# Small Business Lending Under the Community Reinvestment Act

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## Abstract

*This article reviews small business lending patterns from 1996 to 2015 and examines the role of the Community Reinvestment Act (CRA) in shaping small business lending patterns. Using the data that have been reported pursuant to the CRA, we observe that the number of small business loans dramatically increased from 1996 to 2015, while the loan volumes remained essentially unchanged, which translates into a significant decline in the size of the average small business loan. Next, using a regression discontinuity design, we seek linkages between changes in small business lending in a census tract during three distinct periods—1996 to 2002, 2003 to 2011, and 2012 to 2015—and that tract's status as being covered by the CRA. We observe a positive association between small business lending and the CRA from 1996 to 2002 and from 2012 to 2015 and observe a negative association from 2003 to 2011. The findings are consistent with a view that banking institutions strategically respond to the CRA, but that the incentives presented by macroeconomic market conditions can overwhelm any incentives the CRA provides.*

## Introduction

Capital is the lifeblood of every community. For a community's residents, capital is critical for purchasing durable goods, such as appliances and a car, that are essential for a family's day-to-day life. In addition, families generally need capital in order to achieve homeownership, which is a primary vehicle for building wealth and avoiding the costs associated with housing instability (Green and White, 1997; Gyourko, Linneman, and Wachter, 1999; Linneman and Wachter, 1989; Sinai and Souleles, 2005; Turner and Luea, 2009). Capital is also essential for a community's businesses,

which use capital to acquire land and equipment that are needed to stand up and operate their enterprises. Business success is essential for communities, as businesses are an important source of jobs and provide the basic services that enable communities to function and thrive.

Given this essential role of capital for community health, access to capital and credit has been a concern of policymakers for decades. A large volume of evidence has made clear that capital markets have fallen short where equal access is concerned, which has triggered legislative action to try to improve the state of capital access (Blanchflower, Levine, and Zimmerman, 2003; Munnell et al., 1996). The Community Reinvestment Act[1] of 1977 (CRA) is one such piece of legislation. The CRA seeks to ensure that banking institutions reinvest a significant portion of the deposits they take from local communities back into those communities (Garwood and Smith, 1993). The CRA also establishes that a banking institution's record of reinvestment will be considered as a factor when that institution seeks to acquire other institutions or complete another activity that requires regulatory approval.

A revision to the CRA in 1995 gave the act an additional role—to monitor the performance of banking institutions in providing small business credit. The CRA revision established that banking institutions must report on their lending to small businesses and their provision of small loans to businesses (Canner, 1999). The article uses the data that have been compiled under the CRA to describe changes in small business lending from 1996 to 2015 and examine the role of the CRA in shaping small business lending patterns.

We begin by reviewing the literature examining how the CRA has influenced banking activity, particularly mortgage and small business lending. We then introduce our methodology and data set that are used in this article. The subsequent section describes the patterns in small business lending from 1996 to 2015 at a national level. The next-to-last examines the effectiveness of the CRA on small business lending, using a regression discontinuity design (RDD). The final section concludes by summarizing the findings and considering some potential implications of the findings.

## Literature Review—The Effect of the CRA

The literature on the effects of the CRA has focused on how banks engage with local community organizations, the volume and distribution of mortgage loans, and the volume and distribution of small business loans. One response of banking institutions to the introduction of CRA has been to enter into agreements with local organizations, whereby banking institutions pledge to devote significant resources to support CRA objectives. Several studies have sought evidence of whether these agreements are associated with increases in lending activities. Bostic and Robinson (2003) found a positive association between the number of new CRA agreements in a county and lending in that county during a 3-year period. Bostic and Robinson (2005) similarly found that banking institutions that enter into CRA agreements increase their lending activity when the agreement is in force and maintain higher levels of lending even after the agreement has expired.

[1] Pub. L. 95–128, 91 Stat. 1147, Title VIII.

Regarding mortgage lending, a number of studies have sought to quantify the impact of the CRA on the volume and distribution of loans. We highlight only a few here. Based on a survey of banking institutions, Avery, Bostic, and Canner (2005) found that the CRA induced institutions to engage in lending that they would not have and that most of these new activities were profitable. Bhutta (2011) found that the CRA was associated with increases in mortgage lending in large metropolitan areas in the late 1990s and early 2000s, although effects were not significant on average for the entire nation. Bhutta concluded that government interventions to offset information externalities that suppress credit supply may be justified. Gabriel and Rosenthal (2008) compared the effects of the CRA, which targets banking institutions, with similar regulations that target activities of Fannie Mae and Freddie Mac. Their results are mixed, although they found weak evidence that the CRA increases homeownership in CRA-eligible tracts. More recently, some have argued that the CRA was the main catalyst of the financial crisis of the mid-2000s (Agarwal et al., 2012), although the evidence strongly suggests otherwise (Avery and Brevoort, 2015; Reid et al., 2013).

The literature on the CRA's impact on small business lending is much smaller than the literature on the law's impacts on mortgage lending. Zinman (2002) was the first paper, to our knowledge, that examined the (causal) effects of the CRA on small business lending. Using a framework that is analogous to a triple difference approach, the author compared the dollar amount of small business loans outstanding of banks and commercial borrowers by their bank asset size and regulator toughness in the wake of the 1995 CRA reforms. Also, Zinman restricted the bank sample to those around the CRA asset size cutoff (between $150 million and $350 million) to control for any unobserved bank characteristics (regression discontinuity sample). The estimates found in the paper suggest that the CRA (specifically, the 1995 CRA reforms) increased small business lending by 15 percent of base period lending, which ultimately led the CRA-affected areas to increase payroll and reduce bankruptcies.

A more recent attempt to assess the effectiveness of the CRA on small business lending is found in Bates and Robb (2015). From an analysis based on the Kauffman Firm Survey, the paper found positive associations between minority residential areas and loan availability between 2004 and 2011. Although the authors interpreted the regression results as impacts of CRA, the methodology does not allow for a causal interpretation of the findings because the paper (1) equates minority communities with the CRA eligible low- and moderate-income (LMI) neighborhoods and (2) uses ZIP Codes rather census tracts as the geographic unit of analysis.

In sum, relatively little documentation exists of how small business lending has evolved since the introduction of the small business lending data reporting mandate, as part of the major reforms to the CRA in 1995. Relatively little work comprehensively describes patterns in small business lending and empirically examines the effects of the CRA on small business lending. Using the most comprehensive and current data available, we will attempt to fill the gap in the existing literature.

## Method and Data

To examine the role of the CRA on small business lending, we use RDD. One of the key characteristics of the law is that the threshold for eligibility is clear: to be a "CRA-eligible" neighborhood, the Median Family Income (hereafter, median income) in a tract should be less than 80 percent of the

median income for the surrounding area. Given this regulatory framework, neighborhoods slightly below and above the CRA threshold are theoretically quite similar, save for their CRA designation. This close similarity enables us to view any discontinuities in outcomes at the threshold as effects of the CRA. The RDD approach has been often used to evaluate the effectiveness of the CRA on home mortgage lending (Avery and Brevoort, 2015; Berry and Lee, 2007; Bhutta, 2011; Gabriel and Rosenthal, 2008), but this article is the first to apply this approach to examine the CRA effects on small business lending.

In a standard RDD, we estimate the impact of the CRA on small business lending as—

$$y_{ijk} = \beta LMI_{ij} + \psi \boldsymbol{X}_{ijk} + CountyFE_j + YearFE_k + \varepsilon_{ijk}, \quad (1)$$

where $y_{ijk}$ is small business loan originations in census tract $i$ in county $j$ in year $k$. $\boldsymbol{LMI_{ij}}$ is an indicator that is equal to 1 if a census tract is a CRA-eligible LMI neighborhood, and the indicator is equal to 0 otherwise. $\boldsymbol{X_{ijk}}$ is a vector of neighborhood characteristics that are associated with small business lending, including the median income ratio between tract and corresponding metropolitan area. The model also includes county and year-fixed effects to control for any year- and location-specific heterogeneities.

For the model, we use four samples: (1) all census tracts, (2) census tracts with a median income ratio within 10 percentage points of the CRA cutoff, (3) tracts within 5 percentage points of the cutoff, and (4) tracts within 3 percentage points of the cutoff. The results based on all census tracts provide a reference, but we focus on the narrower samples to estimate the effects of the CRA on small business lending. The narrower sample will enable a more accurate comparison, but at the cost of statistical power due to smaller sample size.

