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How Do Government Mortgage Programs Affect Low-Income Neighborhoods

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I. Introduction

An important goal of government intervention in credit markets has been to improve access to credit for lower-income individuals. In an effort to provide equal opportunity to access for credit, the government implemented two policies with objectives designed at making lending more affordable. Government Sponsored Enterprises (GSEs), which were initially established in 1916, encourage mortgage activity in secondary mortgage markets, but it wasn't until the Clinton Administration that the GSEs were given affordable lending goals targeting low-income areas. The GSEs, currently Fannie Mae and Freddie Mac, are privately owned but publicly chartered; being labeled as GSEs gives these agencies the illusion of reliability because of the apparent government endorsement, giving them a possible competitive edge in the secondary market. Conversely, the Community Reinvestment Act (CRA) was initially established in 1977 and designed to make lending more accessible to low income areas and increase access to credit in the primary market, specifically for low-to-moderate income areas. As part of the CRA, banks form pledges with community groups creating lending goals for the neighborhood; this typically involves a pledge amount to target groups currently being underserved (National Community Reinvestment Coalition, 2007). However, over the years the reinforcement of the CRA has been progressively stricter especially with the changes made by the Clinton administration simplifying of the evaluation system and strengthening the reward system.

Due to their focus on lending to low-to-moderate income areas, mortgage credit policies have been called into question in recent years; initially they were blamed for causing the housing crash by giving out loans people could not pay back. The literature, however, provides substantial evidence to the implausibility of this theory, demonstrating that neither policy largely contributed to the housing bubble. Avery, Bostic, and Canner (2000) finds that there are not

higher rates of default due to the CRA credit lending, possibly due to an emphasis by the regulatory examiners on safe and sound practices under CRA. Nevertheless, critics still question if the impact of CRA is worth the dedication of regulatory resources and it is important to consider what the effects of mortgage credit policies are on neighborhoods and individuals.

There has been shown to be an increase in the mortgage supply in underserved areas, but not much past research has delved into the subsequent effects on other outcomes due to the increase in mortgage supply in these neighborhoods (Bhutta, 2008; Gabriel & Rosenthal, 2008; Bostic & Surrette, 2004). Primarily, past literature examines the effect of Government Sponsored Enterprises on community outcomes (An, Bostic, Deng, & Gabriel, 2007; Bostic & Gabriel, 2006; Gabriel & Rosenthal, 2008). Overall it is difficult to parse out what is the actual effect of the housing policies on the community outcome variables. With two housing policies it is important to keep the effects of each policy on the community outcome variables separate. Technological advances have made giving credit access to lower-income areas easier. Characteristics in the neighborhoods vary based in conjunction with characteristics that might influence if neighborhoods would be loaned to or not; therefore, it is important to keep the impact of the policy separate from alternative reasons for the increase in mortgage credit (Avery, Canner, & Calem, 2003). Some research has attempted to examine some of the impact of the CRA on community outcome variables, specifically homeownership, but researchers have not exploited the potential for a regression discontinuity to isolate the effect of CRA and the mortgage credit increase.

In this paper, I examine the effects of CRA increasing the availability of mortgage credit on low-income neighborhoods in two stages. Due to the stronger support in the literature of a significant increase in the mortgage supply, I focus on the CRA policy rather than the GSE

affordable lending goals in order to better examine the effect of the mortgage increase on community outcomes. CRA regulators use an eligibility cutoff determined by the income of the neighborhood as a ratio of the income of Metropolitan Statistical Area (MSA) to distinguish which neighborhoods are underserved. I first use these discontinuous cutoffs in each of the housing goals to look at the effects of the policies on the mortgage volume supplied. The Home Mortgage Disclosure Act (HMDA) data provides micro-data comprised of home purchase, refinance, and home improvement mortgage applications spanning from 1990 to the present. The Geolytics decennial census data from 1990 provides the income variables used to indicate the target neighborhoods and the demographic variables. I find an estimate effect of CRA on the number of originations in marginally treated tracts to be between a 1.7% -1.9% increase for all MSAs and a 5.4%-5.7% significant increase in large MSA

I exploit the CRA cutoff to look at the effects of CRA on community outcome variables from the 2000 Census, specifically homeownership, home values, mobility, educational attainment, and employment factors. To estimate the effect of the increase in mortgage credit caused by the housing policy on these factors, I scale the reduced form estimate by the estimated effect of CRA on log of originations. I find little evidence of significant change in the main community outcome variables of homeownership, home values, and mobility rate when full specifications are included. I find a marginally significant change in commuting time and college education, but all other factors are small and insignificant.

In the next section, I will outline the government policy goals more in depth and summarize what has already been examined in the previous literature. Subsequently I will provide further information regarding the data sources and the summary statistics. I will outline my empirical strategy for analyzing the first and second stages of the key question, followed by

the results section with robustness checks. Finally, the discussion and conclusion section will examine the implications of the housing policies and offer further areas that should be explored in regards to analyzing the effects of the CRA on the targeted communities.

II. Background

In conjunction with a set of housing policies passed in 1977, the Community Reinvestment Act was created to increase credit opportunity to low-to-moderate income areas or high minority areas in particular; the avoidance of these areas was called redlining after the red outline that was used to indicate them as high risk areas in maps of targeted areas for investment (Federal regulation, 2003; Berry & Lee, 2007). Informational barriers existed in these areas caused by the diverse population that lived in the neighborhoods, which lead to investors avoiding an area altogether for fear of making a higher proportion of high risk loans. CRA was established to eliminate the first mover problem by creating incentives for investors to lend in targeted areas. In a recent paper, Bhutta found that CRA did lead to crowd-in of non-CRA mortgage lenders into the neighborhoods targeted by CRA (Bhutta, 2008). Institutions not obligated to loan in the targeted areas have increased investment in low-to-moderate income areas over time suggesting that there were initial informational barriers and that there was a benefit to lending in the low-to-moderate income areas.

CRA applies to all banks and thrifts insured by the Federal Deposit Insurance Corporation (FDIC) (Office of the Comptroller of Currency, 2011). The government left certain parameters of CRA lending up to the discretion of the institutions. In addition to allowing the institutions to make loans of any size, either conforming or non-conforming, the lending goals for the institution are set via a pledge system usually created with the help of a local community group. The government wanted to assure that the banks and thrifts were meeting the needs of the

individual neighborhoods (Avery, Canner, & Calem, 2003). Though the pledges can be focused on a variety of factors, including lending for single family and multifamily home mortgages, non-profit and minority housing developers, and small business owners, the institutions are required to focus efforts towards low-to-moderate income (LMI) neighborhoods (National Community Reinvestment Coalition, 2007). These neighborhoods are defined as census tracts whose median family income is equal to and above 50% but less than 80% of the Metropolitan Statistical Area (MSA) median income (Federal Deposit Insurance Corporation, 2010).

These LMI neighborhoods need to be in the assessment area, which is defined as counties and cities within the MSA where the bank or thrift branch is located. The banks and thrifts are evaluated by their respective regulatory institutions. Initially a complex number system was established to provide the institutions with their performance rating. If a bank does not achieve the necessary rating to meet CRA standards, the regulators can deny bank mergers, new branches, and charters for deposit insurance (Office of the Comptroller of Currency, 2011). Initially, the communities were unable to gain access to this information to effectively evaluate their local institutions, despite the Home Mortgage Disclosure Act (HMDA), a policy aimed at making lending data more accessible to borrowers, being passed in the same year as CRA (Avery, Canner, & Calem, 2003).

CRA, when first created, had very little strength. There was a limit on interstate and occasionally intrastate branching. Therefore, there were restrictions on the size and magnitude of both expansion and mergers. Furthermore, the different regulatory agencies did not reinforce the threat to prohibit charters from being passed or mergers from happening based on a CRA score. In 1989, the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) was passed requiring the regulators to disclose the CRA performance ratings to the public. The

first denial of a merger due to CRA was in 1989 directly after FIRREA was implemented (Berry & Lee, 2007). Regulators designed a simplified evaluation only involving a four-tier rating system: substantial non-compliance, needs improvement, satisfactory, and outstanding. Furthermore, FIERRA also expanded the amount of information collected as part of HMDA and drastically improved communities' ability to attain HMDA data to evaluate CRA themselves and keep regulators in check (Berry & Lee, 2007). Community watch dog groups now could more effectively monitor the actions of their local institutions that fell under CRA regulation.

The Clinton administration strengthened CRA further, putting pressure on policy makers starting in 1993. Changes were not made to CRA itself until 1995, but in 1994 the Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) allowed interstate mergers. IBBEA strengthened incentives for institutions to follow CRA rules. For fear of devaluing CRA incentives, such as deposit insurance, the CRA has not yet fully expanded to encompass independent mortgage companies despite the 1999 Gramm-Leach Baily Act where banking institutions could take over mortgage companies. Further motivating incentives in the 1995 change, a more uniform performance evaluation system was established. A three-part test was created for the regulator examinations involved: test of lending, investment, and services. Each section in the three-part test receives a rating. The lending test is 50% of the entire CRA credit test. Therefore, an institution cannot receive an outstanding or satisfactory if they receive less than a satisfactory on their lending test. The new evaluation system makes the objective of the institutions CRA lending goals much clearer.

When evaluating the effectiveness of CRA, there are some components of the policy that can complicate regression analysis. Under the CRA, institutions are able to loan out of their MSA and shift to include an area "reasonably expected to be served". It must include the whole

geographic area, not just the LMI census tracts. It is difficult to pinpoint which areas outside the assessment area are included in the scope of lending areas under CRA for each institution. Furthermore, because there are four different regulatory bodies monitoring the institution's CRA behavior, there are differences in ratings based on which regulatory body is evaluating the institution. The lack of consistency across institutions' ratings could mean that all institutions that fall under CRA do not feel the same pressure to participate, making the effect of the policy inconsistent and more difficult to generalize.

Several studies summarize the amount of lending to neighborhoods by type of loan. The Joint Center for Housing Studies (JCHS) found that overall home purchase loans to LMI neighborhoods increased by 77% while there was only a 53% increase overall in home purchase loans (Berry & Lee, 2007). However, it is important to decipher what is due to CRA and what could be due to other factors.

Some previous literature finds tries to look at effect of CRA looking indirectly at its effects on the mortgage supply. Avery, Canner, and Calem (2003) compare the market share institutions with outstanding and satisfactory CRA ratings during 1993-1999 above and below the 80% cutoff. These outstanding institutions had 0.37 points higher lending rate in the CRA-eligible group than in the not CRA-eligible areas, but for satisfactory institutions they find a higher lending rate for not CRA-eligible institutions. Additionally, the researchers state that CRA-covered institutions' market shares are the highest where CRA-eligible cohorts' performance is the poorest. This indicates that the neighborhoods in which CRA institutions are most prevalent is where the institutions are least effective. Only the outstanding CRA rated institutions perform well in locations where they hold a high market share. It is never stated, however, on what the researchers are gauging CRA-eligible cohort performance. The analysis

conducted by Avery et al focuses only on the effectiveness of the CRA institutions which do not necessarily reflect the effect of the CRA overall. Berry and Lee (2007) use a linear probability model to examine the rejection rate above and below the cutoff. They find that the rejection rate is lower for banks operating in their assessment area, but this is not due to CRA because the rejections rates are not especially lower for LMI loans. This makes an important statement that any increase in originations for LMI loans is an increase in number of loans made not simply because the application rate increased in one area which would lead to more rejections as well as loans. However, it is critical to look directly at the effects of CRA on its intended target, the mortgage volume of low-to-moderate income areas.

Research finds a significant positive effect when looking directly at CRA impact on the mortgage volume. Bostic and Surrette (2004) use lender-county combinations in a series of four two-year panels to examine the impact of county eligibility on the originations by a lender in that area. The results show a positive and significant effect of CRA on lending in the CRA-eligible counties. Each county, however, may or may not be CRA eligible but rather each census tract is measured to be CRA-eligible or not. Through a regression discontinuity at the census tracts level, Gabriel and Rosenthal (2008) examine CRA impact on conforming and non-conforming loans. For the full sample, the researchers found that CRA leads to a positive increase in number of originations in the treated area. When the window around the cutoff, for which they use the 80% CRA eligibility cutoff is limited to 10 or 5 percentage points, Gabriel and Rosenthal find that CRA has a negative or insignificant effect on number of conforming loans, respectively. The effect of CRA on non-conforming loans remains positive and significant no matter the size of the window. These results may suggest that CRA either at most only increases the number of loans with a larger dollar amount in marginally treated tracts if not decreasing the number loans

with a smaller dollar amount. Gabriel and Rosenthal, however, use only county fixed effects thus limiting the variation especially in rural areas and do not allow their regression to vary with the tract to MSA median income (TM) variable, thereby forcing it to fit a linear model with a flat slope.

