

REDLINING IN HOUSING MARKETS: MORTGAGES AND MINORITIES IN THE U.S.

**By James R. Barth
Joseph J. Cordes
Anthony M. J. Yezer**

Government regulation of market transactions in pursuit of social objectives has become more prevalent in the United States in recent years. Financial markets are no exception to this trend. During the late 1960s and the 1970s, for example, several major regulations were enacted in response to a perceived failure of markets to provide “equal” access to credit. A number of these, particularly the Fair Housing, Home Mortgage Disclosure, and Community Reinvestment Acts, are intended to deal with the perceived social problems of “redlining.”

Anti-redlining legislation raises several important issues concerning definition and detection. The main objective of this paper is to clarify several important issues that arise in defining and detecting redlining. The next section identifies and compares three different definitions of redlining corresponding to the views of economists, lawyers, and anti-redlining activists. These definitions share a common view of “redlining” as denial or limitation of mortgage credit by lenders based on property location. The economic, legal, and activists’ views differ, however, in their judgment of the “social desirability” of particular credit limitations.

After discussing the various definitions of redlining, the statistical tests which are implied by each definition are considered. It is shown that whether any specific mortgage data indicate any factual or logical support for arguments in favor of government action depends directly on the initial definition of redlining which is adopted.

Definitions of Redlining

Redlining is traditionally associated with lender behavior that denies or limits mortgage credit to specific neighborhoods.

However, under this broad rubric, at least three distinct definitions or redlining may be identified. These alternative definitions of redlining emphasize different standards of acceptable lender behavior. Concepts of redlining may be further distinguished by the relative importance accorded to the behavior of individual lenders as opposed to groups of lenders.

A. Criteria of Acceptable Lender Behavior

Three alternative standards of lender behavior may be identified based upon statements made by anti-redlining community activists, empirical economic research which has been conducted, and government anti-redlining regulations which have been passed. When referring to these definitions, they will be termed, respectively, as (1) the "social justice" definition, (2) the "economic" definition, and (3) the "legal" definition.

1. Redlining as a "Social Justice" Problem

Appeals to "social justice" are frequently found in anti-redlining statements. While the question as to whether it is "social justice" to deprive individuals and firms of the right to make independent and free decisions concerning their credit policies is not raised, the limiting or denying credit because of property location is represented as socially undesirable in that it supposedly contributes to greater inequality in the distribution of housing services." It is argued that areas which are allegedly redlined have relatively greater concentrations of low-income and/or minority residents. It is further assumed that the demographic composition of buyers is similar to that of sellers in "redlined" areas. These two assumptions imply that redlining by lenders effectively reduces the access of low-income and minority groups to owner-occupied housing. In addition, redlining is alleged to reduce the supply of "decent, affordable" housing by contributing to the deterioration in the housing stock of older neighborhoods located in central cities. These arguments suggest one definition of redlining as the differential treatment by mortgage lenders of neighborhoods which is harmful to low-income and/or minority groups.

2. Redlining as Economically Inefficient Lender Behavior

Much of the empirical economic research in this area either implicitly or explicitly defines redlining as the differential treatment of neighborhoods by mortgage lenders for reasons other than differences in the costs and risks of making loans. Under this view, redlining occurs whenever lenders fail to make loans in certain neighborhoods that would be profitable at an acceptable level of risk. Presumably this behavior is due to lender misinformation and/or prejudice about the risks of lending in specific geographical areas.

Though redlining may imply non-profit maximizing and, hence, economically inefficient behavior by lenders, this type of behavior may be privately rational if lenders strive to maximize a broadly defined utility function that includes profit as just one of several arguments. This concept of redlining is analogous to models of discrimination in product and factory markets which assume that employers maximize a utility function consisting of ethnic and racial characteristics of employees as well as profits.

Consider first how redlining would be defined if there were no possibility of default or delinquency on the part of borrowers. Maximization of lender's utility would require that mortgage funds be allocated among properties so as to equalize utility per mortgage loan. Neighborhood characteristics may affect lender utility in two distinct ways. First, property location would affect utility indirectly by affecting profits. For example, the costs of processing and servicing loans might vary spatially because of scale economies to lending in certain areas.⁽¹⁾ Lenders would, *ceteris paribus*, earn relatively high profits in neighborhoods requiring relatively low processing and service costs. Utility maximization by lenders would favor such neighborhoods. However, in such cases, *utility maximization* would be equivalent to *profit maximization*. No redlining would be present in the economic sense of the term.

Second, property location could affect lender's utility directly. Presumably, such effects would be due to lenders' subjective attitudes toward lending in different neighborhoods. Utility maximization by lenders would cause them to "value" loans made on some properties more highly than loans on others solely because of neighborhood location. In these cases, utility maximization would not be equivalent to profit maximization and redlining of some form would be present.

