

SEARCHING FOR RED LINES: SPATIAL ANALYSIS OF LENDING PATTERNS IN PHILADELPHIA, 1940-1960

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Introduction

In explaining the racial and economic patterns that developed in cities in the United States during the middle decades of the twentieth century, historians have not given as much attention to mortgage redlining as other forms of housing discrimination.¹ Stories of racial bias among realtors and intimidation and violence by neighbors are much more plentiful than descriptions of redlining, which is commonly understood as the systematic denial of mortgages or insurance based on the racial composition of the applicant's neighborhood rather than the credit-worthiness of the borrower. Charles Abrams, Thomas Sugrue, and Stephen Meyer, among others, have described incidents in which African-American families moving into predominantly white neighborhoods were harassed, threatened, stoned, and fire-bombed. Similarly, works by Rose Helper and Raymond Mohl have documented the systematic bias within the real estate and appraisal

industries that worked to keep African Americans out of white neighborhoods.²

Because redlining involves discrimination based on the characteristics of a neighborhood rather than an individual, it requires a different form of evidence to demonstrate if, and how, it happened. The limited number of references to historical redlining often point to the role of federal housing agencies in directing private mortgage credit away from central city neighborhoods starting in the 1940s. Kenneth Jackson was the first to link the color-coded maps of the Home Owners' Loan Corporation (HOLC) to the practice of redlining. Between 1936 and 1940, HOLC staff created maps of 239 cities across the country that assessed risk levels for long-term real estate investments.³ Areas considered "hazardous" to investors were colored red. Jackson also emphasized the role of the Federal Housing Administration (FHA) in subsidizing new construction in predominantly white, suburban developments through its mortgage insurance program.⁴ Hillier's research into HOLC's impact on Philadelphia indicates that HOLC's maps reflected widespread acceptance of race-based neighborhood appraisal standards and use of maps as lending tools but were not distributed widely enough, or kept sufficiently up-to-date to have been used by lenders to decide where to make loans.⁵ FHA, on the other hand, promoted race-based appraisal standards through its widely distributed *Underwriting Manual*. But the lack of small-area data about where FHA insured loans has made it difficult to assess FHA's impact on lending at anything below the county level.⁶

Hillier developed a research methodology for testing for historical redlining that moves beyond the HOLC maps by using geographic information systems (GIS) and exploratory spatial analysis techniques to analyze patterns in mortgages made by private lenders.⁷ Rather than analyzing the impact of maps with red lines, like those created by the HOLC, this methodology focuses on mapping address-level lending data and then searching for red lines—areas underserved or served differently by mortgage lenders.⁸ This paper applies this research methodology to random samples of mortgage data from Philadelphia between 1940 and 1960. Following a brief description of the national and local lending context, the sample data are described and the results of GIS mapping, hot-spot analysis, and surface interpolation are presented and discussed.

Homeownership and Mortgage Lending, 1940–1960

The residential mortgage industry changed dramatically between the late 1920s and mid-1930s. The number of foreclosures and the losses suffered by lending institutions during the Depression sparked unprecedented federal involvement in the private mortgage market.⁹ The Federal Home Loan Bank System (FHLBS) emerged in 1932, Herbert Hoover's timid response to the demands of realtors, builders, planners, and social workers who attended his Conference on Home Ownership in 1930.¹⁰ FHLBS created twelve home loan banks around the country that provided a credit reserve for mortgage lenders. Responding to Franklin Delano Roosevelt's call for greater emergency assistance for homeowners, Congress created HOLC in 1933, a much bolder initiative that made possible the refinancing of one million home mortgages in default between 1933 and 1936. In addition to helping lenders and homeowners, HOLC established new standards for property appraisals and facilitated the replacement of balloon mortgages with long-term fully amortized mortgages as the industry standard.¹¹ As a somewhat separate effort, HOLC created the infamous color-coded residential security maps.¹²

The Federal Housing Administration (FHA) ventured a step further than HOLC, extending insurance to lenders on home mortgages that met FHA's strict standards, virtually eliminating their risk in lending. The Serviceman's Readjustment Act of 1944 similarly committed the Veterans Administration to insuring loans for veterans who, as they returned home from World War II, contributed significantly to the demand for new housing. Between 1945 and 1960, FHA and VA together insured nearly 25 percent of mortgages on new residential units.¹³ The Federal National Mortgage Association (Fannie Mae) and Government National Mortgage Association (Ginnie Mae) emerged in 1938, establishing a secondary mortgage market that allowed lenders to originate mortgages they did not intend to keep and investors to purchase mortgages they did not originate.¹⁴ FHA-insured mortgages were guaranteed to sell in this new secondary market.

While strong appraisal and real estate professional associations established standards and codes of ethics that impacted mortgage lending everywhere, the industry involved many types of lending institutions operating under different expectations and incentives. Savings and loan associations were the most common type of lending institution in the 1940s and 1950s. Unlike other types of lending institutions, they invested exclusively in mortgages. This lack of

diversification made them more vulnerable during the Depression and thousands of associations went bankrupt as a result. The FHLBS began chartering federal savings and loan associations in 1934, helping to strengthen the industry. These federal S&Ls were all members of the FHLBS and the Federal Savings and Loan Insurance Corporation (FSLIC) insured their account. In the sixteen years after the establishment of FSLIC, savings and loan assets increased by 200 percent.¹⁵ Commercial banks were limited in how much of their holdings they could invest in mortgages and were cautious after the Depression, but the lure of FHA insurance led them to originate a substantial proportion of new loans during this era. Mutual savings banks traditionally offered more conservative, short-term mortgages and were largely unable to compete with the low-interest, long-term loans offered as a result of FHA insurance.¹⁶

Life insurance companies invested in mortgages in the 1930s and 1940s when state regulations required that they diversify their investments. They invested a much smaller proportion of their holdings in mortgages after the Depression but continued to originate and purchase mortgages throughout the 1940s and 1950s.¹⁷ Mortgage companies, a class of lending institutions unknown before the Depression, became significant players in mortgage lending because of FHA insurance and the development of a secondary mortgage market. Mortgage companies originated mortgages, mostly FHA and Veterans Administration loans, and then quickly resold them to life insurance companies, commercial banks, and other investors.¹⁸

Different types of lenders were more likely to receive FHA insurance on their mortgages, a variable that impacted prospective homeowners because FHA mortgages generally required lower down payments and carried lower interest rates, generally 4.25 to 4.5 percent. Nationwide, commercial banks, insurance companies, and mortgage companies originated the vast majority of new FHA mortgages, accounting for 77 percent of FHA originations in 1950. Savings and loan associations, on the other hand, originated only 11 percent despite their wide reach in the lending industry.¹⁹

The Depression-era federal initiatives aimed at strengthening the mortgage finance and construction industries and increasing homeownership succeeded in many respects. Default and foreclosure rates decreased as the typical term for repaying mortgages extended to 20–30 years, interest rates dropped, and first mortgages covered a higher proportion of the purchase price for housing.²⁰ Following the wartime housing shortage, new construction increased dramatically. National homeownership rates increased steadily, from 43.6 percent in 1940 to 55 percent in 1950 and 61.9 percent in 1960.