Bhutta (2008) uses more modern regression discontinuity techniques and conducts a local linear regression discontinuity on the effect of the CRA on all loans. Bhutta found a 3% increase overall in the number of loans originated from the years 1994-2002. Additionally, he broke the data down by sets of years; between 1994-1996 there was a 4% increase in mortgage supply for CRA eligible areas while in the years 1997-2002 there was an 8% increase. The cause of this difference is that after 1997, the CRA guidelines were more strictly enforced. Additionally, Bhutta finds that there is the most impact in large MSAs. He suggests that this may be due to several factors. Large MSAs garner the most attention from the regulators therefore these areas with CRA punishments are most enforced. Furthermore, there may be more motivation in these areas due to the opportunity for expansion and mergers increasing incentives (Bhutta, 2008). Another possibility that Bhutta does not consider is the potential for sampling error in small and medium MSAs. Just examining the MSA that the lender is in may not be enough; because lenders are able to lend outside of their initial assessment area if the regulators deem it fit, those lenders in the smaller areas are more likely to be allowed to lend outside of their MSA. This policy may allow the lenders to have fewer originations over more census tracts instead of focusing efforts on fewer targeted communities. Overall, it is suggested that the CRA has a causal effect on the number of loans originated in underserved areas; due to the variation in previous literature, I verify the increase in mortgage supply in underserved areas.

Some community outcome variables have been explored more in depth than others. Homeownership is one of the main outcome variables expected to be impacted by the increase in mortgage originations in an area. Homeownership is a crucial variable to consider; it is believed that homeownership may lead to investment in local amenities and social capital because it creates barriers to mobility and subsequently provides an incentive to invest in the improvement of the neighborhood (DiPasquale and Glaser, 1996). Past literature finds mixed results regarding the impact of CRA on homeownership rates. Barr (2005) finds that the CRA leads to an increase in low-income and moderate-income areas for minority individuals. Gabriel and Rosenthal (2008) using an regression discontinuity found a significant negative effect of the CRA on homeownership in a large bin around the mean but when the sample was limited to a 10 and 5 percentage point window around the mean the results became positive but insignificant. Avery et al. (2003) finds a significant increase in homeownership around the cutoff in CRA-eligible tracts but they do not attribute it to CRA because in the CRA-eligible tracts where homeownership is the higher, performance of CRA institutions are poorer. I look at the homeownership rate in a modern regression discontinuity format. Additionally, I scale it by the effect found on the mortgage supply to view the relationship between the two.

House prices have also been studied, but not as extensively. House prices are expected to change more dramatically with a mortgage supply increase in areas with an inelastic housing market than areas with a more elastic housing growth (Mian & Sufi, 2010). For low-to-moderate income neighborhoods the lower housing growth in these areas is expected to be more inelastic. Researchers use median self-reported home values from the census as a possible proxy for house prices trying to examine if the stock of housing market is increasing or decreasing in value. Avery et al. find that there is a significantly lower growth of the median home values in CRA-

eligible cohorts. Again, however, like homeownership, they do not attribute this significant effect to CRA (Avery et al., 2003). Due to the minimal literature, I will also examine the effects of CRA and the increase in mortgage supply on the self-reported median home values.

Mobility is an important factor not yet considered quantitatively in the literature that can influence other more individual centric factors, such as employment and educational attainment. It is important to identify if the same people are living in the tract or if the increase in mortgage supply is bringing in a different set of people. An increase in mobility would indicate tract turnover; conversely, a decrease in mobility would indicate that individuals are staying in the tract longer. When paired with an increase in homeownership, a decrease in mobility could be an indication that new homeowners are new residents. Other outcome variables can be influenced by a change in mobility. Andrew Oswald (1996) describes how a decline in the mobility rates from an increase in homeownership leads to a decrease in employment. When individuals are invested and now tied to their homes, it makes it more difficult for the individual to move to a new city to find employment. It is possible then that an increase in mortgage supply in low-income areas could be detrimental to employment. If the individual is a homeowner, they might be barred from leaving an area for a promotion and they will see a stagnation or decline in their wages. Alternatively, an individual might more actively seek out a job with higher wages to pay off the mortgage. Finally, mobility can be examined in conjunction with the educational attainment of the adult population in a tract. Whether an individual stays in a tract might be contingent on their educational attainment. Tract characteristics are possibly influenced by an increase in mortgage lending in previous years; I look to add to the literature which lacks exploration into these areas in conjunction with mortgage lending.

III. Data

To examine the effects of CRA on the mortgage credit supply, I use a regression discontinuity to exploit the CRA eligibility rule. A reduced form regression for each of the community outcome variables is later scaled by the effect of CRA on log number of originations. A regression discontinuity provides a quasi-experimental analysis of the outcome variable around the eligibility cutoff. Under the continuity assumption that all characteristics of the tracts were treated or none were treated, all tracts would vary smoothly across the cutoff; the eligibility cutoff is arbitrary and should not lead to significant differences of the characteristics of tracts above and below the cutoff. Therefore, a regression discontinuity should isolate the effects of the program on the key variables of interest. The eligibility rule for tracts under CRA is determined by the ratio of a tract's family median income to MSA median income (TM). Banks and thrifts under CRA target low-to-moderate income tracts which are defined as having their median family income at least 50% but no more than 80% of the MSA median income. The impact of CRA would be indicated by a jump in the outcome variable at the 80% income ratio cutoff.

For my cutoff identifier variable, I use the same tract to MSA median income ratio that banks and thrifts use to identify the eligibility cutoff. Bank regulators use the decennial census to identify the median income of the tracts and MSAs. Because I am looking at a range from 1994-1999, I use the 1990 decennial census data to determine the MSA and tract median incomes. The MSA boundaries were update in 1993; therefore I use these 1993 MSA definitions from the census website and mapped them onto the 1990 decennial census data via county and state information. There was difficulty applying the 1993 MSA definitions for New England. New England is mapped into towns instead of counties and I did not have the mapping of census

tracts to towns for the 1993 MSA definitions. Any town that was in a different MSA in 1990 and 1993 was dropped from the data set.

I use the Home Mortgage Disclosure Act (HMDA) data to provide me with the key outcome variable for measuring the mortgage volume at the census tract level. Since 1990, HMDA compiles lending activity from the lenders it covers. In 1993, the number of independent mortgage companies required to submit information expanded. Independent banks, however, with less that $30 million in assets are still not required to report to HMDA. Bhutta (2008) found that these only make up 1.6% of all 1-4 family residential loans held by all banks in a MSA at the end of 1998. In particular, I use the HMDA data from 1994-1999. By 1994, the data is cleaner and includes a larger number of institutions. Additionally, effects of some of the other lending are possibly captured in the amount of lending by CRA institutions. I only look at mortgage data up to 1999 in order to limit my data to a range of years that could possibly affect the community outcome variables taken in the 2000 Census.

Census tract characteristics are taken from the 1990 and 2000 decennial census from the Neighborhood Change Database provided by the Geolytics Corporation. The control characteristics are taken from the 1990 census, while the second stage outcome variables are taken from the 2000 decennial census. From the 1990 to 2000 census, some tract boundaries are redefined. To keep a consistent sample of tracts across the first and second stages, I drop all tracts that change boundaries. Table 1 provides a comparison between the full sample and the sample of tracts that do not change boundaries from the 1990 to 2000 census. Both samples are only looking at a bandwidth within 0.3 TM of the 0.8 CRA cutoff variables.

The tracts whose boundaries were unchanged were similar to the full sample of census tracts. The 1990 census characteristics are at most 14% different other than the proportion of

houses built between 1980 and 1990 and the proportion of mobile trailer homes. The unchanged tracts were 26% less likely to have mobile homes; these tracts were more likely to have houses built before 1970 and therefore have an older housing stock. The unchanged tracts have a smaller population, less total housing units and less owner occupied units. The median house value is greater than the full sample and there is a higher proportion of multifamily units but a lower proportion living in group quarters. In unchanged tracts, there is a higher proportion of non-Hispanic Black/African American population and an almost equivalent proportion of Hispanic/Latino population. There is a slightly higher proportion of elderly persons in the unchanged tract. Overall, the homes in the unchanged tract are older, there are more multifamily homes, fewer mobile homes, and there are a higher proportion of black and elderly persons but slightly lower proportion of Hispanic individuals.

Additional restrictions are placed on the data due to underreporting and possible characteristics that may distort the data. I exclude MSAs in Hawaii and Alaska due to underreporting. I drop census tracts with less than 100 housing units; rural areas are under-reported due to fewer assets lent. This restriction brings the focus more towards cities. Similarly, I drop all tracts that do not have at least one owner occupied unit. Due to a desire to focus on individuals eligible for loans, I drop the tracts where more than 30% of the population is in group quarters to avoid heavily prison oriented tracts. These restrictions were modeled after the restrictions set forth in Bhutta (2008).

Comparing the census tracts in wide 30% bandwidths above and below the cutoff reveals systematic differences. All the census characteristics above and below are significantly different. The census tracts below the cutoff have fewer total housing, fewer owner occupied units, and a lower median house value. There are a higher proportion of multifamily homes in the tracts

below the CRA cutoff. Furthermore, this housing stock is more likely built before 1940. The residents are less likely to be non-Hispanic Black/African Americans but more likely to be Hispanic/Latino. There is a slightly smaller proportion of elderly residents and a slightly larger proportion of individuals living in group quarters. These are the differences to be expected comparing low-income and high-income areas.

To examine the effects of CRA, three types of loans are examined together: home purchase loans, home improvement loans, and refinance loans. The average number of originations, for years 1994 through 1999, varies with the median income of the census tract. Tracts above the cutoff have 42% more home purchase originations per year and 39% more combined refinance and home improvement loans per year than those tracts below the cutoff. The log of total originations, including all three types of originations, for a tract is the key outcome variable to examine the effects of CRA on the mortgage credit in targeted areas; the originations are allowed to vary on a logarithmic scale due to the expected growth of originations across the income variable. This transfiguration captures the total number of originations for a tract summed over the years 1994-1999. Again, above the cutoff, the log of originations is significantly greater than for the tracts below the cutoff. Due to the systematic differences in the tracts above and below the cutoff, a more detailed statistical analysis is required to determine the effects of CRA lending.

In addition to the log of originations, I look at the log of the dollar amount originated and the log of the average dollar amount per originations. These factors are vital to obtaining the full picture of mortgage volume. Both amount and number of originations are targets of the CRA. It is important to see if the number originations increase but the value per origination decreases making the total amount lent to the tract the same or less than if the tract is untreated. The full

sample and unchanged tract sample are very similar to each other. Consistent with the log of originations, the log of the dollar amount originated is significantly lower below the cut off as well as the average dollar amount per origination.

The community outcome variables are taken from the 2000 Geolytics census data. To examine the homeownership rate, I scale the number of owner occupied units by the number of occupied housing units in a tract. For the unchanged census tract about half of occupied housing units are owner occupied therefore the homeownership rate is around 49.4%. To examine the house prices for a tract, I use the log of the self-reported median home values from the census. The mobility rate is measured using the proportion of individuals age 5 and above who live in a different house 5 years ago. This variable examines the degree of turnover in a neighborhood. In unchanged tracts about 48.7% of the population lived in a different house 5 years ago. The employment rate looks at the total number of civilians who are employed out of the total civilian population of individuals age 16 and above. The armed forces are separated from the employment variables in the census in an attempt to look at the state of the free job market; 54.4% of all civilians over the age of 16 are employed. The unemployment rate is the proportion of the civilian labor force that identifies as in the labor force and unemployed. In unchanged tracts, 9.6% of the civilian labor force is unemployed. The labor force participation rate is the number of civilians above the age of 16 who classify themselves as in the labor force out of the total population of civilians. 59.9% of the total population of civilians qualifies themselves as in the labor force. The commuting time of individuals is examined if the commute took less than 25 minutes and the individual does not work at home out of all employed individuals. For those who do not work at home, 30.6% of the working population commutes to work in less than 25 minutes. While the proportion of individuals above the age of 25 with a high school diploma is

29.8%, the proportion of individuals with a college degree (Bachelors or above) above the age of 25 is 14.1%.

