

**Market Forces or CRA-induced Externalities:  
What Accounts for the Increase in Mortgage Lending to  
Lower-Income Communities?**

Raphael W. Bostic<sup>1</sup>  
Brian J. Surette<sup>2</sup>

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**Abstract**

This paper examines whether CRA incentives were influential regarding the large increase in lending to lower-income communities through the 1990s and early 2000s. The approach capitalizes on the fact that, because the CRA does not apply to all lenders in all locations, the regulations establish market conditions that approximate a natural experiment. We examine mortgage lending activities during 1994-1995, 1996-1997, 1998-1999, and 2000-2001 and compare the level and the change in lower-income community lending across lenders subject to CRA incentives to varying degrees, controlling for a number of economic and lender characteristics. While the results provide clear support for the view that the CRA has been influential, models that focus on changes in activity over time directly support the view that market forces or some other factors, rather than the incentives established via the CRA, are more important in explaining the observed trends. Taken together, the results provide a mixed picture regarding the importance of the CRA. The results suggest that CRA covered institutions continue to have higher levels and shares of lending to lower-income communities, but that the recent increases in such lending appear to be more a function of market forces than regulation.

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<sup>1</sup> Associate Professor, University of Southern California, Ralph and Goldy Lewis Hall 326, MC 0626, Los Angeles, CA 90089. [bostic@usc.edu](mailto:bostic@usc.edu). (213) 740-1220.

<sup>2</sup> Principal Economist, Freddie Mac, 8250 Jones Branch Dr., Mail Stop A49, McLean, VA 22102. [Brian\\_Surette@Freddiemac.com](mailto:Brian_Surette@Freddiemac.com). (703) 918-8108.

The opinions expressed herein are those of the authors and do not necessarily reflect the views of Freddie Mac or the University of Southern California.



## Introduction

Researchers have debated about the extent to which the historic increase in lending to lower-income borrowers and neighborhoods (lower-income communities) observed during the 1990s was the product of market forces or regulations designed to promote such activities, such as the Community Reinvestment Act (CRA). Studies showing that most of the increase in this lending was by depositories and their affiliates in areas where they are not covered by the CRA have been taken as evidence that the CRA was not a major factor in recent changes in lending patterns. However, scenarios exist in which observed patterns of lending growth could be consistent with the view that the CRA and other regulations were important in this context. For example, it could be that, through activities associated with the CRA and other regulations in their service area, lenders gain experience on how to lend profitably to lower-income communities that can be applied to other areas. In this view, regulation may have externalities that permit the expansion of lower-income lending in other areas.

The current research attempts to distinguish between these possibilities and to promote a deeper understanding of mortgage market dynamics. In particular, the analysis examines the degree to which the level and observed changes in lending to lower-income communities can be viewed as a response to incentives laid out in regulations such as the Community Reinvestment Act (CRA) in addition to a response to market forces. The results provide a mixed picture. On one hand, compared to institutions not subject to the CRA, in all years examined depositories subject to CRA incentives extended more loans and a larger fraction of their loans to lower-income communities in areas where they are covered by the regulation. This result is consistent with the view that CRA has played a central role in lower-income lending.<sup>3</sup> However, examining *changes* in lower-income lending rather than its level in any particular year, we find evidence supporting the view that the CRA has had a smaller role than market forces. In this context, independent mortgage companies not subject to CRA incentives generally showed larger increases in lending to lower-income communities than CRA-covered depository institutions, particularly those operating in counties within their service area. These conflicting

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<sup>3</sup> The Joint Center for Housing Studies (2002) similarly finds a positive association between CRA coverage areas and lower-income lending.

results suggest that, although CRA covered institutions continue to have higher levels and shares of lending to lower-income communities, the recent increases in such lending are more a function of market forces than regulation.

## **1. Background**

Since the early 1990s, there has been a dramatic increase in home mortgage lending and homeownership. The number of single family home purchase mortgage originations increased from 3.2 million in 1993 to 4.9 million in 2001 and homeownership rates increased steadily through the decade, reaching an all-time high of 69 percent in the third quarter of 2004 (Census, 2004).

These increases have been most pronounced in lower-income communities. For example, Avery, Bostic, Calem, and Canner (1999) show that between 1993 and 1997 home mortgage lending to lower-income borrowers increased by 31 percent and lending to lower-income neighborhoods increased by about 32 percent.<sup>4</sup> By comparison, total lending to all borrowers increased by only 21 percent over the same period. More recent data show the same relationship, as annual lending to lower-income communities increased by over 82 percent from 1993 to 2001 while total annual lending increased by about 53 percent over that period (FFIEC, 2002). Further, Bostic and Surette (2001) show that homeownership rates among lower-income families grew faster between 1989 and 1998 than rates for other families. For example, homeownership rates among families in the bottom two income quintiles increased by about 3.5 percentage points over the period, while rates among families in the highest income quintile increased by only 1.5 percentage points.<sup>5</sup>

There are a number of possible explanations for the disproportionate increases among lower-income communities. During the 1990s, the U.S. economy experienced a broad expansion that had significant effects on credit markets. The demand for credit products increased, as incomes, house values, and home equity increased for many households.

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<sup>4</sup> Lower-income borrowers have incomes less than 80 percent of the median family income of the MSA in which they reside. Lower-income neighborhoods are census tracts that have median incomes less than 80 percent of the median family income of the MSA in which they are located.

<sup>5</sup> Bostic and Surette also examine trends in minority homeownership and find significant gains as compared to whites. Homeownership rates for black and Hispanic families increased by 12.5 and 9.4 percent, respectively, while homeownership rates for white families increased by only 4.1 percent.

Lower-income populations could have had larger improvements than other groups in factors that have an important bearing on the decision and ability to own a home, such as economic well-being and family structure. However, Bostic and Surette (2001) show that the changes in observable housing-related characteristics of families between 1989 and 1998 would actually have implied *declines* in homeownership rates among lower-income families.

Another possible explanation is that changes in credit markets have disproportionately benefited lower-income communities. Credit markets have changed dramatically in the last few decades. During the 1990s, mortgage interest rates declined steadily, putting homeownership within the reach of larger numbers of families. In addition, new technologies, such as automated underwriting (also known as credit scoring), improved the ability of lenders to assess and price credit risk and dramatically reduced the cost of doing so. Such changes may also have allowed them to broaden their geographic scope. Moreover, many changes in the structure of lending markets have given consumers access to products from a much broader array of financial services companies than ever before. First, the banking industry consolidated rapidly during this time, which promoted economies of scale. Second, the secondary market for mortgages grew significantly, thereby providing liquidity and a ready outlet for large numbers of home mortgages. Together, these factors may have changed the competitive environment of credit markets in important ways that disproportionately affected lending to lower-income communities. For example, by quantifying credit risk more accurately, credit scoring in principle enables lenders to increase the proportion of applicants they accept. These marginal applicants are likely to have lower than average incomes.

A third possibility is that regulatory changes have been a key influence on the growth in lending to and homeownership among lower-income communities. Three key regulations in this context are the Home Mortgage Disclosure Act (HMDA), the Community Reinvestment Act (CRA), and the Federal Housing Enterprise Financial Safety and Soundness Act of 1992 (FHEFSSA), and each established new incentives to promote lending to lower-income communities in the early 1990s.

Passed in 1975 as part of a program to combat redlining, the HMDA was designed to help make lender activities more transparent and more easily scrutinized by the public.

The HMDA, particularly after revisions in 1990 and 1993, led to the collection of detailed information on the lending activities of institutions, which facilitated more sophisticated statistical analyses of lender activities. Now, the annual release of these data items is met with a flurry of activity by local, typically non-profit, organizations and the media, who closely track the activities of lenders in their areas and report on their performance in serving local communities. This heightened public scrutiny of lender activity has presented an important incentive for lenders to be vigilant in their provision of service to lower-income communities.

The CRA was enacted in 1977 to encourage federally-insured commercial banks and savings associations (banking institutions) to help meet the credit needs of their local communities, including those of lower-income areas, in a manner consistent with their safe and sound operation. In 1995, new regulations were implemented that laid out new evaluation criteria for CRA performance. For large retail banking institutions, these regulations established three performance tests – lending, investment, and service.<sup>6</sup> The lending test, which is more heavily weighted during examinations by CRA examiners than either the investment or service test, involves the measurement of CRA-related lending activity for a variety of loan types, including home mortgage, small business and small farm, and community development loans. In conducting the lending test for each loan type, regulators also assess the geographic distribution of an institution’s lending, including a comparison of the proportion of loans extended (1) within and outside the institution’s service area, (2) to lower-income and other borrowers, and (3) in lower-income and other neighborhoods. Particular attention is given to the proportion of lending extended within the institution’s service area and extended to lower-income borrowers and neighborhoods.<sup>7</sup> At the conclusion of an examination, regulators assign a CRA performance rating for the institution that is made available to the public.

These new tests focused more on actual lending outcomes than previous tests had and, as a consequence, provided new incentives for banking institutions to serve lower-income communities. Moreover, an institution’s CRA performance is considered by regulators when assessing an application for a charter, deposit insurance, a change in

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<sup>6</sup> Wholesale and special purpose banking institutions face different assessment criteria.

<sup>7</sup> For more on the CRA, see Federal Reserve Board of Governors (2000).

branching, or a merger or acquisition, giving institutions an additional incentive to meet CRA objectives and devote considerable attention to lending to lower-income communities.

The FHEFSSA sought in part to increase the level of support the GSEs provide to lower-income and minority communities, and authorizes the Secretary of the Department of Housing and Urban Development to establish for the GSEs “affordable housing goals,” which specify a percentage of the GSEs’ annual loan purchase volume that should be comprised of mortgages made to targeted populations, including lower-income communities.<sup>8</sup> Thus, from 1992, the GSEs faced a new incentive to serve lower-income communities and evidence suggests that they responded by facilitating more purchases of loans made to members of targeted communities (Listokin and Wyly, 2000; Ambrose, Thibodeau, and Temkin, 2002; Bunce and Scheessele, 1996; Bunce, 2000).

### **3. Analytical Framework**

#### *3.1 The basic test*

To test for the contributions of market forces and regulation to growth in lending to lower-income communities, one must be able to identify the independent effects of each. Of the many regulations that banking institutions face in this context, this study focuses exclusively on the effects of the CRA, because it is possible to design a straightforward method for identifying a “CRA effect” that is distinguishable from the influences of general market forces.

Unlike other lending-related regulations, the CRA applies only to Federally-insured depository institutions; other lending institutions are not subject to its regulations. In addition, for institutions covered by CRA objectives, the CRA emphasizes lending activities within an institution’s designated service area, roughly defined as those geographies in which an institution operates a branch office. Institutions generally receive only minimal “CRA credit” for lending outside of their service area. Thus, institutions not covered by the CRA are subject only to market forces, while Federally-insured depository institutions acting within their service areas are subject to market forces and CRA incentives. Differences in the performance of these two groups of

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<sup>8</sup> The FHEFSSA’s definitions of lower-income borrowers and lower-income neighborhoods differ slightly from those targeted by the CRA, though there is substantial overlap.

lenders will be taken as the marginal impact of the CRA on lending to lower-income communities.

Federally-insured depository institutions acting outside of their service areas represent an interesting case. These activities fall outside the purview of the CRA, and so would seem to be influenced by market forces alone. However, it is possible that institutions learn from CRA-related activities within their service area and use this acquired knowledge in their activities outside of their service area. Differences in the lower-income lending of Federally-insured depositories operating outside of their service areas and institutions not covered by the CRA will be taken as evidence regarding the existence of such a CRA “externality.”

### *3.2 Operationalizing the test*

#### 3.2.1 Creating lender “panels”

Given the importance of geography in CRA evaluations, the unit of observation in our analysis is a lender-county combination. Thus, a commercial bank that originated mortgages in 3 counties in a sample period would be represented by 3 distinct observations in the data. Observations of a lender-county combination across a pair of years constitute a lender “panel.” Lenders not present in a particular county for two consecutive years, where presence is defined as originating 10 home purchase loans in a given year, are thereby omitted from our analysis. Clearly, this introduces the potential for sample selection problems but, as will be demonstrated below, the resultant sample features dynamics quite similar to those for all institutions for which data are available. The analysis examines four two-year “panels”: 1994-1995, 1996-1997, 1998-1999, and 2000-2001.