As Jackson wrote, "The middle-class suburban family with the new house and the long-term, fixed-rate, FHA-insured mortgage became a symbol, and perhaps a stereotype, of the American way of life."²¹

At the same time, these federal housing initiatives contributed to patterns of disparity across racial groups and between cities and suburbs, supporting the development of "second ghettos" and hyper segregation.²² They largely ignored the need for new housing among black families and urban households, subsidizing instead construction of developments like Levittown for white, suburban families. Jackson documented FHA's strong suburban bias using data for five metropolitan areas for the period 1934–1960. St. Louis presented a fairly typical example, where the city received one-fifth of the number of FHA mortgages as the surrounding county.²³ During this same time period, less than 2 percent of FHA loans were made to blacks.²⁴ This pattern emerged because of deliberate design, not unintended consequences. FHA's *Underwriting Manual* directed lenders seeking FHA insurance for their mortgages toward new residential areas that were racially homogenous and covered by restrictive covenants, generally neighborhoods in the growing suburbs, away from the central cities.²⁵ As a result, these policies made redlining a pervasive and lucrative practice, as lenders followed the federal money trail to the suburbs.

Homeownership and Mortgage Lending in Philadelphia, 1940–1960

The demand for new housing was as great in Philadelphia as anywhere else by the mid-1940s, largely because of returning veterans. The Philadelphia Veterans Center reported that 4,800 families sought help with housing in 1947 and only 525 found homes.²⁶ In 1948, the Philadelphia Housing Association estimated that the city needed to build 27,000 new homes a year to keep up with the new families and to house existing households confined to substandard and overcrowded housing.²⁷ The Great Migration of African Americans from the South to northern cities changed the racial make-up of Philadelphia substantially during these decades and created further demand for new housing. The number and percent of African Americans living in Philadelphia doubled between 1940 and 1960, increasing from just over 250,000 (13 percent of the population) to nearly 530,000 (26 percent of the population). Restricted housing opportunities translated into intense racial segregation, as newly arrived African Americans moved into the older neighborhoods in North Philadelphia, West Philadelphia, and South Philadelphia, and white and a limited number of

middle-class black residents moved to newer residential areas in the outlying neighborhoods and suburbs.²⁸

Philadelphia's homeownership rate rose more dramatically than the national rate, increasing from 35 percent to 60 percent in the decade following World War II. More than 100,000 new residential units were constructed between 1940 and 1960—a 20 percent increase in the city's housing stock. These residences were built mostly in the Northeast section of the city but also in the neighborhoods of West Oak Lane and Cedarbrook, at the northern edge of the city, and Overbrook and Wynnefield, at the western edge. Unlike the older housing stock composed of two and three-story row houses, many of these new units were semidetached.²⁹

FHA and VA were both active in the Philadelphia metropolitan area, although they accounted for only about one-third of the outstanding mortgages in 1950. FHA's preference for new housing was stronger than the VA's; only one-third of FHA mortgages were made on housing built before 1930 while two-thirds of VA loans were on houses from that era. The metropolitan area statistics on residential financing included in the 1950 census do not allow for a direct comparison of the city with its Pennsylvania and New Jersey suburbs but the census data do include statistics on race. In 1950, FHA had insurance on 41,041 mortgages to whites and just 364 to non-whites (less than 1 percent) while the VA had insurance on 41,527 mortgages to whites and just 2,275 to non-whites (5 percent).³⁰

The Philadelphia Housing Association drew attention to this racial disparity in its 1953 report, *Philadelphia's Negro Population: Facts on Housing*. Relying on data provided by FHA's race relations officer, PHA reported that only 1,044 of the 140,000 housing units constructed in the Philadelphia metropolitan area between 1946 and 1953 were available to blacks, and only 347 of these were for sale. These, PHA complained, were often located in undesirable neighborhoods, near old and dilapidated housing, rail lines, junkyards, and heavy traffic.³¹ Black veterans were also the targets of real estate agent schemes that took advantage of VA and FHA programs to sell poor quality housing for large profits, contributing to foreclosure for a number of black households.³² While black homeownership rates rose dramatically during this time period—from 10 percent in 1940 to 43 percent in 1960—they still lagged well behind white homeownership rates.³³

The housing challenges and discrimination that African Americans faced in Philadelphia, then, were quite representative of the situation in other large cities in the decades 1940–1960. The broad outlines of the debate about how FHA's involvement in the private real estate market shaped developments in

central city neighborhoods are widely accepted. But detailed case studies documenting lending patterns at anything below the county level have been absent. This study uses address-level mortgage data to conduct a spatial analysis of lending patterns in Philadelphia to demonstrate the impact these broad social, political, and financial changes had on individual neighborhoods.

Description of Mortgage Data

The lack of aggregate mortgage data from the period before passage of the Home Mortgage Disclosure Act (HMDA) of 1975 has made it difficult to conduct empirical investigations of historical redlining.³⁴ In the absence of federally collected mortgage information and small-level data about lending in the decennial census after 1940, local mortgage records offer the best source of data. Three different data sets were created for this study. The first, collected from the *Philadelphia Realty Directory and Service*, includes a random sample of one thousand property transactions for each odd year between 1940 and 1959. The *Realty Directory* was published by Curtis Publishing Company between 1925 and 1959 and recorded information about every property transaction in the city of Philadelphia.³⁵ Just over two-thirds of all property transactions involved a mortgage; the rest involved changes in ownership but not a mortgage. The *Realty Directory* is organized by the month of the transaction and the address of the property involved. A random sample was created using randomly generated numbers to select a page and item from the *Realty Directory*. The address of the property, address of the purchaser (if off-property), sales price, mortgage amount, lender name, and interest rate were recorded.