The primary data used for the analysis are the 1996–2014 CRA aggregate flat files provided by the Federal Financial Institutions Examination Council (FFIEC).[2] The CRA aggregate flat files include information on the number and dollar amount of small business loans originated, aggregated at census tract level, by banks and thrifts. In the CRA report, small business loans are defined as business loans of $1 million or less. The data also provide the number and dollar amount of those loans to businesses with gross annual revenues of $1 million or less. Although they provide relatively limited information as compared with the Home Mortgage Disclosure Act[3] data, the CRA data are the most comprehensive publicly available data on small business lending. Greenstone, Mas, and Nguyen (2015) reported that the CRA data cover approximately 86 percent of all loans amounting $1 million or less.

Using the data set, we test the role of the CRA on four outcome variables: (1) number of small business loans ($1 million or less), (2) dollar amount of small business loans, (3) number of small business loans to small firms (with gross annual revenues of $1 million or less), and (4) dollar

[2] The 1995 CRA reform made depository institutions with assets above a certain asset-size threshold report small business, small farm, and community development lending activity that they originate. Since 2005, the CRA asset-size threshold is adjusted on an annual basis. It was $1 billion in 2005 and is $1.226 billion in 2017.
[3] Pub. L. 94–200, 89 Stat. 1124.

amount of small business loans to small firms. In this article, we focus on small business loan originations, rather than loan purchases, and restrict our sample to census tracts within metropolitan statistical areas or metropolitan divisions.

We supplement the CRA data with data from various other sources. First, we use data on every tract's median income as a percentage of the median income for its surrounding metropolitan area, included in the 1996-to-2014 census and demographics files provided by FFIEC. These data enable us to identify those tracts that receive attention under the CRA based on the 80-percent threshold. In addition, we use decennial censuses and the American Community Survey (ACS) to link various neighborhood characteristics of the census tracts in which the small business loans were originated to the CRA data. These characteristics include population, number of housing units, vacancy rate, homeownership rate, minority population share, share of the population age 25 and over, share of the population that has a bachelor's degree, share of the population with income less than the poverty rate, the ratio of the tract median income to the metropolitan area median income, median house value, and median gross rent. We link data from (1) the 1990 census to the CRA data from 1996 to 2002, (2) the 2000 census to the CRA data from 2003 to 2011, and (3) the 2010 census and the 2006–2010 ACS to the CRA data from 2012 to 2014. Lastly, we obtain the number of establishments from the ZIP Code Business Patterns database from 1996 to 2014. As the data set is reported at ZIP Code level, we converted the data into census tracts using population as weights.

## Trends in Small Business Lending

We begin our analysis by presenting trends in the small business lending from 1996 to 2015, focusing on the small business loans originated in LMI neighborhoods. Panel A of Exhibit 1 shows the number and dollar volume of small business loans by income category of census tracts. In 2015, the depository institutions subject to the CRA originated 5.7 million small business loans totaling $219.2 billion.[4] The number and dollar amounts have changed dramatically during the period from 1996 to 2015, corresponding to some extent to the business cycle fluctuations during the period. The number of small business loans exploded from 2.3 million in 1996 to 13.1 million in 2007 before plummeting to 4.0 million in 2010. The average loan size shrank dramatically between 1996 and 2015; the total dollar volume of lending is effectively the same in 2015 as it was in 1996, despite the fact that the number of loans in 2015 is more than double the number in 1996. As a consequence, the average loan size in 2015 ($38,200) is only about 40 percent of the average loan size in 1996 ($93,650).

The data for small business loans to small businesses show the same pattern (Panel B). Current loan volumes are much higher in 2015 than in 1996, whereas real loan dollars are smaller in 2015 than in 1996. Thus, the average small loan to businesses in 2015 ($26,600) was only 37 percent of the average small loan in 1996 ($70,900).

Exhibit 2 shows how small business loans and loans to small businesses are distributed across census tracts grouped by relative median income. Although the number of loan originations has

[4] All monetary amounts throughout this article are in 2016 dollars.

**Exhibit 1**

Number and Dollar Amount of Small Business Loans by Income, 1996 to 2015

Panel A. All Small Business Loans

| | Number of Small Business Loans (in thousands) | | | | | Dollar Amount of Loans (in $ billions) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All Tracts | Below 50% | 50 to 79% | 80 to 119% | 120+% | All Tracts | Below 50% | 50 to 79% | 80 to 119% | 120+% |
| 1996 | 2,332 | 121 | 372 | 1,157 | 683 | 218.4 | 13.8 | 34.9 | 102.5 | 67.2 |
| 1997 | 2,494 | 128 | 399 | 1,228 | 739 | 232.3 | 14.2 | 37.2 | 108.3 | 72.6 |
| 1998 | 2,488 | 121 | 388 | 1,234 | 745 | 227.3 | 13.4 | 35.6 | 106.7 | 71.6 |
| 1999 | 3,091 | 123 | 451 | 1,554 | 962 | 242.0 | 13.6 | 37.6 | 114.2 | 76.5 |
| 2000 | 4,867 | 191 | 711 | 2,446 | 1,520 | 237.1 | 13.0 | 36.4 | 113.1 | 74.7 |
| 2001 | 5,727 | 250 | 872 | 2,871 | 1,735 | 292.6 | 15.9 | 44.5 | 139.7 | 92.6 |
| 2002 | 7,000 | 287 | 1,062 | 3,534 | 2,118 | 324.9 | 17.0 | 49.4 | 155.8 | 102.7 |
| 2003 | 7,429 | 282 | 1,260 | 3,540 | 2,347 | 347.6 | 16.8 | 61.9 | 158.2 | 110.7 |
| 2004 | 7,708 | 285 | 1,283 | 3,677 | 2,463 | 358.0 | 17.0 | 63.8 | 161.7 | 115.4 |
| 2005 | 7,601 | 257 | 1,245 | 3,594 | 2,505 | 322.3 | 15.3 | 56.6 | 142.8 | 107.7 |
| 2006 | 12,238 | 402 | 1,926 | 5,504 | 4,406 | 350.9 | 15.9 | 60.3 | 153.5 | 121.2 |
| 2007 | 13,079 | 414 | 2,013 | 5,931 | 4,721 | 369.7 | 15.9 | 62.3 | 161.9 | 129.6 |
| 2008 | 10,021 | 318 | 1,504 | 4,505 | 3,695 | 311.5 | 13.5 | 51.8 | 137.1 | 109.1 |
| 2009 | 4,455 | 150 | 665 | 1,975 | 1,665 | 208.8 | 9.7 | 35.7 | 92.1 | 71.3 |
| 2010 | 4,048 | 137 | 598 | 1,780 | 1,533 | 187.6 | 8.9 | 32.2 | 82.9 | 63.6 |
| 2011 | 4,852 | 167 | 725 | 2,130 | 1,830 | 202.7 | 9.4 | 34.8 | 89.0 | 69.5 |
| 2012 | 4,924 | 245 | 801 | 1,972 | 1,906 | 203.7 | 13.8 | 37.8 | 80.3 | 71.8 |
| 2013 | 4,743 | 247 | 789 | 1,889 | 1,818 | 206.7 | 14.0 | 38.7 | 81.4 | 72.7 |
| 2014 | 5,302 | 272 | 895 | 2,101 | 2,034 | 207.4 | 13.8 | 38.7 | 81.3 | 73.6 |
| 2015 | 5,741 | 299 | 983 | 2,265 | 2,194 | 219.2 | 14.2 | 40.6 | 85.4 | 78.9 |

Panel B. Small Business Loans to Businesses With Gross Annual Revenues of $1 Million or Less

