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Enforcing Anti-Redlining Policy Under the Community Reinvestment Act

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On October 12, 1977, President Carter signed into law the Community Reinvestment Act (CRA) as Title VIII of the Housing and Community Development Act of 1977. The act was designed to encourage financial institutions "to help meet the credit needs of the local communities in which they are chartered." To meet that intent, the CRA directs each federal financial supervisory agency to take into account an institution's CRA record when ruling on branch, merger, or other applications.

The affirmative orientation of the CRA represents a significant departure from earlier bank regulation, which had been designed primarily to ensure the safety and soundness of the banking system. Regulators examine banks' financial structure and portfolio quality, for example, to monitor their overall soundness and thereby to minimize the incidence of bank failure and the disruptions to financial markets that might ensue. Similarly, they regulate competitive structure in banking markets—through chartering, branching, and merger regulation—presumably with the intention of preserving vigorous rivalry without promoting "overbanking" of individual markets.

Bankers and economists may not all agree that such regulation is necessary (or even desirable) to achieve the goal of a stable banking system. Nonetheless, such regulation does not usually call into question the basic ability of a competitive banking market to make socially appropriate allocative decisions. The passage of the CRA, on the other hand, indicates that Congress questioned the ability of the market to produce desirable patterns of credit use. Moreover, by linking the CRA to the regulatory approval of merger and other applications, Congress has made the future development of banking markets contingent on current patterns of credit service to the community.

This paper traces the origins of the Community Reinvestment Act and examines its aims and the extent to which those aims are being met by the current enforcement process. Section I sets forth the legislative history of the CRA. Sections II and III describe the law in more detail with specific focus on its enforcement. Section IV examines the problem of detecting noncompliance with the anti-redlining provisions of the CRA, with special attention to the agencies' evaluation methodologies and the community group and academic studies of the "redlining" phenomenon. Section V presents our conclusions and discusses the policy implications of a possible alternative evaluation method to those currently used to enforce the Act.

I. Legislative History and Intent of the CRA

The CRA had its origins in long-standing allegations by community groups that financial institutions discriminate against certain neighborhoods in credit decisions. The practice, called neighborhood "redlining", allegedly contributes to and even causes the decline of inner city neighborhoods.

Anti-discrimination and anti-redlining legislation was already in place at the time the CRA was formulated, but community groups saw this earlier legislation as ineffective in structure and application. The Home Mortgage Disclosure Act (1975), for example, required financial institutions to disclose data on the volume of mortgage loans on a census tract or zip code basis. Such disclosure of geographic lending patterns was intended to provide an overt mechanism for detecting redlining—but provided no mechanism for imposing govern-

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mental sanctions should such behavior be detected. Similarly, the Equal Credit Opportunity Act (1974) prohibited discrimination in credit transactions on the basis of race, color, religion, national origin, sex, marital status, or age, but did not address the problem of "geographic discrimination" involved in redlining. Dissatisfaction with the thrust and implementation of existing legislation led citizens' groups to increase lobbying and legal pressure on Congress and the regulatory agencies.

The response was an anti-redlining bill (Senate bill 406), which would have required the federal regulatory agencies to encourage financial institutions to "help meet the credit needs of the local communities." Although banks already were required to serve the "convenience and needs" of their communities,[1] the sponsors of the bill felt that "convenience and needs" had focused traditionally on the provision of deposit facilities. The passage of the CRA would ensure that, in practice, the "convenience and needs" consideration also included credit services. The bill's proponents clearly felt that the "semiexclusive franchise" that government granted financial institutions obligated those institutions to pursue "community" as well as private entrepreneurial goals. More specifically, the draft bill emphasized that a financial institution's first obligation was to the credit needs of its "primary savings service area"—defined as an area from which 50 percent of the institution's deposits were derived. Thus institutions could not "export" credit from the community from which deposits were drawn without attending first to that area's credit demands.

Many saw in these proposals an unrealistic view of the role of financial institutions and a challenge to the traditional market mechanism of allocating credit. As a result, Congress modified the initial bill substantially, removing, for example, the very specific focus on the "primary savings service area" and leaving "community" undefined. In addition, it deleted reporting requirements and inserted a prohibition against the imposition of any additional administration burdens on affected financial institutions. Furthermore, the bill's sponsors argued repeatedly in committee discussions that the bill was not an attempt to allocate credit.

Thus, the final bill which became the Community Reinvestment Act avoided the direct condemnation of "exportation" of credit, because Congress clearly wished to avoid allocating credit or doing anything that might inadvertently sacrifice the safety and soundness of the banking system. At the same time, however, the law retained the idea of "serving the needs of the community," with an emphasis on low- and moderate-income neighborhoods. The reconciliation of these two potentially contradictory aims was left to the regulatory agencies.[2]

II. Regulatory Implementation

Congress gave the financial regulatory agencies the task of drafting regulations which both reflected Congressional intent and provided specific compliance guidelines for financial institutions. The agencies involved—the Federal Reserve Board of Governors, the Federal Deposit Insurance Corporation (FDIC), the Federal Home Loan Bank Board (FHLBB), and the Comptroller of the Currency (OCC)—completed the assigned task by October 1978. The following discussion covers the Federal Reserve's Regulation BB, which is the same in all major respects as the regulations promulgated by the other agencies.