The second type of sample was collected using archived mortgage records. There are two indexes of mortgages at the City of Philadelphia Archives: one organized by the last name of the property owner (mortgagor) and one organized by the name of the lender (mortgagee). Using the index organized by lender name, random samples of mortgages made by five different lenders—Berean Savings and Loan, South Philadelphia Savings and Loan, Cayuga Federal Savings and Loan, Colonial Mortgage Service Company, and Metropolitan Life Insurance Company—were collected. The index includes the volume and item number for the actual mortgage instrument but no details about the mortgage. A list of all the loans made by each of these lenders was created so that a random sample of three hundred mortgages could be generated for each lender. The mortgage instrument was then

located for the three hundred random mortgages to obtain information about the location of the property, amount of the mortgage, and the interest rate.

For the final data set, the address and lender's name for a random sample of sheriff sales was collected using the monthly listing of sheriff sales contained in the *Realty Directory*. Because sheriff sales were not included in all volumes of the *Realty Directory*, the data set includes 250 sheriff sales from each of five volumes that did contain such information (1944, 1947, 1950, 1953, and 1957). Of the 1,250 entries, complete data were available for 786 sheriff sales.

All three random samples were mapped using GIS software and a 2000 street centerline file.³⁶ The overall match (or map) rate for the mortgage data from the *Realty Directory* was 94 percent. The match rate was 99 percent for the Berean Savings and Loan mortgages, 96 percent for the South Philadelphia Savings and Loan mortgages, 94 percent for Cayuga Federal Savings and Loan, 95 percent for the Colonial Mortgage Service Company, and 98 percent for Metropolitan Life Insurance Company. The match rate for the sheriff sales was 96 percent. Not all addresses could be mapped, in part because some street names and the ranges of house numbers have changed over the last forty to sixty years. The results presented in this paper are based only on the data that could be mapped.

Distribution of Mortgages

Of the 8,008 property transactions from the *Realty Directory* that could be mapped, 5,635 (73 percent) involved a mortgage on a residential property.³⁷ A pin map showing all of these mortgages does not reveal any obvious patterns. Visual analysis indicates that the mortgages were spread fairly evenly across the residential parts of the city. The Far Northeast had very few mortgages relative to the central part of the city, but that area was just starting to be developed during this period. Most of the other areas with few or no mortgages represent non-residential areas such as parks and industrial corridors. The mortgages were also mapped against the percentage of African Americans by census tract, according to the 1950 U. S. Census, and the percentage of housing built between 1940 and 1960 by census tract, according to the 1960 U. S. Census. Visual analysis shows that mortgages were made in the predominantly black neighborhoods of Lower North, West, and South Philadelphia. Mortgages were also made in areas with very little new housing in the central part of the city, as well as in areas with a substantial amount of new housing in the Northeast and Olney/Oak Lane (Figure 1).

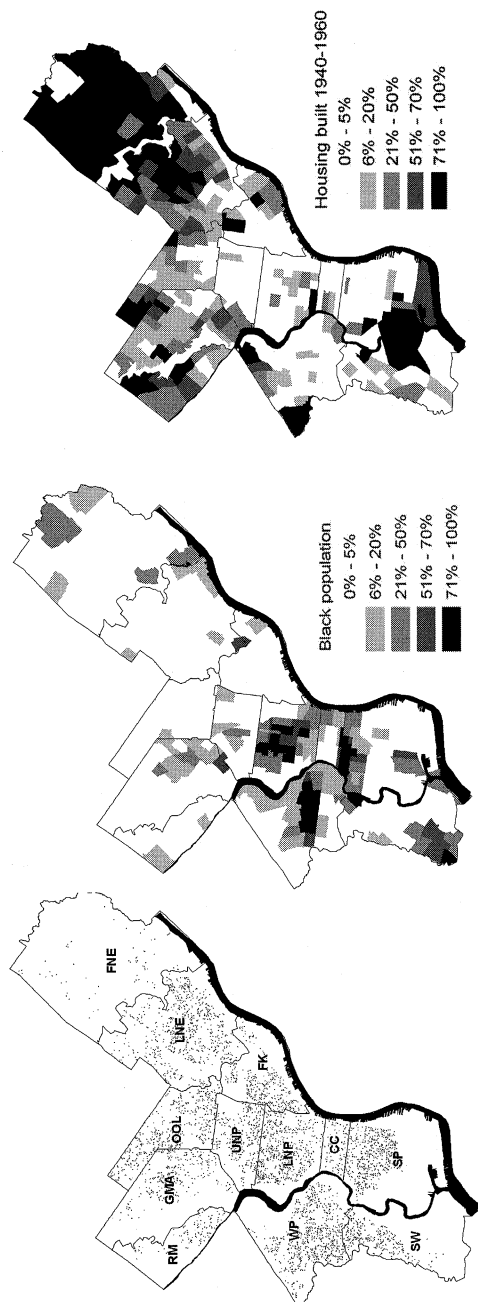


FIGURE 1: Random Sample of Mortgages, 1940-1960 and Area Characteristics

The map on the left, displaying a random sample of 5,635 mortgages, shows that mortgages were made in all parts of the city with clustering in the central areas. The map in the middle with census data shows that concentrations of blacks in 1950 were primarily in the central part of the city. The map on the right with census tract data from 1960 shows that most new housing was constructed outside the central core, primarily in the Far Northeast. RM = Roxborough/Manayunk; GMA = Germantown/Mount Airy; OOL = Olney/Oak Lane; LNE = Lower Northeast; UNP = Upper North Philadelphia; LNP = Lower North Philadelphia; WP = West Philadelphia; CC = Center City; FK = Frankford/Kensington; SW = Southwest; SP = South Philadelphia.

Summary statistics indicate that the pattern of mortgages is better explained by the distribution of owner-occupied housing than the presence of blacks or new housing. The number of mortgages in a census tract is highly correlated ($r = 0.902$) with the number of owner-occupied houses, according to the 1950 U. S. Census. But the ratio of mortgages to occupied housing units is not very highly correlated with the percent of black population, according to the 1950 U. S. Census ($r = -0.035$) or the percent of housing built after 1940, according to the 1960 U. S. Census ($r = 0.034$).

