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Finding a Place to Call Home: An Analysis of Mortgage Lending In Springfield, MA

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Abstract

This study proposes the research question: are banks lending in such a way that under serves the residents of Springfield, resulting in low rates of homeownership? The study finds that empirical differences in lending patterns exists between Springfield and the neighboring communities, between local and non-local banks, and between applicants of different racial and ethnic groups. Statistical analyses at the Census tract level suggest that factors like race and ethnicity do have a negative effect on rates of owner occupancy and loan originations, even when controlling for income. Models measuring the effect of the same variables on loan denials yield less convincing results. The study concludes with a discussion of the practical limitations of the methodology and proposes possible directions for future housing research and policy.

Introduction

For many decades, homeownership has been part and parcel of the "American Dream," and with good reason. One of the essential components for any region's success is homeownership because it ties residents to their immediate communities while also providing economic opportunity and stability for individuals and families (PVPC 2003). In this respect, the residents of Springfield, Massachusetts are at a serious disadvantage. Compared to its immediate neighbors, Springfield has a relatively low proportion of owner-occupied housing units (**Table 1**). Additionally, Springfield is well below the state average in terms of homeownership, and well above the average number of renter-occupied units.

Table 1 – 2010 Housing Statistics

	% Owner Occupied Units	% Renter Occupied Units
Springfield	49.8	50.2
Agawam	74.2	25.8
Chicopee	58.8	41.2
E Longmeadow	62.3	37.7
Longmeadow	89.6	10.4
Ludlow	77.2	22.8
Wilbraham	88.5	11.5
W Springfield	58.0	42.0
State Average	*62.3*	*37.7*

Source: U.S. Census Bureau American Fact Finder, form QT-H1

However, Springfield is fairly similar to other urban areas in the Commonwealth. In Worcester, for instance, only 44.5 percent of housing units are owner-occupied, and Fall River that number drops to

35.7 percent. Nearby Holyoke only has 41.6 percent of its housing units occupied by owners. These empirical observations lead one to believe certain characteristics of urban centers must be related to low rates of homeownership. *This study asks if the banks are at all responsible for the low levels of homeownership seen in Springfield, MA.*

The first section of this study reviews literature that explores the link between urban centers and low rates of homeownership. The research question is then refined and developed. The second portion of the study details the methodology used to answer the question. Results are presented and explained in the third section. The results and the limitations of the study are discussed in the fourth section. The study then concludes with several policy prescription ameliorating housing and lending disparities in urban areas.

Literature Review

A cursory examination of the literature reveals that race and ethnicity are driving factors of housing discrimination. Given Springfield's demographic characteristic (**Table 2**), race and ethnicity appear to be ripe areas of exploration for explaining the low rates of homeownership.[1] Whereas Table 1 illustrates the low rates of homeownership in Springfield compared to neighbors, Table 2 shows that Springfield also has the highest concentration of minorities, and the lowest concentration of non-Hispanic whites.

Restrictive covenants, redlining, other discriminatory practices, and confinement to ghettos where opportunities for homeownership are limited have all conspired to make homeownership an unlikely proposition for minorities through most of the 20th century (Freeman, 2005). The Fair Housing Act (FHA) of 1968 acknowledged the existence of overt racial discrimination in the housing market, and was a major first step towards ameliorating the problem.

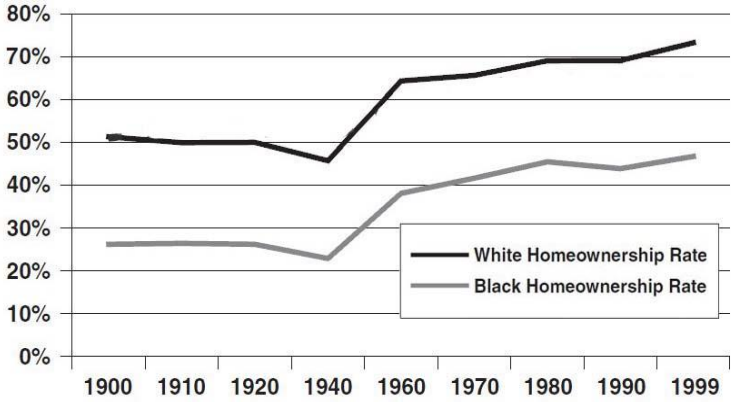
[1] It is important to note here that this study uses the terms "race" and "ethnicity" are used as two separate categories. Race includes white, black, Asian, Native-American, etc., and ethnicity refers to either Hispanic or non-Hispanic.

Table 2 – 2010 Selected Demographic Data

	% Population White, Non-Hispanic	% Population Non-White, incl. Hispanics	% Population Hispanic
Springfield	36.7	63.3	38.8
Agawam	92.4	7.6	3.3
Chicopee	79.5	20.5	14.8
E Longmeadow	93.0	7.0	2.3
Longmeadow	90.7	9.3	2.3
Ludlow	89.9	10.1	5.6
Wilbraham	93.3	6.7	2.4
W Springfield	82.1	17.9	8.7