There are further systematic differences between the tract characteristics from the 2000 census above and below the cutoff. Above the cutoff, there is a high homeownership rate and median home values but lower mobility. As expected in high median income areas. there is a higher employment rate, lower unemployment rate, and high labor force participation rate; additionally, there are higher proportion of employed individuals who commute less than 25 minutes. In the tracts above the cutoff there are a higher proportion of individuals with both a high school diploma and a college degree. Again, though it is apparent there are systematic differences above and below the CRA cutoff, a more thorough analysis is needed to assess the effects of CRA on these tract characteristics and, furthermore, what the effect of a possible increase in mortgage lending has on these community outcome variables.

IV. Empirical Strategy

The main strategy used to look at the effects of CRA on the mortgage volume (as measured by log of originations) and community outcomes is a regression discontinuity. First let Y_{1i} be the tract outcome (e.g. log of origination) for some tract *i* if the tract is treated by CRA and let Y_{0i} be the tract outcome for some tract *i* if the tract is not treated CRA. We want to know the effect of $Y_{1i} - Y_{0i}$. However, we do not observe both the Y_{1i} and Y_{0i} for the same tract. If we let D_i=**1**[TM_i<.80] then we observe:

(1) $$Y_i = \begin{cases} Y1i \text{ if } Di = 1 \\ Y0i \text{ if } Di = 0 \end{cases}$$

In a regression discontinuity to identify the average treatment effect we must have the continuity assumption that the outcome variables would be continuous in the counterfactual situation without the CRA treatment. Therefore if we assume that:

(2) $E[Y_{1i}|TM=x]$ and $E[Y_{0i}|TM=x]$ are continuous at x=0.8

The tract at TM_i is 0.8 would be continuous with the tract at immediately below 0.8 if it were not for the CRA treatment. The tracts directly above and below the cutoff should be exactly the same with the exception of their treatment status under CRA. Therefore, any differences in these tracts should be due to their CRA treatment. If the characteristics of the tracts are assumed to be continuous at the cutoff there should be no other factors that would be changing discontinuously at the cutoff leaving only the treatment effect due to CRA captured. Thus, we are able to estimate the treatment of CRA at the cutoff of $E[Y_{1i} - Y_{0i} |TM=.8]$, as:

(3) $$\lim_{x\uparrow 0.8} E[Y_i|X = x] - \lim_{x\downarrow 0.8} E[Y_i|X = x]$$

This estimates the average treatment effect on the marginal census tract around the cutoff. In practice, to estimate this treatment effect my main specific regression to find the effect of CRA is:

(4) $$Y_i = \beta_0 + \beta_1 D_i + \beta_2 TM_i + \beta_3 TM_i^2 + \beta_4 TM_i^3 + \lambda X_i + \varepsilon_i$$

β_1 is the CRA treatment effect for marginal tracts and the X_i is a vector of controls. TM_i is the running variable allowing the slope to vary across the median income ratio. Included in the controls is the cutoff for the Government Sponsored Enterprises at 0.90 TM. My main specification includes the cubic regression for a 0.3 bandwidth around the cutoff of 0.8. However, also shown in the results are a linear regression and a smaller bandwidth of 0.05. Additionally, estimates are made both with and without MSA fixed effects. Due to the nature of CRA, fixed effects are preferred because the lenders target local communities within their assessment area.

For the community outcome variables, both a reduced form and a two stage least squares regression is conducted. It is the aim to capture both the direct effect of the CRA program on

each of the community outcome variables and the effect on each of these variables of an increase in the mortgage credit due to the CRA program. The reduced form regression of each of the community outcome variables captures the expected effect of the CRA program on the individual variables. The jump in the outcome variable due to the CRA treatment is estimated using equation (4). In practice, in the marginal treated tracts the effect of the increase of originations due to CRA is estimated using the treatment term as an instrumental variable for log of originations in a two stage least squares; therefore, the reduced form of the community outcome variable is scaled by the treatment effect of CRA on the volume of mortgage lending. Using equation (3), if O_i signifies the mortgage outcome variable of log of originations and C_i as the community outcome variables this treatment effect can be written as:

(5)

$$\frac{\lim_{x\uparrow 0.8} \mathrm{E}[C_i|\mathrm{X}=\mathrm{x}] - \lim_{x\downarrow 0.8} \mathrm{E}[C_i|\mathrm{X}=\mathrm{x}]}{\lim_{x\uparrow 0.8} \mathrm{E}[O_i|\mathrm{X}=\mathrm{x}] - \lim_{x\downarrow 0.8} \mathrm{E}[O_i|\mathrm{X}=\mathrm{x}]}$$

In other words, this is the effect of an increase in the number of originations on the community outcome variables. This captures the effect of the outcome variable targeted by CRA, mortgage originations, on other potential outcome variables in the marginal census tracts around the cutoff.

V. Results

Robustness Check

If pre-treatment tract characteristics vary continuously across the cutoff, then it supports our assumption that the outcome variable would otherwise continue continuously across the cutoff. The pre-treatment tract characteristics used are the tract characteristics from the 1990 census. These tract characteristics not only characterized a tract before CRA enforcement became more stringent, but in each decennial census, the regulators reassign a new TM variable to a tract. Those tracts that were treated by CRA before 1990 were not necessarily the same

tracts treated by CRA after 1990. The reassignment allows us to treat 1990 census tract characteristics as a pre-treatment for the 1994-1999 year range.

It is important to demonstrates that all pre-treatment characteristics vary continuously across the cutoff to be able to isolate the CRA as the only factor that influences the tracts at that cutoff point. As laid out by Bhutta (2008), Figure 1 plots the predicted values of the log of total number of originations between a TM 0.5 and 1.10 between the years of 1994-1999. The predicted value of the log of originations is based on a regression of the log of originations on the 1990 tract characteristics from the census, not including the TM variable, the CRA cutoff or GSE cutoff. The variation in these characteristics explains 72.5% of the variation in the log of originations. A cubic regression of the predicted value on the CRA dummy variable without MSA fixed effects indicated an estimated discontinuity of 5.6% increase in log of originations, though this difference is insignificant. Therefore, the pre-treatment characteristics appear not to exhibit a significant discontinuity change at the cutoff. This confirms for this set of years (1994-1999) the results that Bhutta found for the years 1994-2002.

Regressions on Mortgage Volume

The regression results of the effect of CRA on the mortgage volume (as measured through log of the number of originations) can be found in Table 2 A and Table 2 B. Table 2 A shows the initial regression results using the full sample, whereas Table 2 B explicitly sets out the unchanged tracts. Consistent with Bhutta's (2008) regressions, no significant effect is found in any other sample of data other than in the large MSA. The medium MSAs, for the full sample, show a significant difference in mortgage originations when the bandwidth is small with a linear regression without controls; this effect, however, disappears when the bandwidth is expanded and the regression is cubic and includes controls. As Bhutta suggests, large MSAs are more

likely to have a stricter punishment because regulators would target large cities to conserve resources. Furthermore, small banks can use CRA as good publicity to make themselves more appealing to larger companies. Any bank looking to partake in merging activity or expansion activity needs to follow CRA guidelines; both of these activities may be more likely to occur in larger MSAs due to more opportunity to expand or take over smaller banks.

In the full sample, the very basic linear equations with no controls in a small area around the cutoff reveal no significant changes in log of originations due to CRA (Table 2a). Though not significant, the linear regression within 5 percentage points of the cutoff reflects 11% greater originations in CRA treated tracts at the margin. In the wider bin width, with and without controls the large MSAs reflect a significant change due to CRA in marginally treated tracts. For linear regression that is around a 3.87% increase in originations. For the polynomial relationship, without controls there is around a 9.4% increase in originations (see Figure 2), but with the full set of controls there is a 5.73% increase in the number of originations.

The unchanged tracts reflect similar results. Across most of the regressions for the large MSAs there is a significant increase in the percent change of originations (Table 2b). The change in originations due to the tract being treated for CRA right around the cutoff is 19.9%. Figure 3 shows the cubic regression in a wider bin width from column 5, with no controls or fixed effects; this graph show there is a 13.6% jump in log originations at the cutoff. In the wider bin width, a polynomial regression with controls suggests that there is a 5.45% effect of the treatment of CRA on these marginal treated tracts. This percentage increase is the key treatment coefficient for originations capturing the effect of CRA on its directly targeted outcome, number of originations. Therefore, in marginal tracts at the CRA cutoff, assumed and found to be similar on either side of the cutoff, there are 5.45% more originations in marginally

treated tracts than in marginally untreated tracts in large MSAs. Again fixed effects are preferred in order to allow the CRA enforcement and execution to vary across MSAs. Additionally, the controls are useful to control for possible covariates that might confound the results and therefore increase precision.

Looking at the log of the average amount per originations provides evidence that the mortgage originations in a CRA treated area are associated with an increase in the total dollar volume of mortgage lending. There is evidence that the dollar amount originated increases by around .3% in all tracts treated by CRA, though the effect is not significant, and by a marginally significant 6% in large MSAs (Table 3a). This discontinuity indicates that there is an increase in the total dollar amount originated along with the number of originations in each treated tract. The average dollar amount per origination in all MSAs decreases slightly but is insignificant; in large MSAs there is a non-significant increase of 0.5% in average amount per originations (Table 3b). The increase in total dollar amount originated was not associated with a decrease in the average amount originated which suggests that there were not a larger number of smaller loans which would have kept the total dollar volume approximately the same. The amount per loan is roughly the same in marginally treated tracts as in non-treated tracts, and an increase in the total number originations is associated with the total dollar amount originated increasing.

Regressions on Community Outcome Variables

Overall there is little strong evidence of an effect of the program on the community outcome variables. In specifications of a full set of controls, only high school degree rate and commuting time were significantly impacted, but in comparison to the mean this impact was very small. It is expected that the homeownership rate increases when the number of originations increases. With more originations and a greater access to credit, more people can

obtain homes. Homeownership rate could consequently influence the reduced form of other outcome variables. Homeownership could influence a person's ability to move for a job thereby affecting employment, unemployment, mobility, or commuting time. The type of people living in the neighborhood may be influenced by the homeownership rate in characteristics such as high school degree, college degree, or mobility. Home value may also be influenced by the homeownership rate through supply and demand in the market or the investment in the houses. No impact of the homeownership rate eliminates a reason to expect reduced form results. Though there is small evidence of an effect of homeownership, it is not robust across all specifications. I still examine the effect on community outcome variables of CRA and the increase in originations due to CRA despite little evidence indicating a change in homeownership rate. In some areas, mobility may also have an impact, but again, because there is no discernible impact of CRA on mobility, there is less cause for significant results in the reduced form. Additionally, there was neither a significant nor large impact of the increase of originations on most of the community outcomes. The increase in number of originations did show a significant positive moderate increase in the proportion of individuals commuting to work in less than 25 minutes.

Contrary to previous findings, I find only limited evidence for an increase in homeownership which is not robust to MSA fixed effects or additional controls. The reduced form without MSA fixed effects or any controls shows that the marginal treated tracts have a homeownership rate that is significantly 3 percentage points higher (Figure 4). When the full controls are added, the effect diminishes to only a 0.01 percentage point increase in the 49.6% rate of owner-occupied units out of occupied housing units due to the effect of CRA (Table 4). The expected increase in homeownership rates, though, is due to the increase in the number of

originations in the treated groups. The reduced form scaled by the increase in the number of originations for the regression without controls finds and without fixed effects shows that there is a significant 0.23 percentage point increase in homeownership rate in marginally treated tracts with a 1% increase in originations. However, when MSA fixed effects are added, that coefficient diminishes to 0.14 percentage points, and when full controls are added, there is only a .002 percentage point increase in homeownership rate with every 1% increase in originations in a treated tract. The lack of increase in homeownership rate across all specifications suggests that possibly the more originations obtained are used for purposes other than purchasing new homes. Previous literature only uses the total number of owner-occupied units without scaling it by the occupied housing units. This does not account for new construction in the treated areas that would have occurred regardless of the treatment. Furthermore, the number of originations includes home purchase loans, home improvement loans, and refinance loans. It may be that there is not an increase in homeownership rate because home improvement loans and refinance loans are the bulk of the increase in originations. If, however, this is the case, it would be expected that the value of an individual's home would increase instead; there is little evidence of an effect found in the reported median home values, see below. The most likely explanation is that there was a substitution away from using an individual's savings for home investments; in marginally treated tracts, because loans were easier to obtain, individuals received a loan instead of pulling money from their savings.