Regulation BB reflects the apparent Congressional intent that the concept of "community" employed in CRA regulations be flexible enough to accommodate the myriad markets and service needs which banks confront. Regulation BB, in fact, leaves the definition of geographic market and service orientation up to individual banks. The banks must prepare a Community Reinvestment Statement and make it readily available to the public. The statement includes: 1) a clear definition of market area, without arbitrary exclusions of low- and moderate-income areas; 2) a list of the types of credit services offered; and 3) a copy of the public CRA notice, a description of consumers' rights under the CRA. In addition, each bank must maintain a file of all comments received with regard to its community lending practices and must include in the file its replies to complaints and comments.

The evaluation process is based not only on com-

pliance with these procedural requirements, but also on a bank's behavioral compliance—whether the bank's actual lending activity meets the "credit needs of the community." Here, Regulation BB provides only general guidance for compliance, by listing twelve factors the Federal Reserve will consider when making its CRA evaluation. These include:

a. Activities conducted to ascertain a community's credit needs, including the extent of the bank's efforts to communicate with community members regarding the credit services it provides;
b. Extent of the bank's marketing and special credit-related programs to make community members aware of the credit services it offers;
c. Extent of participation by the board of directors in formulating bank policies and reviewing its performance with respect to CRA purposes;
d. Any practices intended to discourage applications for types of credit set forth in the bank's CRA statement(s);
e. Geographic distribution of the bank's credit extensions, credit applications, and credit denials;
f. Evidence of prohibited discriminatory or other illegal credit practices;
g. Record of providing financial services, including opening and closing of offices;
h. Participation, including investments, in local community development and redevelopment projects or programs;
i. Origination of residential mortgage loans, housing rehabilitation loans, home improvement loans, and small business or small farm loans within the bank's community, or the purchase of such loans originated in its community;
j. Participation in government-insured, guaranteed, or subsidized loan programs for housing, small businesses, or small farms;
k. Ability to meet various community credit needs, based on the bank's financial condition and size, legal impediments, local economic conditions, and other factors; and,
l. Other factors that, in the Board's judgment, reasonably bear upon the extent to which a bank is helping to meet the entire community's credit needs.[3]

III. Legal Aspects of the CRA

The CRA legal process follows the pattern of civil rights and equal employment opportunity litigation, wherein the law provides a quick means for establishing the legal standing of a citizen or group. Specifically, a party establishes a *prima facie* case by establishing the basis for a protest under the CRA provisions, subject to the acknowledgement of its validity by the regulator involved. The financial institution then must furnish documentation to show that there are no grounds for the protest. As long as the protest is substantive, the burden of proof lies primarily with the institution to demonstrate its compliance with the requirements and the intent of the CRA.

A legitimate protest does not require demonstration of *intent* to discriminate against a particular neighborhood. Rather, a bank practice can be called into question if it has the *effect* of discriminating against a certain neighborhood. In order to continue such a practice, the bank must show that it is necessary to the business and that another, nondiscriminatory practice cannot be substituted.[4]

Denial of merger or branch applications is the most severe penalty imposed for noncompliance with the CRA. However, the Federal Reserve (and the other agencies) have the authority to condition approval of an application on changes in the applicant's mode of doing business. The Act apparently is influential though somewhat vague in content, since financial institutions and protest groups often reach agreements independently. Most interested parties agree that an accurate, objective measurement method would add a great deal to the current understanding and enforcement of the CRA.

IV. Problem of Detecting Noncompliance

The original legislation provided very little guidance for detecting noncompliance. The regulations formulated by the regulatory agencies set forth general guidelines for assessing lenders' behavior. However, the agencies still had to devise an evaluation method which would yield an accurate detection of undesirable behavior, as is described below.

Regulatory Process

The regulatory agencies are involved in CRA enforcement on two levels. First, the regular examination process involves routine evaluations of CRA compliance. Secondly, as the law states, the agencies must evaluate CRA performance every time a financial institution applies to branch, merge, or otherwise expand its operations. In 1980, for example, the Federal Reserve processed 917 applications with CRA implications. Often, in these cases, the CRA record is determined by studying the bank's most recent examination report. These analyses are expanded, however, when a protest arises.

Examiners conduct a CRA compliance exam as one part of the overall examination which they regularly make at financial institutions. The twelve items listed in Regulation BB serve as a guide to the examiner in determining whether the institution is complying with CRA procedural requirements. In addition, the examiner must study the bank's lending record and its public relations policy as well as many other factors to determine the degree of behavioral compliance. From the observations made and from contact with community groups, the examiner then makes a final judgment regarding the institution's overall record. A rating of 1 or 2, on a scale of 1 to 5, means that the institution's CRA record is above average, while a 3 represents a "less than satisfactory" record. Standardized examination procedures include a weighting scheme designed to cover all twelve assessment factors of Reg BB, but examiners still have some latitude in assessing performance. The agencies, therefore, admittedly rely on the subjective analysis of experienced staff members.

The regulatory agencies have developed a joint evaluation handbook as well as rigorous training programs, but many observers remain uneasy about the regulatory methods of evaluation and enforcement.[5] Even the examination handbook acknowledges the lack of a standardized evaluation technique, when it notes that "the examiner is expected to adjust the CRA procedures on a case-by-case basis to accommodate institutions that vary in size, expertise, and locale."[6] In fact, a financial institution can attempt to serve its community's needs in myriad ways, and somehow the examiner must determine whether the institution's effort is adequate.