Source: U.S. Census Bureau American Fact Finder, Form DP-1

Figure 1 – Homeownership Rates over Time

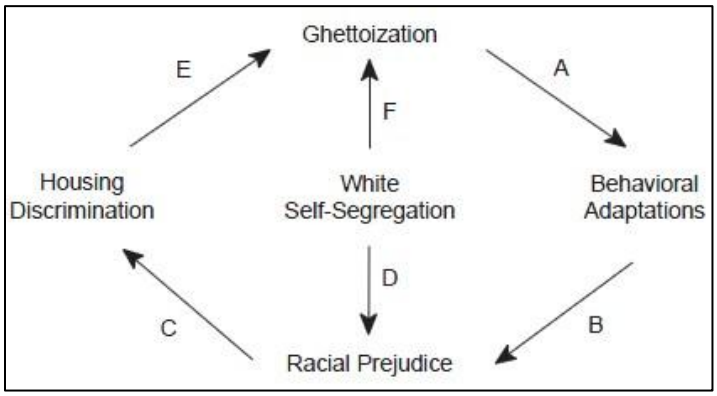


However, despite legislation like the FHA, racial discrimination in the housing market has persisted, on as a comparison of white and black homeownership rates demonstrate. **Figure 1** (adapted from Yinger, 1995) shows a sizable gap between white and black persons in terms of homeownership. A study by Shafer and Ladd (1981) found that race was an explanatory factor of high loan denial rates for minorities in metropolitan areas, even when factors like income were controlled. A multi-year study that took place in Chicago, New York, and Louisville revealed incidents where bank loan officers offered more help and encouragement to white applicants and directed similar minority applicants to government-insured loans (Galster, 1993). Furthermore Census data from 2000 shows that in 29 of the 50 largest metropolitan areas, black-white segregation is extreme, while other areas have remained failry static during the 1980s and 90s (Charles, 2003).

Galster (1999) posits that the existence of ghettos prior to 1968 and their continued existence after the FHA has resulted in a self-reinforcing dynamic of circular causation he calls *spatial racism*. In this process (see **Figure 2**), ghettoization—the spatial confinement of the poor and minorities—results in

certain behavioral adaptation of ghettos residents, i.e. drug use, crime, etc. (Path A). These behaviors reinforce racial prejudices (path B), which in turn can cause differential treatment and adverse impacts in the housing market (path C). Whites are in turn motivated to leave urban centers, aka "white flight," which reinforces racial segregation (path D). White flight and housing discrimination furthers the spacial isolation of urban minorities, and the process of spatial racism perpetually continues (paths E and F). Other scholars concur that segregation today is dues more to white avoidance and flight than restrictive covenants, steering, and racial violence as it was in the early 20th century (Ellen, 2000).

Figure 2 – Galster's *Spatial Racism*



While the work of Galster and others might help to explain the historical differences in the homeownership rates of urban centers (where minorities are concentrated) and non-urban areas (that are predominantly white), other research sheds light on more subtle factors affecting housing disparities. A statistical analysis by Silverman (2008) found that disparities in mortgage lending between census tracts are affected by variables like educational attainment, neighborhood socioeconomic distress, residential stability, and the age of the housing stock in census tract. But more notably, the study did not find that race and core city location affected mortgage lending patterns in a statistically significant manner. Another interpretation of these findings, though, might be that minorities simply have less in the way of educational attainment and tend to live in distressed areas with older housing stock.

Other researchers point out that mortgage markets, once arenas of discrimination by *exclusion*, now operate as means of discrimination by *inclusion* via predatory lending and high-interest credit, which ultimately puts minority borrowers at a higher risk of default and foreclosure (Wyly et al., 2007).

The legacy of race, inequality, and stratification described in the works of Galster may also have provided incentives for financial institutions to engage in racially predatory lending practices in the buildup to the subprime mortgage crisis of 2008 (Price, 2010).

Other research points to policy shortcomings as a cause of continued housing disparities. The Home Mortgage Disclosure Act (HMDA) was enacted in 1975 as a result of community group studies which found that banks were making more mortgages in suburbs than they were in cities, resulting in a deterioration of inner city neighborhoods (Benston, 2010). While the original HMDA required lenders to report where they were originating loans in an attempt to curb redlining, it was not until *fourteen years later* that an amendment to the law required lenders to report on applicants' race, ethnicity, gender, and income.

Although the HMDA required lenders to report the nature of their loan dispositions to regulatory agencies, it did not really incentivize or encourage investment in urban areas or minority groups. In order to eliminate incidents of redlining, Congress passed The Community Reinvestment Act (CRA) of 1977 to encourage lenders to meet the needs of borrowers *all* borrowers, including those in poorer, urban areas. But it was not until the 1990s that regulatory agencies were actually required to evaluate lenders on their compliance with the CRA. However, questions remain as to the efficacy of the CRA. Bostic and Robinson (2003) find that increases in lending as a result of banks trying to improve their CRA evaluations are short-lived, and that lenders view CRA compliance more as a form insurance against the costs associated with fair lending violations and adverse publicity. If so, the CRA does little more than encourage banks to do the bare minimum to achieve adequate CRA evaluations.

A review of the pertinent literature reveals that there is a long-standing racial component to housing discrimination, and that this has helped to reinforce institutional prejudices against minorities. As a result, urban areas, which typically have high concentrations of minorities, often have lower rates of homeownership than non-urban areas, which are predominantly white. Over the past decade, racial

discrimination has become increasingly harder to detect due to inclusionary discrimination practices such as sub-prime or predatory lending. Lackluster enforcement and evaluation mechanisms might also be partly to blame for housing inequities. Indeed, the main flaw of the FHA is that relies on the victims to recognize that they are being discriminated against and formally complain to the proper regulatory agency (Galster, 1991).