Hot spot analysis was conducted using the 5,635 mortgages in order to determine if there were significantly more or fewer mortgages than expected in particular areas.³⁸ Areas with significant "clustering" would be those that received more mortgages than expected while areas with significant "sparseness" would include those that were under-served and possibly redlined. Results varied significantly based on the null hypothesis, the expected distribution of mortgages.³⁹ Comparing the distribution of mortgages to the number of occupied housing units (including rental housing) indicates that much of the central part of the city—including parts of North Philadelphia, South Philadelphia, and the eastern part of West Philadelphia—received significantly fewer mortgages than expected. The outlying areas in the city, including much of the Northeast, most northern parts of North Philadelphia, and the western-most parts of West Philadelphia, on the other hand, received significantly more mortgages than expected. Comparing the distribution of mortgages to all owner-occupied properties, on the other hand, suggests that areas in the central part of the city, including much of West Philadelphia, lower North Philadelphia, Center City, and Southwest Philadelphia as well as the Northeast and parts of Northwest Philadelphia had significantly more mortgages than expected. Much of North Philadelphia and South Philadelphia, on the other hand, had significantly fewer mortgages than expected (Figure 2).

Distribution of Interest Rates

The mortgages in the *Realty Directory* sample had interest rates ranging from 3 to 6 percent. The overall average was 5.3 percent but varied by year. Mapping the interest rates of the *Realty Directory* mortgages shows that the

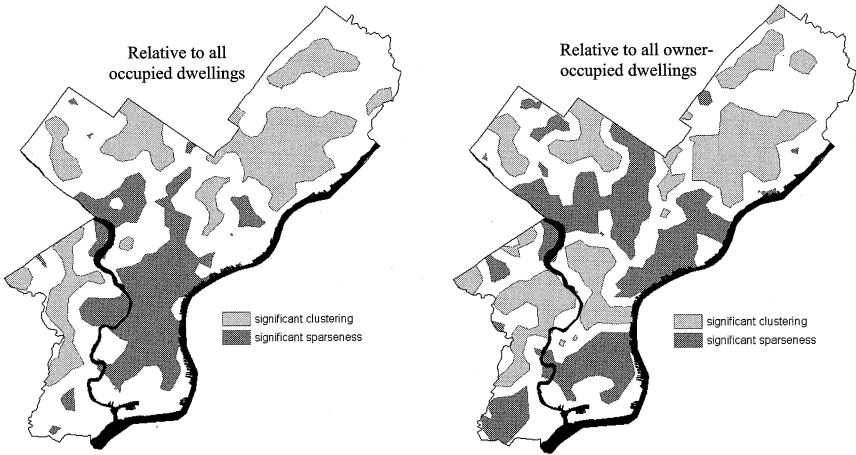


FIGURE 2: Significant Clustering and Sparseness of Mortgages, 1950

These maps show the results of hot spot analysis. At left, the central part of the city is shown to have fewer loans (sparseness) than expected given the total number of occupied properties. The map on the right shows that this is largely explained by the distribution of owner-occupied housing. The central part of the city, as well as the far northeast and northwest, received more mortgages (clustering) than expected given the amount of owner-occupied housing.

central parts of the city had many more mortgages with 6 percent interest than the most northern parts of the city. The 4 percent loans, on the other hand, were most concentrated in the Near Northeast. Using the interest rates for the sample of mortgages, a continuous surface of interest rates was interpolated based on the actual interest rates nearby to give a better idea of the general pattern.⁴⁰ The results show clearly that interest rates tended to be higher in a ring around the central part of the city and lower in the outlying areas (Figure 3). Results from a comparative form of hot spot analysis confirms this, indicating that there was significant clustering of 6 percent mortgages in parts of Lower North Philadelphia, South Philadelphia, and West Philadelphia.⁴¹ These areas with significant amounts of 6 percent loans corresponded to areas with concentrations of blacks, and to a lesser extent, Italians and Jews, as indicated by a map of ethnic composition and real estate activity created by appraiser J.M. Brewer in 1934 and by census data from 1940–1960.⁴² This area also includes much more older housing than the areas with lower interest rates.

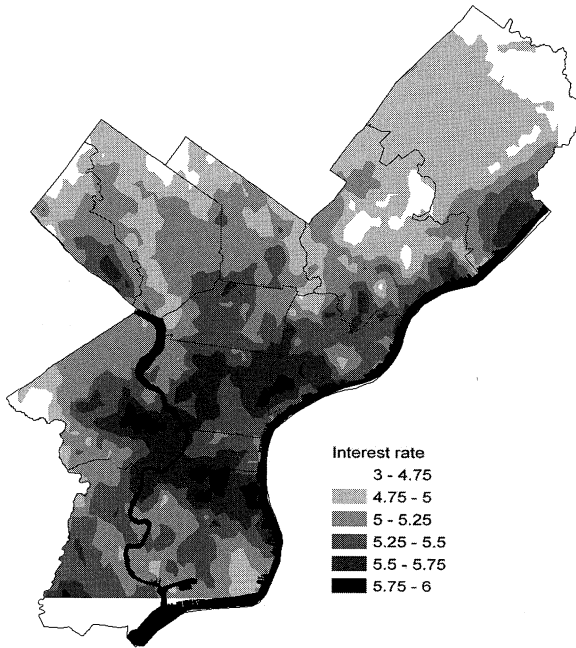


FIGURE 3: Interpolated Interest Rates for Random Sample of Mortgages, 1940–1960

The interest rates for sample mortgages were used to estimate continuous interest rates for all areas. The southern-most part of the city is white because there were no data points for that area. All other white areas indicate the lowest interest rate category.

Distribution of Loans by Lender Type

The lenders for the mortgages in the *Realty Directory* sample were grouped into seven categories: non-federal savings and loan associations, federal savings and loan associations, insurance companies, mortgage companies, banks, savings funds, and individuals. Eighty-six percent of the mortgages that listed the name of the lender could be grouped into one of these lender types. The distribution of mortgage originations for the sample was similar to the distribution for the nation, with savings and loans making the most loans, followed by individuals and mortgage companies. The distribution was fairly consistent across the years, the most notable exception being that both types of savings and loan associations made more loans in the later years.