The analysis is complicated somewhat by introducing uncertainty about the repayment of mortgage loans. If such uncertainty were present, revenue would be a random variable whose value would depend on the terms of the loan (particularly owner's equity), property characteristics, borrower attributes, and location of the property. Neighborhood characteristics also affect lender utility through their impact on expected revenue. It is quite plausible to expect default probabilities and, hence, expected default losses to vary systematically by neighborhood. Other things equal, expected profits would be relatively high in neighborhoods with relatively low expected default losses. Lender behavior that favored such neighborhoods through more lenient credit terms would not be viewed as redlining because maximization of expected utility would be tantamount to maximization of expected profits.

Redlining would occur in two ways when uncertainty is present. First, redlining would occur if property location affected lender's utility directly. Second, redlining would occur if lenders made use of "systematically biased" information in assessing the impact of neighborhood on expected revenue. For example, appraisers might systematically undervalue property in some locations because of class and/or racial composition. In such a situation, the differential treatment of borrowers on the basis of neighborhood would result in the maximization of a biased measure of profits. Unless lender's willingly cooperate, the profit incentive should eliminate any reliance upon inaccurate or biased information. However, it may take time for this type of inefficiency to be eliminated by the dissemination of accurate information.

Thus, redlining, in the economic sense, occurs whenever utility maximization of lenders is not consistent with maximization of an unbiased measure of profits. However, if lenders are assumed to be risk averse, the link between redlining and non-profit maximizing behavior is broken. Risk-averse lenders forego the single goal of the maximization of expected profits because of their concern with "risk." Other things equal, lenders would favor "low risk" relative to "high risk" neighborhoods. In this case, lender behavior would lead to the maximization of expected utility, but not necessarily expected profits. However, if aversion to risk were viewed as a "permissible" preference, differential treatment of loans based on location

would not be considered as redlining, provided that differential treatment corresponded to differences in risk.

3. Redlining as Legally Prohibited or Discouraged Lender Behavior

Lender behavior which is either prohibited or discouraged by government regulation comprises the legal definition of redlining. The legal approach to defining redlining is illustrated by lists of criteria, set forth in the Fair Housing (1968) and Community Reinvestment Acts (1977), that lenders may and may not use in evaluating mortgage applications. Permissible characteristics include:

- (1) the condition or design of the proposed security property, or of nearby properties which clearly affect the value of that property,
- (2) the availability of neighborhood amenities or city services; and
- (3) the need of the bank to hold a balanced real estate portfolio, with a reasonable distribution of loans in various neighborhoods, types of property, and loan amounts.

However, lenders are enjoined from:

- (1) denying or restricting mortgage credit in certain neighborhoods in the lender's service area because of race, color, religion, age, marital status, or national origin of the residents;
- (2) relying on appraisals that assign a lower value to a neighborhood because of a mix of races and national origins;
- (3) equating a racially mixed neighborhood with a deteriorating neighborhood;
- (4) incorporating the idea that deterioration of a neighborhood is inevitable;
- (5) equating age of the property with the value of the property; or
- (6) pre-screening of loan applicants.

Three recent trends in regulatory policy may broaden the legal definition of lending. The first is discouraging lenders from taking into account property characteristics which are correlated with objective determinants of default, but which do not

themselves “cause” default. A second is admonishing lenders to pay special heed to the credit needs of low- and moderate-income neighborhoods. The third is treating as redlining “error of omission” that discourage potential borrowers from applying for loans. For example, under the Community Reinvestment Act lenders are also judged as to whether they make affirmative efforts to encourage applications for credit.

B. Firm vs. Market Redlining

Regardless of how “acceptable” lender behavior is defined, it is important to distinguish between *firm* redlining and *market* redlining. Firm redlining exists when some individual lenders redline certain neighborhoods. Market redlining would occur if all lenders behaved in this manner. In general, redlining at the firm level is a necessary but not a sufficient condition for market redlining.

The distinction between firm and market redlining is important from the standpoint of public policy. Firm redlining affects the terms of mortgages offered in different neighborhoods by some but not all lenders. In contrast, market redlining implies neighborhood variation in mortgage terms offered by all lenders. Thus, if a neighborhood is redlined only by some lenders, borrowers have the alternative of obtaining funds from “nondiscriminatory” lenders. The “costs” of firm redlining are the costs of searching for such alternatives borne by borrowers. By comparison, if a neighborhood is redlined by all lenders, such alternatives are not available. In addition market redlining may depress housing prices in the affected areas, so that the burdens of market redlining may be borne by both sellers and buyers.

C. Comparing Alternative Definitions of Redlining

A proper definition is the first step toward detecting redlining. As seen in Table 1, the term redlining can have as many as nine different meanings, depending on how one defines acceptable behavior as well as the relevant unit of analysis. There are several major differences among these definitions. Under the “social justice” definition, credit denial or limitation, though based on objective economic factors, would nevertheless be