It is the contention of this study that lending institutions *might* bear some responsibility for the low rates of homeownership in urban centers. So, this study will seek to answer the question: *do bank lending practices contribute to the low rates of homeownership in Springfield, MA?* The following section introduces some metrics to discern what factors impact mortgage lending pattern and develops a methodology for answering the research question.

Methodology

Data Sources

The primary data sources used is this study are the U.S. Census Bureau and the Home Mortgage Disclosure Act (HMDA) records kept by the Federal Financial Institutions Examinations Council (FFIEC). The U.S. Census Bureau maintains demographic databases based on decennial surveys, the most recent one completed in 2010. The Home Mortgage Disclosure Act of 1975, and its subsequent amendments, requires lenders to annually report the disposition of their loans, in what census tract the loan is being originated, as well as the race, ethnicity, gender, and income of applicants.[2]

This study uses 2010 HMDA data both because it is the most recent data available, and to be consistent with the currently available Census data. Additionally, 2010 might be far enough removed from the housing market collapse of 2008 so as not require controlling sub-prime lending and over-speculation that contributed to the collapse. That is, lending data from prior to 2008 might not be

[2] 12 U.S.C. Sec. 2801-2810.

comparable to 2010 data without adequate controls. Such controls are beyond the scope of this research. Ideally, 2010 might be used as a starting year for future longitudinal studies.

Definitions & Scope of Research

Unit of Analysis. Unless otherwise noted, the units of analysis in this study are Census tracts. For instance, discussions of the "non-white population" refers the proportion of residents in a given Census tract that identify as a race other than white.

Income. This study examines median Census tract income as a percentage of the Springfield Metropolitan Statistical Area (MSA) median income, as is reported in the HMDA data. The Springfield MSA median income for 2010 is $67,400.[3] To calculate this percentage, the median income of an individual census tract is divided by the Springfield MSA median income:

Percent of Springfield MSA Median Income = (Census Tract Median Income/Springfield MSA Median Income)100

So a tract whose average median income is $33,700 is reported as having an income of 50 percent of the MSA median income.

Lending Institutions. This study specifically examines banks and/or credit unions that have originated loans, or received loan applications, for homes within the city of Springfield. Banks are important institutions in that they are anchored to community, highly visible, and critical to the economic well-being of a community. Private mortgage firms and brokers are not examined in this study.

Loan Types. This study is concerned with rates of homeownership within Springfield, and as such only examines loans for new home purchases. Specifically, only conventional loans for 1- to 4-family dwellings are examined here. Fair Housing Act (FHA) insured loans, home improvement loans, refinancing loans, and non-occupant loans are not examined.

Local and Non-Local. During the initial phases of this study it became apparent that differences in lending practices may exist between local and non-local lending institutions. Here, *local* refers to those

[3] Housing and Urban Development (HUD) estimate for 2010, as reported by the FFIEC.

institutions that are headquartered within Massachusetts, the majority of which are west of Worcester County. *Non-Local* refers to those institutions that are headquartered in other states but have branches or loan activity in Springfield. See **Appendix A** for a complete list of local and non-local institutions examined in this study.

Race and Ethnicity can be defined in several ways, but this study will use categories similar to the U.S. Census Bureau. Race includes: White, Black or African-American, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Other, Unknown, or those Identified by Two or More Races. For the purposes of this study though, race will broken down into three categories: *White* and *Non-White*, the latter of which includes all racial categories besides white. Ethnicity includes: *Hispanic* and *Non-Hispanic.* Race and ethnicity are separate, exclusive categories in this study.

Research Methods

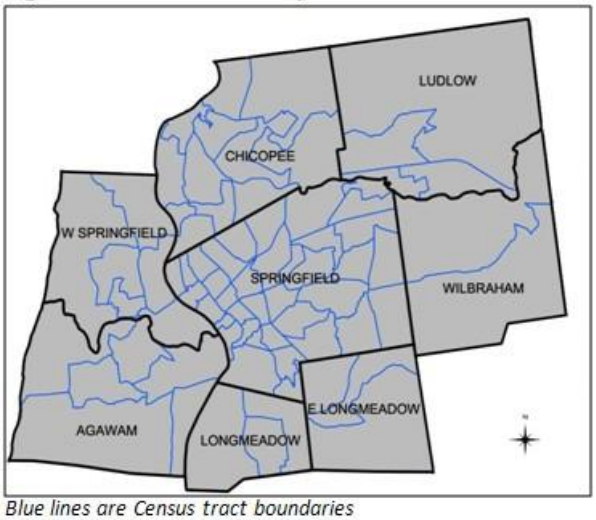
The main goal of this research is to determine if bank lending practices contribute to the low rates of homeownership in Springfield, MA. That is, are there characteristics particular to Springfield that cause banks to under serve the city? In order to answer this question, this study will analyze empirical data and determine what factors, if any, have a statistically significant effect on lending rates.