The log of median values reported for house prices again is insignificant and very small once controls are included. It is not necessarily expected that house prices would respond directly to the tracts being treated by CRA, but it could be expected that either the house prices would increase or decrease due to a greater mortgage supply. The house prices could decrease if

a greater supply of mortgages leads to a greater supply of housing. There could be an increase in housing prices with a mortgage volume increase if those already eligible for mortgages received greater loans to purchase more housing. Because I am looking at self-reported home values, an increase in certain types of loans can also influence this outcome variable. Home improvement loans are included in the number of originations meaning more originations could lead to a higher house value. However, there is neither a significant or large increase nor decrease of self-reported home values across any of the variation in controls (Figure 5; Table 5). Without controls, the value of home values appears to be decreasing though with controls there appears to be an increase in home values. A 1% increase in originations only leads to a .02% increase in the value of homes in the treated tracts.

CRA has no significant influence on the mobility of individuals from their household. The mobility rate measures the proportion of individuals age 5 and above who lived in a different house 5 years ago. With an increase in mortgage credit in marginal treatment tracts it is possible to see a turnover of individuals who live in the tract. There may not be an increase in homeownership, but there may be an increase in mobility changing which individuals live in the tract. Alternatively, there may be a decrease in mobility with more mortgages. People more able to purchase houses would also be able to obtain a loan to improve their house and thus would stay instead of moving. However, neither the reduced form nor the second stage regression shows a significant increase or decrease in the mobility rate in marginally treated tracts across all specifications (Table 6; Figure 6). The scaled reduced form with full controls shows that with a 1% increase in originations, there is a .13 percentage point decrease from the 46.4% mobility rate, but this coefficient is not significant and has a fairly wide confidence interval (Table 6). It

does not appear that number of originations offered in an area causes a significant change in the make-up of a neighborhood.

The education variables, however, may suggest that though the mobility rate is the same, those who are staying in the marginal tracts have a high education. It may be expected, despite the change in mobility rate, that there would be a compositional change in who over the age of 25 with a high school degree would stay in the neighborhoods with an increase in mortgage supply. Those with a high school degree may be more likely to obtain a loan in these areas and \ stay when they would have otherwise left; this would force out those without a high school degree who would have otherwise stayed. The estimate discontinuity in rate of individuals 25-years of age and above who have a high school diploma, however, is small and insignificant which implies there was not a composition change (Figure7; Table 7). In specifications with controls there is some evidence of an effect of CRA on the proportion of individuals above the age of 25 who have a college degree and live in these marginally targeted tracts. In marginally treated tracts, CRA leads to approximately the same coefficient across all levels of precision, but without MSA fixed effects, the regression shows a much smaller increase in proportion of population having a college degree with the increase in mortgage credit (Figure 8). CRA leads to a .75 percentage point increase in the proportion of individuals above 25 who have a Bachelor's degree or above in the marginally treated tracts, which means that a 1% increase in originations leads to a 0.14 percentage point increase in the rate of individuals with a college degree (Table 8). This increase could be due to a shift in savings. Individuals above 25 years of age who live in marginally treated tracts are more able to refinance which frees up their savings to pay for a secondary education. This increase in rate is only marginally significant. These results should be taken with caution. When this many variables are examined, it is more likely

that one of the variables will be found to be significant simply by chance. If a more stringent test was used based on Bonferroni testing, for example, these coefficients would no longer be significant. Caution is also supported by the substantial variation in data points across the cutoff in Figure 8. Since these results are only found to be marginally significant, more investigation would need to be conducted to ensure the robustness of these results.

CRA has the potential to affect the employment rate, unemployment rate, and labor force participation rate. There are no significant or large results for any of these variables across any variation in the degree of controls. Employment may be expected to decrease when the number of originations increases. If the homeownership rate increased, it is possible that this decreases the mobility of the individual; homeownership ties the owner down to a specific geographic area limiting the ability to leave to find work. The employment rate would decrease and the unemployment rate would increase. This would also be the case if the individual invested money to improve his or her home: the home value would go up and a person may be more obligated to stay thereby restraining their ability to leave to find work. Employment without the MSA fixed effects was found to have a positive increase due to CRA and the increase in originations though the increases were insignificant (Figure 9). Employment was found to decrease when fixed effects and then controls were added while unemployment increased in all specifications, though neither variable had a large or significant change (Table 9 & 10; Figure 10). This effect could be due to individuals entering or leaving the labor force; but the labor force in marginal tracts, due to CRA and the increase in originations, had a fairly precise 0 change when MSA fixed effects were included (Table 11; Figure 11).

An alternative explanation is that the commuting time of these individuals would increase allowing them to remain employed and minimize the effect of the mobility. The commuting

time, however, decreased significantly (Table 12). In marginal tracts that are treated for CRA, the proportion of individuals who commuted to work in 25 minutes or less and did not work at home increased by 0.8 percentage points when controls and MSA fixed effects were included; without controls or both of these factors, the effect was found to be insignificant. With a 1% increase, there was a .15 percentage point increase in the proportion of people who commuted to work in less than 25 minutes. The effect is smaller but also marginally significant when neither controls nor fixed effects are included. The increase in a shorter commuting time suggests that people in marginally treated tracts may have substituted away from using their savings on household improvements and home purchases and instead received home loans. Substituting away from their savings for home investments left open the opportunity for individuals to use their savings on alternative large items such as a car. This would explain the decrease in commuting time without a change in employment, mobility, or homeownership rates. However this effect should be taken with caution, similar to the effect found for college degree attainment. Though the coefficient is found to be significant across the cutoff, there seem to be evident variation across cutoff not necessarily suggesting a robust discontinuity.

VI. Discussion and Conclusion

The Community Reinvestment Act began as an effort to decrease redlining. It encouraged the loans in areas that would typically be underserved. Every institution covered under the FDIC is obligated to participate in CRA. The banks work with community groups to create targets and generate lending in targeted areas. There has been evidence in the past of an increase in the mortgage volume in targeted census tracts by CRA. However, there has been little literature that examined the community outcome variables possibly affected by the increase in credit due to CRA. This paper supports evidence that CRA increases mortgage lending in

certain areas, and expands the literature on the effect of the lending increase due to CRA on community outcome variables.

Though no significant effect of lending is found in all MSAs, for large MSAs from 1994 to 1999 in marginally treated tracts there is a 5.7% increase in mortgage originations in the full sample and a 5.4% increase in the mortgage originations in the sample of tracts that remained unchanged between 1990 and 2000. These results prove to be fairly robust in both linear and polynomial regression discontinuities, with and without controls, and in different bins around the cutoff. Furthermore, the total amount originated increases, while the average amount per origination stays the same. The lenders do not substitute away from the amount per origination to get more originations and keep the total amount originated the same. Therefore, the total mortgage volume, both originations and amount originated increases. Large MSAs demonstrate the greatest impact in mortgage originations. The largest MSAs are believed to have a stricter punishment for not completing CRA obligations. The regulators focus on the large MSAs to conserve resources and the banks are more likely to open banks and complete mergers in large MSAs therefore the punishment of regulators not accepting requests for new branches and mergers bears more weight. Furthermore it is suggested, because there is not an effect found in these large MSAs for the average amount given per origination, there is an increase in mortgage volume in targeted tracts due to the number of originations not the amount of the originations.

There is little evidence effect, however, found in the community outcome variables. An increase in homeownership may be expected in tracts with an increase in mortgage lending because more people have gained access to credit and could obtain loans. Little evidence for an increase in the homeownership is found, however. The number of originations includes home purchase, home improvement, and refinance loans making it difficult to discern whether people

are investing in a home or buying a new one. It is not found however, that the self-reported home values increase in targeted areas. Therefore, it is not specifically the type of originations that could cause a lack of increase in homeownership.

Little evidence of a change in mobility rate is found, but there is evidence of a marginally significant change in the make-up of the neighborhood in the education factors. There proved to be little turnover of individuals in these neighborhoods. This indicates that CRA did not necessarily bring in a new set of people to change the composition of the tract. Though college educational attainment changed slightly for the treated tracts, it could have been due to substituting savings for refinancing and therefore putting themselves through school. This result should be taken with caution. So many outcome variables are examined that it is likely that one or two will be marginally significant. With a more stringent test, the significance does not hold up. Employment factors were also potential subjects of CRA impact. However, no effects are found on employment factors. Commuting time does vary significantly due to the effect of CRA on the marginal tracts possibly indicating substituting away from savings and towards borrowing; again this result should be taken with caution.

Overall, I find that though CRA leads to an increase in originations, the increase in originations is not translated necessarily into community outcome variables. It is difficult to indirectly influence community outcome variables through policy; a change in more than 5.4% in originations would most likely be needed in order to find an effect in community outcomes. Though limiting our sample to large MSAs focuses our efforts to areas with the most significant effect on the mortgage supply, this size increase in mortgage originations may not give us enough power to find a significant effect of mortgage supply increase on the community outcome variables.

The regression discontinuity, furthermore, only examined the effect of CRA mortgage lending in the marginal tracts at the CRA cutoff; there may be larger effects on the community outcome variables further from the cutoff. It could also be plausible that looking at these marginal tracts measures the largest effect. It is found GSEs focus their efforts directly below their target cutoff; these neighborhoods are the richest of the low-to-moderate income neighborhoods leading institutions to view them as the least risky (Bhutta, 2009). However, further research should be conducted to see if this is true of the institutions under the regulation of the CRA who may not have as much choice between neighborhoods because they are limited to the census tracts in their assessment area, where the GSEs are able to pick and choose from census tracts throughout the country.

Further investigation could also add to our understanding of which community outcomes could be affected. Research should be expanded into looking at house prices, not just the self-reported home values. It is possible that different ends of the distribution of house prices may be affected, not just the median house price. This could help explain what type of homebuyer lenders are targeting. Changes in other community outcome variables as a result of CRA should be investigated as well. CRA could lead to an influence on the education of individuals. It could also lead to an influence on the crime rate in the area. As DiPasquel and Glaser suggest, more lending to the area could lead to more investment into the area. This investment could be in social capital of their children or keeping their streets safe. The full implications of CRA are not yet examined. Evidence has been provided that in marginally treated tracts CRA does lead to an increase in the number of originations and access to credit in tracts where the punishment and enforcement of punishment of CRA is rigorous. Hopefully, this paper will motivate further discussion of the implications of the increase in the mortgage credit in the CRA targeted tracts.

VII. References

An, Xudong, Raphael W. Bostic, Yongheng Deng, and Stuart A. Gabriel, (2007) "GSE Loan Purchases, The FHA, And Housing Outcomes In Targeted, Low-Income Neighborhoods", *Brookings-Wharton Papers on Urban Affairs*, Brookings Institute Press.

Avery, Robert B., Raphael W. Bostic, and Glenn B. Canner, (2000) "CRA Special Lending Programs", *Federal Reserve Bulletin*, 86(11): 711-731.

Avery, Robert B., Paul S. Calem, and Glenn B. Canner, (2003) "The Effects of the Community Reinvestment Act of Local Communities", *Proceedings.*

Barr, Michael S. (2005) "Credit Where it Counts: The Community Reinvestment Act and its Critics", *New York University Law Review* 80(2) 513-652.

Berry, Christopher R. and Sarah L. Lee, (2007) "The Community Reinvestment Act: A Regression Discontinuity Analysis" Harris School of Public Policy Studies, University of Chicago Working Paper 07.04.

Bhutta, Neil, (2008). Giving Credit Where Credit is Due? The Community Reinvestment Act and Mortgage Lending in the Lower Income Neighborhoods", Federal and Economics Discussion Series, FRB Working Paper 2008-61, 1-40.