TABLE 1
ALTERNATIVE DEFINITIONS OF REDLINING

Standards of Acceptable Behavior	Unit of Behavioral Analysis		
	Market	Individual Firm/Lender	
	Conventional and Government-Insured	Conventional Only	Conventional Only
"Social Justice"	Differential treatment of neighborhoods by <i>conventional and government-insured</i> lenders as a group which is alleged to be harmful to the interests of "low-income" and/or minority groups.	Same as first column but focus limited to the <i>conventional mortgage</i> market.	Same as first column but focus limited to <i>individual lenders</i> .
"Economic Efficiency"	Differential treatment of neighborhoods by <i>conventional and government-insured</i> lenders as a group which is unjustified on the basis of risk, cost, and return considerations.	Same as first column but focus limited to the <i>conventional mortgage</i> market.	Same as first column but focus limited to <i>individual lenders</i> .
"Legal"	Conventional and government-insured lenders as a group use prohibited or discouraged variables in evaluating applications and/or terminating loan terms. Conventional and government-insured lenders as a group use criteria that are correlated with but do not cause default and which have the effect of denying or limiting credit to protected categories.	Same as first column but focus limited to the <i>conventional mortgage</i> market.	Same as first column but focus limited to <i>individual lenders</i> .
	Conventional and government-insured lenders as group fail to make affirmative efforts to provide mortgage credit in target areas.		

classified by activists as redlining if such actions impose relatively onerous terms on "deserving groups." This would definitely not be so under the economic definition. Whether such actions would be redlining in the legal sense is uncertain. Lenders are permitted to deny or modify credit applications provided certain "objective factors" are used. However, if such behavior had the effect of limiting credit to legally protected categories, such as minorities or low- and moderate-income areas, it would be viewed with suspicion.

The economic and legal concepts differ in their approach to defining redlining. The statutory definition presumes that certain property location attributes are not objective measures of cost and risk whereas the economic definition draws upon theory and empirical evidence to assess whether or not particular attributes are objective risk measures. These different approaches, however, need not produce conflicting results. For example, if a mortgage relied on lending criteria which were legally prohibited and which also were not systematically related to costs and risks of lending, redlining would occur in both the legal and economic sense. Lending decisions based on factors "correlated with" but not "causing" risk might, however, be viewed differently under the economic and legal definitions. That is, such decisions might be consistent with economic efficiency although prohibited under anti-redlining legislation.

The "social justice," "economic," and "legal" views of redlining also differ in their definition of the relevant credit market. Anti-redlining community activists have, for example, argued that government-insured mortgages are inferior substitutes for conventional loans. Indeed, some have argued that substantial FHA lending in a neighborhood is itself a sign of credit deprivation. Presumably, such persons would consider the "relevant" market to be limited to conventional mortgages. The economic definition of redlining, on the other hand, has been applied more broadly, having been used in studies of both government-insured and conventional mortgage activity. However, recent studies have tended to focus primarily on conventional loans. Finally, government anti-redlining regulations are written with reference to the practices of individual lenders rather than the entire market.

Detecting Redlining

The various definitions of redlining summarized in Table 1 imply specific empirical tests. This section describes these tests and assesses their relevance for government regulatory policy directed at mortgage markets.

A. Detecting Redlining When Lender Behavior is “Socially Unjust”

Anti-redlining activists often cite higher rejection rates and/or more stringent mortgage terms in “low-income” neighborhoods as evidence of redlining. Indeed, such evidence was prominent in the testimony supporting current regulations to deal with redlining. There are two serious limitations of such studies. First, the data are typically based on the lending practices of only a subset of lenders. Consequently, such empirical findings pertain to lender but not market redlining. A second problem is the use of “neighborhood” as the unit of analysis. If the existence of redlining is to be considered inequitable or unfair, it must be because individuals and not neighborhoods are harmed.

To date, a careful study of the distributional effects of redlining has not been done. (2) However, even if it were, the results of such a study would have limited implications for *regulatory* policies. In particular, this would be the case if more stringent mortgage terms were justified by cost and risk considerations, but were faced by those least able to pay. In this instance, “redlining” would be the result of interactions between a *well-functioning* mortgage market and an unequal income distribution. It is arguable whether an issue of this sort can and should be dealt with by government regulation of mortgage lenders.

B. Detecting Redlining When Lender Behavior is Economically Inefficient

Economic analyses have attempted to test for the presence of redlining both *directly*, by examining neighborhood differences in mortgage acceptance/rejection rates, mortgage loan terms, and mortgage flows, and *indirectly*, by analyzing the impact of property location on default.

B. 1. Detecting Lender Redlining

For simplicity, only the interaction between the behavior of *two* lenders and the mortgage markets in *two* neighborhoods, neighborhood A and neighborhood B, will be considered here. It is initially assumed that both lenders are equally able to make loans in both neighborhoods. It is further assumed that both neighborhoods are identical in all respects but one, racial composition. For sake of illustration, neighborhood B is assumed to have a higher proportion of racial minorities among its residents than neighborhood A.

Figures 1(a) and 1(b) depict the market in the absence of redlining by either lender. Lenders would treat mortgages written in either neighborhood A or B as perfect substitutes, and would, therefore, be prepared to supply credit along the schedule S. Since mortgage demands in both neighborhoods A and B are, by assumption, identical, both mortgage interest rates and dollar mortgage flows would be equal in both neighborhoods if redlining were absent.