Unfortunately, the complex and constantly changing structure of the mortgage industry makes identifying consistent lender-county combinations over time quite difficult for a significant fraction of HMDA filers. As an illustration of the complexities involved in tracking institutions over time, consider the case of Citibank and Associates First Capital, a predominantly subprime lender that was purchased by Citibank in 1999. In HMDA filings, Associates First Capital appears as an independent entity in 1999 but as an affiliate of Citibank in 2000. Assessments of the growth in lending by Citibank that rely only on the 1999 and 2000 HMDA filings of Citibank affiliates will almost certainly



overstate the growth in lending by Citibank, because lending by Associates will be included for 2000 but not for 1999. This problem will be particularly acute in counties where Associates originated large numbers of loans. Consolidation of this sort was quite common during the 1990s and can potentially lead to seriously mismeasured changes in lending to lower-income communities.

To address the measurement problems introduced by these sorts of structural changes, for each year of the panel we combined the operations of all organizations of the same type that were affiliated in the *second* year of the panel. Using the Citibank-Associates example above, the measured change between 1999 and 2000 would be based on (1) the 2000 HMDA filing for Citibank and (2) the combined 1999 HMDA filings for Associates and Citibank. If Citibank had engaged in other consolidations and these were included in the 2000 HMDA filing, the 1999 activities of these other institutions would be added to the 1999 Citibank loan figures as well.

This methodology, which enables us to account for the vast majority of home purchase lending activity in any pair of consecutive years while at the same time retaining much of the complex (and fluid) hierarchical institutional relationship structure prevalent in the industry, was used to combine all affiliated depositories in each county across any pair of years. Although panels of longer than two years would be desirable for examining our research questions, as this example illustrates, use of longer panels quickly becomes nearly intractable.

An additional issue involves the treatment of mortgage subsidiaries of depository institutions. Independent mortgage companies, which are not depositories and do not feature Federal deposit insurance, clearly are subject only to market forces. Equally clear, the lending activity of federally-insured depository institutions outside of their service areas is subject to market forces and CRA externalities, while the lending activity of these institutions within their service areas is subject to both market forces and direct CRA incentives. By contrast, the case is not as clear for mortgage company subsidiaries of depository institutions (mortgage subs), which are typically are not covered by Federal deposit insurance and thus not technically subject to the CRA. Depository institutions with mortgage subs have discretion as to whether lending by mortgage subs is considered in the context of their CRA performance evaluations. Thus, mortgage sub lending may

be relevant in evaluating the lending record of CRA-covered institutions. This potential complication is explored in our sensitivity analysis below.

### 3.2.2 Estimating the effect of market forces and CRA incentives

Theoretically, CRA incentives should induce lenders that are covered by the CRA to lend more to lower-income communities than lenders that are not covered by the law. Measuring lower-income lending in logarithms to capture the skewed distribution of lending, this can be written as

$$(1) \log( low_{ijt} ) = a_t CRA_{ij} + \beta X_{ijt} + e_{ijt} ,$$

where  $low_{ijt}$  represents the amount of lending by lender  $i$  to lower-income communities (borrowers or neighborhoods) in county  $j$  in a given year  $t$ ,  $CRA_{ij}$  is a variable indicating whether county  $j$  is a CRA-eligible market for lender  $i$ ,  $X_{ijt}$  is a vector of market supply and demand factors in year  $t$  that influence lending levels by lender  $i$  in county  $j$ ,  $a_t$  and  $\beta$  are vectors of parameters, and  $e_{ijt}$  is an error term. For ease of explication, we will assume that the branch network of a lender is fixed over time so that the definition of a CRA-eligible market is fixed over time. Thus,  $CRA_{ij}$  does not have a  $t$  subscript.<sup>9</sup>

The test described in section 3.1 calls for decomposing  $CRA_{ij}$  in equation (1) into three variables corresponding to the three lender types – independent mortgage company (INDY), depository within its service area (DEPIN), and depository outside its service area (DEPOUT). Under this formulation, observing that the coefficient on DEPIN to be statistically larger than the coefficient on INDY would be consistent with the view that CRA incentives are important beyond market forces in shaping institutional lending patterns in a given year. Similarly, a finding that the coefficient on DEPOUT exceeds the coefficient on INDY would support the notion that CRA externalities exist.

Because regulators scrutinize the context in which lending to lower-income communities occurs, a CRA-covered lender might also respond to CRA incentives by increasing the share of its originations devoted to lending to lower-income communities

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<sup>9</sup> The Joint Center for Housing Studies (2002) uses a similar specification to examine the impact of branch location on the proportion of loans originated by depositories that meet the CRA.

(“portfolio share”). Thus, we also run tests in which we replace a lender’s level of lending to lower-income borrowers and neighborhoods with the portfolio share of lower-income lending in equation (1).

### 3.2.3 An alternative estimation approach

In equation (1), the effect of CRA incentives on lender behavior is characterized by  $a_t$ , the coefficient on  $CRA_{ij}$ . However,  $CRA_{ij}$  is likely to capture more than just the effect of CRA on lower-income lending. Lenders are surely more likely to choose to locate branches in those locations where they believe lending will grow. Lenders with a physical presence in a county may also know more about the market, have more relationships with the community, and have more commitment to the area. In these cases, lenders could take actions that would increase total lending independent of CRA incentives. And if overall lending increases, it is also likely that lending to lower-income communities would increase. The key point here is that, if this scenario were to hold, lower-income lending would be relatively higher in such areas even in the absence of a CRA impact, and the proposed interpretation of  $a_t$  in equation (1) would attribute more of the increase in such lending to CRA incentives than would be warranted.

Notationally, this line of reasoning implies that  $e_{ijt}$  in equation (1) includes a lender-county specific component that may be correlated with lower-income lending, but may not be due to the CRA alone. That is,

$$(2) e_{ijt} = h_{ij} + v_{ijt},$$

where  $v_{ijt}$  is white noise, and  $h_{ij}$  is a lender-county fixed effect. The fixed effect consists of unobserved lender-county specific variables, such as future growth expectations and detailed within-market knowledge or banking relationships, all of which may affect underwriting and may facilitate more total lending. Importantly, the model we estimate assumes such factors are (more or less) fixed in any adjacent pair of years. If this sort of lender-county fixed effect is present and if  $\text{corr}(h_{ij}, CRA_{ij}) > 0$  then, assuming that the unobserved variables increased lower-income lending, the parameter  $a_t$  would overstate the impact of CRA.

To circumvent this problem, we measure the impact of CRA by looking at the change in lending associated with the CRA, as opposed to the level of lending:

(3)

$$\log(\text{low}_{ijt}) - \log(\text{low}_{ijt-1}) = (a_t - a_{t-1})\text{CRA}_{ij} + \beta(X_{ijt} - X_{ijt-1}) + (v_{ijt} - v_{ijt-1}).$$

Here,  $h_{ij}$  from equation (2) drops out of the error term in equation (3) as long as it is time-invariant. With this assumption,  $(a_t - a_{t-1})$  provides a consistent estimate of the influence that CRA has had on *changes* in lending, though not necessarily on the *level* of lending.

From this framework, it is clear that we will observe the CRA to play a role in changes in lending only if  $a_t$  varies over time, which we believe to be likely. The primary mechanism by which CRA incentives affect institutions is through the application process, mainly for inter-state expansion, mergers and acquisitions. If the likelihood that an institution will need to submit an application changes over time, then the importance of the CRA for an institution –  $a_t$  – will vary over time as well. For various reasons, the incentive to submit an application is likely to have increased during the 1990s. First, consolidation became a more attractive strategic option; witness the dramatic pace of bank merger activity leading up to and during this period (Avery, et al., 1999). Second, changes in the regulatory environment, especially the passage of the 1994 Riegle-Neal Act that relaxed restrictions on interstate banking, undoubtedly changed the viability of consolidation for some institutions. Lastly, the criteria regulators used to evaluate CRA performance were refocused in 1995 to emphasize mortgage lending to lower-income communities.<sup>10</sup> As a good CRA rating is essential to gain regulatory approval for applications, together these factors likely increased the salience of the CRA during the period studied here (1994-2001).

Prior research suggests that lenders do, indeed, consider the CRA and change their behavior accordingly prior to consolidations (Bostic, Mehran, Paulson, and Saidenberg, 2000; Evanoff and Segal, 1997). Moreover,  $a_t$  could vary if the assessment of a lender's compliance with the CRA depended on context in which the lending activity takes place.

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<sup>10</sup> The HMDA data also became much more comprehensive – by including larger numbers of mortgage companies -- starting with reporting year 1993. These data became available late in 1994 and would have provided further incentive to lenders to alter then-current lending patterns to accommodate lower-income communities.

For example, in years with large increases in total lending, institutions may be concerned that the standard for meeting CRA lending objectives might be raised by regulators, which could induce extra attention to lending to lower-income communities.

Regarding the portfolio share estimates, these suffer from similar econometric issues regarding unobserved variable bias, though they are likely to be less severe. While lender-county fixed effects will clearly increase levels of lending, it is less clear that they will alter the mix of applicants such that there are significantly more or fewer loans to lower-income communities. As long as the proportionality within the portfolio remains relatively unaffected, any biases in the estimates will be relatively minor. On the other hand, if market knowledge is relatively more or less important for successfully originating lower-income loans, the CRA parameter may still misstate the impact of the CRA. We use first differences in portfolio shares across time, as in equation (3) for levels of lending, to address this potential problem.

### *3.3 Data for the test*

Data collected pursuant to the Home Mortgage Disclosure Act (HMDA) allow one to develop a comprehensive picture of lending by institutions in local markets. The HMDA requires covered lending institutions to report data on every mortgage loan application they receive and every mortgage loan they originate or purchase through the course of each year. Institutions provide data on each application or loan, including the loan type, loan amount, and location of the property to be purchased.<sup>11</sup> In addition, lenders provide information on the loan applicant, including the applicant's race or ethnicity, gender, and gross annual income. The data on the location of the property and the applicant's income allow for the quantification of an institution's record of service to lower-income communities.

The HMDA covers all lenders with significant activity in the mortgage market. It requires reporting by all federally-insured depository institutions with assets greater than \$30 million and a home or branch office in a metropolitan statistical area (MSA). In addition, the HMDA requires reporting from all for-profit non-depository institutions that have (1) an office or activity in an MSA or received 5 or more loan applications, (2) assets greater than \$10 million or more than 100 loan originations including refinancings,

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<sup>11</sup> For more, see FFIEC (2002).

and (3) a loan portfolio of which more than 10 percent consists of home mortgages. Given estimates suggesting that data reported under the HMDA represent over 80 percent of all home purchase mortgage activity (Avery, et al., 1999), HMDA data appear to be a good representation of overall lending activity in most MSAs.

As noted previously, the exercise requires distinguishing between lending within and outside a depository institution's service area. Defining an institution's service area as all metropolitan counties in which it operates banking branches, we merged data on the location of each institution's bank branches compiled by researchers at the Federal Reserve Board with the HMDA data to identify lending activity by depositories as occurring within or outside the institution's service area. It is important to recognize that this only approximates a depository's service area and may not perfectly align with the service areas of a particular bank. Some banking institutions have service areas that are larger than a county (an MSA, for example), while others are smaller than a county or include rural, non-metropolitan areas in their service area. The current approach attempts to strike a balance between these various cases.