Bhutta, Neil, (2010). "GSE Activity and Mortgage Supply in Lower-Income and Minrity Neighborhoods: The Effect of the Affordable Housing Goals", *Journal of Real Estate Finance and Economics*, 0895-5638, 1-24.

Bostic, Raphael W. and Stuart A. Gabriel, (2006) "Do the GSEs Matter to Low-Income Housing Markets? An Assessment of the Effects of GSE Loan Purchase Activity on California Housing Outcomes", *Journal of Urban Economics*, 59, 458-475.

Bostic, Raphael W. and Brian J. Surette, (2004) "Market Forces or CRA-Induced Externalities:

What accounts for the increase in mortgage lending to lower-income communities?", Lusk Center for Real Estate Working Paper No 2004-1013.

DiPasquale, Denise, and Edward L. Glaeser, (1997) "Incentives and Social Capital: Are Homeowners Better Citizens?", Harvard Institute of Economic Research Working Paper No. 1815.

Federal Deposit Insurance Corporation. (2010, October 28). *Community Reinvestment Act Performance Ratings*. Retrieved December 2011, from Federal Deposit Insurance Corporation: http://www2.fdic.gov/crapes/peterms.asp.

Federal Regulation (2003) § 13161, 6500U.S.C § 202.8.

Gabriel, Stuart A., and Stuart S, Rosenthal, (2008) "The GSE, CRA, and Homeownership in Target Underserved Neighborhoods", presented at National Association of Realtors December 7, 2007.

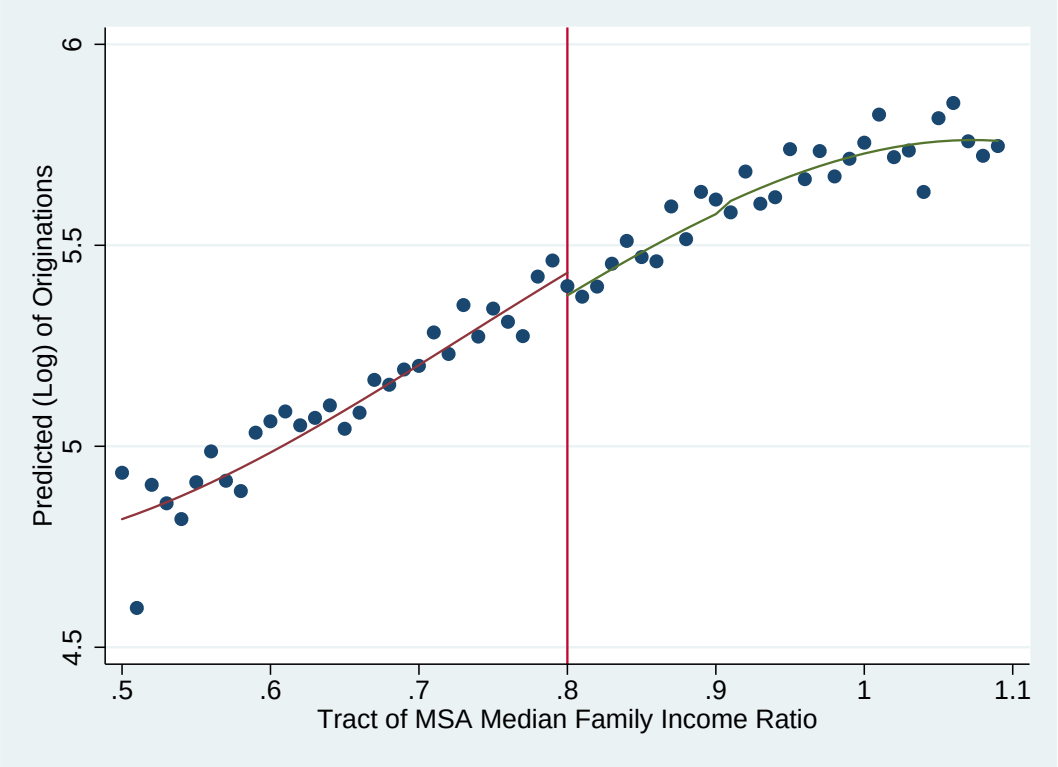
Mian, Atif, and Amir Sufi, (2010) "House Prices, Home Equity-Based Borrowing, and the U.S. Household Leverage Crisis", Chicago Booth Research Paper No. 09-20.

National Community Reinvestment Coalition. (2007). *CRA Commitments.* National Community Reinvestment Coalition.

Office of the Comptroller of the Currency. (2011, December). *Community Reinvestment Act Questions and Answers.* Retrieved December 2011, from Office of the Comptroller of the Currency: http://www.occ.gov/topics/compliance-bsa/cra/questions-and-answers.html.

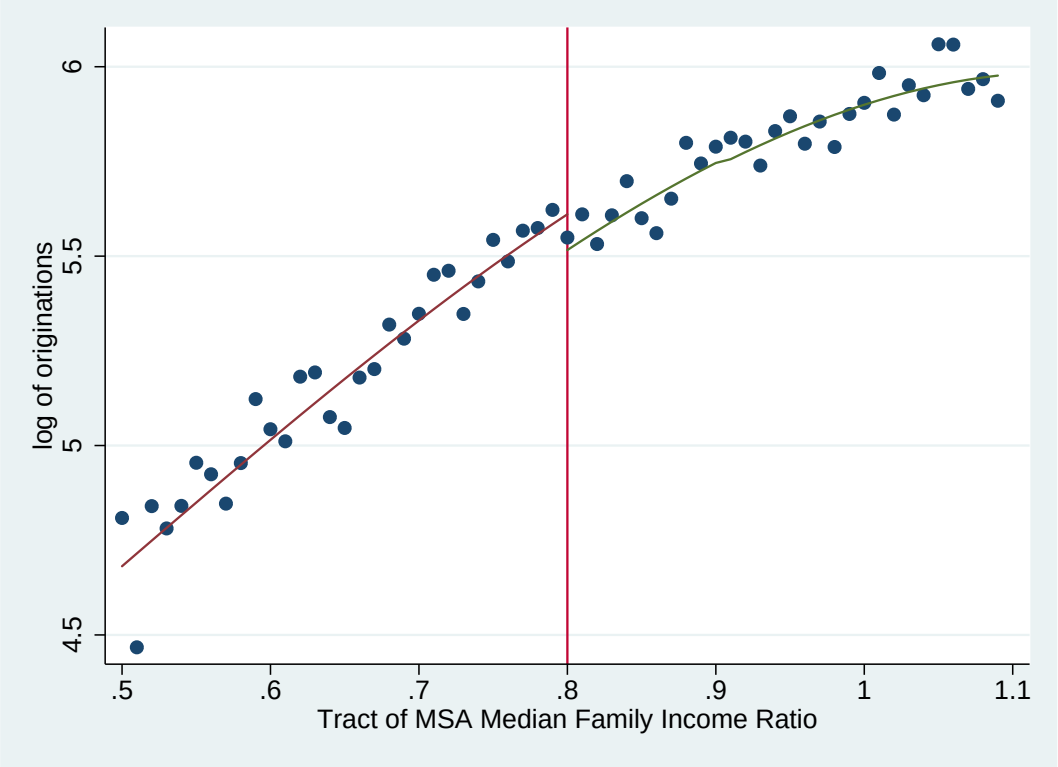
Oswald, Andrew J. (1996) "A conjecture on the Explanation for High Unemployment in the Industrialized Nations: Part I", Warwick Economic Research Paper 475.

Figure 1
Discontinuity of Predicted Log of Bank Originations for Unchanged Tract Sample of Large MSA's



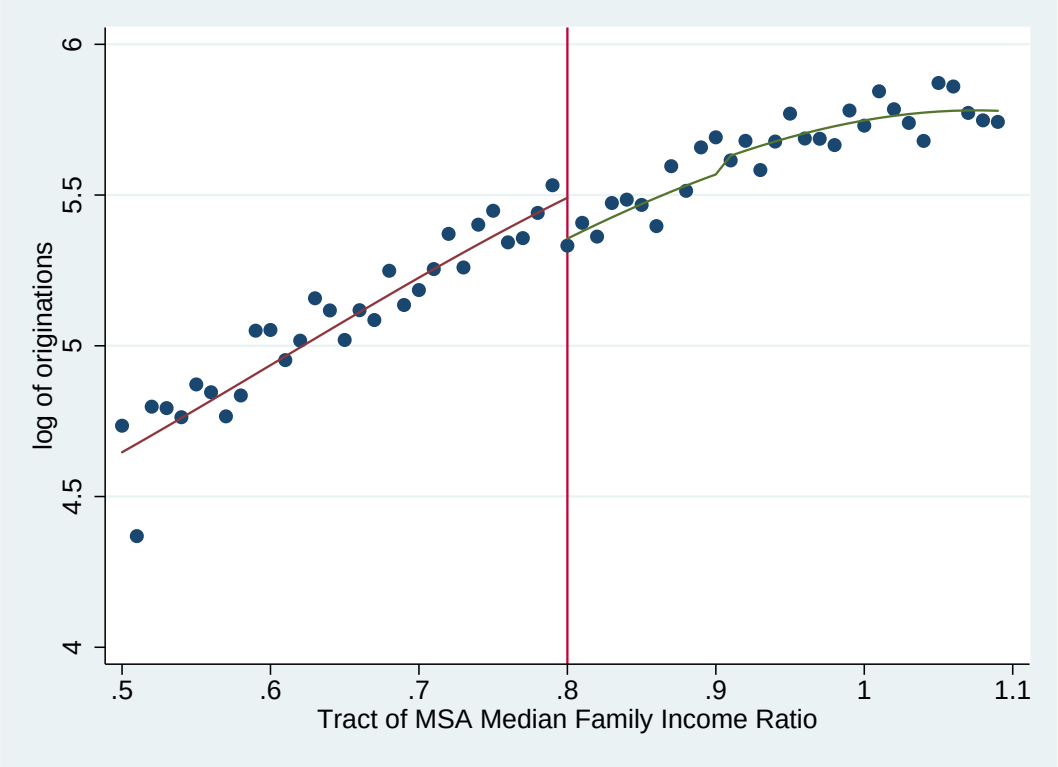
Note: The y-axis is the predicted log of originations estimated by a regression of log of originations between 1994 and 1999 on tract characteristics from the 1990 census without MSA fixed effects. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The data is only for the sample unchanged tracts between the 1990 and 2000 Census with a TM between 0.5 and 1.10. The fitted lines are generated from a cubic regression of the predicted values on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable. The coefficient shown is 0.0563 (0.0516) with a p-value=0.275.

Figure 2
Discontinuity of Log of Bank Originations for the Full Sample of Large MSAs



Note: The y-axis is the log of originations between 1994 and 1999 for the full sample with a TM between 0.5 and 1.10 . Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects.

Figure 3
Discontinuity of Log of Bank Originations for the Unchanged tract of Large MSAs



Note: The y-axis is the log of originations between 1994 and 1999 for the sample of unchanged tracts between the 1990 and 2000 Census with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects.