Redlining of neighborhood B by one lender, but not both, is depicted in Figures 2(a) and 2(b). Lender 1 — the nonredlining lender — still views mortgages in both neighborhoods as perfect substitutes. However, lender 2 would require mortgage rates greater than i^* , say i_2 , in order to provide mortgage credit to neighborhood B.(3)

Figures 2(a) and 2(b) are a simple illustration of lender as opposed to market redlining. Several consequences of this form of redlining can be readily illustrated with the aid of these diagrams.(4) First, neither the *total flow* of mortgage credit to neighborhood B is reduced nor is the mortgage interest rate increased by the discriminatory behavior of only lender 2. That is, firm redlining affects the composition but not the level or price of mortgage credit available to neighborhood B. There are, however, some observable consequences of lender 2's behavior. These include no loans granted by lender 2 in neighborhood B and lower application rates and/or higher rejection rates for mortgages offered by lender 2 in neighborhood B.

This simple model of redlining demonstrates that traditional harms associated with "redlining," such as more stringent interest rates and reduced credit flows, need not occur if redlining is practiced by some, but not all lenders. The model also suggests

Figure 1(b)
Neighborhood B

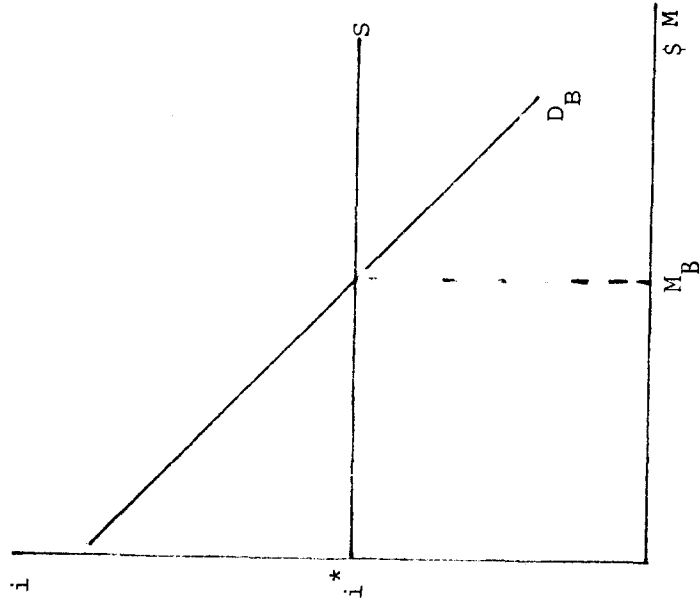


Figure 1(a)
Neighborhood A

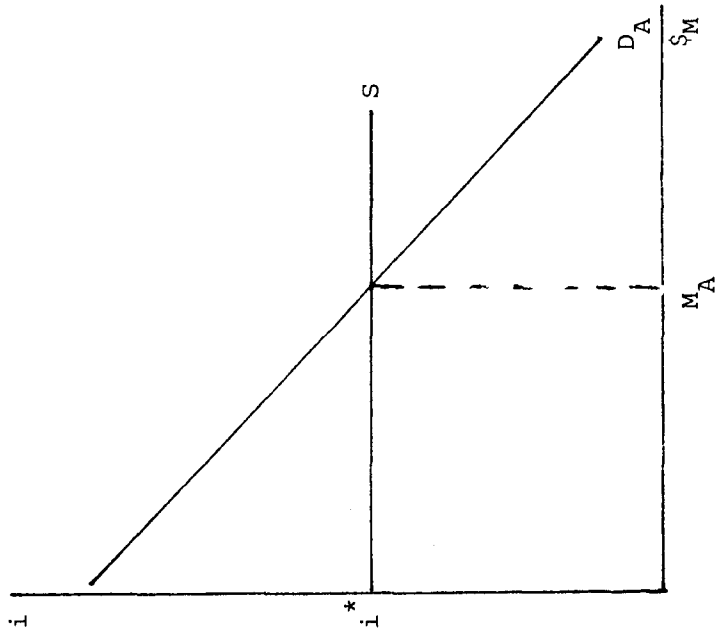


Figure 2(b)
Neighborhood B

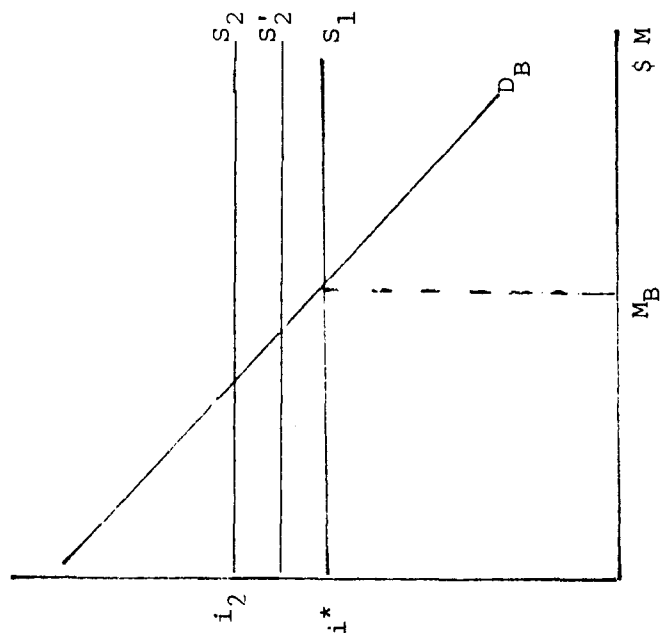
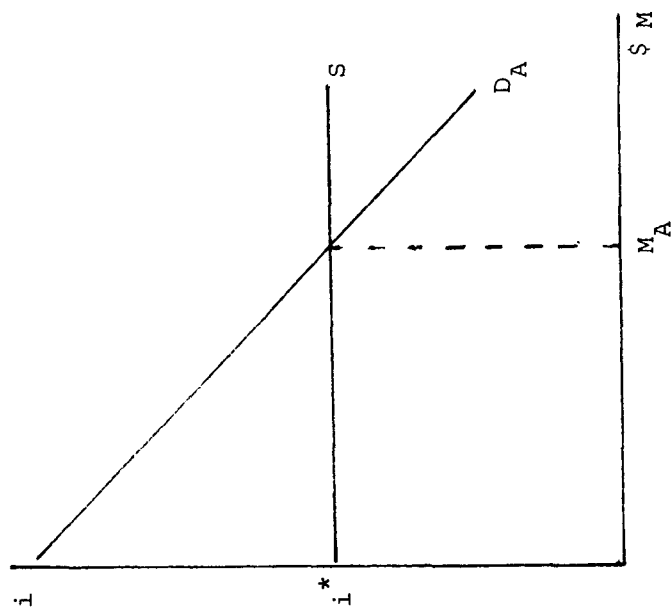


Figure 2(a)
Neighborhood A



that anti-redlining regulations are unlikely to affect the terms and amount of mortgage credit extended in “redlined” areas if redlining is a lender rather than a market phenomenon. This is illustrated in Figure 2(b), where anti-redlining regulations are depicted by a downward shift in the redlining lender’s supply curve from S_2 to S'_2 . In this case, government regulation would not affect the price or amount of mortgage credit, even if the supply curve shifts downward all the way to S_1 .

Detecting redlining by individual firms is still relevant for public policy. The simple redlining model implicitly assumes that discriminatory and nondiscriminatory lenders may be costlessly distinguished by borrowers. In practice, borrowers may have to engage in some amount of search to identify unbiased lenders. The necessity of search behavior has two consequences. First, borrowers must invest resources in order to search for those lenders who do not redline. Second, if borrowers were not completely successful at search, some would transact mortgages at prejudicially more stringent terms. Reducing the incidence of lender redlining would reduce the likelihood to both outcomes. Moreover, the presence of lender redlining is certainly a necessary condition for market redlining.