MSA-level economic characteristics and county-level lender characteristics are included in the specification to represent the market demand and supply factors that influence local mortgage lending and are represented by the  $X_{ijt}$  vector in equations (1) and (3). The MSA-level variables, which proxy for general credit demand and supply factors, include MSA median family income, the MSA unemployment rate, the ratio of MSA housing prices and rent levels, market size measured by total home purchase originations in the county, and an 8-firm Herfindahl index for the county to account for market concentration.<sup>12</sup> We include the shares of each lender-county's mortgages that were refinanced or sold to account for two key dimensions of lenders' business models that might influence differences in lending. We also include total home purchase lending by all affiliated lender-counties as a measure of the size of each lender nationwide. This provides some indication of the whether an institution has scale economies in its local

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<sup>12</sup> MSA rent is obtained from the HUD fair market rent series. Fair market rents prior to 1995 were defined to be the 45<sup>th</sup> percentile, whereas later years were defined to be the 40<sup>th</sup> percentile of the rent distributions. We adjusted the earlier rents using the ratio of the 45<sup>th</sup> and 40<sup>th</sup> percentile, available for 1995 only. MSA housing prices are based on annual, MSA-level median house price provided by researchers at the National Association of Realtors. MSA-level unemployment rates were obtained from the Bureau of Labor Statistics annual series.

service areas, which might suggest increased lending in the future, or the extent to which an institution might already be meeting CRA objectives, which might suggest decreased or steady levels of lending in the future. For the levels regressions (equation 1) the MSA and lender variables are included as initial base year levels; for the change regressions (equation 3) the MSA variables are included as initial levels and changes over the panel time period.

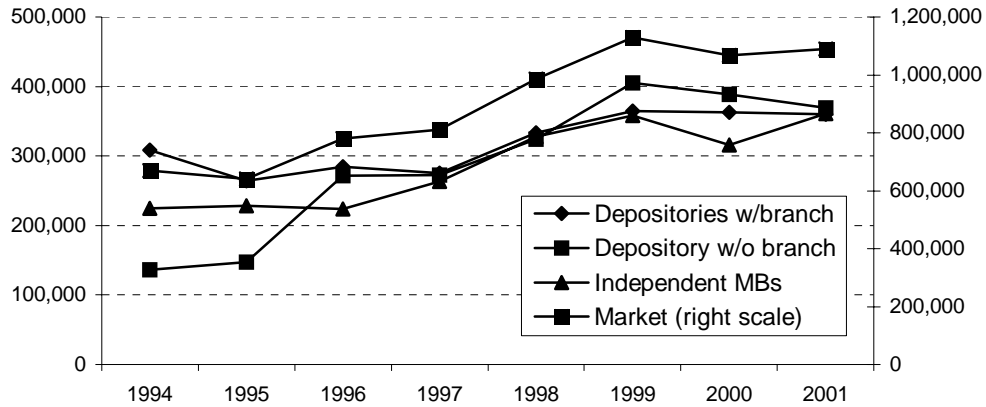
#### **4. Results**

The data show dramatic growth in lending to lower-income communities over the 1990s for the market as a whole and for all institution types except depositories acting within their service areas. For the home purchase market as a whole, home purchase lending increased 46 percent between 1994 and 2001, from 2.6 to 3.9 million loans.<sup>13</sup> Over the same period, home purchase lending to lower-income borrowers increased 57 percent, from 732,000 to 1.2 million (Figure 1), and lending to borrowers living in lower income neighborhoods also increased 57 percent, from 280,000 to 440,000 (Figure 2). These increases were attributable largely to depositories lending outside of their service areas and the growth of independent mortgage companies. Lending to lower-income communities by depositories located outside of their service areas nearly tripled between 1994 and 2001. Independent mortgage companies increased their lower-income lending by about 50 percent. Moreover, both of these institution types increased their lower-income lending by more than they increased their lending to other groups. By contrast, lending by depositories to lower-income communities located within their service areas increased by much more modest amounts (10 to 20 percent), and by about the same amount as they increased lending to other groups.

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<sup>13</sup> These descriptive statistics are based on metropolitan area HMDA data and are limited to loans for which the information necessary to identify lender type, borrower income, and home location were non-missing. The exclusion of rural lending and loans with missing data results in lower total lending compared to figures reported by FFIEC.

**Figure 1: Aggregate Lending to Lower-Income Borrowers, by Institution Type**



**Figure 2: Aggregate Lending to Lower-Income Neighborhoods, by Institution Type**

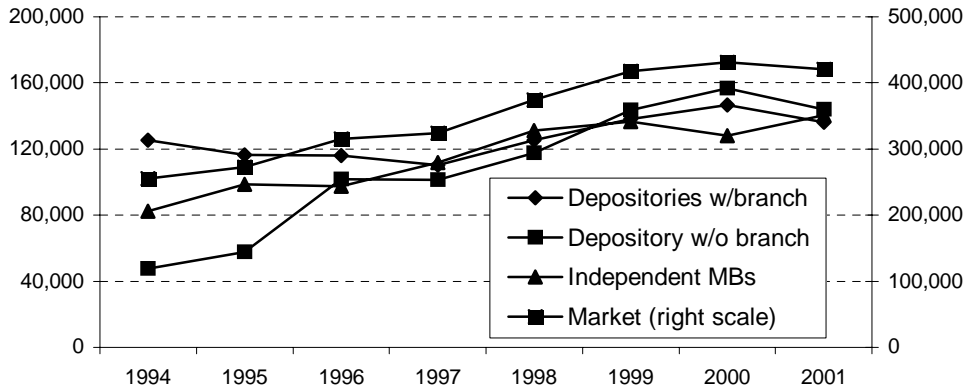


Table 1.A reports the aggregate lending patterns for each two-year panel in our sample, by institution type and in total. The rightmost columns show the initial number of loans extended to lower-income communities and the percent change over the two-year period for the entire panel sample as well as for all HMDA reporters, as a point of reference.<sup>14</sup> The trends in our panel data are quite similar to the aggregate trends reported in Figures 1 and 2: Lower-income lending by depositories within their service

<sup>14</sup> Our panel data differs from the aggregate HMDA data reported in Figures 1 and 2 in two dimensions. First, by necessity, lender-county combinations must have been active within the same county in both years of the panel. Second, the panel drops lenders that did not file in HMDA in both years. Nonetheless, each two-year panel captures about 90 percent of total home purchase and lower-income lending reported in HMDA.



areas increased modestly between 1994 and 2001, while lower-income lending by other institution types grew briskly.

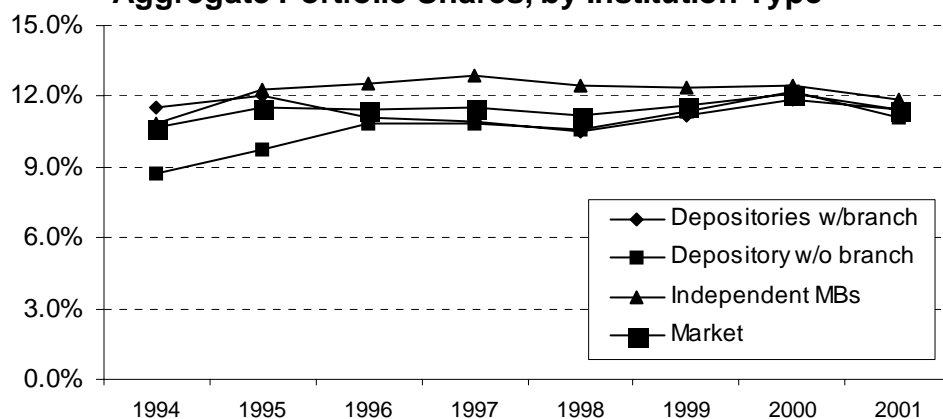
These aggregate trends are consistent with the findings of previous research. For example, Avery, Bostic, Calem, and Canner (1999) show that depository lending to lower-income borrowers and neighborhoods located outside of their service area increased by between 68 and 93 percent, while depository lending to members of these groups located within their service areas rose by only 4 percent (table 4, p. 92). Such conformity provides some comfort that the panel construction methodology did not yield a sample significantly different from the overall mortgage lending market.

### Portfolio Shares

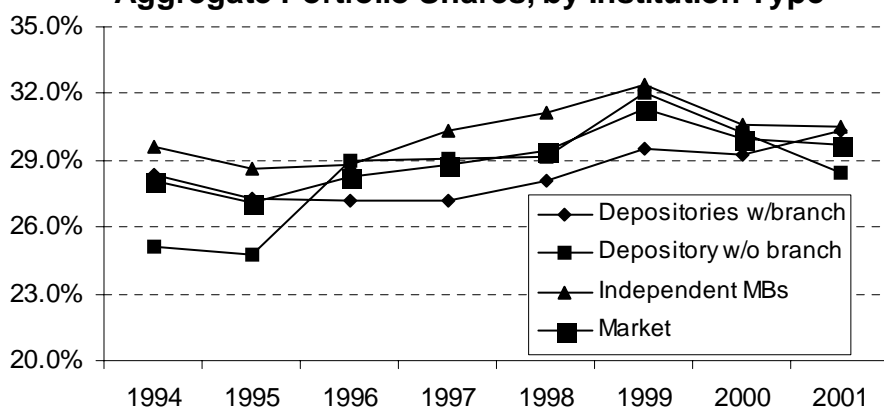
Recent trends in lower-income lending are somewhat muted when one examines trends in the *shares* of aggregate lending (portfolio shares) going to lower-income communities. For the market as a whole, there is a modest upward trend in the share of lending going to lower-income communities: Lower-income borrower shares increased by 2.0 percentage points, from 27.8 to 29.8 percent, and lower-income neighborhood shares increased 0.8 percentage points, from 10.7 to 11.5 percent (Figures 3 and 4). These increases in lower-income shares would have been somewhat larger had we excluded 2001, a recession year that appears to have hit lower-income community lending harder than other types of lending.

Depositories lending outside of their service areas increased lower-income portfolio shares by more than any other institution type. Their share of home purchase loans going to lower-income borrowers rose from 25.1 to 28.4 percent between 1994 and 2001, and there was a comparable increase in their share of loans going to borrowers living in lower-income neighborhoods. Independent mortgage companies also increased their lower-income shares over this period, though by less than depositories outside their service areas. Depositories lending within their service areas increased their lower-income borrower shares at the same pace as the market, but their lower-income neighborhood shares declined slightly. The portfolio share trends for our panels are nearly identical to those shown in Figures 3 and 4 (Table 1.A).

**Figure 3: Lower-Income Neighborhood  
Aggregate Portfolio Shares, by Institution Type**



**Figure 4: Lower-Income Borrower  
Aggregate Portfolio Shares, by Institution Type**



Separating Depositories from their Mortgage Company Subsidiaries

The analysis has thus far grouped lending by mortgage company subsidiaries of depositories with that of their depository parents. Table 1.B details lower-income lending patterns in our two year panels when depositories and their mortgage company subsidiaries are grouped separately. Institution-specific trends in portfolio shares discussed thus far are quite similar when one examines mortgage subsidiaries of depositories separately from their depository parent. For example, depositories lending within their service areas did not increase their lower income lending at all between 1994

and 2001, whereas the other institution types saw robust increases. This suggests that analyses of the nature and causes of recent growth of lower-income lending are relatively unaffected by treatment of mortgage companies owned by depositories. Nonetheless, throughout this analysis, we draw attention to areas where this distinction may be important.

The data offer mixed signals regarding the relative influences of market forces and CRA incentives in driving increases in lending to lower-income communities. The data show that institution types not definitively covered by the CRA increased their lending to lower-income borrowers and neighborhoods relatively more than depositories in areas where they are covered by CRA. This is true both in terms of the change in the level of lending to lower-income communities and the share of loans going to lower-income communities, and suggests that market forces played a principal role in shaping observed increases. On the other hand, mortgage subs, whose activity depositories can include in assessments of their CRA performance, showed the largest increases in lower-income lending, both in levels and portfolio shares. This finding suggests that CRA-related externalities may be an important part of the increased lower-income lending observed between 1994 and 2001.

### Regression Analysis

The models in equations (1) and (3) are designed to advance firmer conclusions about the relative importance of market forces and CRA on the recent increases in lower income lending. Descriptive statistics for variables used to estimate the models are presented in Table 2.A and show trends consistent with well-documented events.<sup>15</sup> The data show a declining presence for the typical depository institutions lending within their service areas and a corresponding increase in the importance of depositories lending in counties where they operate no branches. Consistent with the consolidation trend in the 1990s, large institutions became more prevalent over the decade. Finally, the data show some evidence of the business cycle, as an accelerating growth in income and decline in unemployment slowed in 2000-2001.

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<sup>15</sup> Table 2.B reports descriptive statistics separately for depositories and their mortgage company subsidiaries.