Resolution of a protest also involves evaluation of CRA compliance. The protest process begins when a group claims that an institution has failed to serve a community's credit needs. The group then submits a protest to the appropriate regulatory agency asking that the institution's application to expand be delayed until after examination of its CRA record. When the Federal Reserve is involved, the Board first determines whether the protest is nonsubstantive on its face or whether it warrants a detailed investigation—and in the latter case, it conducts a thorough analysis of the bank's CRA performance.

In practice, the Federal Reserve first attempts to create a constructive dialogue between the protesters and the bank to clarify the issues. Often a case is then dismissed due to a prior misunderstanding of the law or because of poor communication. At other times, the two parties reach an agreement on their own and the group drops the protest. However, sometimes a thorough investigation is necessary, and in such cases, the Board may hold a public meeting where both sides may present their views.

The Federal Reserve's analysis entails the evaluation of the statements of the two parties and some investigative research. The agency studies the bank's marketing programs, along with other factors which may reflect the affirmative action it has taken to serve community credit needs. To detect whether actual lending behavior is in compliance with the CRA, it also examines data available as a

result of the Home Mortgage Disclosure Act (HMDA data), often along with real estate transfer records and bank loan applications to account (at least partially) for loan demand. Other relevant data include information on neighborhood characteristics, compiled from such information sources as U.S. Census data and city planning records. Using all of these sources, the Board's Research staff recommends whether the protest is substantive—and whether the bank's application to expand its operations should be approved, approved subject to certain conditions, or denied. The Board's decision is based on some objective analysis coupled with a subjective judgment of the bank's behavior and management attitudes. Precedents are set on a case by case basis.

One possible way of handling a protest case is "conditioned approval," whereby the application is approved subject to certain requirements. For example, the Federal Home Loan Bank Board approved the application of Midwest Federal Savings and Loan Association, Minot, North Dakota, to establish a new branch—provided that the Association change its delineation of its local community and withdraw its policy of refusing to make mobile home loans on American Indian reservations unless the policy could be shown to have a firm economic basis.

On other occasions, a bank and a protesting group have privately agreed on conditions, leading the community group to drop its charges. Landmark Bancshares Corporation of Clayton, Missouri, for example, upon protest of its application to acquire Ladue Bank and Trust Company, made an agreement with the Missouri Association of Community Organizations for Reform Now (ACORN). The agreement, which led ACORN to drop charges, included a commitment of $1 million for home improvement loans and mortgage loans to the Wellston, Missouri community at below market rates. Clearly, in cases such as these, conditioned approval and private agreement raise concerns about credit allocation, an activity not intended by Congress. The Federal Reserve Bank of St. Louis, reflecting the Federal Reserve System's opinion, held, in the Landmark Bancshares case, that "since the Board of Governors has stated that neither the Bank Holding Company Act nor the Community Reinvestment Act requires that the Board impose commitments to allocate credit, the Reserve Bank does not endorse any term of the agreement between applicant and protestant which may have such a result."[7]

As these examples show, the costs involved in lodging a protest are usually relatively low. On the other hand, the protest process can be costly to the institution involved. First, conditioned approval or private agreements can result in significant financial commitments. Second, the application to expand must be delayed until the CRA issue is resolved. The bank must not only pay the costs incurred in public meetings (legal fees, etc.) but also those resulting from substantial delays in expansion plans, including the costs of affected competitive positions. In addition, protesters need not be community groups, but can even include competing banks, which sometimes file CRA protests, presumably with the hope of delaying or preventing competitors' expansion plans.

In view of the high costs of an inaccurate decision to all parties involved, the regulatory agencies should attempt to devise the best possible methods of detecting CRA violations and to encourage the use of the best methods by protesters. In essence, regulators have relied on a two-part approach. First, regulators focus considerable attention on what could be called affirmative marketing efforts. In this regard, the law is designed to ensure that the demand for loans is not adversely affected by a lack of knowledge about availability. Since marketing efforts such as advertising, community meetings and discussions with realtors can enhance the flow of information between potential loan applicants and lenders, the monitoring of such efforts under the CRA probably improves the efficiency of the marketplace. It is probably impossible to measure the optimum level of market information, so it is reasonable to use only general criteria to form judgments on a bank's performance in this area.

A second important part of the CRA enforcement process involves the examination of actual lending activity to determine evidence (if any) of discrimination. Here, detailed objective analysis is desirable, despite the difficulty of developing a good evaluation method for detecting noncompliance.

The remainder of the paper, therefore, addresses the problems associated with those CRA enforcement procedures which focus on possible discriminatory lending patterns, or redlining.

Definition of Redlining

Part of the trouble in this area stems from the lack of a generally accepted definition of redlining. Before choosing a method for detecting violations, it is essential to decide on a correct legal definition of redlining and determine what type of behavior would be deemed unacceptable. From the beginning, differences of opinion arose over the intent of the CRA, and these differences naturally carried over into the debate over the definition of redlining. Community groups and other CRA proponents, being concerned about urban "disinvestment," criticized as redlining any lending behavior resulting in an uneven distribution of loans across neighborhoods, regardless of the reason for this pattern. In their view, lending policies that create uneven distributions of mortgage credit have the *effect* of discriminating. Many also argued that banks have an obligation to make every effort to serve their communities, even if this means lower profits than could be earned elsewhere. By refusing to lend in a neighborhood, for whatever reason, community groups claim banks otherwise would create an externality effect: deterioration of the community.