Table 1a
Summary Statistics

	Full Sample	Unchanged Tracts	.5<=Tmi<.80	.8<=Tmi<1.10	p-value of t-test
Census tract characteristics from 1990 census	**N=23151**	**N=13038**	**N=4887**	**N=8151**	
Tract Population	4406.707 (2301.331)	4005.900 (1699.848)	3837.293 (1765.747)	4106.988 (1650.956)	p<.01
Total Housing Units	1812.388 (988.6271)	1660.780 (751.2276)	1591.259 (768.3947)	1702.46 (737.6564)	p<.01
Owner Occupied Housing Units	977.5589 (629.8486)	869.570 (488.6388)	656.5181 (422.1152)	997.3055 (481.2308)	p<.01
Median House Value	88737.68 (63264.37)	91140.93 (67183.40)	77690.48 (63886.55)	99205.26 (67821.07)	p<.01
Prop. of 1 Detached Unit	0.5518 (0.2687)	0.5308 (0.2861)	0.4349 (0.2883)	0.5883 (0.2689)	p<.01
Prop. of Multifamily Units	0.1847 (0.2137)	0.1992 (0.2255)	0.2376 (0.2485)	0.1762 (0.2071)	p<.01
Prop. of Mobile or Trailer Homes	0.0641 (0.1188)	0.0508 (0.1076)	0.0447 (0.1114)	0.0545 (0.1050)	p<.01
Prop. of Total Units Built Between 1980-1990	0.1522 (0.1586)	0.1271 (0.1443)	0.1045 (0.1240)	0.1406 (0.1537)	p<.01
Prop. of Total Units Built Between 1940-1969	0.4446 (0.2176)	0.4640 (0.2216)	0.4465 (0.2075)	0.4744 (0.2291)	p<.01
Prop. of Total Units Built Before 1940	0.2229 (0.2297)	0.2476 (0.2420)	0.3153 (0.2580)	0.2071 (0.2222)	p<.01
Prop. of non-Hispanic/Latino Black/AA population	0.1452 (0.2451)	0.1686 (0.2706)	0.2800 (0.3316)	0.1018 (0.1981)	p<.01
Prop. of Hispanic/Latino population	0.1075 (0.1853)	0.1057 (0.1786)	0.1630 (0.2309)	0.0714 (0.1261)	p<.01
Prop. of Persons 65+	0.1335 (0.0751)	0.1361 (0.0742)	0.1300 (0.0768)	0.1398 (0.0725)	p<.01
Prop. in Group Quarters	0.0161 (0.0358)	0.0152 (0.0345)	0.0172 (0.0363)	0.0141 (0.0333)	p<.01

Note: This table shows the mean (standard deviation) for the census tract characteristics taken from the 1990 Census Neighborhood Change Database released by Geolytics. Both the full sample and the unchanged tracts are only for $0.5<TM_i<1.10$. Columns 3 and 4, $0.5<=TM_i<0.80$ and $0.8<TM_i<1.10$ respectively, describe the mean (standard deviation) for the sample of unchanged tracts.

Table 1b
Summary Statistics – Outcome Variables

	Full Sample	Unchanged Tracts	.5<=Tmi<.80	.8<=Tmi<1.10	p-value of t-test
Banks and Thrifts - HMDA Characteristics	**N=23151**	**N=13038**	**N=4887**	**N=8151**	
Average of Home Purchase Originations	30.5963 (31.2422)	25.3653 (.20.9067)	17.4004 (15.4410)	30.1208 (22.2576)	p<.01
Average of Refinance and Home Improvement Originations	39.6013 (31.8608)	34.5484 (25.1073)	24.7474 (18.6742)	40.4247 (26.5927)	p<.01
Mortgage Outcome Variables	**N=23151**	**N=13038**	**N=4887**	**N=8151**	
Log of Total Originations	5.7228 (0.8690)	5.6064 (0.8265)	5.2451 (0.8319)	5.823 (0.7435)	p<.01
Log of Total Amount ($) of Originations	8.8709 (1.0708)	8.7567 (0.9970)	8.2138 (0.9966)	9.0817 (0.8440)	p<.01
Log of Average Amount ($) per Origination	3.1458 (0.5234)	3.1464 (0.5335)	2.9620 (0.5850)	3.2568 (0.4665)	p<.01
Community Outcome Variables		**N=13038**	**N=4887**	**N=8151**	
Homeownership Rate in 2000		0.5807 (0.2234)	0.4944 (0.2114)	0.6474 (0.2029)	p<.01
Log of Median Home Values in 2000		11.564 (0.5521) N=12934	11.3933 (0.6013) N=4817	11.666 (0.4935) N=8117	p<.01
Mobility Rate		0.4565 (0.1219)	0.4865 (0.1264)	0.4385 (0.1155)	p<.01
Employment-to-Population of Civilians Ratio in 2000		0.5876 (0.0950)	0.5436 (0.0968)	0.6140 (0.0834)	p<.01
Unemployment Rate of Civilians in 2000		0.0706 (0.0457)	0.0958 (0.0521)	0.5545 (0.0332)	p<.01
Labor Force Participation Rate of Civilians in 2000		0.6305 (0.0864)	0.5994 (0.0896)	0.6492 (0.0787)	p<.01
Commuting for 25 minutes or less in 2000		0.3311 (0.1205)	0.3058 (0.1249)	0.3463 (0.1152)	p<.01
Proportion With a High School Diploma in 2000		0.3080 (0.0886)	0.2983 (0.0863)	0.3138 (0.0894)	p<.01
Proportion With a College Degree in 2000		0.1831 (0.1259)	0.1411 (0.1189)	0.2083 (0.1232)	p<.01

Note: This table shows the mean (standard deviation) for the types of originations and the mortgage outcome variables taken from HMDA summed for each tract across 1994-1999 and the community outcome variables taken from the 2000 Census Neighborhood Change Database released by Geolytics. Both the full sample and the unchanged tracts are only for $0.5<TM_i<1.10$. Columns 3 and 4, $0.5<=TM_i<0.80$ and $0.8<TM_i<1.10$ respectively, describe the mean (standard deviation) for the sample of unchanged tracts.

Table 2 a

Regression of Log of Originations on CRA Treatment – Full Sample

Dependent Variable: Log of Originations	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All MSAS	0.0804	0.0320	-0.0116	0.0011	0.0369	0.0146	0.0166
mean 5.6692 (*0.7933*)	(0.0574)	(0.0420)	(0.0226)	(0.0181)	(0.0318)	(0.0263)	(0.0138)
	N=4268	N=4268	N=23151	N=23151	N=23151	N=23151	N=23151
Small MSAs	-0.0644	-0.1295	-0.0581	-0.0211	-0.0365	-0.0281	-0.0024
mean 5.7516 (*0.7191*)	(0.0915)	(0.0999)	(0.0143)	(0.0366)	(0.0541)	(0.0490)	(0.0284)
	N=1130	N=1130	N=6358	N=6358	N=6358	N=6358	N=6358
Medium MSAs	0.1447*	0.1223*	-0.0344	-0.0235	0.0208	0.0150	-0.0183
mean 5.7063 (*0.7314*)	(0.0759)	(0.0707)	(0.0378)	(0.0364)	(0.0511)	(0.0512)	(0.0245)
	N=1474	N=1474	N=7869	N=7869	N=7869	N=7869	N=7869
Large MSAs	0.1182	0.0433	0.0406	0.0387*	0.0943*	0.0425	0.0573****
mean 5.5794 (*0.8843*)	(0.1123)	(0.0609)	(0.0367)	(0.0202)	(0.0504)	(0.0373)	(0.0147)
	N=1664	N=1664	N=8924	N=8924	N=8924	N=8924	N=8924
MSA FE		x		x		x	x
Full Controls							x
Bandwidth	0.05	0.05	0.3	0.3	0.3	0.3	0.3
Control for	linear	linear	linear	linear	cubic	cubic	cubic

Note: This table supplies the coefficients from the full sample for the regression of log of originations on the dummy for treated by the CRA. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA level. Each of the mean in italics is given is for the area directly above the cutoff (0.8<TM_i<0.82). Small MSAs have a population of less than 500,000 people; medium MSAs have a population between 500,000 and 2 million people; large MSAs have a population of more than 2 million people according to the 1990 Census.

Table 2 b

Regression on Log of Originations – Sample of Unchanged Tracts

Dependent Variable: Log of Originations	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All MSAS	0.1242*	0.0798	0.0053	0.0143	0.0324	0.0002	0.0187
mean 5.5370 (0.7758)	(0.0664)	(0.0504)	(0.0312)	(0.0247)	(0.04631)	(0.0321)	(0.0176)
	N=2493	N=2493	N=13038	N=13038	N=13038	N=13038	N=13038
Small MSAs	-0.0192	0.0134	-0.0080	0.0290	-0.0225	-0.0219	0.0225
mean 5.7125 (0.6461)	(0.1197)	(0.1570)	(0.0510)	(.0490)	(0.0719)	(0.0637)	(0.0334)
	N=621	N=621	N=3301	N=3301	N=3301	N=3301	N=3301
Medium MSAs	0.1321	0.0620	-0.0571	-0.0435	-0.0554	-0.0587	-0.0299
mean 5.6078 (0.6904)	(0.1061)	(0.1011)	(0.0565)	(0.0536)	(0.0696)	(0.0675)	(0.0347)
	N=843	N=843	N=4341	N=4341	N=4341	N=4341	N=4341
Large MSAs	0.1994*	0.1168**	0.0689**	0.0557*	0.1357*	0.0571	0.0545***
mean 5.3676 (0.8804)	(0.0997)	(.1168)	(0.0468)	(.0256)	(0.0716)	(0.0377)	(0.0177)
	N=1029	N=1029	N=5396	N=5396	N=5396	N=5396	N=5396
MSA FE		x		x		x	x
Full Controls							x
Bandwidth	0.05	0.05	0.3	0.3	0.3	0.3	0.3
Control for	linear	linear	linear	linear	cubic	cubic	cubic

Note: This table supplies the coefficients from the sample of unchanged tracts between the 1990 and 2000 Census for the regression of log of originations on the dummy for treated by the CRA. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA level. Each of the mean in italics is given is for the area directly above the cutoff (0.8<TM_i<0.82). Small MSAs have a population of less than 500,000 people; medium MSAs have a population between 500,000 and 2 million people; large MSAs have a population of more than 2 million people according to the 1990 Census.

Table 3 a

Regression on Log of Total Amount ($) Originated – Sample of Unchanged Tracts

Dependent Variable: Log of Total Dollar Amount Originated							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All MSAS	0.0839	0.0499	0.0090	0.0136	-0.0096	-0.0191	0.0033
mean 8.6556 (0.8759)	(0.0667)	(0.0669)	(0.0323)	(0.0265)	(0.0421)	(0.0336)	(0.0250)
	N=2490	N=2490	N=13024	N=13024	N=13024	N=13024	N=13024
Small MSAs	0.0443	-0.0111	0.0223	0.0362	-0.0036	-0.0345	0.0143
mean 8.5954 (0.8169)	(0.1467)	(0.1612)	(0.0632)	(0.0511)	(0.0901)	(0.0649)	(0.0447)
	N=621	N=621	N=3301	N=3301	N=3301	N=3301	N=3301
Medium MSAs	0.0012***	-0.0236	-0.0747	-0.0492	-0.1316*	-0.1063	-0.0803*
mean 8.6532 (0.7970)	(0.1388)	(0.1174)	(0.0684)	(0.0594)	(0.0763)	(0.0681)	(0.0431)
	N=842	N=842	N=4340	N=4340	N=4340	N=4340	N=4340
Large MSAs	0.1683**	0.1255	0.0526	0.0531*	0.0845*	0.0566	0.0610*
mean 8.6952 (0.9713)	(0.0715)	(0.1006)	(0.0355)	(0.0292)	(0.0481)	(0.0448)	(0.0328)
	N=1027	N=1027	N=5383	N=5383	N=5383	N=5383	N=5383
MSA FE		x		x		x	x
Full Controls							x
Bandwidth	0.05	0.05	0.3	0.3	0.3	0.3	0.3
Control for	linear	linear	linear	linear	cubic	cubic	cubic

Note: This table supplies the coefficients from the sample of unchanged tracts between the 1990 and 2000 Census for the regression of log of total dollar amount originated in each tract on the dummy for treated by the CRA. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA level. Each of the mean in italics is given is for the area directly above the cutoff (0.8<TM_i<0.82). Small MSAs have a population of less than 500,000 people; medium MSAs have a population between 500,000 and 2 million people; large MSAs have a population of more than 2 million people according to the 1990 Census.