Disclosure requirements imposed on lenders in California, Massachusetts, and New York have produced data on individual loan terms along with borrower, property, and neighborhood characteristics. These data have been used to analyze allegations of redlining by Benston, Horsky, and Weingartner (1978), Schafer (1978), and Muth (1979). A common feature of all these studies is that they fail to examine the lending behavior of *all* mortgage lenders. Thus, they are tests of lender rather than market redlining. Moreover, all of these studies find that neighborhood and property location variables either have a marginal or no significant impact on mortgage terms. Such findings are consistent with our simple model in which some, but not all lenders redline.

Figure 2(b) suggests that lower application and/or rejection rates may be an observable consequence of lender redlining. Warner and Ingram (1979) and King (1979) have analyzed rejection rates at S/L’s. Both studies fail to find a significant relationship between neighborhood location and rejections after controlling for objective economic factors. A major limitation of both studies is the low incidence of rejections — roughly a

meager 6% of all applicants. Such a low rejection rate is unlikely to reveal sharp differentials in the treatment of borrowers based on neighborhood location. More importantly, such a low rejection rate is to be expected if either applicants are able to identify and avoid lenders who redline or lenders pre-screen applicants. In either case, rejection rates in the redlined area would not be discernibly higher, even though some lenders engaged in redlining.

Figure 2(b) also suggests lender redlining may be manifested in reduced mortgage flows between some lenders and redlined areas. Studies of the spatial distribution of mortgages contributed significantly to testimony in support of current regulations on redlining. Indeed, the Home Mortgage Disclosure Act (1975) requires that financial institutions make available data on the locations, by census tract, of mortgages made and held in their portfolios. There is, however, a general problem with existing analyses of mortgage flows. As noted by King (1979), in an excellent survey, both supply and demand determine the quantity of mortgage credit extended in a neighborhood. Single equation models of mortgage flows therefore describe a reduced form relationship between mortgage activity and neighborhood characteristics, rather than the supply behavior of lenders. If redlining is associated with differential supply behavior across neighborhoods, then the existing mortgage flow studies have little, if any, ability to identify markets in which redlining has occurred.