Other studies have shown that difference exist between local and non-local lending institutions. Most notably, a 2003 study by the Pioneer Valley Planning Commission found that from 1997 to 2001, the loan approval rate of local lenders grew from 85 to 89 percent while the rate for non-local lenders was significantly lower at 67 and 65 percent for the same time period. Since non-local banks increased their control of the Springfield home-loan market in 2001, and because they approved loans applications at a lower rate than local lenders, potential borrowers had less access to institutions where they would be more likely to be approved for a home loan than they did in 1997 (PVPC 2003). As such, exploring the differences between local and non-local lenders seems an appropriate means of addressing the research

question of this study. That is, do either local or non-local banks do better job of serving the Springfield area?

Implicit in this question is a geographic dimension. Examining lending differences between Springfield the seven communities that border it will also help to answer the research question. The study area (**Figure 3**) was selected in order to have a "baseline" with which to compare Springfield. By limiting the study area to the communities immediately surrounding Springfield, any lending differences that are discovered will not be distorted by lending data from dissimilar communities in the Springfield MSA.[4]

Figure 3 – Research Study Area



Blue lines are Census tract boundaries

Geographic Lending Disparities

The first part of this study finds if any empirical lending disparities exist between local and non-local banks for Springfield and the rest of the study area. To determine this, loan origination rates for local and non-local lenders are examined on a per 1000 person basis in order to control for varying population size and loan numbers across tracts. For each tract in the study area (n = 72), these rates are calculated by multiplying the number of originations by 1000, and dividing by the tract population. For instance, a tract with a population of 5000 and 7 loan originations has an origination rate of 1.4.

Origination Rate = (# of Originations or Denials in Tract x 1000)/Tract Population

[4] The Springfield MSA The Springfield MSA includes: Amherst, Ashfield, Agawam, Belchertown, Blandford, Brimfield, Chester, Chesterfield, Chicopee, Cummington, Deerfield, East Longmeadow, East Windsor, Connecticut, Easthampton, Enfield, CT, Goshen, Granby, Granby, CT, Granville, Greenfield, Hadley, Hampden, Hatfield, Holyoke, Huntington, Longmeadow, Ludlow, Middlefield, Monson, Montgomery, Northampton, Palmer, Plainfield, Russell, Somers, CT, South Hadley, Southampton, Southwick, Springfield, Suffield, CT, Tolland, Wales, Ware, West Springfield, Westfield, Westhampton, Whately, Wilbraham, Williamsburg Windsor Locks, CT, and Worthington.

Loan denials are calculated as a percentage of all loan applications in a tract:

Denial Rate = # of Denials in a Tract / Total # of Loan Applications in Tract

From there, separate averages are calculated for the all the Springfield Census tracts and for the rest of the tracts in the study area. These calculations serve to empirically demonstrate if Springfield is being underserved in relation to its neighbors, and if the type of lending institution has any sort of impact. Averages are also calculated for all lenders, both local and non-local, in the study.

Racial and Ethnic Disparities

As the literature review demonstrates, minorities own homes disproportionately less often than their white, non-Hispanic counterparts. Springfield is no different. Whereas non-Hispanic whites make up 36.7 percent of the city's population and own 31.7 percent of owner-occupied dwellings, African-Americans and black Hispanics make up 22.3 percent of the population but own only 9.2 percent of owner-occupied dwellings.[5]

Continuing with the hypothesis that that lending disparities exist between local and non-local institutions, the second part of this study compares the percentage of loan applications that are originated and denied for each racial and ethnic category. Since Springfield is home to a higher concentration of minorities than the neighboring communities (see **Table 2**), this is an important metric to consider in answering the research question. Due to logistical constraints, data for this portion of the study could not be calculated at the tract level. Instead, this information is gathered from HMDA reports for the *entire* Springfield Metropolitan Statistical Area.

To calculate these percentages, the number of loan originations and denials for each racial/ethnic group are divided the total number of loan applications, and multiplied by 100:

*Lender's Origination or Denial Rate = (# of Originations or Denials/# of Total Applications)*100*

[5] U.S. Census Bureau American Fact Finder, forms QT-H1 and DP-1

Applications that were declined by the applicant or closed for incompleteness are not examined due to the fact HMDA reports do not provide explanations as to why the loans were never completed.

Origination and denial rates for each racial/ethnic group are compared for local and non-local lenders. To put these numbers in perspective, the volume of loan activity for local and non-local lenders, i.e. their market share, is also considered.

Determining Significant Relationships

Examining the results from the first two prongs of this study empirically demonstrate what sort of lending disparities might exist between Springfield and its neighbors, based on the type of lending institution, and on racial and ethnic categories. But statistical analyses are also need to determine what, if any, factors are significant predictors of homeownership and bank lending rates. For instance, loan origination rates for minorities might be lower than for whites, but that could just be a result of income differences between the two. Economic factors, like income, are of course a legitimate reason for banks to deny a loan application. As such, the third part of this study will run several multiple regression models, *controlling for income*, to determine 1) what factors predict the levels of homeownership in a tract, 2) what factors affect loan origination and denial rates for *all* banks in the study, and 3) if those same factors can be used to explain lending disparities between local and non-local lenders. So whereas the first two portions of this study demonstrate lending disparities empirically, the third part will statistically establish if factors like race or ethnicity impact homeownership and lending patterns.

The unit of analysis for this portion of the study is again the census tract. Although there are 72 census tracts in the study area, some of the regression models will show that $n = 66$. The reason for this disparity is that six tracts[6] are missing data for Income, and Loan Denial and Origination Rates. Several tract numbers now exist in the U.S. Census Bureau databases that are not present in the HMDA reports.