Under the community groups' definition, successful CRA enforcement would mean a more equal distribution of loans across neighborhoods. Evaluation methods devised under this approach simply involve the examination of loan distribution patterns for inequalities, as discussed below. However, in its final form, the CRA falls far short of mandating credit allocation or affirmative urban renewal efforts if they are unprofitable. Instead, the law seems to recognize that there may be sound business reasons for an uneven pattern of loans—partly reflecting differences in demand across neighborhoods, but also lenders' recognition of higher risks in certain areas. In the economic literature, this type of lender behavior is referred to as "rational" redlining. Lenders who operate efficiently will make loans to minimize risk and maximize profit, subject to regulations regarding the overall quality of loan portfolios. We assume here that the law was not meant to outlaw rational redlining—but rather irrational practices whereby a lender avoids lending in a certain area despite the fact that the activity would yield a normal balance between risk and return. Under irrational redlining a property's location remains a significant explanatory factor for a given lending pattern, even after adjustment for all the factors which might explain the pattern on the basis of sound business judgment.

This does not mean that a lender who uses a property's location as a decision criterion *necessarily* has discriminatory (irrational) *intent*. To make economically sensible decisions, lenders must use the available information to evaluate individual requests for funds. At times, the cost of obtaining this information is prohibitively high, so that lenders may attempt to economize on information costs by using proxies for certain variables. If these proxies have statistically significant results, the quality of the lending decision is probably enhanced. However, the law prohibits the use of certain variables (such as zip code), assuming that their use would have discriminatory *effects*. This practice may be rational in a purely private decision-making process, but since the law outlaws it in a social context, we must include such variables in our definition of irrational redlining.

The use of the CRA's anti-redlining provisions to address *irrational* redlining gives us the basis for choosing an appropriate evaluation method. Detection of irrational redlining requires an understanding of the factors necessary to make a sound business decision. We will narrow our focus to the factors that affect risk and return in the mortgage market, since it is the behavior of lenders in this market that has drawn the most criticism from CRA proponents. After discussing these factors, we will examine the evaluation methods devised to detect redlining by interested parties (community groups, academicians and regulators) to determine whether they account for the rational business reasons affecting lending decisions.

Demand for Mortgages

Outcomes in the mortgage market (as elsewhere) result from the interaction of demand and supply forces. Although the CRA directs its attention to supply side (i.e., lender) behavior, it is also necessary to specify demand behavior to extract evidence on supply behavior from the available data on mortgage activity.

According to a number of studies,[8] the desired stock of household debt is determined as an element of a broader decision concerning the consumption of housing and non-housing goods and services. In the most general models, household wealth, current income, prevailing interest rates, and market housing prices are found to determine the demand for housing and mortgage debt. (Here wealth is defined as the present value of lifetime earnings plus the stock of savings.)

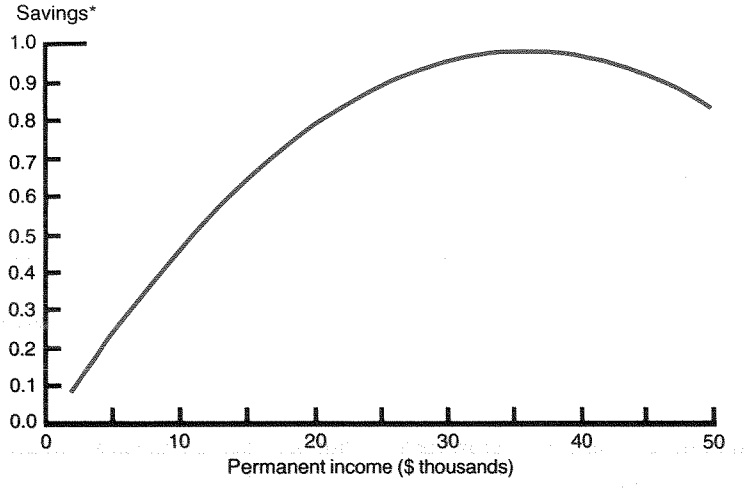
This relatively straightforward assumption is complicated, however, by certain imperfections in the credit and housing markets. First, the progressiveness of income tax rates and the tax deductibility of mortgage interest reduce the after-tax cost of indebtedness to wealthier households. Second, the lifetime earnings portion of household wealth is fairly illiquid; households are typically not able to borrow against their future income. Coupled with the convention of minimum downpayment requirements, this fact may make initial savings—and not simply total household wealth—independently important to housing and mortgage demand. A household with a lower level of initial savings would display a lower effective demand for housing than an equally wealthy household with a higher initial level of savings.

In addition, the household's current income position (rather than its wealth alone) may be an important independent factor influencing its housing ownership decision. With conventional mortgage instruments, the borrower can encounter cash-flow problems if the monthly loan payment is large relative to current nominal income. Lower current income is likely to result in lower demand for housing, everything else being equal.

Finally, the variability of income may play a role in the demand for housing and mortgage debt—the more variable its income, the greater the risk that a household will be unable to meet mortgage payments in the normal manner. Because of the high legal and other costs of meeting (or avoiding) loan delinquencies and defaults, a household with a variable income may have a lower effective demand for debt and for housing than a similarly situated family with a stable income.