Detecting lender redlining is further complicated by lender specialization and risk aversion. That is, even if one had sufficient data to estimate lender supply curves such as S_1 and S_2 in Figure 2(b), such estimates would have to be interpreted with considerable caution. For example, with nonconstant returns to scale, mortgage terms depend on the number of mortgages written in a neighborhood. If mortgage demand is greater in area A than B, then some lenders would specialize by lending in area A. Alternately, if each lender makes the same ratio of mortgages in areas A and B and, given returns to scale, there will either be unexploited returns to scale in lending to area B (lenders on the falling portion of their average cost curve) or lenders in area A will be operating on the rising portion of their average cost curve. This type of situation makes it difficult to identify unwarranted *lender* price discrimination because firms

specializing in area A will have more stringent terms for mortgages in area B than in area A, while their terms for area B will be stricter than those of other lenders who are lending in area B.

Risk-aversion also raises several difficulties with respect to economic definitions of redlining. If lenders are risk-averse, the detection of lender redlining requires that differential treatment of neighborhoods due to risk-aversion be distinguished from differential treatment due to prejudice. Since both risk-aversion and prejudice imply that lenders would not simply maximize expected profits, such distinctions may be difficult to make, unless one is able to measure "risk" across neighborhoods. Furthermore, one would need information about a lender's preference toward risk since different risk preference may explain why some lenders are willing to make loans in some areas, while others are not.⁽⁵⁾

Hence, direct tests of whether individual lenders redline are difficult to implement. Analyzing the impact of neighborhood characteristics on default experience of lenders, does not provide a direct test of whether redlining occurs. However, determining which neighborhood characteristics, if any, affect default, is essential for both detection and regulation of lender redlining. A common defense by lenders against allegations of redlining is that lending in certain neighborhoods is riskier than lending in other areas. Government regulations prohibit lenders from using certain neighborhood characteristics. Empirical studies of the spatial determinants of default should therefore provide evidence on both the validity of lenders' claims and the impact of various government regulations.

Single equation models of default experience on FHA-insured mortgages estimated by von Furstenberg (1969), and Jackson, Kasserman and Thompson (1979) have shown that default probability increases with the loan-to-value ratio and the term of a mortgage, in addition to being affected by borrower characteristics, particularly income, and by property attributes. A study done by von Furstenberg and Green (1974) of mortgage delinquencies (payment 40+ days in arrears) in the portfolio of a Pittsburgh savings and loan association indicates that loan terms and borrower income affect delinquency in a manner similar to default. Neighborhood racial composition, however, is significant only when age of the unit is omitted from the regression. Von Furstenberg and Green conclude that borrower

and property characteristics dominate neighborhood location as determinants of delinquency on home mortgages.

Recent studies by Schafer (1978) and Barth, Cordes, and Yezer (1980a, B) examine the relationship between default and property location in great detail. Descriptive tabulations of Schafer's data from regulated lenders located in Buffalo, Rochester, New York, and Nassau-Suffolk, indicate substantial variation in foreclosure and delinquency rates across neighborhoods and lenders. However, differences in these rates were not systematically related to neighborhood income. More specifically, economic burden and equity variables often affected delinquency and default in ways anticipated by economic theory. However, neighborhood characteristics failed to exhibit a consistent and significant relationship to the probability of delinquency and serious delinquency.

Barth, Cordes and Yezer (1980a) (BCY) estimate both single and multi-equation models of default using data obtained from the 1975 Annual FHA-Master Statistical File (FHA-MSF). This data set contains information on FHA mortgage insurance written under various sections of the National Housing Act. This analysis is confined to transactions involving existing units under Section 203(b) because this particular program most resembles conventional mortgage insurance activity in cities.

The results presented by BCY indicate that many, but not all, property and locational characteristics have a significant impact on foreclosure. From the standpoint of regulatory policy, these characteristics can be grouped into two categories: (1) those prohibited or discouraged by regulations, and (2) those permitted by regulations. Currently, lenders are proscribed from limiting mortgage credit due to age of the property and racial composition of the neighborhood. The BCY results indicate that neither prohibited attribute has a significant impact on default once other factors are taken into account. By contrast, the Fair Housing Act allows lenders to take into account both the structural condition of the property itself and the structural condition of nearby properties. BCY's results indicate these characteristics do significantly affect default rates.