TABLE 1. Random Sample of Mortgages, 1940-1960, by Lender Type

Lender Type	Loan Originations
non-federal savings and loans	1,491 (27.1%)
federal savings and loans	1,331 (24.2%)
life insurance companies	175 (3.2%)
mortgage companies	681 (12.4%)
commercial banks	163 (3.0%)
savings banks	391 (7.1%)
individuals	758 (13.8%)
others	561 (10.2%)

Maps showing the sample loans by each lender type show distinct geographic patterns in the lending of these different types of institutions. Non-federal savings and loan associations made most of their mortgages in the central part of the city, in the areas with older housing and more African Americans. Federal savings and loans had a similar pattern but made a disproportionate number of loans in the westernmost part of the city. Insurance and mortgage companies tended to avoid the areas that savings and loan associations serviced most heavily, focusing on parts of the Near Northeast and Oak Lane that had much new residential construction during this period. Banks and savings fund societies also tended to avoid the central city in favor of the Near Northeast and Oak Lane. The pattern for individuals was most similar to that of non-federal savings and loans, with most of their lending in the central part of the city (Figure 4).

Descriptive statistics confirm these visual results. Non-federal savings and loans, federal savings and loans, and individuals were much more likely than the other types of lenders to make loans in areas with African Americans, and together they made 76.6 percent of the mortgages in the sample to areas where 20 percent or more of the population was black. Insurance companies, mortgage companies, banks, and savings fund societies, on the other hand, were more likely to make loans in areas with a substantial amount of new housing. They made 54.4 percent of all mortgages to areas with 20 percent or more of the housing built after 1940, even though they made just 25.7 percent of all loans in the sample.

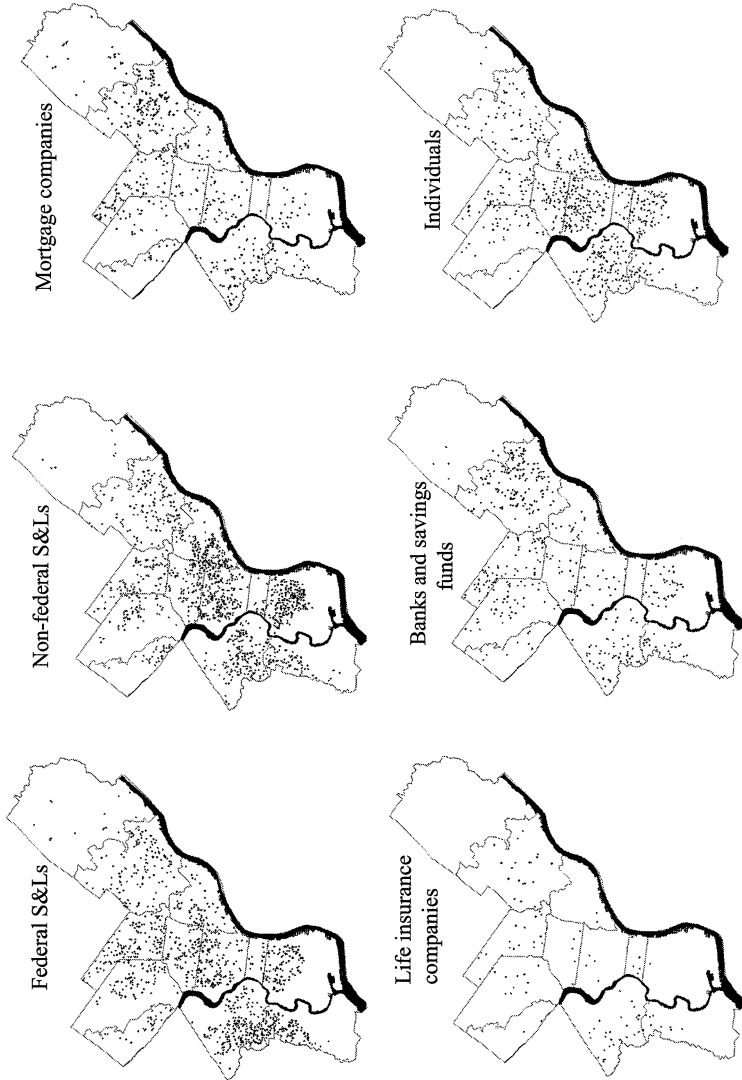


FIGURE 4: Distribution of Random Sample of Mortgages by Lender Type

TABLE 2. Distribution of Random Sample of Mortgages, 1940–1960, by Lender Type and 1950 Census Tract Characteristics

Lender Type	% own loans in black tracts*	% all loans in black tracts	% own loans in new housing tracts**	% all loans in new housing tracts
Savings & loan	23.4%	31.2%	9.1%	13.6%
Federal S&L	21.7%	25.8%	11.1%	15.0%
Insurance co.	10.3%	1.6%	30.3%	5.3%
Mortgage co.	11.6%	7.1%	43.4%	30.0%
Bank	16.0%	2.3%	23.3%	3.8%
Savings fund	7.7%	2.7%	38.9%	15.3%
Individual	28.9%	19.6%	9.4%	7.2%
Other	21.6%	9.7%	19.2%	9.8%

* Black tracts were defined as those where 20 percent or more of the 1950 population was black.

** New housing tracts were defined as those with 20 percent or more of housing built after 1940.

Comparative hot spot analysis confirms the pattern indicated by maps and descriptive statistics.⁴³ Non-federal savings and loans made significantly more loans in Lower North Philadelphia and South Philadelphia. Federal savings and loans made significantly more loans along the western edge of the city. Insurance companies made significantly more loans in the Near Northeast and the western edge of the city. Mortgage companies made significantly more loans in the Near Northeast. Individuals made significantly more loans in Lower North Philadelphia (Figure 5).