[6] 8019.02 (Springfield), 8122.02, 8124.04 (Chicopee), 8132.08, 8132.09 (Agawam), and 8133.04 (Longmeadow).

It can only be assumed that the U.S. Census Bureau created these tract numbers recently and the FFIEC has yet to update their HMDA reporting methods to reflect these changes.

The analysis uses the following multiple regression model:

$$\hat{Y}_{tract} = b_o + b_1X_1 + b_2X_2 + \ldots + b_kX_k$$

Where:

$\hat{Y}_{tract}$	*Predicted value of the dependent variable*
b_o	*Constant*
b_k	*Regression coefficient of the independent variable*
X_k	*Independent variable*

A total of seven regression models will be calculated using the following variables (Please See **Table 3** in the Results section for Springfield and non-Springfield averages of the dependent variables):

	Variable Name	Definition
Dependent Variables	*% Owner Occupied*[7]	Percent of housing units in a tract that are owner occupied
	All Origination Rate	Loan origination rate for tract of all banks, local and non-local. Reported as # of originations per 1000 people.
	All % Denials	Percentage of applications that are denied by all banks, local and non-local.
	Local Origination Rate	Loan origination rate for tract of all local banks. Reported as # of originations per 1000 people.
	Local % Denials	Percentage of applications that are denied by all local banks.
	Non-Local Origination Rate	Loan origination rate for tract of all non-local banks. Reported as # of originations per 1000 people.
	Non-Local % Denials	Percentage of applications that are denied by all non-local banks.

	Variable Name	Definition	Springfield Avg	Non-Springfield Avg
Independent Variables	*% Non-White*	Percent of tract pop. that is not white	48%	10%
	% Hispanic	Percent of tract pop. that is Hispanic	42%	8%
	Income	Median tract income as a percent of MSA median income	68%	110%
	Springfield	1/0 dummy variable. Indicates whether tract is in Springfield	1	0

The four independent variables were selected because they are factors of primary concern. As the literature shows, racial and ethnic minorities own homes disproportionately less than their white, non-Hispanic counterparts. So, testing for the "*% Non-White*" and "*% Hispanic*" variables will show if

[7] The average percentage of owner-occupied housing units across the Springfield Census tracts is 44 percent. The average for the rest of the study area is 67 percent.

lending disparities in the Springfield area are due to its demographic composition. However, banks do deny loan applications for legitimate financial reasons such as income. As such, the *"Income"* variable is included to control for these economic factors. The regression model also seeks to demonstrate if a "Springfield effect" exists. That is, does a tract being located in a central city like Springfield result in lower rates of owner-occupancy or lending for the residents of that tract?

To parse out if a Springfield effect does exist, the study will build a regression for the *"% Owner Occupied,"* testing first for "*Springfield*," then adding one variable at a time to discern the effects.

Results

Geographic Lending Disparities

Tabulating the origination and denial rates of local and non-local lenders for each tract within the study area, and then taking the mean figures for Springfield and non-Springfield tracts yields the results shown in **Table 3**.

Table 3 – 2010 Lending Rates, Local vs. Non-Local, Springfield vs. Neighbors

	Local Lenders		**Non-Local Lenders**		**All Lenders**	
	Origination Rate	*% Apps Denied*	*Origination Rate*	*% Apps Denied*	*Origination Rate*	*% Apps Denied*
Springfield	1.42	15%	1.56	35%	1.49	25%
Neighbors	2.51	11%	2.10	18%	2.31	15%

This table shows that on a per-1000 person basis, Springfield has loan origination about a third lower than its neighbors, from both local and non-local banks. Non-local lenders are shown, on average, to have slightly higher origination rates in Springfield and lower rates in the surrounding area than their locally-based counterparts. However, non-local banks are also shown to have far higher denial rates as well. Compared to local lenders, non-local banks deny twice as many applications in Springfield, and approximately two-thirds more in the rest of the study area. These results demonstrate that empirical differences do exist between Springfield and its neighbors, and between local and non-local banks. Furthermore, these numbers imply that Springfield is underserved in the mortgage market compared to its neighbors.

Racial and Ethnic Disparities

Tabulating the origination and denial rates for racial and ethnic groups within the *entire* Springfield MSA yields the results shown in **Table 4**.

Table 4 – 2010 Loan Decisions by Race & Ethnicity, Local vs. Non-Local

	Local lenders		**Non-Local Lenders**	
	% Originated	*% Denied*	*% Origination*	*% Denied*
White	75	10	71	17
Non-White	71	10	55	29
Hispanic	61	21	72	14
Non-Hispanic	75	10	68	19

These results demonstrate that the percentage of loan applications that are originated and denied for white and non-white applicants at local institutions are fairly similar. However, the origination rate for non-white applicants at non-local institutions are about a third lower, and the denial rates are an astounding three times higher compared to local banks. The denial rate for white applicants at non-local banks is also noticeably higher. Ethnic categories yield unexpected results. Hispanic applicants appear to fare better at non-local institutions than at local ones. Non-local banks originated a little under a quarter more loans for Hispanic applicants than local banks, and their denial rates are about a third less. Local lenders originated a higher proportion of loans for non-Hispanic applicants, with fewer denials, than non-local lenders.