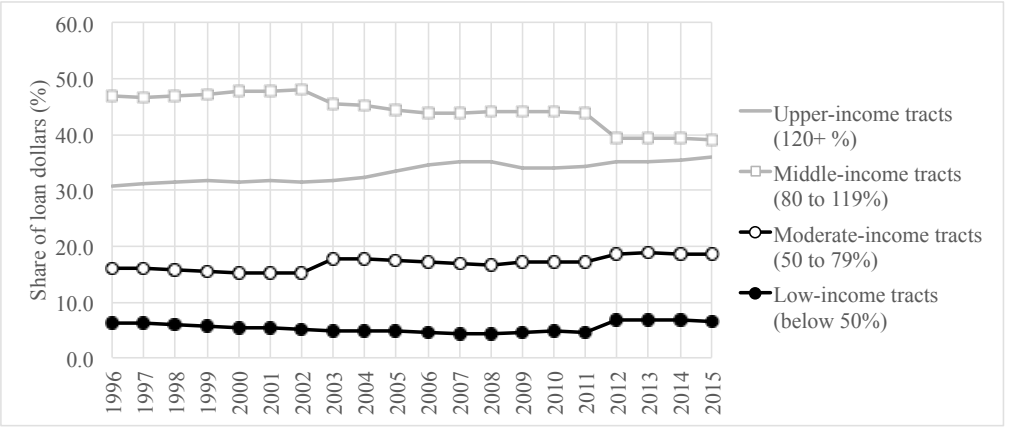
| | Number of Small Business Loans (in thousands) | | | | | Dollar Amount of Loans (in $ billions) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All Tracts | Below 50% | 50 to 79% | 80 to 119% | 120+% | All Tracts | Below 50% | 50 to 79% | 80 to 119% | 120+% |
| 1996 | 1,334 | 57 | 201 | 688 | 388 | 94.6 | 4.8 | 14.1 | 46.1 | 29.5 |
| 1997 | 1,260 | 52 | 186 | 647 | 375 | 98.1 | 4.8 | 14.1 | 47.1 | 32.2 |
| 1998 | 1,451 | 57 | 211 | 745 | 438 | 107.7 | 5.0 | 15.2 | 52.2 | 35.4 |
| 1999 | 1,858 | 68 | 262 | 950 | 579 | 117.7 | 5.3 | 16.6 | 57.5 | 38.3 |
| 2000 | 2,022 | 72 | 286 | 1,042 | 621 | 110.0 | 4.9 | 15.5 | 54.2 | 35.5 |
| 2001 | 2,481 | 104 | 373 | 1,259 | 744 | 134.9 | 5.8 | 18.6 | 66.5 | 44.0 |
| 2002 | 2,215 | 82 | 310 | 1,137 | 686 | 145.2 | 6.1 | 19.8 | 71.5 | 47.9 |
| 2003 | 2,851 | 95 | 465 | 1,386 | 905 | 161.4 | 6.3 | 26.3 | 76.1 | 52.8 |
| 2004 | 2,919 | 92 | 464 | 1,419 | 944 | 160.0 | 6.1 | 26.0 | 74.7 | 53.2 |
| 2005 | 3,646 | 110 | 565 | 1,749 | 1,221 | 146.7 | 5.7 | 23.4 | 66.8 | 50.7 |
| 2006 | 4,483 | 134 | 686 | 2,102 | 1,561 | 154.7 | 5.8 | 24.4 | 69.6 | 54.8 |
| 2007 | 4,988 | 146 | 763 | 2,345 | 1,735 | 154.2 | 5.5 | 24.1 | 69.8 | 54.8 |
| 2008 | 3,135 | 91 | 470 | 1,486 | 1,088 | 115.4 | 4.1 | 17.6 | 53.1 | 40.6 |
| 2009 | 1,527 | 44 | 223 | 721 | 538 | 77.6 | 2.7 | 11.8 | 35.6 | 27.4 |
| 2010 | 1,422 | 41 | 206 | 667 | 509 | 68.9 | 2.5 | 10.3 | 31.6 | 24.5 |
| 2011 | 2,192 | 67 | 312 | 983 | 831 | 76.1 | 2.7 | 11.5 | 34.5 | 27.4 |
| 2012 | 2,183 | 96 | 341 | 877 | 869 | 75.2 | 3.9 | 12.7 | 30.4 | 28.1 |
| 2013 | 2,315 | 104 | 364 | 921 | 926 | 75.2 | 3.9 | 12.9 | 30.3 | 28.1 |
| 2014 | 2,494 | 116 | 406 | 990 | 982 | 72.7 | 3.9 | 12.4 | 29.1 | 27.2 |
| 2015 | 3,015 | 143 | 500 | 1,194 | 1,179 | 80.1 | 4.2 | 13.5 | 31.9 | 30.5 |

*Notes: Based on the Federal Financial Institutions Examination Council's tract classification rules, neighborhoods are categorized by Median Family Income (MFI) into low- (less than 50% of MFI), moderate- (50 to 79% of MFI), middle- (80 to 119% of MFI), and upper- (equal to or more than 120% of MFI) income. The sample is restricted to small business loans in metropolitan statistical areas or metropolitan divisions, reported by the lending institutions that are subject to the Community Reinvestment Act (CRA) of 1977. Dollar figures are adjusted to 2016 dollars.*
*Source: 1996–2015 CRA aggregate flat files*

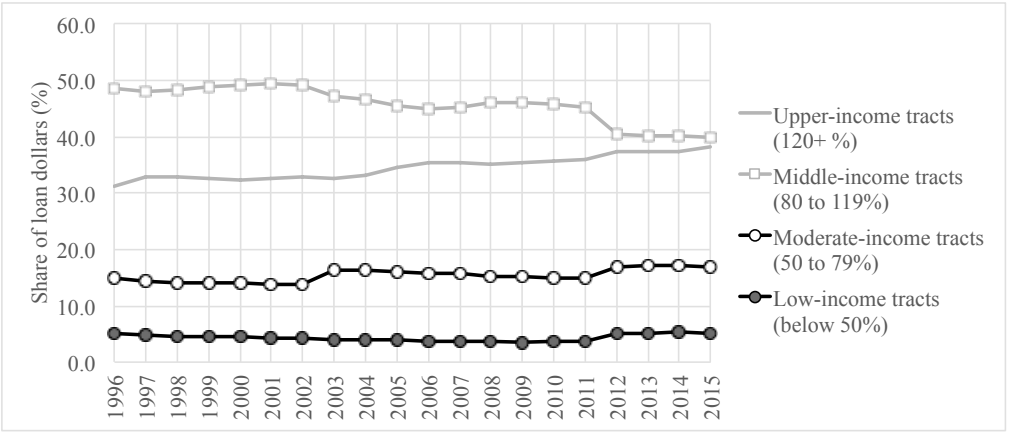
**Exhibit 2**

Distribution of Small Business Loan Dollars Across Tracts Grouped by Relative Median Income, 1996 to 2015

Panel A. All Small Loans




Panel B. Small Loans to Small Businesses




*Notes: Based on the Federal Financial Institutions Examination Council's tract classification rules, neighborhoods are categorized by Median Family Income (MFI) into low- (less than 50% of MFI), moderate- (50 to 79% of MFI), middle- (80 to 119% of MFI), and upper- (equal to or more than 120% of MFI) income. The sample is restricted to small business loans in metropolitan statistical areas or metropolitan divisions, reported by the lending institutions that are subject to the Community Reinvestment Act (CRA) of 1977.*
*Source: 1996–2015 CRA aggregate flat files*

fluctuated during the period, the dollar-calculated share of loans has been relatively stable, even during the financial crisis of 2007 through 2008. Upper- and middle-income tracts have received between 75 and 80 percent of small business loan dollars, while LMI tracts have received from 20 to 25 percent of small business loan dollars. The skew of loan dollars to more affluent neighborhoods may not come as a surprise, but the lack of variation through the difference stages of the business cycle does.[5] One might have expected increasing concentrations in higher-income tracts as the economy weakened. One sees similar trends when shares are calculated based on the number of loans.[6]

## Regression Discontinuity Analysis

To examine whether the evidence is consistent with the view that the CRA influences small business lending, we pooled the CRA aggregate flat files from 1996 to 2014 and conducted regressions using samples that vary in terms of the bandwidths around the 80-percent CRA eligibility threshold (regression discontinuity samples). Exhibit 3 presents the results for regressions including four distinct dependent variables: (1) number of small business loans (panel A), (2) dollar amount of small business loans (panel B), (3) number of small business loans to firms with gross annual revenues of $1 million or less (panel C), and (4) dollar amount of small business loans to firms with gross annual revenues of $1 million or less (panel D).

Before turning to the main relationships of interest, we discuss the relationships between the dependent variables and the covariates. The relationships are largely consistent across the four regressions and conform to expectations. Small business lending activity, whether measured in terms of the number of loans or the loan dollar volume, is greater in census tracts with more business establishments and more residents with college degrees and less in tracts with higher homeownership rates, minority population shares, unemployment rates, median rents, and median house value. We also generally observe less small business lending activity in tracts with larger populations and in tracts with higher vacancy rates. The one exception is that the results show that small business lending activity is higher in tracts that have higher poverty rates. This finding is somewhat surprising but could be explained by the fact that small businesses often lack the capital and cash flows required to locate in more affluent communities. It could also be the result of general land use patterns, as higher-income neighborhoods tend to be more residential and not have large commercial corridors. These relationships, which almost uniformly conform to what is seen in other research on small business lending, suggest that the regression results represent legitimate relationships (Bates, 1997, 1991; Bates and Robb, 2015; Bostic and Lampani, 1999; Cavalluzzo and Cavalluzzo, 1998; Immergluck, 1999, 2004).