B. 2. Detecting Market Redlining

Figures 3(a) and 3(b) depict the outcome when two lenders

Figure 3(b)
Neighborhood B

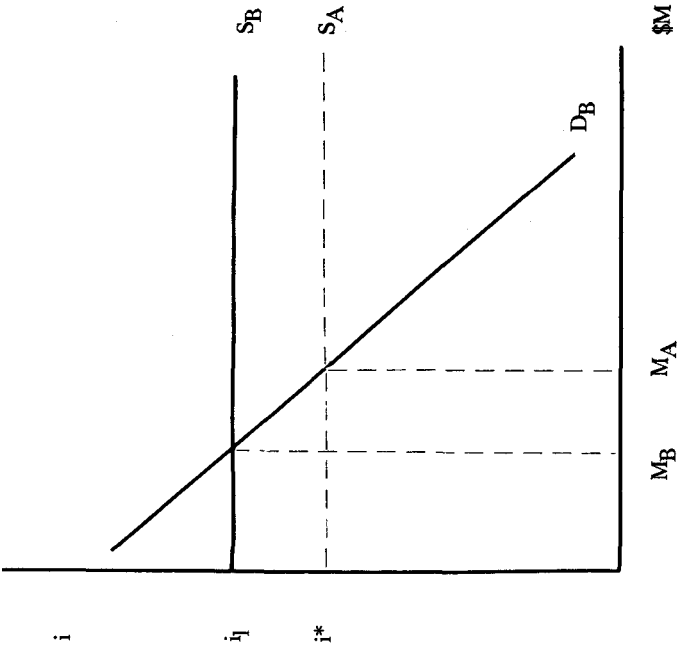
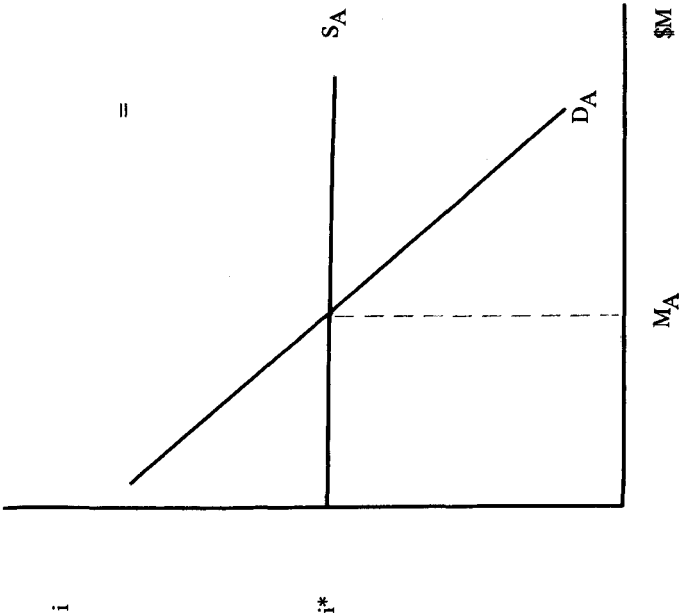


Figure 3(a)
Neighborhood A



view mortgages in neighborhood B as inferior substitutes to mortgages in neighborhood A. In this case, both lenders require a mortgage interest rate in B which is higher than that in A. The initial outcome of market redlining is the one "traditionally" associated with redlining. That is, the interest rate on mortgages in neighborhood B rises to i_1 , while the flow of mortgage credit falls to M_B .

However, these outcomes may only be first-round effects. Assuming that houses in both neighborhoods may be viewed as consols, which yield a fixed flow of housing services over time, the asset values of housing in neighborhoods A and B would be determined by equations (1) and (2).

$$(1) V_A = \frac{P_A h_A}{r_A} = \frac{N_A}{r_A}$$

$$(2) V_B = \frac{P_B h_B}{r_B} = \frac{N_B}{r_B}$$

where p_j is the rental price per unit of housing services in neighborhood j , h_j is the flow of housing services provided by a house in neighborhood j , and f_j is the cost of financing the purchase of housing in neighborhood j . N_j is the rental value per period of a house in neighborhood j .

Given that units in A and B are identical, $P_A = P_B$ and $h_A = h_B$. This implies that $N_A = N_B$, which in turn implies that the housing asset values V_A and V_B are uniquely determined by costs of financing housing purchases in each neighborhood. The cost of financing housing purchases, r_j , is a function of the mortgage interest rate i , the opportunity cost of equity, r_o , and the equity (loan)-to-value ratio.

If the increase in the mortgage interest rate due to market redlining causes r_B to rise, but does not in and of itself affect the net flow of housing services, N_B , the asset value of houses in neighborhood B will decline. (For a more formal analysis of the impact of lender prejudice on r_B , an Appendix is available on request from the authors). This implies that those who purchased houses in B prior to redlining will suffer capital losses. More significantly, such households will experience an increase

in their loan-to-value ratios, since V falls relative to the outstanding mortgage loan. Based on the equity theory of default, this latter event may trigger increased defaults in neighborhood B.

If defaults in neighborhood B increase in the manner described redlining would appear to be a self-fulfilling prophecy. That is lenders could point to greater defaults in B as evidence of greater risk even though such activity was caused by lender actions. For this reason, *time-series* observations on default rates in different neighborhoods may be unreliable indicators of whether lenders as a group are justified in treating some neighborhoods differently than others.

The increase in defaults which confirms lender expectations, should, however, be a temporary phenomenon. That is, there is no reason to expect default rates in B to permanently exceed those in the non-redlined area, A. Indeed, new migrants into B would have *lower* loan-to-value ratios than those persons leaving the area if the higher interest rates in B lead to greater down-payments. Thus, in the new "equilibrium with redlining" mortgages actually written in B would have lower loan-to-value ratios and the same or higher interest rates than those written in A.

In sum, market redlining would have several impacts. First, the burdens of such universal discrimination would be borne by both sellers and buyers in the redlined area. The presence of capital losses suffered by sellers in redlined areas might therefore be viewed as a sign of market redlining. However, without additional information, one cannot determine whether such capital losses are due to racial preferences or to directly economic factors.(6)

The adjustment of loan-to-value ratios by home purchasers in response to lender behavior may provide a basis for detecting market redlining. Specifically, such adjustments imply that direct tests of redlining based on comparisons across neighborhoods of loan terms or mortgage flows are relevant, provided that two conditions are fulfilled. All mortgage lenders must be included in the sample used for such comparisons and one must control for the impact of objective economic factors, such as income, wealth, etc., in both loan terms and mortgage flows.