Lender-specific Samples

The samples of loans taken for the five lenders—Berean Savings and Loan, Colonial Mortgage Service Company, Metropolitan Life Insurance Company, South Philadelphia Savings and Loan, and Cayuga Federal Savings and Loan—allow for a more careful examination of the geographic distribution of loans by different types of lender. Even more than the mortgage samples for each type of lending institution, these samples show how lenders targeted certain geographic

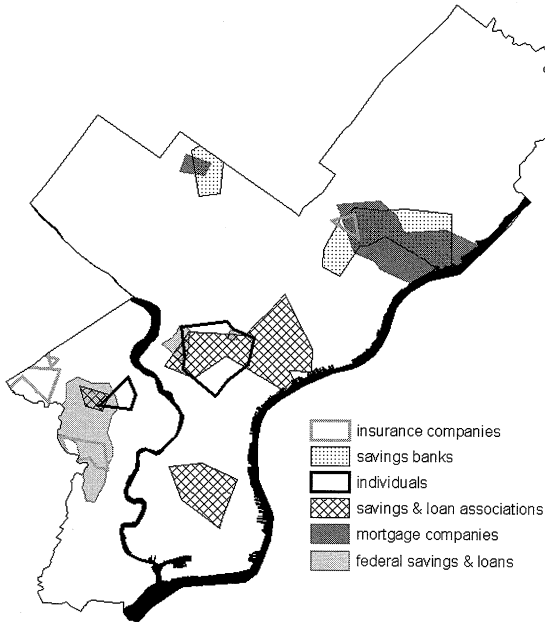


FIGURE 5: Significant Clustering within Random Sample of Mortgages, 1940–1960, Based on Lender Type
Hot spot analysis indicates that different types of lenders made a disproportionate share of their mortgages in different areas. Results indicate statistically significant clustering relating to the random sample of loans by all lender types.

areas. Berean was the leading black-owned lender at the time. A map of the distribution of the random sample of three hundred mortgages shows that Berean made most of its loans in the predominantly black neighborhoods of Germantown, Lower North Philadelphia, West Philadelphia, and Point Breeze in South Philadelphia. South Philadelphia S&L made most of its loans in South Philadelphia, in areas with large numbers of Italians, with a scattering of loans in West Philadelphia and a small cluster of loans in North Philadelphia beside Fairmount Park. Cayuga Federal S&L made most of its loans in the southern and western parts of West Philadelphia, with a scattering of loans in central North Philadelphia and Germantown. Colonial Mortgage Services Company made its loans away from the central part of the city, primarily in areas with a substantial proportion of new housing and relatively few African Americans. Metropolitan Life Insurance Company made most of its loans in the western part of West Philadelphia, with a scattering of loans in the northern-most part of North Philadelphia and the Lower Northeast (Figure 6).

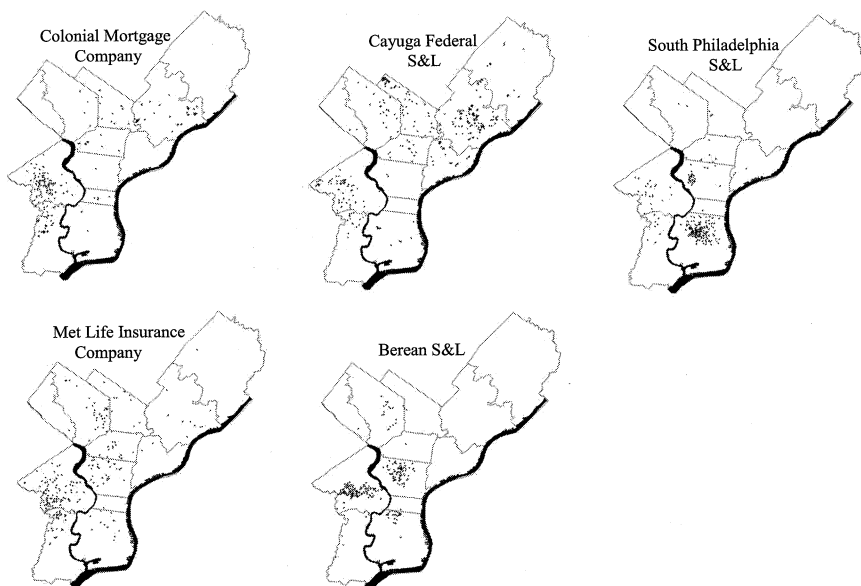


FIGURE 6: Random Sample of Mortgages by Individual Lenders

Random samples of mortgages made by individual loans also show geographic clustering. Black-owned Berean Savings and Loan made nearly all of its loans in four (predominantly black) areas: Germantown, Lower North Philadelphia, Point Breeze (South Philadelphia) and West Philadelphia. Similarly, South Philadelphia S&L made nearly all its loans in (Italian) South Philadelphia.

Sheriff Sales

Mapping the random sample of sheriff sales for the same time period shows that the central city neighborhoods experienced the most foreclosures. Comparative hot spot analysis confirms this pattern, identifying significant clustering of sheriff sales in Lower North Philadelphia, West Philadelphia, and the western part of South Philadelphia relative to the distribution of the random sample of mortgages (Figure 7). These were the same areas that paid higher interest rates, were serviced primarily by non-federal savings and loans, and were home to most of the city's black population.

Discussion and Conclusion

The mapping and statistical results based on the address-level mortgage and sheriff sales data reveal distinct lending patterns in Philadelphia between 1940

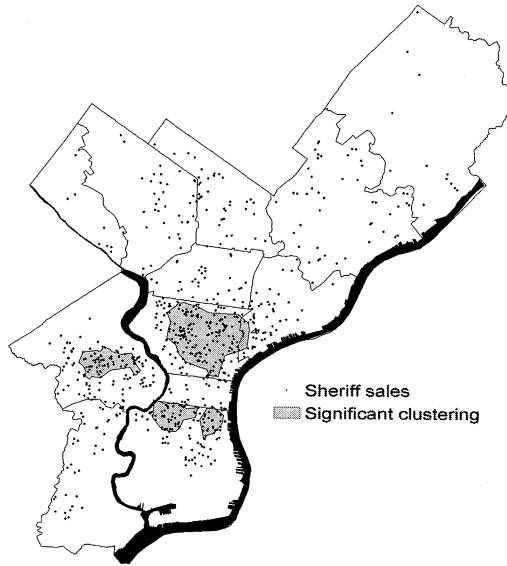


FIGURE 7: Significant Clustering of Sheriff Sales, 1940–1960

and 1960. Households living in the central core, or what Burgess termed the “zone in transition” and “zone of workingmen’s homes”—generally areas with older homes and concentrations of blacks—did have access to mortgage credit, but they had fewer choices in the type of lender and paid higher interest rates for their loans.⁴⁴ The lack of address-level FHA data makes it difficult to prove that none, or few, of these households received FHA-insured mortgages, but the tendency for FHA to support new construction, avoid insuring mortgages for blacks, and the much lower interest rates their loans carried virtually guarantees that few homeowners in these areas were the beneficiary of FHA insurance.