Turning to the variable of interest—being in a CRA-covered LMI tract—we see that the full sample shows small significant positive relationships, which would generally be consistent with the idea that the CRA had significant positive effects on small business lending activity. However, further examination calls this interpretation into question. Coefficient estimates on LMI status become

[5] We observe two discontinuities in the data, in 2002–2003 and in 2011–2012. We believe these discontinuities are a result of updates to the census tract boundaries that occur with each decennial census.

[6] The calculation, not shown in this article, is available on request from the authors.

**Exhibit 3**

Results of Regression Discontinuity Analysis, 1996–2014 (1 of 4)

Panel A. Number of Small Business Loans

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 1.368 | *** | 0.559 | | – 0.076 | | 0.142 | |
| **Neighborhood characteristics** | | | | | | | | |
| Population | 0.001 | *** | – 0.003 | *** | – 0.001 | *** | – 0.001 | |
| Housing units | 0.007 | *** | 0.010 | *** | 0.002 | | – 0.000 | |
| Establishments | 0.512 | *** | 0.504 | *** | 0.577 | *** | 0.593 | *** |
| % vacancy | 0.224 | *** | – 0.257 | *** | – 0.076 | | 0.021 | |
| % homeownership | – 0.181 | *** | – 0.285 | *** | – 0.285 | *** | – 0.264 | *** |
| % minority | – 0.347 | *** | – 0.291 | *** | – 0.320 | *** | – 0.321 | *** |
| % bachelor's or higher | 0.399 | *** | 0.297 | *** | 0.153 | ** | 0.155 | * |
| % unemployed | – 0.136 | *** | 0.015 | | 0.062 | | – 0.385 | ** |
| % poverty | 0.354 | *** | 0.296 | *** | 0.364 | *** | 0.116 | |
| Median income ratio | 0.372 | *** | 0.395 | *** | 0.217 | | 0.468 | |
| Median gross rent | – 0.008 | *** | – 0.022 | *** | – 0.021 | *** | – 0.029 | *** |
| Median value | – 0.000 | *** | – 0.000 | *** | – 0.000 | ** | – 0.000 | *** |
| **Year FEs (Ref. 1996)** | | | | | | | | |
| 1997 | 0.237 | | – 0.198 | | – 0.538 | | – 1.219 | |
| 1998 | – 1.387 | *** | – 1.544 | ** | – 1.624 | | – 2.180 | |
| 1999 | 7.999 | *** | 5.404 | *** | 5.420 | *** | 4.522 | *** |
| 2000 | 36.977 | *** | 28.536 | *** | 28.488 | *** | 26.724 | *** |
| 2001 | 50.671 | *** | 41.134 | *** | 41.220 | *** | 38.900 | *** |
| 2002 | 70.340 | *** | 57.738 | *** | 57.699 | *** | 53.809 | *** |
| 2003 | 66.064 | *** | 53.628 | *** | 55.936 | *** | 50.026 | *** |
| 2004 | 69.124 | *** | 55.496 | *** | 58.269 | *** | 52.310 | *** |
| 2005 | 66.596 | *** | 51.717 | *** | 54.216 | *** | 48.514 | *** |
| 2006 | 137.182 | *** | 102.317 | *** | 104.463 | *** | 98.313 | *** |
| 2007 | 149.185 | *** | 110.945 | *** | 112.906 | *** | 106.781 | *** |
| 2008 | 102.890 | *** | 72.249 | *** | 74.669 | *** | 68.497 | *** |
| 2009 | 18.422 | *** | 6.805 | *** | 9.554 | *** | 3.437 | * |
| 2010 | 12.367 | *** | 1.820 | ** | 4.649 | *** | – 1.394 | |
| 2011 | 25.126 | *** | 11.909 | *** | 14.880 | *** | 8.744 | *** |
| 2012 | 24.957 | *** | 15.872 | *** | 17.913 | *** | 15.516 | *** |
| 2013 | 21.770 | *** | 13.758 | *** | 15.653 | *** | 13.198 | *** |
| 2014 | 28.631 | *** | 19.806 | *** | 22.069 | *** | 19.144 | *** |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.410 | | 0.357 | | 0.350 | | 0.359 | |
| Number of observations | 1,213,980 | | 264,734 | | 133,133 | | 79,091 | |

**Exhibit 3**

Results of Regression Discontinuity Analysis, 1996–2014 (2 of 4)

Panel B. Dollar Amount (in Thousands) of Small Business Loans

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 157.284 | *** | – 13.621 | | – 43.193 | | 10.004 | |
| **Neighborhood characteristic** | | | | | | | | |
| Population | – 0.179 | *** | – 0.369 | *** | – 0.244 | *** | – 0.179 | *** |
| Housing units | – 0.094 | *** | 0.202 | ** | – 0.381 | *** | – 0.507 | *** |
| Establishments | 32.654 | *** | 31.599 | *** | 35.071 | *** | 34.648 | *** |
| % vacancy | 18.537 | *** | – 4.303 | | 9.988 | ** | 13.483 | ** |
| % homeownership | – 36.723 | *** | – 34.483 | *** | – 35.554 | *** | – 34.592 | *** |
| % minority | – 8.516 | *** | – 7.396 | *** | – 11.817 | *** | – 14.364 | *** |
| % bachelor's or higher | – 11.465 | *** | – 20.361 | *** | – 24.934 | *** | – 26.071 | *** |
| % unemployed | – 13.881 | *** | – 4.937 | | – 13.469 | | – 38.580 | * |
| % poverty | 3.193 | *** | 17.702 | *** | 22.183 | *** | 9.124 | |
| Median income ratio | 24.015 | *** | 21.545 | *** | 14.200 | | 52.839 | ** |
| Median gross rent | – 0.119 | *** | – 0.001 | | 0.159 | | – 0.528 | *** |
| Median value | – 0.001 | *** | – 0.001 | *** | – 0.001 | * | – 0.003 | *** |
| **Year FEs (Ref. 1996)** | | | | | | | | |
| 1997 | 95.139 | *** | 62.077 | | 67.704 | | 23.825 | |
| 1998 | – 34.070 | | – 40.764 | | – 48.726 | | – 79.750 | |
| 1999 | 169.949 | *** | 147.719 | ** | 153.953 | | 120.315 | |
| 2000 | 44.323 | | 76.579 | | 58.426 | | – 72.395 | |
| 2001 | 952.542 | *** | 747.526 | *** | 704.688 | *** | 562.681 | *** |
| 2002 | 1,392.043 | *** | 1,120.210 | *** | 1,092.542 | *** | 897.420 | *** |
| 2003 | 1,631.522 | *** | 1,519.169 | *** | 1,600.939 | *** | 1,130.636 | *** |
| 2004 | 1,711.392 | *** | 1,569.795 | *** | 1,691.739 | *** | 1,205.396 | *** |
| 2005 | 1,105.599 | *** | 996.182 | *** | 1,094.211 | *** | 607.780 | *** |
| 2006 | 1,492.491 | *** | 1,231.292 | *** | 1,354.065 | *** | 903.729 | *** |
| 2007 | 1,722.410 | *** | 1,382.915 | *** | 1,480.346 | *** | 1,021.885 | *** |
| 2008 | 876.474 | *** | 728.665 | *** | 832.337 | *** | 353.352 | |
| 2009 | – 619.574 | *** | – 416.929 | *** | – 308.445 | ** | – 787.210 | *** |
| 2010 | – 929.205 | *** | – 664.522 | *** | – 563.048 | *** | – 1,040.692 | *** |
| 2011 | – 675.790 | *** | – 464.771 | *** | – 345.630 | ** | – 825.632 | *** |
| 2012 | – 634.690 | *** | – 375.300 | *** | – 364.694 | *** | – 533.726 | *** |
| 2013 | – 623.969 | *** | – 339.416 | *** | – 327.930 | *** | – 506.278 | *** |
| 2014 | – 658.897 | *** | – 368.798 | *** | – 342.551 | *** | – 561.497 | *** |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.270 | | 0.197 | | 0.186 | | 0.153 | |
| Number of observations | 1,213,980 | | 264,734 | | 133,133 | | 79,091 | |