Table 3 b

Regression on Log of Average Amount ($) per Origination – Sample of Unchanged Tracts

Dependent Variable: Log of Average Dollar Amount per Origination							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All MSAS	-0.0300	-0.0208	-0.0019	0.0001	-0.0482	-0.0243	-0.0183
mean 3.1185 (0.5236)	(0.0510)	(0.0336)	(0.0237)	(0.0174)	(0.0298)	(0.0160)	(0.0165)
	N=2490	N=2490	N=13024	N=13024	N=13024	N=13024	N=13024
Small MSAs	0.0634	0.0245	0.0304	0.007	0.0189	-0.0125	-0.0083
mean 2.8829 (0.3929)	(0.0735)	(0.0556)	(0.0299)	(0.0192)	(0.0431)	(0.0260)	(0.0264)
	N=621	N=621	N=3301	N=3301	N=3301	N=3301	N=3301
Medium MSAs	-0.1137*	-0.0680*	-0.0254	0.0140	-0.0871**	-0.0598**	-0.0592**
mean 3.0454 (0.4233)	(0.0667)	(0.0390)	(0.0302)	(0.0219)	(0.0380)	(0.0250)	(0.0233)
	N=842	N=842	N=4340	N=4340	N=4340	N=4340	N=4340
Large MSAs	-0.0211	0.0148	-0.0047	0.0059	-0.0568	-0.0026	0.0057
mean 3.3276 (0.5896)	(0.0889)	(0.0633)	(0.0471)	(0.0368)	(0.0498)	(0.0308)	(0.0314)
	N=1027	N=1027	N=5383	N=5383	N=5383	N=5383	N=5383
MSA FE		x		x		x	x
Full Controls							x
Bandwidth	0.05	0.05	0.3	0.3	0.3	0.3	0.3
Control for	linear	linear	linear	linear	cubic	cubic	cubic

Note: This table supplies the coefficients from the sample of unchanged tracts between the 1990 and 2000 Census for the regression of log of average dollar amount per origination in each tract on the dummy for treated by the CRA. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA level. Each of the mean in italics is given is for the area directly above the cutoff (0.8<TM_i<0.82). Small MSAs have a population of less than 500,000 people; medium MSAs have a population between 500,000 and 2 million people; large MSAs have a population of more than 2 million people according to the 1990 Census

Table 4

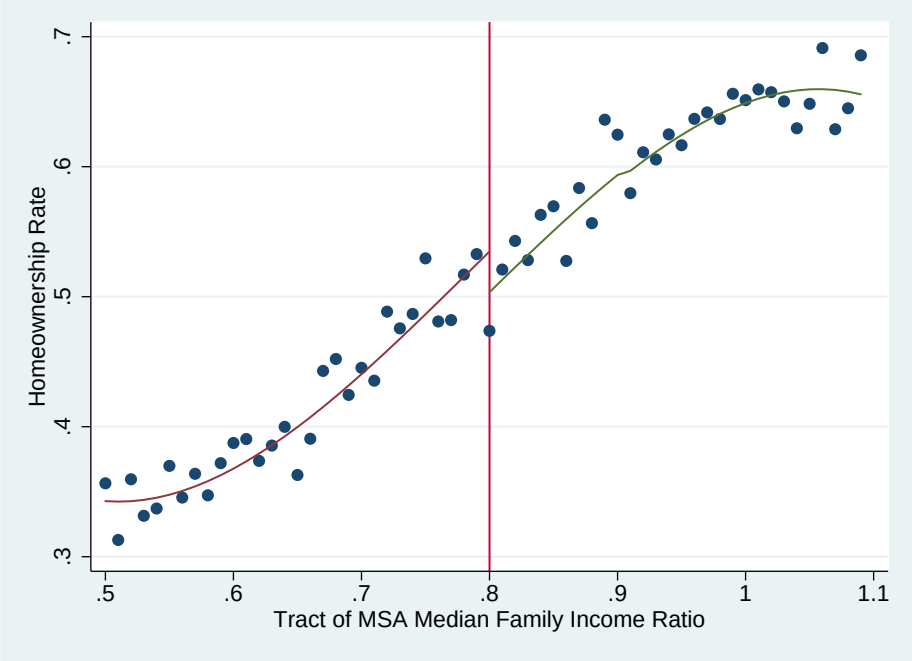
Homeownership for Large MSA's

Mean 0.4959 (0.2327)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	0.0316**	0.0082	0.0001	0.2329***	0.1440	0.0019
	(0.0145)	(0.0100)	(.0039)	(0.0797)	(0.1687)	(.0702)
N	5396	5396	5396	5396	5396	5396
R^2	0.1880	0.4149	0.9067	0.3515	0.5538	0.9072
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of proportion of all occupied units that are owner-occupied units on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). The homeownership rate is taken from the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 4
Discontinuity of Homeownership for Large MSAs



Note: The y-axis is the homeownership rate with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 4 above.

Table 5

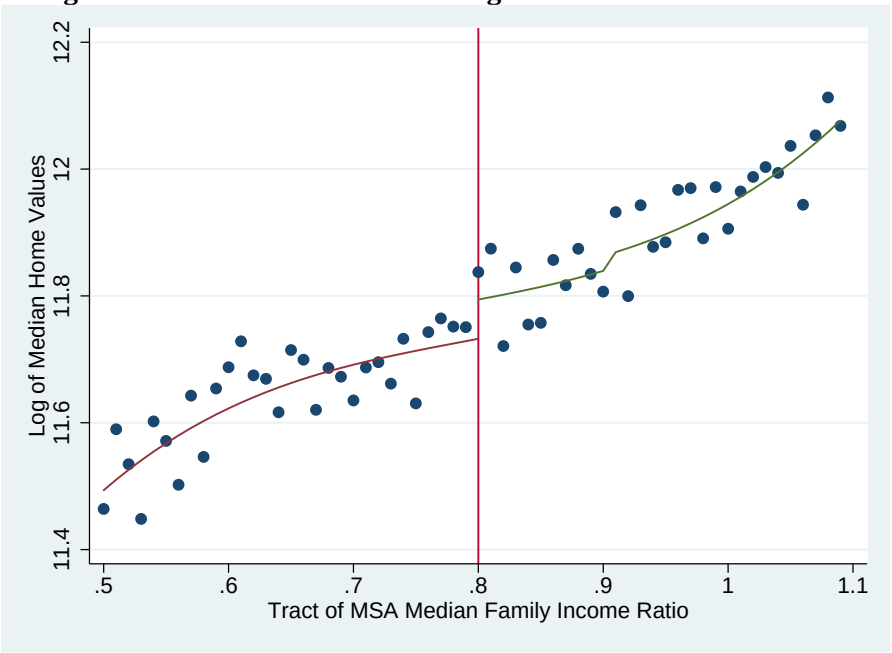
Log of Self-Reported Home Values

Mean 11.8552 (0.5018)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	-0.0618 0.0420	-0.0033 (0.0140)	0.0001 (0.0123)	-0.4819 (0.3059)	-0.0810 (0.3669)	0.0169 (0.3044)
N	5310	5310	5310	5310	5310	5310
R^2	0.0703	0.6273	0.7814			
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of log of median home values on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). The median home values are taken from the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 5
Discontinuity of Log of Median Home Values for Large MSAs



Note: The y-axis is the log of median home values with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 5 above.

Table 6

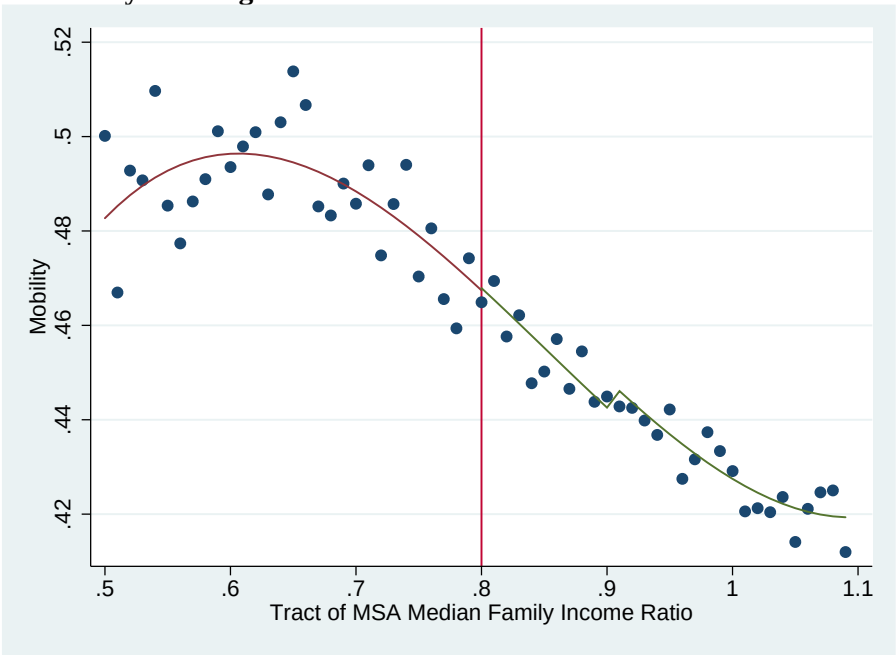
Mobility

Mean 0.4614 (0.1232)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	0.0024	-0.0006	0.0067	0.0176	-0.011	0.1229
	(0.0109)	(0.0097)	(0.0058)	(0.0770)	(0.1683)	(0.1229)
N	5396	5396	5396	5396	5396	5396
R^2	0.0343	0.2765	0.6499	0.0272	0.2864	0.5377
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of mobility on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). Mobility is defined by the degree of turnover in the tract by looking at the share of the population ages 5+ who lived in a different tract 5 years previously on the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 6
Discontinuity of Mobility for Large MSAs



Note: The y-axis is the mobility rate with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 6 above.

Table 7

Proportion of Individuals with High School Diploma

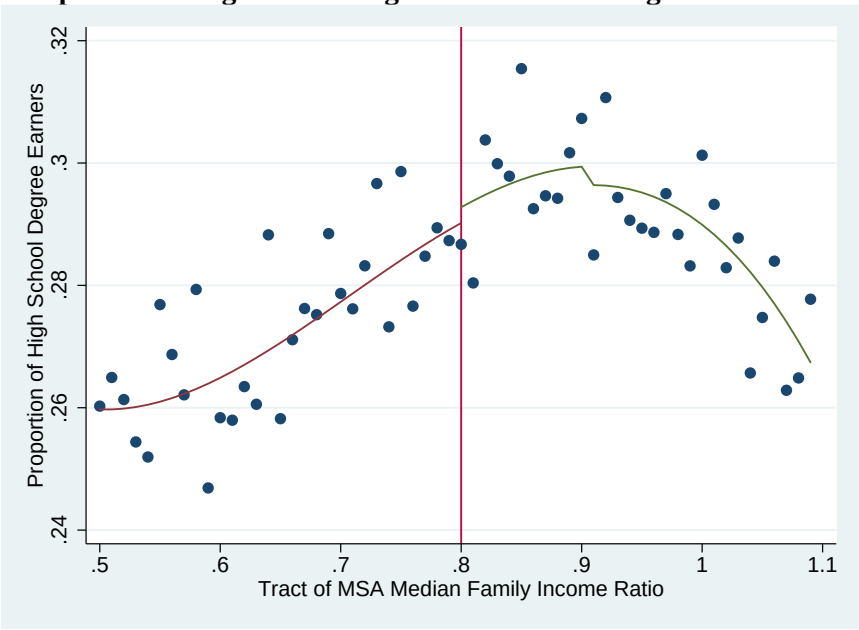
Mean 0.2838 (0.0883)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	-0.0026	-0.0062	-0.0049	-0.0195	-0.1089	-0.089
	(0.0058)	(0.0044)	(0.0035)	(0.0426)	(0.1122)	(0.0712)
N	5396	5396	5396	5396	5396	5396
R^2	.0207	0.3616	0.5936			0.5016
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of the proportion of individuals 25+ with a High School Diploma on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). The proportion of individuals with a High School Diploma is taken from the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 7

Discontinuity of Proportion of High School Degree Earners for Large MSAs



Note: The y-axis is the proportion of individuals 25+ with a high school degree with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 7 above.