These neighborhoods with higher interest rates, greater numbers of sheriff sales, and presumably fewer FHA-insured mortgages during this era continued to struggle over the next four decades. Middle-class blacks moved to neighborhoods farther from the city’s core, such as Germantown and Oak Lane, as well as to the inner-ring suburbs. The neighborhoods of Strawberry Mansion, North Central, eastern North Philadelphia, Kensington, Mantua, West Philadelphia, and Point Breeze—all areas that showed signs of struggling in the 1940s and 1950s—are now for the most part segregated and the poorest in the city, with poverty rates in 2000 of

between 30 and 60 percent. They became home to most of the city's public housing during the 1950s and 1960s, a pattern just now shifting as the Philadelphia Housing Authority disperses its tenant population through the Section 8 and Hope VI programs.

These neighborhoods have lost a third or more of their population since 1970 and contain a disproportionate amount of the city's 40,000 vacant lots and 30,000 vacant buildings. The Home Owners' Loan Corporation appraisers deemed these areas "hazardous" in the 1930s, before FHA insurance caused further disparities. In 2001, the Mayor's Neighborhood Transformation Initiative deemed them suitable for "reclamation"—essentially demolishing properties and starting over. The actual people living in these neighborhoods and the urban renewal efforts aimed at improving them have changed over the decades, but their standing relative to the rest of the city's neighborhoods and the metropolitan area has not.⁴⁵

Does discrimination account for the distinct lending patterns demonstrated in this study and do those patterns account for the continued problems with segregation, poverty, housing disrepair, and population loss those areas face? Research on more recent redlining often debates whether geographically based differences in mortgage lending can be explained as the rational response of lenders to the increased cost of doing business in a particular area.⁴⁶ The concentration of sheriff sales between 1940 and 1960 in the same neighborhoods that paid higher interest rates may indicate a rational response of lenders, rather than discrimination. Following this logic, if homeowners in certain areas were more likely to default on their mortgages, lenders should have charged a greater fee for their service.

It is difficult, however, to determine which came first, higher interest rates or a greater number of sheriff sales. One could argue that higher interest rates made borrowers in those areas more likely to default. Paying 6 percent interest rather than 4.5 percent would have increased monthly payments on a 20-year, \$8,000 mortgage by nearly \$7 and increased the total interest paid from \$4,147 to \$5,755, a difference of 20 percent of the principal. Was this enough to make the difference in whether a household was able to maintain payments or not? Coupled with other forms of discrimination—such as having to make a larger down payment, paying higher sales prices for inferior quality housing, and having lower wages and less job stability, the answer is probably "yes."

A similar problem in determining cause and effect relates to mortgage access and homeownership rates. The results of the hot spot analysis of the distribution of the sample mortgages indicated that differences in homeownership rates

largely accounted for the smaller number of mortgages made in the central core neighborhoods. But which circumstance came first? Did lenders make fewer loans because there were fewer homeowners, or were there fewer homeowners because lenders made fewer loans? Like research on contemporary redlining, research on historical redlining is unlikely to identify definitive evidence of a causal relationship between discrimination and disinvestment. But the pattern demonstrated here is at the very least suggestive and confirms the conclusions of urban historians that limited access to mortgage credit contributed to the concentrated poverty, racial segregation, and population loss of the central city. Along with race-restrictive covenants, concentrated public housing, failed urban renewal efforts, and federally subsidized suburbanization, redlining was just one factor in the disinvestment those areas experienced, but it was likely an important one in Philadelphia and elsewhere.⁴⁷

While it is unlikely that researchers will find definitive proof that racial discrimination caused the disparities within cities, there are other types of data and studies that could further demonstrate the relationship between lender practices and the well being of central city neighborhoods. Comparative studies that map and analyze mortgage data from other cities would allow for greater generalization than this study focused on Philadelphia. Case studies of individual homeowners, blocks, neighborhoods, and lenders would complement the citywide maps, providing greater detail and context for the lending patterns identified using the citywide data. Relative to other types of housing discrimination, redlining has received little attention from urban historians. New empirically based research promises to reveal more about how mortgage lending practices contributed to the stark disparities that emerged within metropolitan areas during the middle of the twentieth century.

NOTES

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2. See Charles Abrams, *Forbidden Neighbors* (New York: Harper Brothers, 1955); Thomas J. Sugrue, *The Origins of the Urban Crisis* (Princeton, NJ: Princeton University Press, 1996); Rose Helper, *Racial Policies and Practices of Real Estate Brokers* (Minneapolis: University of Minnesota Press, 1969); Stephen Grant

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3. Kenneth T. Jackson, "Race, Ethnicity, and Real Estate Appraisal: The Home Owners Loan Corporation and the Federal Housing Administration," *Journal of Urban History* 6 (August 1980), 419-52.
4. Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press, 1985).
5. Amy Hillier, "Redlining and the Home Owners' Loan Corporation," *Journal of Urban History* 29 (May 2003): 394-420.
6. Jackson, "Race, Ethnicity, and Real Estate Appraisal," 451n54.
7. Amy Hillier, "Spatial Analysis of Redlining: A Methodological Exploration," *Journal of Housing* 14 (2003): 137-67.
8. For an explanation of the HOLC maps, see Amy Hillier, "Who Received Loans? Home Owners' Loan Corporation Lending and Discrimination in Philadelphia in the 1930s," *Journal of Planning History* 2 (2003): 3-24.
9. Guy Stuart, *Discriminating Risk: The U.S. Mortgage Lending Industry in the Twentieth Century* (Ithaca, NY: Cornell University Press, 2003).
10. Jackson, *Crabgrass Frontier*.
11. C. Lowell Harriss, *History and Policies of the Home Owners' Loan Corporation* (New York: National Bureau of Economic Research, Inc., 1951); Hillier, "Who Received Loans?"
12. Amy Hillier, "Residential Security Maps and Neighborhood Appraisals: The Home Owners' Loan Corporation and the Case of Philadelphia," *Social Science History*, forthcoming.
13. U.S. Department of Housing and Urban Development, *Annual HUD Report* (Washington DC: U.S. Government Printing Office, 1965), Table 310, p. 281.
14. Jack Guttentag, "The Federal National Mortgage Association," in *Federal Credit Agencies* (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1963); Stuart, *Discriminating Risk*.
15. Thomas B. Marvell, *The Federal Home Loan Bank Board* (New York: Frederick A. Praeger, 1969); Gary Orfield, "Federal Policy, Local Power, and Metropolitan Segregation," *Political Science Quarterly* 89 (Winter 1974-75): 785.
16. David A. Climan, "The Federal Housing Administration and the Mortgage Market" (M.B.A. thesis, Wharton School, University of Pennsylvania, 1952).
17. Kenneth J. Meier, *The Political Economy of Regulation: The Case of Insurance* (Albany: SUNY Press, 1988); Climan, "Federal Housing Administration and the Mortgage Market."
18. Climan, "Federal Housing Administration and the Mortgage Market."
19. Ibid.
20. Jackson, *Crabgrass Frontier*; Climan, "Federal Housing Administration and the Mortgage Market."
21. Jackson, *Crabgrass Frontier*, 206.
22. Arnold R. Hirsch, "Choosing Segregation: Federal Housing Policy between Shelley and Brown," in *From Tenements to the Taylor Homes: In Search of Urban Housing Policy in Twentieth Century America* ed. John F. Bauman, Roger Biles, and Kristin M. Szylvian (University Park: The Pennsylvania State