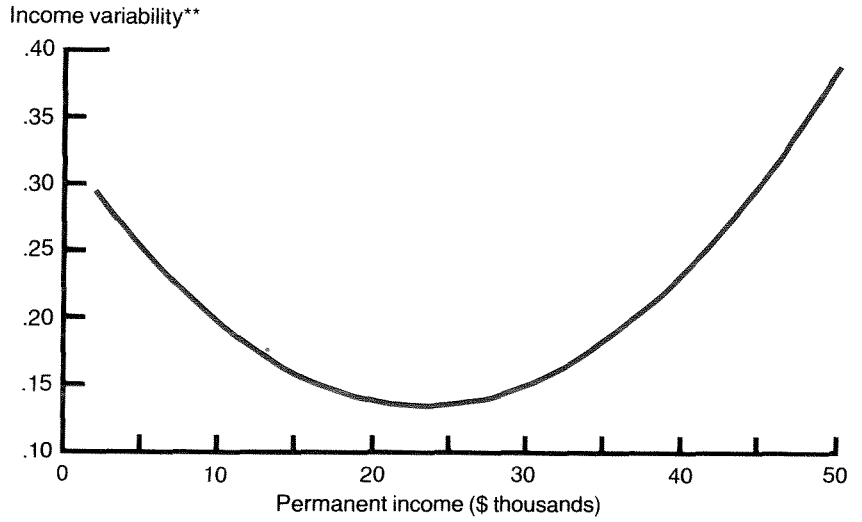
These demand variables would suggest the weak-

Chart 1



*Savings is a dichotomous variable where O=households without savings greater than two months' income and 1=all other households. The relationship estimated here represents the probability of a household at various permanent income levels having savings greater than two months' income.[10]

Chart 2



**Income variability is defined as the standard deviation of each household's income from its nine-year-average trend values.[10]

ness of wealth alone (or its reasonable proxy, permanent income) as an accurate predictor of the demand for mortgages. Indeed, data on family economic characteristics[9] suggest that savings as a proportion of wealth tends to increase as wealth increases over much of its range (see Chart 1). Moreover, poorer households also tend to have more variable incomes than all but the wealthiest households (see Chart 2).

These nonlinear relationships suggest that mortgage demand on the part of less wealthy households should be less than their wealth alone would predict. Therefore, we would expect to find poorer households demanding fewer mortgages than richer households, even after adjustment for income and wealth. Since neighborhoods tend to be relatively homogeneous with respect to household wealth, an uneven pattern of mortgage lending across neighborhoods may be explained, in part, by these differences in mortgage demand.

Mortgage Supply

In addition to these demand-side influences, a number of factors relating to the applicant and the property will necessarily influence lenders' willingness to supply credit. One major factor is the lender's general inability to obtain security for the loan by attaching the borrower's future income; thus, the loan must be secured by the property itself. Factors bearing on the likelihood and cost of foreclosure and liquidation will thus influence the lender's willingness to supply credit. The borrower's ability to handle the cash-flow burdens of a mortgage, of course, would be paramount in a bank's assessment of the risk of foreclosure. Thus, the borrower's current income, liquid asset position and income stability are all considered by lenders in this regard.

The lender's perceptions about the "quality" of the real assets securing a loan also will affect the lender's willingness to make a real estate loan. In obtaining a secured loan, the borrower in effect obtains an option to hand over the security (the house) to the lender and abandon the loan. As option theory suggests, the more uncertain the future value of the security (the house), the more valuable this option becomes. Thus, lenders should charge more or demand more security (by offering a lower loan-to-value ratio, for example) for a loan on a property with an uncertain future value. Such uncertainty typically will arise due to the lender's assessment of the remaining economic life of the house. This assessment, in turn, may be a function of the house's current level of upkeep and of the maintenance of nearby properties.

Consequently, we would expect fewer loans to be supplied to those loan applicants with lower

incomes, with lower savings/loan ratios, or with intentions to buy homes with uncertain future value, all else being equal. The greater income variability of poorer households (see Chart 2) should also have consequences for mortgage supply. Lenders would be willing to supply less mortgage money at any given mortgage rate to variable-income households because of potentially greater delinquency and default risks.

Resultant Lending Patterns

An accurate evaluation method for detecting noncompliance with the CRA, or "irrational" redlining, thus would necessarily incorporate variables such as those discussed above. No available data set would permit us to prove this point directly or to test directly all the implications of our model on the demand and supply of mortgages. However, some of these variables are important to household financial decisions through their influence on the pattern of home ownership.[11]

Since households of various wealth levels tend to be concentrated geographically, these conclusions about demand and supply factors may translate into unevenness in the observed number, value, or price of mortgage loans across neighborhoods. In particular, households in poor neighborhoods are likely to receive less mortgage money than households in well-to-do neighborhoods. In fact, a comparison of lending outcomes between inner city and suburban neighborhoods probably would reveal a pattern of fewer loans and lower dollar loan values in the typical American inner city because of its general pattern of household characteristics. The uneven distribution can, therefore, often result from rational behavior on the part of both lender and potential loan applicant. However, the evaluation methods used traditionally by community groups generally have led them to equate such uneven distributions with redlining.