It is important to note here that the categories do not add up to 100 percent. Rates for white applicants at local banks only add up to 85 percent, and non-white rates at non-local lenders only add to 84 percent. The missing numbers represent applications that were either withdrawn, closed for incompleteness, or approved but declined by the applicant. The study does not examine these numbers since the HMDA does require that banks furnish information as to why these applications were not completed or declined by the applicant.

Table 5 shows the number of conventional mortgage applications received by all local and non-local lenders and their respective market share in the Springfield MSA.

Table 5 – 2010 Market Share of Local vs. Non Local Lenders

	Number of Applications	**Market Share**
Local Lenders	2150	**73.4%**
Non-Local Lenders	779	**26.6%**
Totals	2929	100.0%

These numbers are significant in that they demonstrate that nearly a quarter of all 2010 mortgage applications in the Springfield MSA were through non-local institutions. Viewed in conjunction with the data from **Table 4**, it is apparent that choosing which bank to go to could mean the difference between owning a place to call home, or being denied that dream.

Determining Significant Relationships

The results of the first two prongs of the study empirically demonstrate that lending disparities exist between Springfield and its neighbors. The data imply that banks are under serving Springfield, which has resulted in lower rates of owner-occupancy in the city. Furthermore, the results imply that these lending disparities might be a function of the racial and ethnic composition of the city. However, statistical analyses that control for income are needed to determine if these implications are valid.

Table 6 builds a regression that tests the effects of the 4 independent variables on owner-occupancy at the census tract level

Table 6 – Predictors of Owner-Occupancy

	Model 1 Coefficients	**Model 2 Coefficients**	**Model 3 Coefficients**	**Model 4 Coefficients**
Constant	*66.722* (4.142)*	*80.672* (3.222)*	*79.849* (2.613)*	*22.77*** (8.830)*
Springfield	-22.889* (5.859)	32.514* (7.329)	30.186* (5.948)	22.529* (4.760)
% Non-White	-	-1.431* (0.159)	-0.662* (0.179)	-0.272*** (0.149)
% Hispanic	-	-	-0.819* (0.134)	-0.446* (0.117)
Income	-	-	-	0.452* (0.069)

**p < .001, ***p < .10. Standard errors in parentheses.*
Model 1: p < .001, n = 72, F(1, 70) = 15.26, adj-R^2 = .167
Model 2: p < .001, n = 72, F(2, 69) = 57.05, adj-R^2 = .612
Model 3: p < .001, n = 72, F(3, 68) = 70.40, adj-R^2 = .746
Model 4: p < .001, n = 66, F(4, 61) = 93.08, adj-R^2 = .850

The most unexpected result of building this regression model is the "Springfield" variable. *Model 1* suggests that a census tract located in Springfield will face a 22.9 percent drop in owner-occupied dwellings, something that might be expected given the data already reviewed in this study.

However, adding variables to the model causes the Springfield coefficient to change signs, thus having a positive effect on owner-occupancy. In the second model, controlling for the non-white population suggests that tracts located in Springfield will have an increase in owner occupancy of 32.4 percent. Adding the "*% Hispanic*" variable in *Model 3* yields a similar result of 30 percent. *Model 4*, which also controls for income, causes the Springfield coefficient to drop slightly to 22.7 percent. So according to this model, a census tract located in Springfield will cause the proportion of owner-occupied units to increase approximately 23 percent—a very curious result in light of the data in **Table 1**.

Two possibilities might explain this unexpected result. The first is that the rate of owner-occupied housing is so well explained by the other variables, that after controlling for income and racial composition, the "Springfield Effect" has an unexpected positive sign. If true, this implies that Springfield actually has a relatively high rate of homeownership given its racial and ethnic composition.

The second possibility is that model is flawed, and that other unaccounted for variables are having an effect at the tract level. If so, this means that other tract-characteristics are stronger indicators of homeownership than just location in a central city. If true, this means that different tracts across the metropolitan area might bear stronger resemblances to each other than to other tracts within the same city.

The other important result of these models is that the percentage non-white and Hispanic residents in a tract has a negative impact on owner-occupancy rates, *even when controlling for income*. According to *Model 4*, for every 10 percent increase of the non-white population in a tract, homeownership will drop by 2.7 percent. The same increase in the Hispanic population yields a decrease of 4.5 percent in owner occupancy.

These results seem to verify the implicit message of **Tables 1** and **2** that high concentrations of minorities in an area are associated with lower rates of homeownership, even regardless of income. But

do these same factors similarly impact home mortgage lending? To test that hypothesis, **Tables 7** and **8** show the results of the regression model when applied to the lending rates of all the banks in the study:

Table 7 – Predictors of Loan Origination Rates, All Banks

	Coefficient
Intercept	3.932** (1.118)
% Non-White	-0.042*** (0.019)
% Hispanic	-0.021[t] (0.014)
Income	-.0422[t] (0.018)
Springfield	1.172*** (0.603)

***p < .05, ***p < .10, [t]Not statistically significant*
p < .001, n = 66, F(4, 61) = 18.09, adj-R^2 = .513. Standard errors in parentheses.