Summary and Conclusions

Government policies to discourage redlining have dealt with actions of lenders that deny or limit credit to specific neighborhoods. This broad conception of redlining, however, includes at least three distinct definitions of redlining. These alternative definitions differ in two important respects: the standard established for acceptable lender behavior, and the relative emphasis placed on the behavior of individual lenders rather than groups of lenders.

Three alternative standards of lender behavior are implied in statements made by anti-redlining activists, in empirical economic research on redlining, and in government anti-redlining regulations. These are termed, respectively, the "social justice," "economic," and "legal" definitions. A major difference among these definitions is the treatment of objective economic factors in evaluating lender behavior. Under the "social justice" definition, credit denial or limitation, though based on objective economic factors would nevertheless be classified as redlining provided such actions imposed relatively onerous terms on deserving groups. This would clearly not be so under the economic definition. The role of objective economic factors in legal definitions of redlining is more ambiguous. Lenders are permitted to deny or modify credit applications provided certain "objective factors" are used. However, if such actions had the effect of limiting credit to legally protected categories, or low- and moderate-income areas, they would be discouraged.

The various conceptions of redlining also define the relevant credit market differently. Anti-redlining community activists have tended to view government-insured mortgages as inferior substitutes for conventional loans and therefore consider the relevant market to be limited to conventional mortgages. The economic literature has dealt with both conventional and government-insured loans, though recent studies have focused primarily on conventional mortgage loans. Finally, government regulations are written with reference to the practices of individual lenders rather than groups of lenders.

Regardless of how redlining is defined, the burden of proof rests with those who allege that redlining is an undesirable and a widespread activity requiring government intervention into private transactions. The distinction between market and lender redlining is particularly relevant since the social harms alleged

by anti-redlining activists occur only in the former instance. Existing economic analyses of neighborhood variation in loan terms are not capable of determining whether specific subsets of lenders engage in redlining. However, such studies are capable of determining whether redlining exists in the market as a whole, and to date, provide no evidence of such market redlining. There is, therefore, no evidence of any such market failure as anti-redlining regulations purport to remedy.

FOOTNOTES

- (1) For a more detailed discussion of such factors, see Clapp (1979).
- (2) It should be noted that socio-economic variables have been included in econometric analyses of rejection rates on mortgage applications. See Schafer (1978) and King (1979). The findings of such studies could, therefore, be used to examine the distributional impacts of lender behavior.
- (3) It is interesting to note that "Many lenders will not make a mortgage loan until after FNMA has approved the loan for its purchase" [Federal National Mortgage Association (1979, p. 31)]. If a loan made by a lender is therefore deemed to carry excess or onerous terms due to "redlining," it may actually be due to FNMA policies.
- (4) Our analysis assumes that borrowers are aware of which lender charges the lower mortgage interest rate.
- (5) Needless to say, usury ceilings and foreclosure laws further complicate the detection of redlining.
- (6) That is, one must be able to determine whether to decline in V_B is due to an increase in i_B , holding N_B constant, or to a decline in N_B , holding i_B constant.

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LABOR VERSUS CAPITAL IN THE U.S. PUBLIC SECTOR

By William Paul Orzechowski

An important characteristic common to many countries has been the growing size and rising power of the public sector. Over the past century many nations have allocated an increasing amount of resources and decision making power to the public sector. A larger public sector is seen by many as a viable means for achieving important social and economic goals. While some may quarrel with the intent of these goals, there is increasing skepticism about the efficacy of the government in attaining these objectives. In particular, the seemingly world-wide experiment with big government has led to a greater awareness of bureaucracy or control of resources by public agency. The traditional approach to bureaucracy has been to assume that bureaus would mechanically implement their assigned tasks of social policy; however, recent theoretical developments in economics have explicitly analyzed the bureau within the context of behavior models.

In general, the economic approach to bureaucracy assumes that bureaucrats attempt to maximize personal goals or utility within an environment that is inextricably dominated by both political and economic forces. The economic approach, then, does not view the bureaucrat as an automaton but as a conscious benefit-cost calculator. From this perspective, economists have argued that public agencies tend to operate in a highly political manner and are apt to choose policies designed primarily to maintain the growth and survival of the public agency. Consequently, this approach has repeatedly stressed the range and nature of bureaucratic choice. It suggests that public decision makers will use resources in a manner that is often constrained by political pressures and that a successful effort, in this regard, will simultaneously reward the bureaucrat with a pay-off in the form of considerable managerial discretion. The thrust of the analysis indicates that bureaus will operate in a notoriously inefficient manner relative to the private sector.⁽¹⁾ That is, they will tend to use resources in a "wasteful" manner or pursue strategies that result in an over-expansion of their activities.

One extremely important aspect of this economic approach