Community Group Studies

Because of their limited resources, community groups have tended to use the simplest analytical procedures when providing evidence to support their protests against financial institutions. Typically, their analysis of residential lending patterns consists of construction of simple indices—such as loans per census tract—to depict the geographic pattern of mortgage lending. The type of indices has depended upon the type of data available.

Prior to the passage of the HMDA, these groups obtained their data from manual reviews of public registers of real estate transactions—as seen, for example, in the New York Public Interest Research Group report on redlining in Brooklyn. The report compared total value of Brooklyn mortgages made by certain Brooklyn savings banks to these lenders' total assets and total mortgage-loan volume. The resultant ratios were small, and the report's authors thus inferred that the lenders were redlining Brooklyn neighborhoods.[12]

The passage of the HMDA considerably facilitated this simple index analysis, because it required each financial institution to disclose the number and value of all mortgage and home improvement loans made, by type and by neighborhood (using census tracts or zip codes to represent neighborhoods).[13] The HMDA provided much of the data used by community groups to stimulate Congressional interest in the CRA. For example, in her March 1979 testimony, Gale Cincotta of National Peoples' Action used such data to show that three major cities received a smaller share of urban financial institutions' loans than did their suburbs and non-metropolitan areas.[14] Ms. Cincotta used this example of asymmetry between urban and suburban lending patterns as evidence of the existence of redlining and of the need for the CRA.

The Buckeye-Woodland Community Congress (BWCC) in Ohio also used HMDA data and simple index analysis to establish its standing in a CRA protest. When AmeriTrust, a Cleveland bank holding company, proposed to acquire a new bank early in 1980, BWCC alleged that AmeriTrust had a poor record of real estate lending in predominantly black

areas of the community. These accusations were based on simple indices developed from HMDA data, real estate transfer data, and deposit data.[15]

Although simple index analysis has been very effective in attracting policy-makers' attention, it suffers from serious analytical problems. Clearly, simple index analysis does not address the problem of irrational redlining. It compares only *outcomes* across neighborhoods, and thus cannot show if a lender is arbitrarily discriminating against a given neighborhood. Data on geographic lending patterns alone cannot show whether the outcome is a result of demand or supply factors or, if the latter, whether the behavior is rational or irrational (discriminatory). In addition, these indices give no consideration to the impact of risk variables on lenders' behavior. Without controlling for other factors that legitimately influence mortgage demand and supply, it is not possible to use such indicators to prove discriminatory lending practices. Furthermore, HMDA data do not correct for population or size differences among neighborhoods, and their use would be inappropriate even to coarsely screen for CRA violations. Indeed, redlining behavior could be occurring in those markets where the simple index measures might imply the opposite.

Some groups have recognized the severe limitations of the simple index approach and have tried to overcome them—for example, by using additional data to compensate for differences in demand.[16] Some have used real estate transfer activity and other variables as proxies for mortgage demand. However, these variables have limited value as well, since it is doubtful that they adequately control for demand factors in a neighborhood.[17]

Therefore, simple index analysis is clearly incapable of proving the existence of irrational redlining, despite its frequent use in CRA protests. To isolate lending patterns that involve something more than economically "rational" behavior—namely, to identify discriminatory and irrational redlining—analysts must adjust for the factors expected to influence rational lending behavior. Academic researchers, in their search for better measurement methods, have come to employ one of two approaches: 1) market models or 2) applications analysis.[18]

Market models

In the market model approach, researchers have recognized the joint involvement of demand and supply factors in the process that determines observed mortgage activity. Demand for mortgages is typically assumed to have the form

$M_d = M_d (i, P, X)$

where M_d is the demand for mortgages, i is the mortgage interest rate and other loan terms, P is the price of housing, and X is a set of variables influencing the scale of demand (such as the borrower's demographic and financial characteristics). The mortgage supply relationship takes the general form

$M_s = M_s (i, B, R)$

where i is the terms of the mortgage, B is a set of borrower characteristics related to creditworthiness, and R is a set of characteristics of the property. Then, in equilibrium,

$M_d = M_s = M_{observed}$

and the model can be solved for the relationship between observed mortgage activity ($M_{observed}$) and borrower and property characteristics:

(1) $M_{observed} = f (P, X, B, R)$.

This "reduced form" relationship is typically estimated with regression analysis, using data on the number or value of mortgages made in various census tracts or neighborhoods in a certain period as measures of M. The borrower and property characteristics are the average characteristics of the occupants and properties in those tracts.

Within this general framework, analysts have attempted to obtain evidence of redlining in several ways. Under one approach, certain characteristics of the borrower (such as race) or the property (such as the age of housing in the census tract) would be considered irrelevant to the banking decision. Thus if these variables are statistically significant in explaining observed mortgage activity, the analysts conclude that redlining is involved.

Hutchinson, Ostas and Reed,[19] for example, found the number of mortgages made in a cross-section of 120 census tracts in Toledo, Ohio, to be negatively related to average housing age. They

took these findings as evidence of redlining.

The difficulty with this approach, of course, is that the underlying assumption may be faulty. The age of the house may be irrelevant in and of itself, but it may be related to a variable overlooked by analysts but used by the lender, such as uncertainty about the property's future value. Similarly, the race of the borrower may capture the effect of an excluded variable, such as the borrower's initial savings position or income variability. By law, of course, the lender should not use variables such as these, but they may be statistically significant in a retrospective analysis.