Table 8 – Predictors of Percentage of Loan Denials, All Banks

	Coefficient
Intercept	0.144*** (0.082)
% Non-White	-0.004** (0.001)
% Hispanic	0.005* (0.001)
Income	-0.000[t] (0.001)
Springfield	0.098*** (0.044)

**p < .001, **p < .05, ***p < .10, [t]Not statistically significant.*
p < .001, n = 66, F(4, 61) = 13.77, adj-R^2 = .44. Standard errors in parentheses.

According to the results in **Table 7**, the only factors that have a significant influence on loan origination rates are the percentage of non-whites in tract, and whether or not the tract is in Springfield. The model suggests that for every 10 percent increase in the non-white population, the loan origination rate for that tract drops by.04. But given the size of the standard error and the fact that the result is on the tail end of significance, there is a possibility the variable *might* be negligible. The Springfield effect again has a curiously large, positive effect, suggesting that a tract being located in Springfield increases the loan origination rate by 1.17 per 1000 people. This unexpected result might be due to the possibilities discussed in the previous model. Again though, this variable is on the tail end of statistical significance, and *might* be negligible. Income is not shown to be statistically significant.

Table 8 shows curious results. The model suggests that a 10 percent increase in the non-white population of tract will actually decrease loan denials by 0.4 percent. A minor effect to be sure, but one

that is still statistically significant. At the same time though, the same increase in the Hispanic population will increase the percentage of loan denials by 0.5 percent—a result that has a higher probability of significance than the "*%Non-White*" variable. The model also suggests that census tracts in Springfield will have 9.8 percent more loan denials than other tracts in the study. However, this effect is also just barely significant. Income also does not prove be a statistically significant factor in affecting loan denials.

The next set of regressions is similar to the last, but instead examines the effects of the independent variables on the loan origination and denial rates for local and non-local lenders separately:

Table 9 – Predictors of Loan Origination Rates, Local Banks

	Coefficient
Intercept	1.09[t] (0.798)
% Non-White	-0.017[t] (0.014)
% Hispanic	-0.007[t] (0.011)
Income	0.015*** (0.006)
Springfield	0.439[t] (0.430)

p < .001, n = 66, F(4, 61) = 14.93, adj-R^2 = .462. Standard errors in parentheses.
***p < .10, [t]Not statistically significant.*

Table 10 – Predictors of Percentage of Loan Denials, Local Banks

	Coefficient
Intercept	0.210*** (0.116)
% Non-White	-.002[t] (0.002)
% Hispanic	-0.000[t] (0.002)
Income	-0.001[t] (0.001)
Springfield	0.108*** (0.063)

Model is not statistically significant.
***p < .10, [t]Not statistically significant.*

Table 11 – Predictors of Loan Origination Rates, Non-Local Banks

	Coefficient
Intercept	2.846** (0.794)
% Non-White	-0.025*** (0.013)
% Hispanic	-0.014[t] (0.010)
Income	-0.003[t] (0.006)
Springfield	0.733*** (0.428)

p < .05, n = 66, F(4, 61) = 5.12, adj-R^2 = .202. Standard errors in parentheses.
**p < .05, ***p < .10, [t]Not statistically significant.*

Table 12 – Predictors of Percentage of Loan Denials, Non-Local Banks

	Coefficient
Intercept	0.150[t] (0.139)
% Non-White	-0.003[t] (0.002)
% Hispanic	0.006** (.002)
Income	-4.99[^-07t] (0.001)
Springfield	0.072[t] (0.075)

$p < .001$ n = 66, $F(4, 61) = 8.98$, adj-$R^2 = .329$. Standard errors in parentheses.
***p < .05, ***p < .10, [t]Not statistically significant.*

The results in **Table 9** show that only income is a significant predictor of the loan origination rates of local banks. But the effect is very minor and at the tail end of statistical significance. The model demonstrating the effects on loan denials at local banks (**Table 10**) is not statistically significant.

The same models for non-local banks (**Tables 11 and 12**) suggest that a 10% increase in the non-white population will decrease loan originations by a quarter of a percent, though the effect is barely significant. Again the "*Springfield*" variable has the unexpected result increasing loan origination rates by 0.73, an effect that is also on the tail end of statistical significance. The only significant predictor of loan denials at non-local banks was the "*% Hispanic*" variable. The model suggests that for every 10 percent increase in the Hispanic population loan denials increase by 0.06 percent.

In trying to distinguish between the lending rates of local and non-local banks, the regression models are fairly unconvincing. One possibility for this might be that the numbers in the raw data are so small that demonstrating statistical significance for local and non-local banks separately is too difficult. Combining the data for both types of lenders (**Tables 7 and 8**) seems to ameliorate this problem. To this end, the data analyzed here is only from 2010. A longitudinal study that collects lending data from several years might also produce more convincing models.

Discussion

The biggest limitation of this study derives from the limitations of the data used. Under the HMDA, data about loan applicants is kept anonymous, which introduces problems of redundancy. For

instance, one person might apply for a loan at several different banks, and so those applications will be recorded as several unique applications in the HMDA reports. Or that data might represent several unique applications from several different applicants. There is simply no way of knowing. The possibility of redundancy might cause distortions in the data. Future studies might try to explore the extent of these data redundancies and develop methods to control for them in statistical analyses.

