D_{i,t}$	0.152	0.452
	(0.119)	(0.399)
N	18,866	23,709

Note: This table reports the estimated elasticity of individual bank's annual community development lending in a county to the predicted level of community development lending by all banks in that county. Predicted levels of aggregate lending, $\widehat{CD}_{i,t}$, are the sum of a bank-specific expected lending, as described in equation 3. Regressions additionally control for fixed effects at the bank and county level, and for the beginning and ending years of the evaluation period. Column 1 shows baseline results; column 2 shows results for which the logs of all variables X are replaced with the logs of $X + 1$, to avoid dropping observations with values of zero. Bootstrapped standard errors, robust to clustering at the bank level, are reported in parentheses. * $p < .05$, ** $p < .01$.

Table 8: Endogeneity Test of CDFEs

		Bandwidth					
Sample	Variable	0.05	0.1	0.25	0.5	1	2
Full Sample	Employment	0.680	0.556	0.349	0.070	-0.003	0.299
		(0.663)	(0.506)	(0.289)	(0.206)	(0.146)	(0.216)
	Wages	0.675	0.575	0.346	0.042	-0.039	0.314
		(0.725)	(0.549)	(0.317)	(0.225)	(0.159)	(0.237)
	N	582	1,005	2,211	4,335	14,008	25,383
Single Bank Majority Sample	Employment	0.227	0.236	0.119	-0.025	-0.042	-0.004
		(0.487)	(0.416)	(0.263)	(0.189)	(0.125)	(0.121)
	Wages	0.218	0.268	0.119	-0.044	-0.070	-0.009
		(0.545)	(0.467)	(0.294)	(0.210)	(0.137)	(0.130)
	N	354	627	1,493	2,699	7,626	13,508

Note: This table reports the results of the Caetano (2015) test of endogeneity. Point estimates and standard errors of the discontinuity in the log of employment and wages at the county/year level as the estimated CDFE of the largest local bank (by deposit share) approaches zero are shown. The Single Bank Majority Sample restricts the estimation sample to county/years in which the largest bank holds an outright majority of local deposits. Standard errors, robust to clustering at the bank level and county level, are reported in parentheses. * $p < .05$, ** $p < .01$.