**Exhibit 3**

Results of Regression Discontinuity Analysis, 1996–2014 (3 of 4)

Panel C. Number of Small Business Loans to Small Firms

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | – 0.163 | | 0.213 | | 0.402 | | 0.358 | |
| **Neighborhood characteristics** | | | | | | | | |
| Population | 0.001 | *** | – 0.001 | *** | – 0.000 | | – 0.000 | |
| Housing units | 0.004 | *** | 0.005 | *** | 0.002 | *** | 0.002 | ** |
| Establishments | 0.179 | *** | 0.171 | *** | 0.198 | *** | 0.201 | *** |
| % vacancy | 0.004 | | – 0.190 | *** | – 0.115 | *** | – 0.088 | *** |
| % homeownership | – 0.062 | *** | – 0.095 | *** | – 0.089 | *** | – 0.086 | *** |
| % minority | – 0.132 | *** | – 0.118 | *** | – 0.128 | *** | – 0.134 | *** |
| % bachelor's or higher | 0.216 | *** | 0.207 | *** | 0.163 | *** | 0.162 | *** |
| % unemployed | – 0.013 | | – 0.023 | | – 0.024 | | – 0.115 | ** |
| % poverty | 0.113 | *** | 0.132 | *** | 0.154 | *** | 0.099 | *** |
| Median income ratio | 0.121 | *** | 0.161 | *** | 0.186 | *** | 0.185 | |
| Median gross rent | – 0.004 | *** | – 0.010 | *** | – 0.009 | *** | – 0.012 | *** |
| Median value | – 0.000 | *** | – 0.000 | | 0.000 | | – 0.000 | ** |
| **Year FEs (Ref. 1996)** | | | | | | | | |
| 1997 | – 2.100 | *** | – 2.276 | *** | – 2.340 | *** | – 2.542 | *** |
| 1998 | 0.645 | *** | – 0.107 | | – 0.197 | | – 0.334 | |
| 1999 | 7.222 | *** | 5.005 | *** | 5.057 | *** | 4.882 | *** |
| 2000 | 9.621 | *** | 7.218 | *** | 7.216 | *** | 6.843 | *** |
| 2001 | 17.072 | *** | 13.730 | *** | 13.627 | *** | 12.984 | *** |
| 2002 | 12.000 | *** | 8.556 | *** | 8.406 | *** | 7.574 | *** |
| 2003 | 17.912 | *** | 14.033 | *** | 15.099 | *** | 13.246 | *** |
| 2004 | 18.528 | *** | 14.175 | *** | 15.327 | *** | 13.562 | *** |
| 2005 | 29.422 | *** | 22.286 | *** | 23.273 | *** | 21.402 | *** |
| 2006 | 42.023 | *** | 31.260 | *** | 32.130 | *** | 30.183 | *** |
| 2007 | 49.472 | *** | 37.472 | *** | 38.301 | *** | 36.245 | *** |
| 2008 | 21.202 | *** | 14.502 | *** | 15.531 | *** | 13.625 | *** |
| 2009 | – 3.132 | *** | – 5.197 | *** | – 4.132 | *** | – 6.097 | *** |
| 2010 | – 4.685 | *** | – 6.583 | *** | – 5.446 | *** | – 7.344 | *** |
| 2011 | 7.331 | *** | 1.797 | *** | 2.925 | *** | 0.925 | |
| 2012 | 5.508 | *** | 1.775 | *** | 2.921 | *** | 2.487 | *** |
| 2013 | 7.106 | *** | 2.787 | *** | 3.815 | *** | 3.438 | *** |
| 2014 | 9.295 | *** | 5.077 | *** | 6.282 | *** | 5.815 | *** |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.401 | | 0.335 | | 0.348 | | 0.341 | |
| Number of observations | 1,213,980 | | 264,734 | | 133,133 | | 79,091 | |

**Exhibit 3**

Results of Regression Discontinuity Analysis, 1996–2014 (4 of 4)

Panel D. Dollar Amount (in Thousands) of Business Loans to Small Firms

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 85.835 | *** | – 9.557 | | 9.043 | | 10.991 | |
| **Neighborhood characteristics** | | | | | | | | |
| Population | – 0.038 | *** | – 0.130 | *** | – 0.078 | *** | – 0.069 | *** |
| Housing units | 0.195 | *** | 0.291 | *** | 0.090 | *** | 0.103 | *** |
| Establishments | 10.252 | *** | 9.407 | *** | 10.337 | *** | 9.830 | *** |
| % vacancy | 2.184 | *** | – 8.414 | *** | – 3.483 | *** | – 3.971 | *** |
| % homeownership | – 13.259 | *** | – 13.062 | *** | – 13.052 | *** | – 12.448 | *** |
| % minority | – 3.264 | *** | – 2.809 | *** | – 3.978 | *** | – 4.860 | *** |
| % bachelor's or higher | 3.387 | *** | 0.199 | | – 0.754 | | – 1.919 | |
| % unemployed | – 5.173 | *** | – 4.473 | *** | – 6.287 | *** | – 12.043 | *** |
| % poverty | 3.021 | *** | 10.520 | *** | 11.568 | *** | 9.336 | *** |
| Median income ratio | 10.950 | *** | 10.432 | *** | 13.837 | *** | 18.362 | ** |
| Median gross rent | – 0.180 | *** | – 0.192 | *** | – 0.119 | *** | – 0.277 | *** |
| Median value | – 0.000 | *** | 0.000 | | 0.000 | | – 0.000 | * |
| **Year FEs (Ref. 1996)** | | | | | | | | |
| 1997 | 13.359 | | – 36.431 | * | – 37.483 | | – 62.449 | |
| 1998 | 161.172 | *** | 86.519 | *** | 93.639 | *** | 81.821 | * |
| 1999 | 311.794 | *** | 222.048 | *** | 235.004 | *** | 222.586 | *** |
| 2000 | 163.312 | *** | 119.800 | *** | 119.730 | *** | 78.528 | * |
| 2001 | 572.105 | *** | 415.413 | *** | 405.562 | *** | 365.309 | *** |
| 2002 | 711.259 | *** | 517.698 | *** | 505.751 | *** | 455.856 | *** |
| 2003 | 798.475 | *** | 703.885 | *** | 748.147 | *** | 623.367 | *** |
| 2004 | 752.324 | *** | 661.010 | *** | 726.854 | *** | 607.474 | *** |
| 2005 | 528.510 | *** | 449.287 | *** | 507.231 | *** | 384.615 | *** |
| 2006 | 635.176 | *** | 504.336 | *** | 574.988 | *** | 459.529 | *** |
| 2007 | 609.207 | *** | 484.533 | *** | 544.791 | *** | 413.074 | *** |
| 2008 | 27.721 | ** | 36.656 | | 101.241 | *** | – 27.467 | |
| 2009 | – 529.544 | *** | – 404.294 | *** | – 355.247 | *** | – 476.979 | *** |
| 2010 | – 659.078 | *** | – 516.316 | *** | – 461.213 | *** | – 583.210 | *** |
| 2011 | – 540.328 | *** | – 429.045 | *** | – 368.175 | *** | – 493.373 | *** |
| 2012 | – 599.313 | *** | – 439.903 | *** | – 406.926 | *** | – 443.850 | *** |
| 2013 | – 610.139 | *** | – 441.388 | *** | – 407.550 | *** | – 444.015 | *** |
| 2014 | – 661.552 | *** | – 490.633 | *** | – 443.572 | *** | – 497.518 | *** |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.285 | | 0.229 | | 0.228 | | 0.213 | |
| Number of observations | 1,213,980 | | 264,734 | | 133,133 | | 79,091 | |

*FE = fixed effects. LMI = low- and moderate-income.*

** p < 0.1. ** p < 0.05. *** p < 0.01.*

*Notes: Robust standard errors are in parentheses. The fixed effects regression models were conducted for county fixed effects. The sample is restricted to small business loans, in metropolitan statistical areas or metropolitan divisions, reported by the lending institutions that are subject to the Community Reinvestment Act of 1977. Headers of columns 3–5 indicate interval rotations for the samples used.*

statistically insignificant as we narrow the bandwidth around the 80-percent CRA threshold. It would seem that the link between the CRA and small business lending activity from 1996 to 2014 is, at best, weak.