Furthermore, HMDA data does not report why applicants withdraw or fail to complete an application, nor does it include reasons as to why an applicant declines a loan offer. As Galster (1993) demonstrates, discrimination can be as subtle as loan officers simply offering less encouragement and support to minorities than to white applicants. Another possibility is that the applicant was offered such a high interest rate that they declined the loan—the "discrimination by inclusion" process discussed by Wyly et al. (2007). Future studies might explore these possibilities and try to determine if they are linked to race, ethnicity, or location in a central city. Interview-based, qualitative studies might also help to shed light on these subtle factors that can not quantified by HMDA reporting procedures.

Another limitation of the study is that it is only a snapshot of one year of lending activity. Longitudinal studies of several years' worth of lending data might make the results more convincing. However, a 2003 study by the Pioneer Valley Planning Commission (PVPC, 2003) did find similar disparities between the lending activity of local and non-local banks in Springfield and the neighboring communities, which concurs with the results of this study. Another publication by the PVPC (2010) found that in 2008, the foreclosure rate in Springfield was nearly four times the mean rate in the MSA, the highest in the area. These findings suggest that the residents of Springfield are disadvantaged in the housing market when compared to their neighbors.

However, the most unexpected result of the study is the unintended effect that the "Springfield" variable had on the regression models, particularly in **Table 6**. The data in **Tables 1 and 3**

lead one to expect the "Springfield" variable to have a negative effect on owner-occupancy and loan origination rates, but the models show just the opposite.

As previously mentioned, one possibility for these results is that Springfield actually has fairly high rates of homeownership given its racial and economic composition. If this is case, then the residents of Springfield might actually not be underserved. However, in order to test this possibility further comparative studies are needed. Future researchers would have to determine how lending and the proportion of owner-occupied units in urban areas operate as a function of race, ethnicity, and income across several MSAs similar to Springfield. With this data in hand, the quizzical effect of the "Springfield" variable in this analysis might be better understood.

But given what is currently known it seems equally plausible that the regression is model flawed due to the influence of unaccounted for variables, if not more so. This hypothesis concurs with Silverman's (2008) finding that disparities in mortgage lending between census tracts are attributable to such differences as the educational attainment of the residents, neighborhood socioeconomic distress, the age and condition of the available housing units, and *not* race or core city location. Such findings suggest that housing disparities are no longer particular to urban centers, but are becoming a more general condition of metropolitan areas. If these finding are correct, they present exciting new areas of research for housing policy in that they challenge conventional notions of white-flight, redlining, and urban ghettoization, and present new phenomena to be studied and understood.

But regardless of the limitations of this study—and what they mean for future research—lending disparities do still exist. The empirical results of the study show that Springfield has fewer loan originations and more loan denials than in the neighboring communities. Furthermore, racial and ethnic disparities exist between local and non-local lenders (**Table 4**). And given the racial composition of Springfield (**Table 2**), this appears to put the city's residents at a disadvantage for home loans. As some of the regression models (**Table 6 and 7**) suggest, having a higher concentration of minorities in a tract

decreases rates of owner-occupancy and loan originations in a statistically significant manner, even when controlling for income.

Conclusion

Given the lending disparities demonstrated in this study, the criticisms of federal housing policy by Galster and others are well-founded. The fundamental flaw of laws like the Fair Housing Act and the Community Reinvestment Act is that are *passive* regulations that rely on individuals to recognize that they are being discriminated against, however subtle that discrimination may be. Furthermore, CRA evaluations appear to do little in way of stimulating investment in the areas that most need it. More often than not, the evaluations are only given serious consideration when banks are considering mergers or acquisitions. It should be noted that all of the lenders in this study received either "satisfactory" or "outstanding" ratings on their most recent CRA evaluation, *yet still lending disparities exist*.

The findings and discussions in this study suggest several policy prescriptions. One is to amend the HMDA to require banks to furnish more information regarding the nature of the loans they offer applicants, particularly rates. Determining if minority applicants are given more unfavorable rates and terms more when compared to their white counterparts would be a useful metric in trying to discern *inclusionary discrimination*.

Another policy solution might be to rework the Community Reinvestment Act so that banks are evaluated more often, by more rigorous metrics, and in more quantifiable measures than subjective terms like "satisfactory" and "outstanding." Massachusetts is one of several states that has its own CRA legislation, though it is almost exactly the same as the federal legislation. As such, there may be some flexibility to amend CRA protocol at the state level, at least more so than at the federal level.

Failing any major changes to existing housing policy, another solution might be to allocate more resources to private and governmental fair housing agencies so that they may conduct ongoing

enforcement testing programs (Galster, 1999). It is entirely possible that more *active* enforcement of existing policies might reduce the lending disparities seen here in this study. Of course, these policy recommendations require further analysis and feasibility studies, and should be backed by useful metrics and thorough analytical research of lending disparities.

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Appendix A – Lending Institutions Included in the Study

Local Institutions

Aldenville Credit Union
Berkshire Bank
Chicopee Savings Banks
Country Bank for Savings
Easthampton Savings Bank
Florence Savings Bank
Freedom Credit Union
Greater Springfield Credit Union
Hampden Bank
Holyoke Credit Union
LUSO Federal Credit Union
MassMutual Federal Credit Union
Monson Savings Bank
Nuvo Bank
Polish National Credit Union
Springfield Teachers Credit Union
UMass Five College Credit Union
United Bank
Westfield Bank

Non-Local Institutions

Bank of America
Citizen's Banks
NewAlliance Bank
People's United Bank
Sovereign Bank
TD Bank
Webster Bank