#### *4.1 Results from levels regressions*

Table 3 shows the regression results for estimates of equation (1) where the focus is on levels of lending activity in a given year. Panel A presents estimates where the dependent variable is the amount of lending to either lower-income borrowers or neighborhoods in the initial year of each two-year panel.<sup>16</sup> Panel B of the table uses the same structure as Panel A, this time with the focus being on the portfolio shares of lending to lower-income borrowers and neighborhoods.

The estimates clearly show that, controlling for other factors, banking institutions operating within their service areas do significantly more lower-income lending than other lender categories (independent mortgage banks are the omitted group). This difference is economically meaningful as well, as banks operating in their service areas are estimated to originate many more loans to lower-income borrowers than the average lending institution. This result is consistent with the view that CRA incentives shape lender decisions in important ways. By contrast, aside from in 2000-2001, banking institutions operating outside of their service areas lagged behind all institutions in terms of providing loans to lower-income communities, although the difference with independent mortgage companies is often not statistically significant. This latter finding casts doubt on the CRA externality hypothesis.

The results for portfolio shares, shown in panel B of table 3, suggest the same relationships as those for lending volumes. Relative to the lower-income lending portfolio shares of independent mortgage companies, the portfolio shares were larger for banking institutions operating within their service areas and smaller for banking institutions operating outside of their service areas. The effects here are considerably weaker than those for lending volumes. However, portfolio share models are less likely than the models of the level of lending to suffer from biases associated with the possible endogeneity of branch location. Portfolio share results are thus an important confirmation of the importance of within service area lower-income lending by depositories.

Table 4 converts the regression results into implied activity levels, which permits a more straightforward comparison of how the relative lower-income lending activity of

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<sup>16</sup> Estimates were also obtained using the level of lending in the second year as a dependent variable. These produced substantively identical results and so are not shown.

various lender types changed over time. The table reports the estimated amount of lending to a particular population and the portfolio share for a large-sized institution with identical average sample characteristics save for whether it was a banking institution operating within its service area or an independent mortgage company. The table also indicates the ratio of activity by the two large “average” lender types in a given year.

The main result is that there appears to be a divergence of effects according to whether one examines levels of lending or lending portfolio shares. Looking at levels of lending, the evidence suggests that banking institutions operating within their service area increased their importance relative to independent mortgage companies over the 1990s. The ratio of lending activity by banking institutions within their service areas to lending activity by independent mortgage companies increased over time for lending to both lower-income borrowers and lower-income neighborhoods. This evidence is consistent with the view that CRA incentives have a significant marginal effect above and beyond market forces regarding lending to this population over the decade. By contrast, for portfolio shares, the comparable ratio declined slightly over the decade, suggesting that independent mortgage companies were “catching up” to banks operating within their service area in terms of the extent of their business focused on lower-income communities. These latter findings suggest that market forces played a proportionally larger role in the increase of lending shares to lower-income communities.

The table also reports the relative amount of lower-income lending by banks operating within and outside their services areas. Relative to banks operating outside their service areas, those operating inside their service areas declined in relative importance – both in levels and shares of lending to lower-income communities. This latter finding is consistent with the view that both market forces and CRA-related externalities were important during the period studied. The data also suggest that CRA-related externalities may have been important, as lending by banks operating outside of their services areas gained on lending by independent mortgage companies.

Among other variables in the models, most had expected signs. Not surprisingly, scale is an important consideration for the level of lending (though not portfolio shares), as more lending is observed for lender-counties that are part of larger institutions or operate in larger markets. The relationships between the lending measures and the

economic variables also conformed to expectations, as lending was generally lower in counties with higher unemployment rates and greater in areas with higher median family incomes. The results also point to several notable findings regarding the role of market structure. Higher market concentration, as measured by the 8-firm Herfindahl index, is positively associated with lower-income lending (both level and share).<sup>17</sup> The number of loans in a county sold into the secondary market generally positively associated with both the level and share of lower-income lending in that county, though the results are more mixed for lending to lower-income neighborhoods. Collectively, these results, along with the magnitude of the goodness of fit measure across the four sets of regression results, offer some reassurance that the empirical specification is a reasonable proxy for the forces that drive lower-income lending.

#### *4.2 Results from the changes regressions*

The regression results in Tables 3 and 4, though informative, may be misleading if there are important, unobservable variables associated with both lower-income lending and branch location. To address this possibility, Table 5 shows the regression results for estimates of equation (3) where the focus is on changes in activity in a given two-year interval.<sup>18</sup> As in table 3, panel A in this table focuses on the amount of lending and panel B focuses on portfolio shares. The first observation from the regression estimates in Table 5 is that the models have relatively low R-squared statistics, which suggests that much of the observed variation in the data can not be explained by the model. Although low R-squares are common in models of this type, some caution is warranted with respect to the implications of these models' results.

That said, the estimates do present a fairly consistent picture regarding the relative importance of particular lender types in terms of growth in lower-income lending and portfolio shares. In this context, in cases where one institution type was a definitive leader, it was consistently independent mortgage companies, regardless of whether one considers growth in lending to lower-income borrowers and neighborhoods or growth in

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<sup>17</sup> Nothaft and Surette (2001) report similar findings with respect to the role of market structure on lending to lower-income groups.

<sup>18</sup> Results for lending and portfolio share changes are not sensitive to the inclusion of a constant term or to the inclusion of independent variables as both levels and changes. We therefore report the more technically correct specification, which includes only changes in the explanatory variables and omits the constant term.

the portfolio share of such lending. In terms of changes in lending activity, independent mortgage companies led banking institutions operating within and outside their service areas in all panel years except 1998-99, and these differences tended to be statistically significant. Moreover, regarding banks, when there was a significant difference in the locus of increases in their lending activity, growth was larger outside of their service area than inside.

On this latter point, relative growth in lending by banks was considerably more volatile outside of their service areas than within their service areas. In some cases, the average growth in lending by banks to lower-income groups located outside their service areas exceeded the growth in lending to lower-income groups by independent mortgage companies, albeit by magnitudes that were not statistically significant. In other cases, the growth in such activity was similar to the growth in lending by banks to lower-income groups located within their service areas. This volatility suggests that market forces influenced the activities of banks and independent mortgage companies in varying ways across years. This potentially differential impact of market forces on different institutional types is a puzzle worthy of additional study.

The results for changes in portfolio shares are somewhat similar to those for changes in lending levels, although the relationships are considerably weaker. There is slight evidence that growth in lending to lower-income neighborhoods was greater among independent mortgage companies, but the low levels of statistical significance argue for not emphasizing such a finding too strongly. On balance, apart from the 1995-96 panel, there is little compelling evidence suggesting that there were important differences in the evolution of portfolio shares over time across the various institutional types.

Taken together the overall lending and portfolio share change regressions support the view that market forces were the more powerful force driving changes in lower income lending. Independent mortgage companies increased their lower-income lending by more than other institution types in all but the 1998-99 panel.<sup>19</sup> These results also suggest that lower-income lending by banks generally increased more rapidly outside their service areas than within. It is somewhat difficult to assess the CRA externality argument from

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<sup>19</sup> The multivariate results presented in tables 3 and 5 are qualitatively similar when compared to alternative specifications that minimize the impact of influential outlier observations.

these estimates, as it is possible to argue that banks would not otherwise have increased their lower-income lending as rapidly as other lending in areas outside of their service area. However, the fact that the growth in bank lending to lower-income communities trailed independent mortgage company lending to similar communities runs counter to this view and suggests that increased lower-income lending among depositories outside their service areas is mainly due to the power of market forces.

Left unanswered to this point is the question of why institutions subject only to market forces should have increased their lending to lower-income communities by more than institutions subject to both market forces and regulations designed to encourage lower-income lending. This paper cannot offer definitive answers to this question. However, we speculate that independent mortgage companies may have been better able than other lenders to identify underserved niches in the marketplace due to the emergence of new technologies and new markets. The development of credit scoring likely was particularly important in enabling innovative lenders to experiment with underwriting guidelines. Equally important, secondary markets (including primary lenders, GSEs, and Wall Street) further developed and deepened during this time, which facilitated the purchase, securitization, and sale of mortgages previously considered less than prime quality.<sup>20</sup> Indeed, the development of the secondary market would have been essential, given that independent mortgage companies typically sell all the mortgages they originate. Lastly, a lower interest rate environment along with the availability of flexible underwriting may have encouraged more lower-income families to seek out homeownership. Though speculative, our research is consistent with the view that independent mortgage companies may have been best-positioned to take advantage of these phenomena.

#### *4.3 Robustness of the results: Separating mortgage subs*

As noted previously, banks have some discretion as to how to report the activity of their mortgage subsidiaries (mortgage subs). During CRA performance examinations, banks can choose to either include such activity as part of their CRA activity or have it

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<sup>20</sup> Non-prime consists of subprime loans, home equity loans, the so-called “alt-A” loans and other products at the margin between prime and subprime credit distribution. The secondary market for these products would have included mortgage asset-backed securities, private label securities, and other structured securitizations created by and invested in by primary lenders, GSEs, and Wall Street and other investors.



considered separately. In the previous sections, each bank was assumed to include its mortgage sub lending as part of the bank's overall activity, and we included mortgage sub lending as either within or outside of service area activity as appropriate. An interesting and important issue is the extent to which the observed results are sensitive to the inclusion of this activity.

To test this issue, equations (1) and (3) were re-estimated where the activity of mortgage subs was kept separate from the activity of its parent banking institution. The results using this new data configuration (not shown) are virtually identical to those using the sample where mortgage sub activity was aggregated within the bank. For example, banks operating within their service area show the largest levels of lending to lower-income borrowers and neighborhoods in each two-year panel. Similarly, when changes rather than levels are examined, as before, independent mortgage companies generally outperform banks operating within their service area.

Interestingly, the activity of mortgage subs in the sample is most similar to the activity of independent mortgage companies. Subs trail banks operating within their service area in terms of lending levels, but are a relative leader as regards lending growth. In fact, mortgage subs show the largest growth in lower-income lending in the 1994-95 and 1998-99 panels. The discretion banks have to either include or exclude lending by their subs during CRA exams may have important implications for the comparability of CRA ratings across institution types. This issue is worthy of additional study.

#### *4.4 Robustness of the results: Parsing out mortgage submarkets*

Another issue is whether the observed relationships for the overall market also apply uniformly across the various subsets of the mortgage market. Much recent research has highlighted differences in the spatial distribution of loans. For example, Canner, Passmore, and Laderman (1999) find that loans in lower-income and minority neighborhoods are disproportionately originated by subprime lenders and some researchers have expressed concerns about such trends.<sup>21</sup> Given the rapid rise in subprime lending during the sample period and the fact that a significant fraction of the independent mortgage companies engaged in subprime lending, it is conceivable that the

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<sup>21</sup> See, for example, Canner, Passmore, and Laderman (1999), Courchane, Surette, and Zorn (2004), Calem, Gillen, and Wachter (2004), and Calem, Hershafl and Wachter (2004).

observed relationships may be driven by the growth of subprime lending.<sup>22</sup> It is important to evaluate this possibility, because depositories may shy away from subprime lending owing to concerns about loan performance and the appropriateness of lending to credit-impaired borrowers.

Tables 6 and 7 present the results of a replication of the preceding analysis using a sample that excludes lending by subprime specialty lenders; thus, the conventional conforming mortgage market is considered exclusively.<sup>23</sup> The results in table 6 reinforce our conclusions that banks operating within their service area are dominant in terms of loan volumes and portfolio shares. In fact, the portfolio share results for conventional lending to lower-income borrowers and neighborhoods are stronger than those using the entire panel sample. These results suggest that subprime lending by independent mortgage companies partly explains their growing role in lower-income lending.

In contrast, the estimates from the changes regressions, shown in table 7, confirm that the key relationships observed over all mortgages also exist in the narrower conventional conforming mortgage market. Relative to the other institution types, independent mortgage companies generally remain the leader in terms of lending growth to lower-income borrowers and neighborhoods, as the coefficients and levels of statistical significance for the conventional conforming lending activity estimates closely track those for the overall market estimates. Consistent with the stronger portfolio share performance of banks operating within their service area in table 6, the independent mortgage company advantage for portfolio share changes is considerably weaker when conventional conforming lending activity is considered alone.