However, the pooled cross-sectional regressions, which present average effects of the CRA on small business lending from 1996 to 2014, might conceal changes in the CRA impacts during a period of nearly two decades that included two recessions and two long periods of extended growth. To find out, we repeated this regression discontinuity analysis on an annual basis, and the results based on the sample 77-to-83 bands are shown in exhibit 4.[7] The error bars, in light gray, show the 95-percent confidence intervals and indicate that the estimated coefficients on the LMI dummy are not statistically different from 0 in general. However, we can observe certain cycles in the effects of the CRA over time. Although statistically not significant, positive estimated coefficients are mainly found in the 1996-to-2003 and 2012-to-2014 regressions, and negative coefficient estimates are found in the 2003-to-2011 regressions.

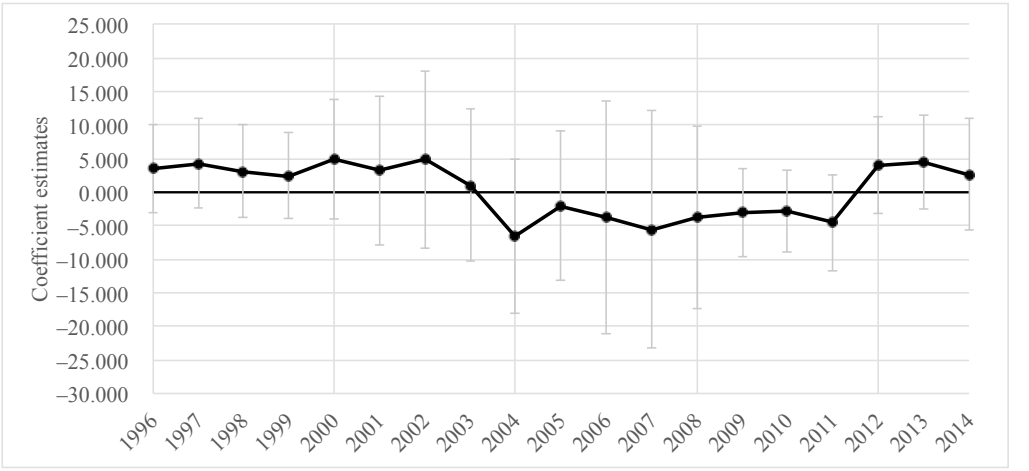
The three distinctive periods coincide with the years when the LMI status was determined based on the 1990 census, 2000 census, and 2006–2010 ACS 5-year estimates, respectively. Thus, we pooled the CRA data into those three time periods and repeated the regression analysis. The results are shown in exhibits 5 through 7. As one might expect, the CRA impact generally is found to be positive for both the number and amount of small business loans in the 1996-to-2002 sample, even within a narrow range around the income threshold (exhibit 5). During this period, the effects are strongest in the regressions using the narrowest band, which is the cleanest test of the role of the CRA in influencing small business lending activity. Although no clear relationship between the CRA and the number of small business loans from 2003 to 2011 was seen, we do observe significantly lower small business loan dollar volumes in the LMI neighborhoods as compared with non-CRA eligible tracts (exhibit 6). Finally, during the most recent 3 years of 2012 to 2014, we observe an opposite pattern from that of the 2003-to-2011 period (exhibit 7). Here again, the number of loans is not statistically different in LMI tracts than in other tracts, but the size of the loan dollars is significantly larger.

[7] The relationships for the covariates (available on request) are qualitatively unchanged with varying bandwidths.

**Exhibit 4**

Estimated Coefficients on LMI Dummy From Stratified Regressions by Year, 77 to 83 Percent (1 of 2)

Panel A. Number of Small Business Loans




Panel B. Dollar Amount (in Thousands) of Small Business Loans

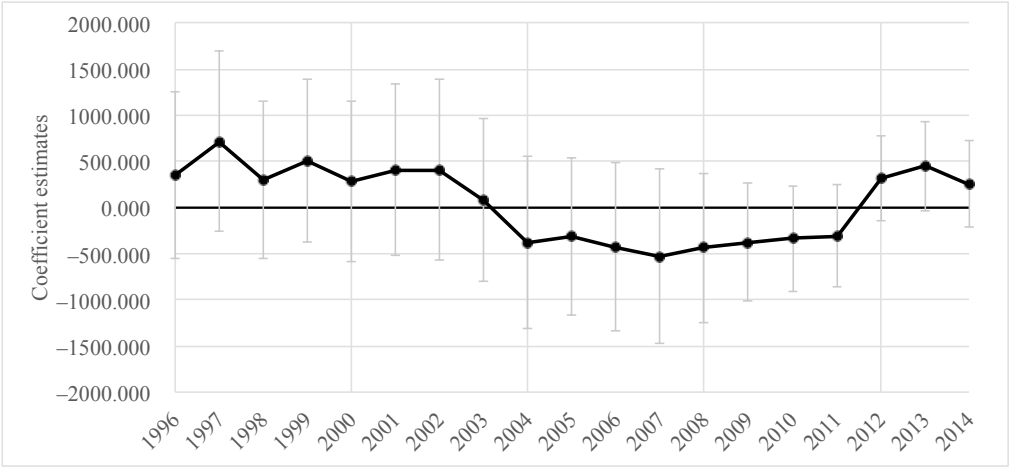
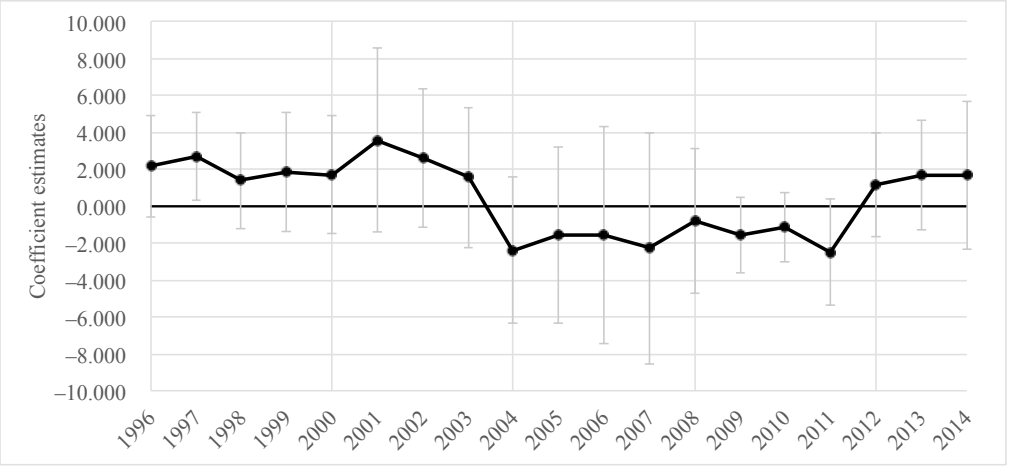


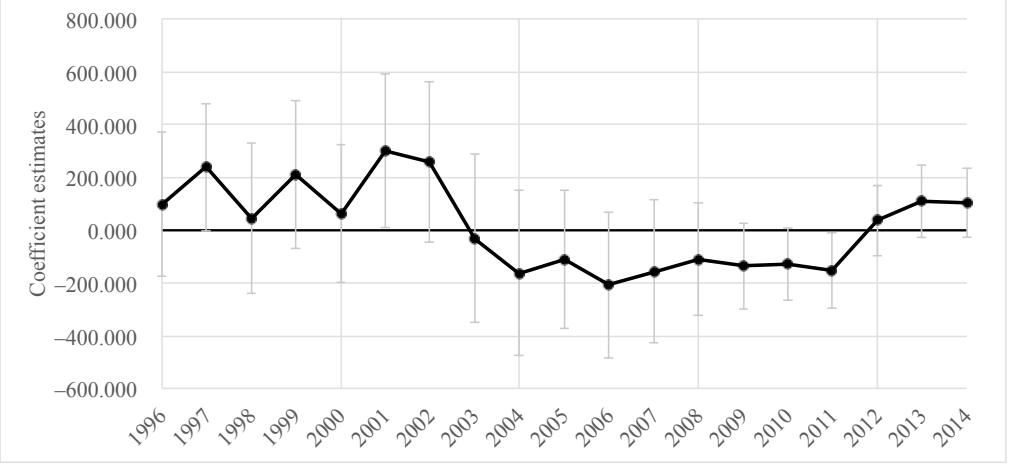
**Exhibit 4**

Estimated Coefficients on LMI Dummy From Stratified Regressions by Year, 77 to 83 Percent (2 of 2)