A second approach is to estimate equation (1) to predict mortgage volumes for allegedly redlined areas on the basis of data from purportedly nonredlined areas. If the predicted volume for the allegedly redlined areas exceeds the actual volume, the analysts consider this evidence of redlining. Using this approach, Richardson and Gordon found study areas in West Oakland, California not to be "mortgage deficient" relative to surrounding areas, while Schafer found evidence that certain areas in New York City were "redlined."[20]

With this approach, however, valid comparisons may not be possible because not enough legitimate factors influencing mortgage volumes have been included in the prediction relationship. Richardson and Gordon, for example, point out the need for cautious conclusions about "mortgage deficiencies," because allegedly redlined and nonredlined areas typically differ dramatically in borrower and property characteristics.

Market model redlining studies also involve a number of general problems. First, the complexity of the mortgage market makes it extremely hazardous to rely on simplified model representations of this type. To our knowledge, for example, no market model study has incorporated household wealth, initial savings, and income variability in the specification of mortgage demand (mainly for a lack of data). Yet Michigan Panel Survey data suggest that these variables are significant in the prediction of home ownership because of their relevance to either demand or supply.[21] Similarly, data are probably not available to characterize adequately the risk characteristics of the properties, so that the supply relationships are also misspecified. As mortgage market theory suggests these are likely to be important determinants of the pattern of mortgage demand and, hence, of observed mortgage flows. The omission of such basic variables makes the results of such studies highly tentative.

In addition, market model studies focus only on a portion of the mortgage market (typically institutional mortgage lending), often excluding the activity of mortgage bankers and other non-bank lenders. The exclusion from these studies of private mortgage sources, which now represent an increasingly important component of mortgage supply, may negate any findings of redlining behavior, since lenders may specialize in certain kinds of loans and perhaps neighborhoods as well.

For these reasons, market models have not resolved and are unlikely to resolve the debate about redlining. Moreover, the difficulties encountered in verifying allegations of redlining for the market as a whole are multiplied severalfold when a specific lender's behavior is involved, since the market model must then explain the market shares of various lenders as well as aggregate mortgage activity. Yet, the behavior of individual lenders is what the CRA is meant to address. Conceptually, market models are far superior to the simple index analysis practiced by community analysts and some regulatory agencies. However, market models have not been consistently successful in detecting "redlining." Indeed, their generally ambiguous findings suggest that the "strong" superficial evidence of redlining indicated by simple index analysis is much more difficult to verify in a more appropriate modelling context.

Applications Analysis

Because of the difficulties encountered with market models, some academic analysts have tried to simplify the problem by focusing only on the lender's loan evaluation process. If lenders reject loan applications involving properties in certain locations more frequently than similar applications elsewhere, this could be taken as an indication of possible redlining behavior.

In essence, such studies are pure supply studies; "demand" is given since an application has been filed.[22] This alleviates the problem of modelling the demand process. In addition, inferences about *individual* mortgage suppliers can potentially be made by focusing on the applications process of the specific lender.

The typical applications analysis model involves estimation of a mortgage decision relationship of the form

$$\text{Prob(MD)} = f(i, B, R)$$

where MD is the mortgage decision made concerning the application (such as "denial" of the application), and Prob = f(...) is a function describing the probability of that decision as a function of i, the terms of the loan request, B, the characteristics of the applicant, and R, the characteristics of the property, (including location). This model indicates the presence of irrational redlining if all characteristics of the applicant and the property relevant to a wise business decision are included and the property's location is still independently important.

The most thorough study of this type was conducted by Schafer and Ladd for the Department of Housing and Urban Development.[23] Since such studies require detailed data on individual mortgage applications, the researchers were limited to an analysis of mortgage markets in New York and California, where state laws require certain institutional lenders to provide information in applications registers.[24] The authors obtained information on allegedly redlined areas, and then tested whether such property locations were independently important in explaining mortgage decisions.

The results of the study are mixed; the location of a property in an allegedly redlined area increases the probability of adverse treatment by the lender in some but not all of the cities studied. More surprisingly, there are statistically significant cases where "nonredlined" areas appear to receive less favorable consideration than "redlined" areas. Indeed, in California, there are only six cases in which an adverse mortgage decision is statistically more likely for central city properties than for suburban properties; yet there are twenty-one cases where the reverse is true. Similar, though less pronounced ambiguities arise from the New York data.

The authors conclude from their results that "some neighborhoods appear to be redlined and others do not." An alternative explanation, however, is the omission of some locally important variable(s) from the model specification. The applications data provide relatively good information on the applicant's financial position (such as some savings and net worth data), but they lack most information that might bear on the market's perception of the riskiness of the specific property (with the exception of age of house). The data thus had to be augmented with census and other data, which might have been insufficient to the task; indeed, the analyst really needs all of the data available to the lender to discern accurately the "unbiasedness" of the loan decision process. Nevertheless, applications analysis, by virtue of narrower focus, has greater practical potential than market modelling or index analysis for CRA evaluation.