Table 8

Proportion of Individuals with College Degree

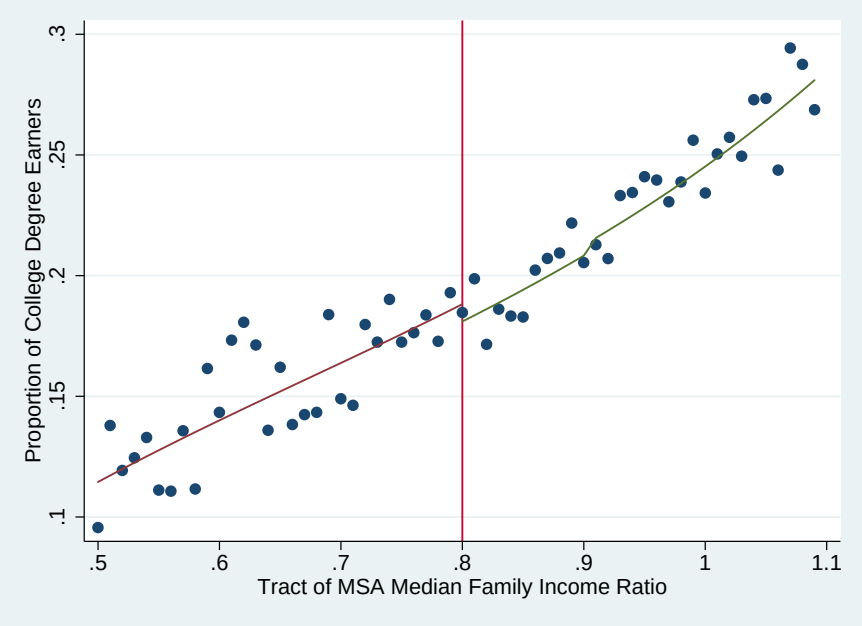
Mean 0.1912 (0.1291)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	0.0073	0.0074	0.0075*	0.0535	0.1289	0.1373*
	(0.0069)	(0.0061)	(0.0036)	(0.0628)	(0.1500)	(0.0690)
N	5396	5396	5396	5396	5396	5396
R^2	0.1063	0.2271	0.5479			0.4956
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of the proportion of individuals 25+ with a College Degree (Bachelors and above) on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). The proportion of individuals with a College Degree is taken from the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 8

Discontinuity of Proportion of College Degree Earners for Large MSAs



Note: The y-axis is the proportion of individuals 25+ with a college degree with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 8 above.

Table 9

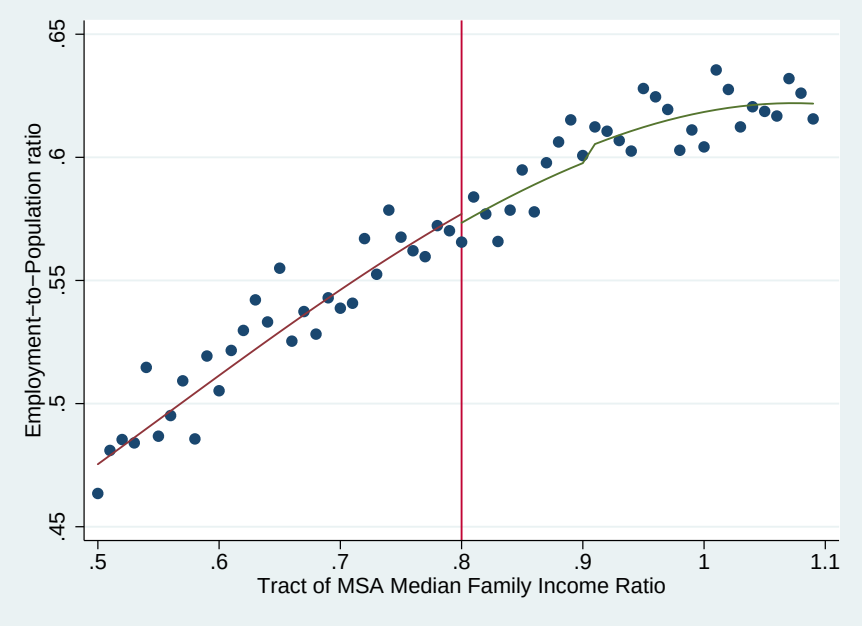
Employed-to-Population Ratio

Mean 0.5742 (0.0908)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	0.0039	-0.0012	-0.0011	0.0285	-0.0207	-0.0196
	(0.0088)	(0.0061)	(0.0053)	(0.0529)	(0.1105)	(0.0993)
N	5396	5396	5396	5396	5396	5396
R^2	0.1813	0.3792	0.6417	0.2569	0.3463	0.6197
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of the proportion of the total population of civilians 16+ who are employed on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). The employed-to-population ratio is taken from the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 9
Discontinuity of Employment to Population Ratio for Large MSAs



Note: The y-axis is the employment to population with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 9 above.

Table 10

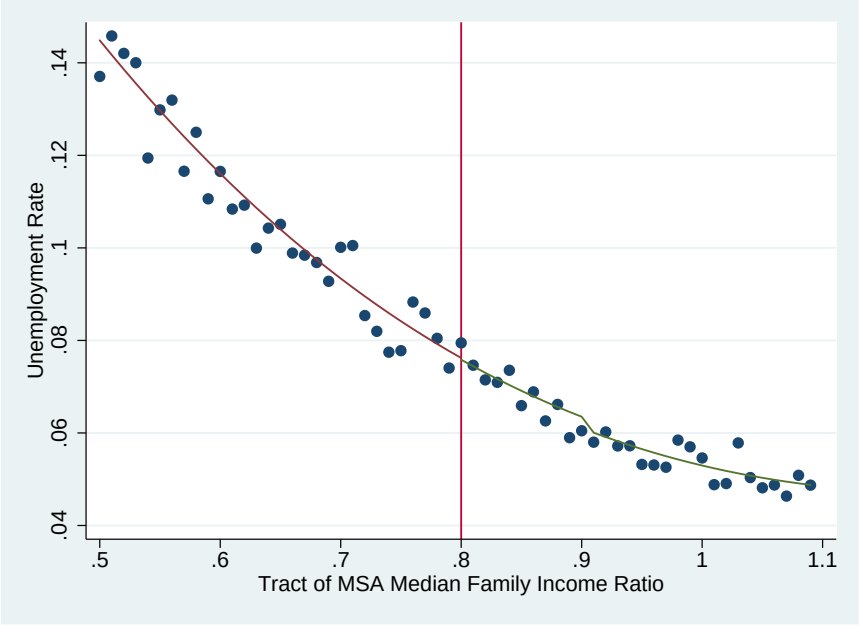
Unemployment Rate

Mean 0.0772 (0.0474)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	0.0001	0.0024	0.001	0.0007	0.042	0.0175
	(0.0040)	(0.0031)	(0.0028)	(0.0296)	(0.0687)	(0.0528)
N	5396	5396	5396	5396	5396	5396
R^2	0.2702	0.3923	0.5574	0.2649	0.0517	0.5226
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of the proportion of the civilian labor force 16+ who are unemployed on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). The unemployment rate is taken from the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 10
Discontinuity of Unemployment Rate for Large MSAs



Note: The y-axis is the unemployment rate with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 10 above.

Table 11

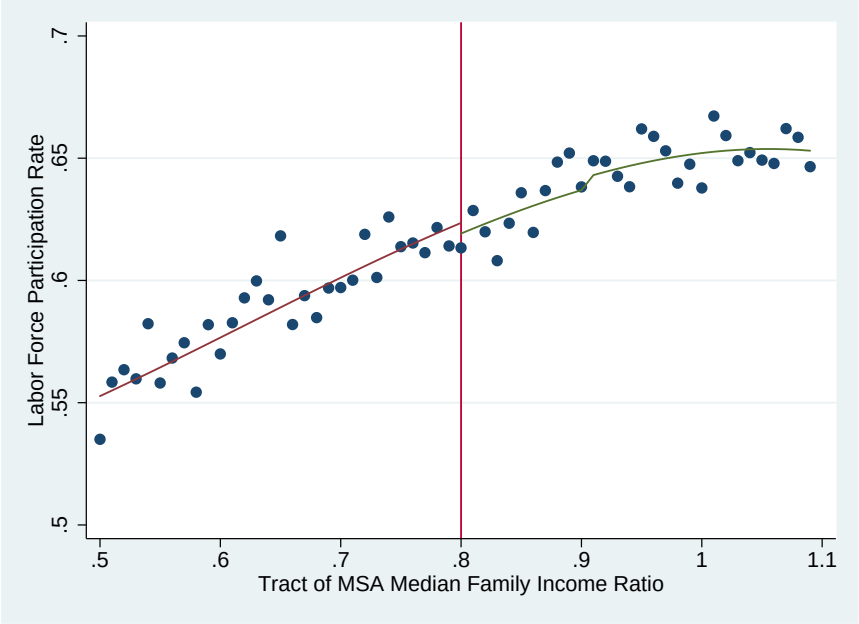
Labor Force Participation Rate

Mean 0.6205 (0.0816)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	0.0046	0.0006	-0.0001	0.0336	0.011	-0.0021
	(0.0080)	(0.0060)	(0.0049)	(0.0471)	(0.1044)	(0.0897)
N	5396	5396	5396	5396	5396	5396
R^2	0.1099	0.2893	0.5977	.1714	0.2919	0.5957
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of the proportion of the total population of civilians 16+ who participate in the labor force on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). The labor force participation rate is taken from the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 11
Discontinuity of Labor Force Participation Rate for Large MSAs



Note: The y-axis is the labor force participation rate with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 11 above.

Table 12

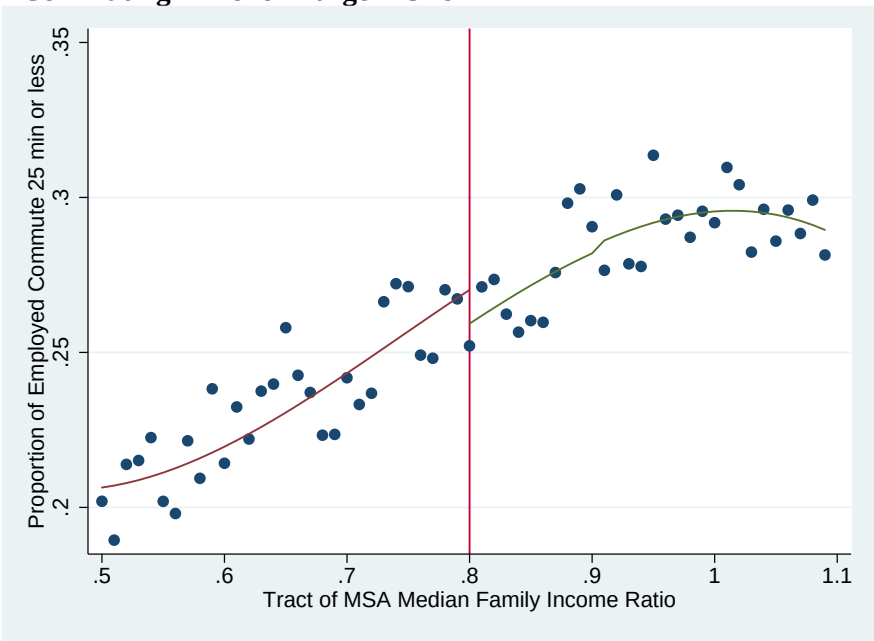
Proportion of Employed with Commuting Time <25 minutes

Mean 0.2610 (0.1090)

	Reduced Form			IV		
	1[TM<.8]	**1[TM<.8]**	**1[TM<.8]**	**ln(orig)**	**ln(orig)**	**ln(orig)**
	0.0110	0.0050	0.0082**	0.0807*	0.0870	0.1502*
	(0.0088)	(0.0046)	(0.0036)	(0.0427)	(0.0931)	(0.0798)
N	5396	5396	5396	5396	5396	5396
R^2	0.0689	0.5240	0.6400	0.1216	0.2498	0.3770
MSA FE		x	x		x	x
Full Controls			x			x
Bandwidth	0.3	0.3	0.3	0.3	0.3	0.3
Control for	cubic	cubic	cubic	cubic	cubic	cubic

Note: This table supplies the coefficients for the regression of the proportion of working civilians 16+ who are commute to work in under 25 minutes and do not work at home on the CRA dummy variable (reduced form) and log of originations instrument for the CRA dummy (IV). The commuting time rate is taken from the 2000 Census. The coefficients show are from the sample of large MSAs with a TM between 0.5 and 1.10 in unchanged tracts between the 1990 and 2000 Census. *p-value < 0.1, **p-value <0 .05, ***p-value<0.01, ****p-value<0.005 All of the regressions control for the potential effects of the GSE policy (TM_i<0.90). The standard errors are clustered at the MSA levels. The mean (in italics) is given is for the tracts directly above the cutoff (0.8<TM_i<0.82).

Figure 12
Discontinuity of Commuting Time for Large MSAs



Note: The y-axis is the proportion of employed commuting time 25 min or less with a TM between 0.5 and 1.10. Each data point represents the mean tract values for tracts for 1 percentage point intervals of TM. The fitted lines are generated from a cubic regression of the log of originations on the CRA dummy variable (TM_i<0.8), the GSE dummy variable (TM_i<0.9), and the TM variable without MSA fixed effects shown in column 1 in Table 12 above.