Panel C. Number of Small Business Loans to Small Firms




Panel D. Dollar Amount (in Thousands) of Business Loans to Small Firms




*LMI = low- and moderate-income.*

*Notes: Estimated coefficients are based on the regression discontinuity analysis, with the sample 77–83% bands, repeated on an annual basis. The error bars, in light gray, show the 95% confidence intervals of the estimates.*

**Exhibit 5**

Results of Regression Discontinuity Analysis, 1996–2002

Panel A. Number of Small Business Loans

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | – 0.533 | | 0.618 | | 0.031 | | 3.685 | ** |
| | (0.435) | | (1.032) | | (1.283) | | (1.689) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.364 | | 0.245 | | 0.221 | | 0.240 | |
| Number of observations | 414,714 | | 92,906 | | 47,371 | | 27,934 | |

Panel B. Dollar Amount (in Thousands) of Small Business Loans

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 177.884 | *** | – 89.343 | | 8.937 | | 410.028 | ** |
| | (41.508) | | (95.883) | | (129.149) | | (161.287) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.247 | | 0.128 | | 0.118 | | 0.089 | |
| Number of observations | 414,714 | | 92,906 | | 47,371 | | 27,934 | |

Panel C. Number of Small Business Loans to Small Firms

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | – 0.273 | | 0.036 | | 0.457 | | 2.263 | *** |
| | (0.175) | | (0.355) | | (0.472) | | (0.633) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.332 | | 0.213 | | 0.250 | | 0.233 | |
| Number of observations | 414,714 | | 92,906 | | 47,371 | | 27,934 | |

Panel D. Dollar Amount (in Thousands) of Business Loans to Small Firms

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 99.436 | *** | – 57.241 | ** | 24.809 | | 167.638 | *** |
| | (13.544) | | (27.246) | | (38.573) | | (51.035) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.253 | | 0.173 | | 0.172 | | 0.148 | |
| Number of observations | 414,714 | | 92,906 | | 47,371 | | 27,934 | |

*FE = fixed effects. LMI = low- and moderate-income.*

** $p < 0.05$. *** $p < 0.01$.

*Notes: Robust standard errors are in parentheses. The fixed effects regression models were conducted for county fixed effects. The sample is restricted to small business loans, in metropolitan statistical areas or metropolitan divisions, reported by the lending institutions that are subject to the Community Reinvestment Act of 1977. Headers of columns 3–5 indicate interval rotations for the samples used.*

**Exhibit 6**

Results of Regression Discontinuity Analysis, 2003–2011

Panel A. Number of Small Business Loans

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | – 1.213 | ** | – 1.016 | | – 2.303 | | – 3.297 | * |
| | (0.532) | | (1.031) | | (1.462) | | (1.916) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.421 | | 0.397 | | 0.410 | | 0.413 | |
| Number of observations | 583,102 | | 127,974 | | 63,474 | | 37,604 | |

Panel B. Dollar Amount (in Thousands) of Small Business Loans

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 80.884 | *** | – 19.232 | | – 193.724 | ** | – 287.597 | ** |
| | (30.023) | | (61.382) | | (89.751) | | (120.825) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.282 | | 0.250 | | 0.258 | | 0.256 | |
| Number of observations | 583,102 | | 127,974 | | 63,474 | | 37,604 | |

Panel C. Number of Small Business Loans to Small Firms

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | – 1.381 | *** | – 0.801 | ** | – 0.656 | | – 1.192 | * |
| | (0.180) | | (0.370) | | (0.524) | | (0.686) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.430 | | 0.396 | | 0.406 | | 0.408 | |
| Number of observations | 583,102 | | 127,974 | | 63,474 | | 37,604 | |

Panel D. Dollar Amount (in Thousands) of Business Loans to Small Firms

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 56.669 | *** | – 28.554 | | – 44.186 | | – 95.308 | ** |
| | (10.438) | | (20.984) | | (30.615) | | (39.887) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.301 | | 0.254 | | 0.257 | | 0.258 | |
| Number of observations | 583,102 | | 127,974 | | 63,474 | | 37,604 | |

*FE = fixed effects. LMI = low- and moderate-income.*

** p < 0.1. ** p < 0.05. *** p < 0.01.*

*Notes: Robust standard errors are in parentheses. The fixed effects regression models were conducted for county fixed effects. The sample is restricted to small business loans, in metropolitan statistical areas or metropolitan divisions, reported by the lending institutions that are subject to the Community Reinvestment Act of 1977. Headers of columns 3–5 indicate interval rotations for the samples used.*

**Exhibit 7**

Results of Regression Discontinuity Analysis, 2012–2014

Panel A. Number of Small Business Loans

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 1.284 | *** | 2.437 | ** | 4.723 | *** | 3.604 | * |
| | (0.483) | | (1.141) | | (1.599) | | (2.080) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.364 | | 0.273 | | 0.276 | | 0.285 | |
| Number of observations | 216,162 | | 43,773 | | 22,149 | | 13,403 | |

Panel B. Dollar Amount (in Thousands) of Small Business Loans

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 80.604 | ** | 88.211 | | 384.676 | *** | 317.680 | ** |
| | (32.802) | | (76.705) | | (104.817) | | (129.645) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.232 | | 0.192 | | 0.193 | | 0.210 | |
| Number of observations | 216,162 | | 43,773 | | 22,149 | | 13,403 | |

Panel C. Number of Small Business Loans to Small Firms

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 0.614 | *** | 1.346 | *** | 2.065 | *** | 1.349 | |
| | (0.198) | | (0.492) | | (0.698) | | (0.935) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.408 | | 0.280 | | 0.263 | | 0.271 | |
| Number of observations | 216,162 | | 43,773 | | 22,149 | | 13,403 | |

Panel D. Dollar Amount (in Thousands) of Business Loans to Small Firms

| | All Tracts | | [70%, 90%) | | [75%, 85%) | | [77%, 83%) | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. | Coef. | Sig. |
| LMI tract | 50.702 | *** | 45.896 | ** | 111.915 | *** | 75.031 | ** |
| | (9.022) | | (21.874) | | (29.691) | | (36.889) | |
| Neighborhood characteristics | Yes | | Yes | | Yes | | Yes | |
| County FEs | Yes | | Yes | | Yes | | Yes | |
| Year FEs | Yes | | Yes | | Yes | | Yes | |
| Within *R*-squared | 0.253 | | 0.185 | | 0.161 | | 0.178 | |
| Number of observations | 216,162 | | 43,773 | | 22,149 | | 13,403 | |

*FE = fixed effects. LMI = low- and moderate-income.*

** p < 0.1. ** p < 0.05. *** p < 0.01.*

*Notes: Robust standard errors are in parentheses. The fixed effects regression models were conducted for county fixed effects. The sample is restricted to small business loans, in metropolitan statistical areas or metropolitan divisions, reported by the lending institutions that are subject to the Community Reinvestment Act of 1977. Headers of columns 3–5 indicate interval rotations for the samples used.*

## Conclusion

The CRA was enacted in response to concerns that banking institutions were not allocating sufficient capital to neighborhoods in their service areas that had been historically underserved. As part of the evolution of the CRA, starting in 1995, banking institutions were required to report on the geographic distribution of their small business lending activity, both in terms of numbers of loans and the total volume of lending in dollars. The hope was that greater transparency in actual bank activity would trigger scrutiny of the lending sector and trigger changes in practices that would lead to increased small business lending in targeted geographies.

This article reviews how small business lending activity has evolved since the small business data reporting requirement was introduced. Between 1996 and 2015, the number of small business loans increased dramatically, but the total dollar volume of small business lending in 2015 was largely unchanged from 1996. Thus, the size of the average small business loan was smaller in 2015 than in 1996. The data also show that 75 to 80 percent of all small business lending occurred in upper- and middle-income census tracts, and this share was consistent throughout the entire period.

Regarding the effect of the CRA, analyses using the pooled sample suggest that the CRA has had minimal effect on the geographic distribution of small business lending activity since the introduction of the data-reporting requirement. However, subsequent analysis shows that this initial conclusion is a function of three different trends. We observe significant positive associations between small business lending activity and being a CRA-covered census tract from 1996 to 2002 and from 2012 to 2014. These periods are marked by steady economic growth. By contrast, we observe a negative relationship between small business loan dollar volume and being a CRA-covered census tract during the 2003-to-2011 period. During the same period, however, we find no significant relationship between the number of small business loans and CRA designation.