## **5. Discussion**

Many have noted the large increase in lending to lower-income communities through the 1990s and early 2000s, and there has been some debate as to whether the CRA can claim any credit for the trend. This paper attempts to shed some light on this debate by

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<sup>22</sup> Although subprime lending is disproportionately for refinancings, a growing share of subprime business has been for home purchase.

<sup>23</sup> HMDA does not identify subprime loans directly and this exercise is therefore somewhat imprecise. We “eliminate” the subprime market based on a list of subprime “specialty” lenders provided by researchers at HUD. This list identifies HMDA reporters for which subprime lending constitutes a majority of their business. To the extent non-specialty lenders also originate significant amounts of subprime loans (and vice versa), our “conventional conforming” market analysis will continue to include some subprime lending.

focusing on the extent to which the CRA has influenced changes in lending to lower-income communities. The approach capitalizes on the fact that the CRA does not apply to all lenders in all locations. Rather, it only applies to depository institutions in their service areas. Thus, the regulations establish market conditions that approximate a natural experiment. By comparing the activities of lenders covered by the CRA in the locations of primary interest under the CRA and the activities of other lenders, we can draw some conclusions about the relative importance of the CRA in the observed increases in lower-income lending. We examine mortgage lending activities during 1994-1995, 1996-1997, 1998-1999, and 2000-2001 and compare the level and the change in lower-income community lending for individual lenders, controlling for a number of economic and lender characteristics.

The results provide some support for the view that the CRA has been influential. Depositories lending within their service area originated larger numbers of loans, and higher shares of lending to lower-income borrowers and neighborhoods than other institution types for most years examined. This result holds even after controlling for observed lender- and market-specific factors and examining how the gap in lending between depositories operating within their service area and other institutions evolved over the decade.

In contrast, models that use actual changes in activity over time as the dependent variable provide evidence supporting the view that market forces or some other factors, rather than the incentives established via the CRA, are more important in explaining the observed trends. In three of our four lender panels (1994-1995, 1996-1997, and 2000-2001), independent mortgage companies generally showed larger increases in lending to lower-income communities than depository institutions, particularly those operating in within their service areas. The models of the change in lower-income lending tend to fit less well than the models of the levels or portfolio shares of such lending. However, the results for both levels and changes are robust to a number of alternative specifications.

Taken together, the results provide a mixed picture regarding the importance of the CRA. The results suggest that CRA-covered institutions continue to have higher levels and shares of lending to lower-income communities, but that the recent increases in such lending appear to be more a function of market forces than regulation. We find only

limited support for the notion that CRA-related externalities have increased lower-income lending.

These mixed results almost certainly reflect the complexity of lending markets. For example, depositories might vary in their responsiveness to CRA incentives, as some might view their lower-income programs as meeting local needs while others might take the incentives as an instruction to find new loans. There could be significant variation across markets, with the CRA being relatively important in some local markets but not others.

A further refinement to the current work would be to distinguish between lenders in different segments of the mortgage market. For example, it has been documented that the manufactured housing lending market is quite different than the standard single-family home purchase lending market (Canner, Passmore, and Laderman, 1999). Future work could distinguish between patterns in these two markets. Another important market is the subprime lending market, which increased dramatically during the period we analyze. An interesting question is the degree to which the trends observed are a function of subprime lending activities by ostensibly “prime” lenders. The new HMDA data, to be released in 2005 and which will include information about APR spreads and manufactured housing, may inform such questions.

We should also point out that the results here address the role of the CRA and not of regulation considered more generally. For example, the results showing that independent mortgage companies increased their lending to lower-income communities more than other lenders has been presented here as being consistent with a “market forces” view of the mortgage market. This evidence could alternatively be interpreted as evidence that the affordable mortgage goals for the GSEs established by HUD have been effective. Because they typically lack ready sources of funds with which to lend, independent mortgage companies are particularly sensitive to the availability of funding in the secondary market. If the GSE goals caused the GSEs to provide more liquidity in the lower-income segment of the mortgage market, one would expect those institutions most sensitive to liquidity to change their behavior the most. In this view, that the independent mortgage companies increased their lending by more than depositories suggests that the incentives created by the GSE goals were more efficacious than those created by the

CRA. We partially addressed the GSE role by controlling for the proportion of loans sold in each county, but inferences about the GSE role are fairly sensitive to model specification and time period studied. Future research could attempt to tease out the effects of incentives provided from these and other regulatory sources.

Further, although not emphasized here, the results suggest that organizational structure may be an important consideration. The results show that the lower-income lending activity of a depository institution often differed from that of its subsidiary. Also, the results indicate that the relative levels of depository and subsidiary lower-income lending activity varied over time, with depositories showing significantly less growth in the early 1990s and more growth at the end of the decade. The reasons for this are not immediately clear, and suggest a fertile area for future research.

Finally, while the growth in lending and homeownership has been faster for lower-income communities, significant gaps in lending and homeownership remain. For example, in 1997, 20.7 percent of loans were extended to minority borrowers while minorities comprised nearly 30 percent of the general population. Moreover, in 1999, the homeownership rates for both black and Hispanic families still lagged the rate for white families by 20 percentage points. These differences are still a source of concern and warrant continuing investigation.

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**Table 1.A Trends in lower-income lending within sample panels, total and by institution type – Depositories and Mortgage Subsidiaries Combined**

	Depositories within Service Areas		Depositories out of Service Areas		Independent Mortgage Companies		Entire sample		Full HMDA data <sup>1</sup>	
	Initial level	Percent change <sup>2</sup>	Initial level	Percent change <sup>2</sup>	Initial level	Percent change <sup>2</sup>	Initial level	Percent change <sup>2</sup>	Initial level	Percent/Percentage point change <sup>2</sup>
<i>Number of loans</i>										
Lower-income borrowers										
1994-95	308304	-14.4	136271	8.1	225013	1.6	669588	-4.4	731617	-4.3
1996-97	284691	-3.2	271980	0.1	223931	17.6	780602	3.9	828609	4.4
1998-99	333090	9.6	323727	25.1	327952	9.2	984769	14.6	1041211	13.3
2000-01	362589	-0.8	388527	-5.0	315497	14.3	1066613	2.1	1119926	2.3
Lower-income neighborhoods										
1994-95	125306	-7.2	47444	21.7	82502	19.3	255252	6.8	282691	5.0
1996-97	116082	-4.9	101800	-0.2	97625	14.5	315507	2.6	337529	3.8
1998-99	125177	10.2	117706	21.8	131129	4.2	374012	11.7	401641	10.0
2000-01	146551	-7.1	156773	-8.1	128134	9.7	431458	-2.5	455167	-2.5
<i>Portfolio share (% of loans)</i>										
Lower-income borrowers										
1994-95	28.4	-1.1	25.1	-0.4	29.6	-1.0	28.0	-1.0	27.8	-0.5
1996-97	27.2	0.0	29.0	0.1	28.8	1.5	28.3	0.5	28.3	0.5
1998-99	28.1	1.5	29.1	2.9	31.2	1.2	29.4	1.9	29.3	1.9
2000-01	29.3	1.0	30.2	-1.8	30.6	-0.1	30.0	-0.3	30.0	-0.2
Lower-income neighborhoods										
1994-95	11.5	0.5	8.7	1.0	10.9	1.5	10.7	0.8	10.7	0.8
1996-97	11.1	-0.2	10.9	0.0	12.6	0.3	11.4	0.1	11.5	0.2
1998-99	10.5	0.6	10.6	0.8	12.5	-0.1	11.2	0.4	11.3	0.4
2000-01	11.8	-0.4	12.2	-1.1	12.4	-0.6	12.1	-0.7	12.2	-0.7

1. Excludes lending by credit unions.

2. Change in levels reported as percent change. Change in portfolio shares reported as percentage point change.

Note: Table reports aggregate lending by ‘lender-county panels’, the core unit of observation in our analysis. Panels consist of metropolitan area lender-county combinations that originated 10 or more single-family, owner-occupied, home purchase loans within their county in each pair of adjacent years. All entities of the same institution type affiliated in the second year of the panel are aggregated into a single “lender”. ‘Full HMDA data’ column reports total metropolitan, owner-occupied, home purchase lending without aggregating to lender-county combination or imposing other restrictions other than income, tract, or county being identified in the HMDA data.



**Table 1.B Trends in lower-income lending within sample panels, total and by institution type – Depositories and Mortgage Subsidiaries Separated**

	Depositories within Service Areas		Depositories out of Service Areas		Independent Mortgage Companies		Mortgage Subsidiaries of Depositories		Entire sample		Full HMDA data <sup>1</sup>	
	Initial number	Percent change <sup>2</sup>	Initial number	Percent change <sup>2</sup>	Initial number	Percent change <sup>2</sup>	Initial number	Percent change <sup>2</sup>	Initial number	Percent change	Initial number	Percent/Percentage Point Change <sup>2</sup>
<i>Number of loans</i>												
Lower- income borrowers												
1994-95	231,387	-18.5	36,746	-5.4	225,013	1.6	169,151	5.6	662,297	-4.8	731617	-4.3
1996-97	198,275	-5.3	129,563	-6.5	223,921	17.6	220,881	4.4	772,640	3.9	828609	4.4
1998-99	212,235	10.5	121,047	16.0	327,952	9.2	314,486	23.8	975,720	15.0	1041211	13.3
2000-01	235,383	-1.3	126,199	-14.4	315,497	14.3	377,286	2.2	1,054,365	3.0	1119926	2.3
Lower-income neighborhoods												
1994-95	95,796	-10.6	13,099	6.2	82,502	19.3	61,191	15.3	252,588	6.3	282691	5.0
1996-97	84,807	-6.6	45,644	-7.4	97,625	14.5	84,480	3.6	312,556	2.6	337529	3.8
1998-99	82,977	9.8	44,069	13.7	131,129	4.2	112,602	22.3	370,777	12.1	401641	10.0
2000-01	98,244	-8.0	50,281	-14.2	128,134	9.7	149,831	-2.9	426,490	-1.6	455167	-2.5
<i>Portfolio share (% of loans)</i>												
Lower-income borrowers												
1994-95	27.9	-1.4	24.3	-0.5	29.6	-1.0	27.4	-0.7	28.1	-1.0	27.8	-0.5
1996-97	26.3	-0.2	33.2	0.2	29.0	1.4	27.3	0.3	28.4	0.5	28.3	0.5
1998-99	27.7	0.9	31.0	0.4	31.2	1.2	28.3	3.7	29.4	1.9	29.3	1.9
2000-01	27.7	1.7	29.3	-1.8	30.6	-0.1	31.4	-1.5	30.0	-0.2	30.0	-0.2
Lower-income neighborhoods												
1994-95	11.5	0.9	8.7	0.9	10.9	1.5	9.9	0.6	10.7	0.8	10.7	0.8
1996-97	11.3	-0.1	11.7	-0.1	12.6	0.2	10.5	0.0	11.5	0.0	11.5	0.2
1998-99	10.8	-0.1	11.3	0.5	12.5	-0.1	10.1	1.2	11.2	0.4	11.3	0.4
2000-01	11.6	-0.3	11.4	-0.3	12.4	-0.6	12.5	-1.2	12.1	-0.6	12.2	-0.7

1. Excludes lending by credit unions.

2. Change in levels reported as percent change. Change in portfolio shares reported as percentage point change.

Note: Table reports aggregate lending by ‘lender-county panels’, the core unit of observation in our analysis. Panels consist of metropolitan area lender-county combinations that originated 10 or more single-family, owner-occupied, home purchase loans within their county in each pair of adjacent years. All entities of the same institution type affiliated in the second year of the panel are aggregated into a single “lender”. ‘Full HMDA data’ column reports total metropolitan, owner-occupied, home purchase lending without aggregating to lender-county combination or imposing other restrictions other than income, tract, or county being identified in the HMDA data.