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23. Jackson, *Crabgrass Frontier*, 211.
24. Beth J. Lief and Susan Goering, "The Implementation of the Federal Mandate for Fair Housing," in *Divided Neighborhoods: Changing Patterns of Racial Segregation*, ed. Gary A. Tobin (Newbury Park, CA: SAGE Publications, 1987), 227-67.
25. See FHAs *Underwriting Manual*; Lief and Goering, "Implementation of the Federal Mandate for Fair Housing"; Orfield, "Federal Policy, Local Power, and Metropolitan Segregation"; Jackson, *Crabgrass Frontier*.
26. "There is a Shortage!" *Issues: Philadelphia Housing Association* 6 (January-February, 1948): 3.
27. "Metropolitan Housing Needs," *Issues: Philadelphia Housing Association* 6 (November-December 1948): 2.
28. Carolyn Adams et al., *Neighborhoods, Division, and Conflict in a Postindustrial City* (Philadelphia: Temple University Press, 1991).
29. Ibid.
30. U.S. Census Bureau, 1950 *Census of Housing*, vol. 4, Residential Financing, part 2, Large Standard Metropolitan Areas.
31. Philadelphia Housing Association, *Philadelphia's Negro Population: Facts on Housing* (Philadelphia: October, 1953), 39.
32. Clea Benson, "A Block's Rise and Ruin," *Philadelphia Inquirer*, August 11, 2002, A1 and A20.
33. "Housing in the Changing Metropolis," *Issues: Philadelphia Housing Association* (December 1961): 3.
34. The one exception seems to be a special supplement to the 1940 Census of Housing that included data on outstanding mortgages by type of lender.
35. Curtis Publishing also published real estate directories for the Main Line and Delaware County in suburban Philadelphia.
36. A street centerline file is a map layer that uses line segments to represent each part of the street network, corresponding to the center of street. Through the geocoding process, a house number and street name are matched with the appropriate point along one of these line segments.
37. Properties that covered more than one address (such as 124-28 Main Street) or with sales values of more than \$50,000 were considered commercial and excluded from the sample.
38. The hot spot analysis was conducted using Ripley's local K function. See Trevor C. Bailey and Anthony C. Gatrell, *Interactive Spatial Data Analysis* (Essex, England: Longman Scientific and Technical, 1995); Noel C. Cressie, *Statistics for Spatial Data* (New York: John Wiley and Sons, Inc., 1993). The local K Function was run using the program "k_count_loc.m" written for Matlab by Tony E. Smith. A distance of 3000 feet (about 0.6 miles) was used and 999 simulations were conducted. The backcloths—total occupied housing units and total owner-occupied housing units—were based on 1940 tract-level U. S. Census data.
39. Ideally, it would have been possible to compare the distribution of mortgage applications to mortgages made but no data on mortgage applications were available.
40. This was done using predictive Kriging in ESRI's Geostatistical Analyst with ArcView 8.2 and the values for the five nearest neighboring points.

41. See Bailey and Gattrell, *Interactive Spatial Data Analysis*, 120, for details of what they call a "cross K function." The analysis reported here was conducted using a program called "k2_loc.m" written by Tony E. Smith for Matlab.
42. Brewer's map is part of the map collection at the Free Library of Philadelphia. A digital version is available at <http://cml.upenn.edu/redlining>.
43. This cross K function was conducted using the program "k2_loc.m" written by Tony E. Smith for Matlab.
44. Ernest W. Burgess, "The Growth of the City: An Introduction to a Research Project," in Robert E. Park and Ernest W. Burgess, *The City: Suggestions for Investigations of Human Behavior in the Urban Environment* (Chicago: University of Chicago Press, 1925), 47-62.
45. See Amy Hillier and Dennis Culhane, "Closing the Gap: Housing (un)Affordability in Philadelphia," Cartographic Modeling Lab, March 2003; Earni Young and Yvonne Latty, "To Rebuild the city, large swaths must be torn down," *Philadelphia Daily News*, April 19, 2001; "Strawberry Mansion: One 'reclamation' neighborhood," *Daily News*, April 19, 2001. Data on 2000 poverty and vacancy were obtained from the neighborhoodBase <http://cml.upenn.edu/nbase>, which includes data from the U. S. Census and administrative data from Philadelphia city agencies. Data on population loss were obtained from the Neighborhood Change Database, which includes tract-level census data from 1970 to 2000.
46. See, for example, Stuart, *Discriminating Risk* and Elvin K. Wyly, "Mortgaged Metropolis: Evolving Urban Geographies of Residential Lending," *Urban Geography* 23 (2002): 3-30.
47. See Hirsch, "Choosing segregation: Federal housing policy between Shelley and Brown"; Hirsch, *Making the Second Ghetto*; Jackson, *Crabgrass Frontier*; Sugrue, *Origins of the Urban Crisis*; Orfield, "Federal Policy, Local Power, and Metropolitan Segregation."