The positive relationships observed in the 1996-to-2002 period support the view that the CRA has influenced the distribution of small business credit, as does the relationship in the 2012-to-2014 period. In the latter case, the relationship is significant for loan dollars but not for the number of loans, which could reflect a desire for reinvestment by businesses that had survived the Great Recession and were positioned to become larger and more mature, coupled with weakened aggregate demand by small businesses generally in the wake of the Great Recession. The pattern of the relationships in the 2003-to-2011 period is interesting and suggests that banks may have responded to the more turbulent economic period by sustaining loan numbers so as not to trigger CRA concerns but reducing loan volumes to limit their exposure to perceived higher risks posed by businesses in CRA-designated neighborhoods. The insignificant result for number of loans could also be a function of fewer applications for loans, as businesses might have been less likely to seek financing in the midst of a deep recession.

These results have some interesting implications. First, they suggest that banking institutions respond affirmatively to CRA incentives during times of economic growth. At least two possible dynamics might be at work. First, periods of economic growth will be times when banking institutions might be considering making strategic moves, such as acquisitions and expansions, that will

be subject to CRA scrutiny, so banking institutions will have an incentive to score well along CRA dimensions. Second, it is during periods of economic growth that conventional notions of marginal borrowers might no longer hold, such that borrowers who might not have been deemed good prospects might be viewed in a different light. In such an instance, we might observe experimentation and a willingness to expand the margin such that loans in geographies that were previously "off limits" become acceptable. Our results suggest that the CRA establishes markers about where the thresholds for acceptability might lie. The significant break in small business lending activity that occurs at the 80-percent threshold established by the CRA strongly suggests that lenders view the CRA cutoff as a clear delineation of where such experimentation should occur.

Another important implication of our results is that broader macroeconomic forces swamp the specific social incentives introduced by the CRA. During times when economic performance is particularly uncertain, we observe that banking institutions "flee to safety," and retrench their lending activity such that places that are widely viewed to be marginal, whether that perception is legitimate or not, receive significantly less lending. Thus, market and risk perceptions trump social purpose when economic uncertainty is broader.

It is important to emphasize that this study tests only indirectly whether the CRA influenced decisionmaking at an institutional level. We examine whether small business lending activity was elevated in CRA-covered census tracts, which is different from examining whether institutions covered by the CRA increased their lending activity in CRA-covered census tracts. Future research should conduct this more direct test of the CRA's effect on small business lending activity, as well as the effects of this investment on the revitalization of LMI neighborhoods.

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## References

Agarwal, Sumit, Efraim Benmelech, Nittai Bergman, and Amit Seru. 2012. Did the Community Reinvestment Act (CRA) Lead to Risky Lending? NBER Working Paper No. w18609. Cambridge, MA: National Bureau of Economic Research.

Avery, Robert, Raphael W. Bostic, and Glenn B. Canner. 2005. "Assessing the Necessity and Efficiency of the Community Reinvestment Act," *Housing Policy Debate* 16 (1): 143–172.

Avery, Robert, and Kenneth Brevoort. 2015. "The Subprime Crisis: Is Government Housing Policy to Blame?" *Review of Economics and Statistics* 97 (2): 352–363.

Bates, Timothy. 1997. "Unequal Access: Financial Institution Lending to Black- and White-Owned Small Business Startups," *Journal of Urban Affairs* 19 (4): 487–495.

———. 1991. "Commercial Bank Financing of White and Black-Owned Small Business Start-Ups," *Quarterly Review of Economics and Business* 31 (1): 64–80.

Bates, Timothy, and Alicia Robb. 2015. "Has the Community Reinvestment Act Increased Loan Availability Among Small Businesses Operating in Minority Neighbourhoods?" *Urban Studies* 52 (9): 1702–1721.

Berry, Christopher, and Sarah Lee. 2007. The Community Reinvestment Act: A Regression Discontinuity Analysis. Harris School Working Paper Series No. 704. Chicago, IL: University of Chicago.

Bhutta, Neil. 2011. "The Community Reinvestment Act and Mortgage Lending to Lower Income Borrowers and Neighborhoods," *The Journal of Law and Economics* 54 (4): 953–983.

Blanchflower, David G., Phillip B. Levine, and David J. Zimmerman. 2003. "Discrimination in the Small-Business Credit Market," *Review of Economics and Statistics* 85 (4): 930–943.

Bostic, Raphael W., and K. Patrick Lampani. 1999. "Racial Differences in Patterns of Small Business Finance: The Importance of Local Geography." In *Business Access to Capital and Credit: A Federal Reserve System Research Conference*, edited by Jackson L. Blanton, Alicia Williams, and Sherrie L.W. Rhine. Washington, DC: Federal Reserve System: 149–179.

Bostic, Raphael W., and Breck L. Robinson. 2005. "What Makes Community Reinvestment Act Agreements Work? A Study of Lender Responses," *Housing Policy Debate* 16 (3–4): 513–545.

———. 2003. "Do CRA Agreements Influence Lending Patterns?" *Real Estate Economics* 31 (1): 23–51.

Canner, Glenn B. 1999. "Evaluation of CRA Data on Small Business Lending." In *Business Access to Capital and Credit: A Federal Reserve System Research Conference*, edited by Jackson L. Blanton, Alicia Williams, and Sherrie L.W. Rhine. Washington, DC: Federal Reserve System: 53–84.

Cavalluzzo, Ken, and Linda Cavalluzzo. 1998. "Market Structure and Discrimination: The Case of Small Businesses," *Journal of Money, Credit, and Banking* 30 (4): 771–792.

Gabriel, Stuart A., and Stuart Rosenthal. 2008. "The GSEs, CRA, and Homeownership in Targeted Underserved Neighborhoods." In *Conference on Built Environment: Access, Finance, and Policy*. Cambridge, MA: Lincoln Institute of Land Policy: 202–229.

Garwood, Griffith L., and Dolores S. Smith. 1993. "Community Reinvestment Act: Evolution and Current Issues," *Federal Reserve Bulletin* 79: 251–267.

Green, Richard K., and Michelle J. White. 1997. "Measuring the Benefits of Homeowning: Effects on Children," *Journal of Urban Economics* 41 (3): 441–461.

Greenstone, Michael, Alexandre Mas, and Hoai-Luu Nguyen. 2015. Do Credit Market Shocks Affect the Real Economy? Quasi-Experimental Evidence From the Great Recession and Normal Economic Times. NBER Working Paper No. w20704. Cambridge, MA: National Bureau of Economic Research.

Gyourko, Joseph, Peter Linneman, and Susan Wachter. 1999. "Analyzing the Relationships Among Race, Wealth, and Home Ownership in America," *Journal of Housing Economics* 8 (2): 63–89.

Immergluck, Dan. 2004. *Credit to the Community: Community Reinvestment and Fair Lending Policy in the United States*. Armonk, NY: M.E. Sharpe.

———. 1999. "Intrametropolitan Patterns of Small-Business Lending: What Do the New Community Reinvestment Act Data Reveal?" *Urban Affairs Review* 34 (6): 787–804.

Linneman, Peter, and Susan Wachter. 1989. "The Impacts of Borrowing Constraints on Homeownership," *AREUEA Journal* 17 (4): 389–402.

Munnell, Alicia H., Geoffrey M.B. Tootell, Lynn Browne, and James McEneaney. 1996. "Mortgage Lending in Boston: Interpreting HMDA Data," *The American Economic Review* 86 (1): 25–53.

Reid, Carolina, Ellen Seidman, Mark Willis, Lei Ding, Joshua Silver, and Janneke Ratcliffe. 2013. Debunking the CRA Myth—Again. UNC Center for Community Capital Working Paper. www.ccc.unc.edu/abstracts/debunkingCRAMyth.php.

Sinai, Todd, and Nicholas S. Souleles. 2005. "Owner-Occupied Housing as a Hedge Against Rent Risk," *Quarterly Journal of Economics* 120 (2): 763–789.

Turner, Tracy M., and Heather Luea. 2009. "Homeownership, Wealth Accumulation and Income Status," *Journal of Housing Economics* 18 (2): 104–114.

Zinman, Jonathan. 2002. *The Efficacy and Efficiency of Credit Market Interventions: Evidence From the Community Reinvestment Act*. Cambridge, MA: Joint Center for Housing Studies of Harvard University.