**Table 2.A Descriptive statistics of the lender county-panel, by panel year (depositories and their subsidiaries combined)**

	1994-1995	1996-1997	1998-1999	2000-2001
<i>Average home purchase lending by a lender-county observation</i>				
Total <sup>a</sup>	111.2	109.2	120.4	124.5
Percent change	-1.8	1.4	6.8	3.3
To lower-income borrowers <sup>a</sup>	31.4	31.0	35.3	37.2
Percent change	-6.0	3.1	13.7	2.1
To lower-income neighborhoods <sup>a</sup>	11.9	12.4	13.2	14.9
Percent change	5.2	1.2	11.2	-2.7
Refinance intensity (2-year avg., %)	31.3	32.6	45.3	43.4
<i>Distribution of loans by lender type</i>				
Depositories in service area (%)	36.9	30.6	27.6	26.3
Depositories outside service area (%)	29.1	38.2	39.2	39.9
Independent mortgage companies (%)	34.0	31.1	33.2	33.8
<i>Lender Characteristics</i>				
Percent large <sup>b</sup>	49.6	55.6	60.0	61.6
Percent medium-sized <sup>b</sup>	23.3	22.3	21.7	21.6
Percent small <sup>b</sup>	24.1	20.3	17.0	15.9
Single county lender (%)	3.0	1.9	1.3	0.9
<i>Average MSA characteristics</i>				
Median house price (\$ thousands) <sup>a</sup>	124.5	132.3	145.1	157.9
Percent change	2.2	5.3	3.9	8.9
Unemployment rate (%) <sup>a</sup>	5.7	4.9	4.1	3.7
Percent change	-8.1	-8.1	-5.5	26.1
Median family income (\$thousands) <sup>a</sup>	43.6	45.9	49.8	54.9
Percent change	0.7	4.7	5.9	4.4
Fair Market Rent (40 <sup>th</sup> percentile, \$) <sup>a</sup>	564	581.2	611.6	641.7
Percent change	2.3	2.7	2.5	5.6
<i>Average county characteristics</i>				
Herfindahl index*100 (8 firm) <sup>a</sup>	5.2	4.7	4.8	4.2
# Loans in county sold	6,688	7,184	15,981	8,994
Observations (lender-MSA combinations)	20,040	23,620	26,162	26,708

<sup>a</sup> First year in the panel.

<sup>b</sup> Lenders originating more than 5,000 loans nationwide in a year are defined as large, lenders originating between 500 and 5,000 loans nationwide in a year are defined as medium-sized, and those originating fewer than 500 loans nationwide in a year are defined as small.

**Table 2.B Descriptive statistics of the lender county-panel, by panel year (depositories and their subsidiaries separated)**

	1994-1995	1996-1997	1998-1999	2000-2001
<i>Average home purchase lending by a lender-county observation</i>				
Total <sup>a</sup>	106.6	104.7	114.0	118.0
Percent change	-0.1	1.4	7.4	4.7
To lower-income borrowers <sup>a</sup>	30.1	29.8	33.5	34.7
Percent change	-5.5	3.2	14.2	4.5
To lower-income neighborhoods <sup>a</sup>	11.4	11.9	12.5	14.0
Percent change	5.6	1.4	11.4	-0.1
Refinance intensity (2-year avg., %)	31.1	32.3	45.2	43.3
<i>Distribution of loans by lender type</i>				
Depositories in service area (%)	31.5	25.7	22.6	22.6
Depositories outside service area (%)	9.4	18.2	16.6	16.2
Mortgage subs (%)	25.6	25.4	28.8	28.3
Independent mortgage companies (%)	33.4	30.7	32.0	32.9
<i>Lender Characteristics</i>				
Percent large <sup>b</sup>	47.0	52.7	58.5	60.6
Percent medium-sized <sup>b</sup>	25.2	24.9	23.3	22.4
Percent small <sup>b</sup>	24.8	20.5	16.9	16.0
Single county lender (%)	2.9	1.9	1.3	0.9
<i>Average MSA characteristics</i>				
Median house price (\$ thousands) <sup>a</sup>	124.9	133.4	147.9	163.9
Percent change	3.7	5.9	5.4	7.3
Unemployment rate (%) <sup>a</sup>	5.7	4.9	4.1	3.7
Percent change	-8.1	-8.1	-5.5	26.3
Median family income (\$thousands) <sup>a</sup>	43.6	45.9	49.9	55.2
Percent change	0.7	4.7	6.0	4.4
Fair Market Rent (40 <sup>th</sup> percentile, \$) <sup>a</sup>	563.0	580.9	613.4	644.8
Percent change	2.3	2.7	2.5	5.7
<i>Average county characteristics</i>				
Herfindahl index*100 (8 firm) <sup>a</sup>	4.8	4.3	4.3	3.8
# Loans in county sold	5,433	5,818	12,814	7,663
Observations (lender-MSA combinations)	20,461	24,089	27,146	27,365

<sup>a</sup> First year in the panel.

<sup>b</sup> Lenders originating more than 5,000 loans nationwide in a year are defined as large, lenders originating between 500 and 5,000 loans nationwide in a year are defined as medium-sized, and those originating fewer than 500 loans nationwide in a year are defined as small.

**Table 3 Regression results for dependent variables as levels**

Panel A: Dependent variable is level of lending (in logs)

	Lending to lower-income borrowers				Lending to lower-income neighborhoods			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1994-95	1996-97	1998-99	2000-01	1994-95	1996-97	1998-99	2000-01
Bank within service area	0.936 (0.134)***	1.005 (0.111)***	0.978 (0.191)***	1.017 (0.164)***	0.773 (0.110)***	0.752 (0.093)***	0.762 (0.152)***	0.854 (0.147)***
Bank outside service area	-0.275 (0.154)*	-0.051 (0.151)	-0.048 (0.213)	0.065 (0.184)	-0.275 (0.121)**	-0.151 (0.124)	-0.103 (0.164)	0.062 (0.156)
Small Lender	0.030 (0.070)	-0.058 (0.078)	0.028 (0.099)	-0.054 (0.127)	-0.043 (0.079)	-0.125 (0.084)	-0.030 (0.099)	-0.020 (0.123)
Medium-sized Lender	0.449 (0.082)***	0.255 (0.096)***	0.417 (0.121)***	0.297 (0.145)**	0.333 (0.086)***	0.209 (0.094)**	0.346 (0.115)***	0.300 (0.137)**
Large Lender	0.782 (0.091)***	0.758 (0.099)***	0.951 (0.131)***	1.036 (0.150)***	0.582 (0.095)***	0.599 (0.099)***	0.776 (0.129)***	0.941 (0.147)***
Log(Price/Rent)	-0.268 (0.151)*	-0.052 (0.137)	-0.038 (0.131)	-0.838 (0.129)***	0.494 (0.156)***	0.292 (0.130)**	0.738 (0.126)***	0.260 (0.136)*
Log(UE rate)	-0.372 (0.056)***	-0.432 (0.058)***	-0.366 (0.046)***	-0.219 (0.034)***	0.087 (0.059)	-0.003 (0.056)	-0.014 (0.040)	-0.126 (0.033)***
Log(MFI)	0.501 (0.102)***	0.353 (0.124)***	0.370 (0.137)***	0.589 (0.124)***	-0.001 (0.115)	-0.168 (0.110)	-0.043 (0.122)	-0.401 (0.097)***
Refinance share	-2.080 (0.180)***	-2.120 (0.197)***	-1.782 (0.276)***	-1.535 (0.225)***	-1.231 (0.162)***	-1.532 (0.182)***	-1.332 (0.233)***	-0.898 (0.208)***
Herfindahl-8	6.740 (0.592)***	6.161 (0.973)***	5.209 (0.793)***	3.502 (0.928)***	7.716 (0.755)***	7.092 (0.808)***	6.436 (0.758)***	6.835 (0.716)***
Log(total HP lending in county)	0.388 (0.065)***	0.310 (0.090)***	0.364 (0.122)***	-0.672 (0.137)***	0.737 (0.079)***	0.836 (0.096)***	1.197 (0.111)***	-0.354 (0.139)**
Log(Sold)	0.136 (0.058)**	0.207 (0.078)***	0.146 (0.120)	1.153 (0.130)***	-0.106 (0.070)	-0.215 (0.081)***	-0.578 (0.107)***	0.995 (0.134)***
Constant	-4.870 (1.630)***	-4.304 (1.985)**	-4.693 (1.648)***	-2.737 (1.452)*	-6.678 (1.879)***	-3.431 (1.843)*	-7.361 (1.575)***	-0.961 (1.373)
Within v. Outside**	Within	Within	Within	Within	Within	Within	Within	Within
Observations	20040	23620	26135	26571	20040	23620	26135	26571
R-squared	0.32	0.29	0.29	0.32	0.25	0.22	0.23	0.27

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

\*\* This row reports the result of a t-test comparing the coefficients on “Banking within service area” and “Bank outside service area”. A positive t-statistic indicates that “within” is greater and a negative t-statistic indicates that “outside” is greater. Asterisks indicate the statistical significance of the test.

Table 3, Panel B: Dependent variable is portfolio share (in logs)

	Lending to lower-income borrowers				Lending to lower-income neighborhoods			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1994-95	1996-97	1998-99	2000-01	1994-95	1996-97	1998-99	2000-01
Bank within service area	0.165 (0.114)	0.122 (0.068)*	0.078 (0.068)	0.087 (0.056)	0.129 (0.062)**	0.046 (0.068)	0.022 (0.058)	0.049 (0.053)
Bank outside service area	-0.180 (0.135)	-0.072 (0.101)	-0.074 (0.097)	-0.004 (0.073)	-0.239 (0.071)***	-0.197 (0.089)**	-0.153 (0.085)*	-0.038 (0.073)
Small lender	-0.070 (0.036)*	-0.150 (0.034)***	-0.181 (0.039)***	-0.250 (0.045)***	-0.081 (0.056)	-0.164 (0.062)***	-0.176 (0.074)**	-0.151 (0.090)*
Medium-sized lender	-0.088 (0.048)*	-0.194 (0.048)***	-0.179 (0.052)***	-0.237 (0.056)***	-0.046 (0.061)	-0.106 (0.068)	-0.081 (0.080)	-0.076 (0.095)
Large lender	-0.014 (0.065)	-0.057 (0.054)	-0.140 (0.059)**	-0.177 (0.059)***	-0.018 (0.065)	-0.007 (0.071)	-0.069 (0.083)	0.001 (0.094)
Log(Price/Rent)	-0.537 (0.074)***	-0.549 (0.090)***	-0.543 (0.083)***	-1.130 (0.078)***	0.453 (0.082)***	0.028 (0.082)	0.381 (0.075)***	0.046 (0.076)
Log(U.E. rate)	-0.446 (0.033)***	-0.464 (0.037)***	-0.380 (0.028)***	-0.229 (0.020)***	0.070 (0.035)**	-0.018 (0.038)	-0.027 (0.025)	-0.146 (0.027)***
Log(MFI)	0.769 (0.082)***	0.621 (0.090)***	0.572 (0.110)***	0.852 (0.106)***	0.323 (0.070)***	0.019 (0.067)	0.073 (0.068)	-0.259 (0.071)***
Refinance share	-0.739 (0.184)***	-0.546 (0.180)***	-0.509 (0.162)***	-0.432 (0.155)***	-0.218 (0.133)	-0.346 (0.172)**	-0.327 (0.151)**	-0.023 (0.156)
Herfindahld-8	1.297 (0.290)***	0.845 (0.501)*	-0.878 (0.506)*	-2.755 (0.681)***	4.489 (0.453)***	3.199 (0.494)***	1.839 (0.443)***	1.828 (0.491)***
Log(total HP lending in county)	-0.201 (0.047)***	-0.485 (0.061)***	-0.390 (0.079)***	-0.970 (0.065)***	0.299 (0.041)***	0.167 (0.060)***	0.527 (0.075)***	-0.676 (0.071)***
Log(sold)	0.150 (0.049)***	0.407 (0.057)***	0.301 (0.076)***	0.844 (0.064)***	-0.135 (0.040)***	-0.032 (0.053)	-0.398 (0.071)***	0.817 (0.070)***
Constant	-0.695 (0.977)	1.303 (1.109)	1.844 (1.163)	2.148 (1.139)*	-5.594 (0.962)***	0.589 (0.975)	-1.884 (0.844)**	3.657 (0.784)***
Within v. Outside **	Within	Within	Within	Within	Within	Within	Within	Neither
Observations	20029	23485	26056	26546	19691	23504	26078	26480
R-squared	0.13	0.11	0.12	0.14	0.04	0.02	0.02	0.03

Robust standard errors in parentheses.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

\*\* This row reports the result of a t-test comparing the coefficients on “Banking within service area” and “Bank outside service are”. A positive t-statistic indicates that “within” is greater and a negative t-statistic indicates that “outside” is greater. Asterisks indicate the statistical significance of the test.

**Table 4 Levels of activity over time as implied by the regression results in table 3**

	Bank within its service area	Indep. Mort. Co.	Bank outside its service area	Bank/IMC Ratio	Within/Outside Ratio	Outside/IMC Ratio
Low-income borrower lending						
1994-95	55.5	21.8	16.5	2.550	3.357	0.757
1996-97	57.8	21.2	20.1	2.732	2.875	0.948
1998-99	70.3	26.4	25.2	2.659	2.790	0.955
2000-01	73.1	26.4	28.2	2.765	2.591	1.068
Low-income neighborhood lending						
1994-95	14.9	6.9	5.2	2.166	2.852	0.754
1996-97	16.1	7.6	6.5	2.121	2.466	0.855
1998-99	17.1	8.0	7.2	2.143	2.375	0.900
2000-01	19.3	8.2	8.7	2.349	2.208	1.061
Low-income borrower portfolio share						
1994-95	28.3	24.0	20.1	1.179	1.411	0.838
1996-97	28.1	24.9	23.2	1.130	1.214	0.932
1998-99	28.6	26.4	24.6	1.081	1.164	0.932
2000-01	29.9	27.4	27.3	1.091	1.095	0.996
Low-income neighborhood portfolio share						
1994-95	8.2	7.2	5.7	1.138	1.445	0.792
1996-97	8.4	8.0	6.6	1.047	1.275	0.825
1998-99	7.8	7.6	6.6	1.022	1.191	0.868
2000-01	8.5	8.1	7.8	1.050	1.091	0.963

NOTE: Figures in the table were calculated by (1) multiplying each coefficient in Table 3 by the average value for its respective variable, (2) taking the sum of these products, (3), assuming the lender of interest was big (adding the value of the coefficient on 'big'), (4) adding the coefficient on banking institutions operating within their service area and independent mortgage company as appropriate, and (5) taking the inverse logarithms of the final sums.

**Table 5 Regression results for dependent variables as changes**

Panel A: Dependent variable is change in level of lending (difference in logs)

	Lending to lower-income borrowers				Lending to lower-income neighborhoods			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1994-95	1996-97	1998-99	2000-01	1994-95	1996-97	1998-99	2000-01
Bank within service area	-0.047 (0.075)	-0.156 (0.040)***	0.013 (0.059)	-0.127 (0.049)***	-0.091 (0.038)**	-0.120 (0.037)***	0.013 (0.047)	-0.112 (0.042)***
Bank outside service area	0.063 (0.097)	-0.171 (0.047)***	0.089 (0.076)	-0.162 (0.082)**	0.002 (0.049)	-0.120 (0.042)***	0.057 (0.058)	-0.123 (0.069)*
Small lender	-0.059 (0.042)	-0.002 (0.036)	-0.107 (0.048)**	-0.033 (0.049)	-0.005 (0.037)	0.032 (0.034)	-0.043 (0.043)	-0.021 (0.041)
Medium-sized lender	-0.101 (0.048)**	-0.063 (0.037)*	-0.136 (0.049)***	-0.060 (0.049)	-0.087 (0.046)*	-0.038 (0.034)	-0.112 (0.044)**	-0.051 (0.040)
Large lender	-0.156 (0.080)*	-0.081 (0.041)**	-0.073 (0.069)	-0.153 (0.052)***	-0.032 (0.046)	-0.037 (0.039)	-0.012 (0.064)	-0.112 (0.051)**
<i>Changes</i>								
Log(Price/Rent)	-0.276 (0.163)*	-0.199 (0.192)	-0.065 (0.101)	-0.057 (0.119)	-0.160 (0.152)	-0.166 (0.174)	-0.006 (0.102)	-0.019 (0.096)
Log(UE rate)	-0.001 (0.089)	0.253 (0.095)***	0.054 (0.057)	0.060 (0.032)*	-0.128 (0.086)	0.075 (0.089)	-0.051 (0.049)	0.004 (0.026)
Log(MFI)	0.567 (0.512)	1.431 (0.255)***	2.058 (0.143)***	1.452 (0.103)***	-0.424 (0.328)	-0.126 (0.216)	-0.058 (0.116)	-0.013 (0.089)
Refinance share	-0.378 (0.127)***	-0.069 (0.077)	-0.069 (0.112)	0.087 (0.201)	-0.321 (0.101)***	0.059 (0.066)	0.030 (0.090)	0.027 (0.176)
Herfindahl -8	0.201 (0.296)	0.298 (0.213)	-0.269 (0.265)	0.412 (0.300)	0.029 (0.234)	0.253 (0.222)	-0.136 (0.240)	-0.069 (0.272)
Log(total lending in county)	0.631 (0.103)***	0.709 (0.163)***	0.560 (0.130)***	0.855 (0.088)***	0.284 (0.070)***	0.651 (0.132)***	0.474 (0.133)***	0.696 (0.088)***
Log(sold)	0.034 (0.046)	0.084 (0.036)**	0.008 (0.054)	-0.007 (0.035)	0.112 (0.041)***	0.019 (0.033)	-0.009 (0.048)	0.027 (0.034)
Within v. Outside **	Outside	Neither	Outside	Neither	Outside	Neither	Neither	Neither
Observations	20034	23620	26135	26568	20034	23620	26135	26568
R-squared	0.07	0.03	0.05	0.05	0.02	0.02	0.01	0.03

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

\*\* This row reports the result of a t-test comparing the coefficients on “Banking within service area” and “Bank outside service are”. A positive t-statistic indicates that “within” is greater and a negative t-statistic indicates that “outside” is greater. Asterisks indicate the statistical significance of the test.

Table 5, Panel B: Dependent variable is change in portfolio share (difference in logs)

	Lending to lower-income borrowers				Lending to lower-income neighborhoods			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1995-96	1995-96	1998-99	2000-01	1994-95	1996-97	1998-99	2000-01
Bank within service area	0.058 (0.076)	-0.073 (0.018)***	-0.040 (0.039)	0.011 (0.016)	-0.018 (0.016)	-0.051 (0.016)***	-0.028 (0.018)	0.002 (0.017)
Bank outside service area	0.053 (0.092)	-0.074 (0.021)***	0.003 (0.040)	-0.019 (0.024)	-0.029 (0.020)	-0.058 (0.017)***	-0.008 (0.022)	-0.022 (0.023)
Small lender	-0.032 (0.040)	0.041 (0.023)*	-0.021 (0.035)	-0.014 (0.020)	0.035 (0.026)	0.030 (0.028)	0.033 (0.038)	-0.030 (0.025)
Medium-sized lender	-0.011 (0.038)	0.019 (0.023)	0.020 (0.035)	-0.034 (0.022)	0.029 (0.026)	0.008 (0.028)	0.021 (0.038)	-0.047 (0.023)**
Large lender	-0.070 (0.086)	0.007 (0.027)	-0.003 (0.036)	-0.065 (0.020)***	0.072 (0.025)***	0.018 (0.028)	0.057 (0.039)	-0.059 (0.023)***
<i>Changes</i>								
Log(Price/Rent)	-0.415 (0.106)***	-0.070 (0.116)	-0.103 (0.055)*	-0.193 (0.058)***	-0.297 (0.121)**	-0.041 (0.102)	0.043 (0.083)	-0.106 (0.069)
Log(UE rate)	0.018 (0.056)	0.185 (0.047)***	0.049 (0.029)*	0.064 (0.017)***	-0.151 (0.066)**	0.026 (0.056)	-0.032 (0.040)	0.011 (0.020)
Log(MFI)	0.992 (0.385)**	1.602 (0.176)***	2.296 (0.102)***	1.632 (0.082)***	-0.055 (0.329)	-0.016 (0.175)	-0.124 (0.082)	0.034 (0.077)
Refinance share	-0.021 (0.061)	-0.051 (0.035)	0.042 (0.052)	-0.031 (0.071)	-0.086 (0.039)**	0.066 (0.037)*	0.072 (0.034)**	-0.064 (0.077)
Herfindahl -8	-0.014 (0.168)	0.099 (0.134)	0.027 (0.150)	0.052 (0.213)	0.041 (0.141)	-0.030 (0.147)	-0.058 (0.189)	-0.260 (0.170)
Log(total lending in county)	0.171 (0.078)**	0.026 (0.054)	-0.026 (0.050)	0.143 (0.053)***	0.038 (0.052)	0.045 (0.062)	0.036 (0.071)	0.055 (0.054)
Log(sold)	-0.061 (0.027)**	0.036 (0.026)	-0.047 (0.034)	-0.008 (0.011)	0.016 (0.027)	0.001 (0.027)	-0.028 (0.037)	0.029 (0.018)
Within v. Outside **	Neither	Neither	Outside	Neither	Neither	Neither	Neither	Neither
Observations	19998	23439	26054	26537	19579	23496	26077	26475
R-squared	0.02	0.02	0.08	0.03	0.01	0.00	0.00	0.00

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

\*\* This row reports the result of a t-test comparing the coefficients on “Banking within service area” and “Bank outside service are”. A positive t-statistic indicates that “within” is greater and a negative t-statistic indicates that “outside” is greater. Asterisks indicate the statistical significance of the test.



**Table 6 Regression results for dependent variables as levels, conventional conforming lending only**

Panel A: Dependent variable is level of lending (in logs)

	Lending to lower-income borrowers				Lending to lower-income neighborhoods			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1994-95	1996-97	1998-99	2000-01	1994-95	1996-97	1998-99	2000-01
Bank within service area	1.066 (0.166)***	1.228 (0.127)***	1.054 (0.200)***	1.083 (0.179)***	0.943 (0.137)***	0.987 (0.114)***	0.925 (0.163)***	1.017 (0.175)***
Bank outside service area	-0.317 (0.182)*	0.209 (0.179)	-0.019 (0.235)	0.050 (0.205)	-0.288 (0.138)**	0.052 (0.151)	-0.052 (0.192)	0.083 (0.189)
Small lender	0.028 (0.064)	0.045 (0.065)	0.063 (0.081)	0.003 (0.093)	-0.056 (0.073)	-0.079 (0.077)	-0.048 (0.093)	-0.050 (0.111)
Medium-sized lender	0.409 (0.079)***	0.270 (0.086)***	0.392 (0.103)***	0.262 (0.112)**	0.301 (0.082)***	0.190 (0.090)**	0.231 (0.107)**	0.180 (0.126)
Large lender	0.875 (0.082)***	0.887 (0.085)***	1.006 (0.116)***	0.964 (0.113)***	0.692 (0.083)***	0.687 (0.090)***	0.785 (0.120)***	0.816 (0.129)***
Log(Price/Rent)	-0.645 (0.157)***	-0.385 (0.147)***	-0.171 (0.170)	-0.781 (0.155)***	0.043 (0.166)	-0.034 (0.143)	0.515 (0.148)***	0.236 (0.156)
Log(UE rate)	-0.310 (0.051)***	-0.386 (0.053)***	-0.369 (0.045)***	-0.152 (0.032)***	0.092 (0.056)*	-0.067 (0.054)	-0.115 (0.041)***	-0.130 (0.035)***
Log(MFI)	0.600 (0.102)***	0.396 (0.137)***	0.610 (0.157)***	0.927 (0.135)***	-0.038 (0.116)	-0.282 (0.112)**	-0.001 (0.128)	-0.319 (0.111)***
Refinance share	-1.091 (0.237)***	-1.362 (0.326)***	-1.166 (0.383)***	-0.980 (0.317)***	-0.418 (0.186)**	-0.938 (0.304)***	-0.967 (0.327)***	-0.578 (0.278)**
Herfindahl -8	5.212 (0.502)***	6.471 (0.593)***	6.120 (0.655)***	5.335 (0.837)***	5.771 (0.680)***	6.497 (0.607)***	6.041 (0.794)***	6.393 (0.749)***
Log(total lending in county)	0.785 (0.066)***	0.794 (0.105)***	1.332 (0.099)***	-0.170 (0.163)	0.900 (0.083)***	1.026 (0.120)***	1.741 (0.113)***	0.078 (0.160)
Log(sold)	-0.298 (0.053)***	-0.314 (0.087)***	-0.823 (0.102)***	0.626 (0.147)***	-0.338 (0.067)***	-0.483 (0.099)***	-1.178 (0.104)***	0.493 (0.148)***
Constant	-4.545 (1.531)***	-3.811 (1.938)**	-7.570 (1.798)***	-7.228 (1.558)***	-3.993 (1.894)**	-0.523 (1.756)	-6.730 (1.599)***	-1.606 (1.556)
Within v. Outside **	Within	Within	Within	Within	Within	Within	Within	Within
Observations	15885	18186	19633	19568	15885	18186	19633	19568
R-squared	0.35	0.30	0.32	0.35	0.27	0.22	0.23	0.27

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

\*\* This row reports the result of a t-test comparing the coefficients on “Banking within service area” and “Bank outside service are”. A positive t-statistic indicates that “within” is greater and a negative t-statistic indicates that “outside” is greater. Asterisks indicate the statistical significance of the test.

Table 6, Panel B: Dependent variable is portfolio share (in logs)

	Lending to lower-income borrowers				Lending to lower-income neighborhoods			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1994-95	1996-97	1998-99	2000-01	1994-95	1996-97	1998-99	2000-01
Bank within service area	0.020 (0.028)	0.041 (0.019)**	0.037 (0.018)**	0.043 (0.016)***	0.020 (0.008)***	0.017 (0.012)	0.019 (0.008)**	0.025 (0.007)***
Bank outside service area	-0.059 (0.034)*	0.013 (0.031)	-0.004 (0.030)	0.012 (0.025)	-0.021 (0.009)**	-0.007 (0.014)	-0.004 (0.013)	0.009 (0.010)
Small lender	-0.016 (0.006)***	-0.017 (0.006)***	-0.027 (0.007)***	-0.033 (0.009)***	-0.013 (0.006)**	-0.018 (0.007)***	-0.023 (0.008)***	-0.018 (0.010)*
Medium-sized lender	-0.018 (0.009)*	-0.027 (0.009)***	-0.033 (0.010)***	-0.037 (0.011)***	-0.014 (0.007)**	-0.023 (0.008)***	-0.028 (0.009)***	-0.023 (0.011)**
Large lender	0.018 (0.012)	0.013 (0.013)	-0.005 (0.015)	-0.022 (0.015)	-0.004 (0.007)	-0.006 (0.009)	-0.015 (0.010)	-0.014 (0.011)
Log(Price/Rent)	-0.058 (0.016)***	-0.039 (0.017)**	-0.022 (0.020)	-0.129 (0.019)***	0.071 (0.009)***	0.036 (0.010)***	0.058 (0.008)***	0.039 (0.008)***
Log(UE rate)	-0.041 (0.005)***	-0.043 (0.007)***	-0.052 (0.007)***	-0.030 (0.005)***	0.015 (0.003)***	0.001 (0.004)	-0.003 (0.003)	-0.017 (0.003)***
Log(MFI)	0.153 (0.011)***	0.124 (0.014)***	0.117 (0.017)***	0.177 (0.013)***	0.079 (0.007)***	0.047 (0.009)***	0.058 (0.010)***	0.013 (0.008)
Refinance share	-0.076 (0.051)	-0.083 (0.055)	-0.104 (0.052)**	-0.108 (0.050)**	-0.005 (0.021)	-0.036 (0.029)	-0.071 (0.021)***	-0.038 (0.019)**
Herfindahl -8	0.116 (0.066)*	0.290 (0.083)***	0.146 (0.083)*	0.162 (0.063)**	0.271 (0.044)***	0.199 (0.059)***	0.095 (0.045)**	0.120 (0.046)***
Log(total lending in county)	0.010 (0.006)	-0.020 (0.009)**	0.046 (0.015)***	-0.153 (0.015)***	0.030 (0.005)***	0.013 (0.008)	0.064 (0.009)***	-0.050 (0.009)***
Log(sold)	-0.022 (0.007)***	0.004 (0.008)	-0.059 (0.015)***	0.133 (0.013)***	-0.030 (0.004)***	-0.018 (0.007)***	-0.069 (0.009)***	0.049 (0.009)***
Constant	-0.907 (0.138)***	-0.681 (0.180)***	-0.690 (0.207)***	-0.700 (0.138)***	-1.185 (0.102)***	-0.559 (0.121)***	-0.794 (0.107)***	-0.211 (0.096)**
Within v. Outside **	Within	Neither	Within	Within	Within	Within	Within	Within
Observations	15877	18157	19628	19560	15619	18096	19589	19499
R-squared	0.12	0.09	0.11	0.13	0.05	0.02	0.03	0.02

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

\*\* This row reports the result of a t-test comparing the coefficients on “Banking within service area” and “Bank outside service area”. A positive t-statistic indicates that “within” is greater and a negative t-statistic indicates that “outside” is greater. Asterisks indicate the statistical significance of the test.

**Table 7 Regression results for dependent variables as changes, conventional conforming lending only**

Panel A: Dependent variable is change in level of lending (difference in logs)

	Lending to lower-income borrowers				Lending to lower-income neighborhoods			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1994-95	1996-97	1998-99	2000-01	1994-95	1996-97	1998-99	2000-01
Bank within service area	-0.053 (0.089)	-0.115 (0.043)***	0.032 (0.054)	-0.185 (0.054)***	-0.109 (0.042)***	-0.087 (0.043)**	0.024 (0.050)	-0.193 (0.048)***
Bank outside service area	0.078 (0.111)	-0.137 (0.044)***	0.125 (0.065)*	-0.159 (0.087)*	0.004 (0.054)	-0.082 (0.042)**	0.102 (0.055)*	-0.163 (0.075)**
Small lender	-0.050 (0.050)	0.003 (0.036)	-0.050 (0.046)	-0.002 (0.059)	0.010 (0.043)	0.067 (0.037)*	0.007 (0.048)	0.019 (0.050)
Medium-sized lender	-0.087 (0.056)	-0.045 (0.037)	-0.071 (0.043)*	0.010 (0.055)	-0.068 (0.056)	-0.004 (0.036)	-0.052 (0.047)	0.011 (0.048)
Large lender	-0.146 (0.082)*	-0.096 (0.038)**	-0.069 (0.055)	-0.105 (0.058)*	-0.021 (0.051)	-0.030 (0.039)	-0.013 (0.058)	-0.050 (0.057)
<i>Changes</i>								
Log(Price/Rent)	-0.551 (0.174)***	-0.299 (0.217)	0.020 (0.105)	0.035 (0.115)	-0.300 (0.169)*	-0.361 (0.214)*	0.155 (0.104)	0.101 (0.101)
Log(UE rate)	-0.001 (0.095)	0.227 (0.105)**	0.003 (0.058)	0.031 (0.033)	-0.121 (0.091)	0.039 (0.093)	-0.028 (0.056)	-0.048 (0.030)
Log(MFI)	0.839 (0.566)	1.332 (0.243)***	2.051 (0.147)***	1.383 (0.134)***	-0.282 (0.368)	-0.205 (0.212)	-0.087 (0.128)	-0.033 (0.091)
Refinance share	-0.378 (0.157)**	-0.166 (0.079)**	-0.142 (0.107)	0.256 (0.169)	-0.296 (0.118)**	-0.052 (0.070)	0.007 (0.088)	0.211 (0.143)
Herfindahl - 8	0.699 (0.318)**	0.500 (0.264)*	-0.025 (0.241)	-0.001 (0.317)	0.298 (0.247)	0.296 (0.245)	-0.058 (0.216)	-0.236 (0.350)
Log(total lending in county)	0.755 (0.120)***	0.796 (0.193)***	0.722 (0.137)***	0.946 (0.111)***	0.350 (0.082)***	0.676 (0.162)***	0.562 (0.142)***	0.783 (0.114)***
Log(sold)	-0.006 (0.061)	0.065 (0.038)*	-0.039 (0.058)	-0.028 (0.027)	0.086 (0.048)*	0.003 (0.038)	-0.067 (0.056)	0.005 (0.022)
Within v. Outside **	Outside	Neither	Outside	Neither	Outside	Neither	Outside	Neither
Observations	15883	18186	19633	19567	15883	18186	19633	19567
R-squared	0.08	0.04	0.06	0.05	0.02	0.02	0.01	0.03

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

\*\* This row reports the result of a t-test comparing the coefficients on “Banking within service area” and “Bank outside service are”. A positive t-statistic indicates that “within” is greater and a negative t-statistic indicates that “outside” is greater. Asterisks indicate the statistical significance of the test.

Table 7, Panel B: Dependent variable is change in portfolio share (difference in logs)

	Lending to lower-income borrowers				Lending to lower-income neighborhoods			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1994-95	1996-97	1998-99	2000-01	1994-95	1996-97	1998-99	2000-01
Bank within service area	0.024 (0.023)	-0.005 (0.003)	-0.003 (0.009)	0.002 (0.004)	-0.002 (0.002)	-0.004 (0.001)**	-0.001 (0.002)	-0.002 (0.001)*
Bank outside service area	0.032 (0.026)	-0.008 (0.003)***	0.002 (0.009)	0.007 (0.004)	-0.002 (0.002)	-0.003 (0.002)**	0.001 (0.002)	-0.002 (0.001)
Small lender	-0.009 (0.011)	0.002 (0.004)	0.012 (0.006)**	-0.005 (0.005)	0.003 (0.002)	0.004 (0.003)	0.007 (0.004)*	0.001 (0.002)
Medium-sized lender	-0.008 (0.010)	-0.000 (0.004)	0.022 (0.006)***	-0.008 (0.005)	0.003 (0.002)	0.002 (0.003)	0.009 (0.004)**	-0.002 (0.002)
Large lender	-0.021 (0.021)	-0.005 (0.004)	0.014 (0.005)**	-0.015 (0.006)**	0.004 (0.003)	0.001 (0.003)	0.007 (0.004)*	-0.000 (0.002)
<i>Changes</i>								
Log(Price/Rent)	-0.103 (0.018)***	-0.002 (0.017)	-0.009 (0.012)	-0.034 (0.010)***	-0.034 (0.012)***	0.007 (0.010)	0.015 (0.009)*	-0.003 (0.006)
Log(UE rate)	-0.003 (0.011)	0.028 (0.008)***	0.001 (0.007)	0.010 (0.003)***	-0.009 (0.007)	-0.001 (0.005)	-0.007 (0.004)*	-0.005 (0.002)***
Log(MFI)	0.238 (0.092)***	0.229 (0.032)***	0.377 (0.018)***	0.331 (0.019)***	0.017 (0.029)	-0.008 (0.015)	-0.017 (0.006)***	0.004 (0.007)
Refinance share	0.002 (0.012)	-0.014 (0.004)***	-0.010 (0.013)	0.002 (0.008)	0.003 (0.005)	-0.000 (0.003)	0.010 (0.004)***	-0.003 (0.003)
Herfindahl – 8	0.049 (0.026)*	0.045 (0.023)*	-0.012 (0.023)	0.004 (0.027)	-0.010 (0.015)	-0.006 (0.015)	-0.017 (0.018)	-0.048 (0.020)**
Log(total lending in county)	0.055 (0.026)**	-0.001 (0.008)	0.014 (0.014)	-0.002 (0.009)	0.003 (0.006)	0.003 (0.006)	0.017 (0.009)*	-0.005 (0.006)
Log(sold)	-0.025 (0.011)**	0.005 (0.004)	-0.012 (0.008)	-0.001 (0.002)	0.001 (0.003)	0.000 (0.003)	-0.009 (0.004)**	0.003 (0.001)***
Within v. Outside **	Neither	Neither	Neither	Neither	Neither	Neither	Neither	Neither
Observations	15860	18151	19628	19555	15537	18091	19588	19497
R-squared	0.05	0.02	0.11	0.05	0.01	0.00	0.01	0.00

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

\*\* This row reports the result of a t-test comparing the coefficients on “Banking within service area” and “Bank outside service area”. A positive t-statistic indicates that “within” is greater and a negative t-statistic indicates that “outside” is greater. Asterisks indicate the statistical significance of the test.