Use of Applications Analysis

Most of the regulatory agencies have access to the loan application register (LAR) maintained by each institution. The LAR is a record of loans made, including details related to the applicant, the property and the loan terms. This record must be maintained for 25 months for every loan made by each institution.[25]

The Federal Home Loan Bank Board conducted a pilot study of such data in 1978 to detect discrimination in the overall lending practices of savings and loan associations.[26] Discrimination was defined as the arbitrary use of applicants' age, race, sex, or marital status, or property location, to make decisions regarding appraised value, loan acceptance or

denial, or mortgage terms. Violations of CRA would have been found if property location alone had made a difference in lending decisions, but discrimination was not evident after controlling for applicant and property risk variables.[27] The pilot study demonstrates the agencies' concern about finding appropriate objective measurements of CRA compliance. It also suggests that detailed studies of individual applications reveal more information than simple index models and can explain much "suspect" activity.

V. Conclusions and Policy Implications

This paper has focused on some of the analytical challenges posed by the Community Reinvestment Act. Proponents of the CRA had many policy aims in mind—including the regulation of credit flows to stimulate redevelopment of deteriorated urban areas. But in view of analytical limitations as well as Congressional intent in the ultimate CRA legislation, we believe that enforcement of the CRA's anti-redlining provisions should center on detection of *irrational* redlining, or arbitrary geographic discrimination. Indeed, the debate surrounding the passage of the CRA makes it clear that geographic credit allocation was not Congressional intent in the Act's final form.

With this in mind, we have attempted to assess the usefulness of various analytical techniques and data sources in detecting the arbitrary use of property location in mortgage lending decisions. We found that the simple index techniques commonly used by community groups are likely to be unreliable, because they ignore the complexity of the economic decisions involved in the mortgage market. These measures simply do not account for the sound business reasons or demand factors which may be the reason for disparities in loan volumes among neighborhoods. We also found that the market model approaches used in more sophisticated studies were also inappropriate, due to the difficulty of defining an individual lender's role in such a complex context. A more reliable technique for evaluating charges of geographic discrimination may be loan applications analysis, because it focuses on individual lending decisions, while at the same time drawing on a more complete set of data than the simple index techniques.

These conclusions suggest that effective CRA enforcement may require substantive changes in the methodology used by regulators to assess a lender's CRA performance and to evaluate allegations of redlining. In the absence of quantitative evaluation techniques, CRA assessments today largely depend on the judgment of CRA examiners. Since the detection of CRA violations is considered an important regulatory responsibility, decisions should be accurate, and consistently applied, given their far-reaching consequences. The use of formal, objective methods of evaluation can make a positive contribution to both of these goals. Among the methods that probably should be considered are those which analyze loan application records.

At the present time, regulators must conduct thorough analyses of CRA compliance when a protestant alleges the existence of redlining and also during routine examinations. With a loan application register readily available for analysis, regulators could address complaints more quickly and accurately. The burden of the analysis would rest with the regulatory agencies, which have the appropriate staff and resources for the task. This should serve the desire of Congress to keep enforcement costs to a minimum. Also, it should save protestants from the time-consuming, unreliable use of simple index methods, and should reduce the burden of the existing CRA process on affected institutions.

However, the loan application register has drawbacks also. The need to maintain the necessary standard-format applications data files would impose a non-trivial compliance burden on affected institutions. (There is now no standard format nor standard method of analysis, and lending institutions must only maintain a file of loan applications and make these records accessible to regulators.) The costs of maintaining the loan registers would be high, especially since relatively few banks are faced with protests or allegations of poor performance. In addition, unless institutions were also required to maintain records of all requests for lending information (in addition to formal applications), this method would not detect "pre-screening" forms of

lending discrimination.

Given the serious problems associated with existing evaluation methods, and given the high costs of a more accurate, (but still imperfect) alternative method, regulators might do well not to try to detect redlining per se, but rather to concentrate on encouraging the affirmative marketing efforts of financial institutions. Assuring the free flow of information to all market participants should increase competitive pressures on lenders who discriminate, making them less able to continue such practices in the long run.

If the efforts to detect redlining are to continue, however, improvements in evaluation methods may be necessary. At the very least, analysts should conduct a more thorough study of the costs and benefits of alternative evaluation methods than we have attempted here. Our analysis indicates that the current method has severe limitations, and that a more accurate method would involve incorporating all the information lenders receive in loan applications. Although the substantial investment of time and capital necessary to maintain these data may exceed the explicit costs of current compliance regulations, an accurate cost/benefit analysis would also have to consider the high, hidden costs incurred under existing protest procedures—such as concessions made in private agreements, penalties incurred through conditioned approvals, legal fees, and costs of jeopardized competitive positions. When these hidden costs are taken into account, it is not obvious that loan applications analysis would be too costly to implement. Indeed, if CRA enforcement and elimination of discriminatory lending practices continue to be desirable legislative goals, a review of the current evaluation method clearly would be in order.

FOOTNOTES

1. Whenever a bank applies to expand its operations, the regulatory agency does an analysis of the competitive effects of the proposed activity and an analysis of how the expansion meets the "convenience and needs" of the community. Banks must, therefore, include in their applications descriptions of how the expansion will benefit customers by improving services in their communities.

2. For further details, see U.S. Senate, **Hearings before the Committee on Banking, Housing and Urban Affairs on S. 406**, "Community Credit Needs," March 23–25, 1977, 95(1), and Consumer Bankers Association, **A Compliance Guide for the Community Reinvestment Act: Background and Implications**.

3. Board of Governors of the Federal Reserve System, Regulation BB (12 CFR 228), effective November 6, 1978.

4. For a thorough discussion of the effects test as it applies to consumer credit legislation, see Sarah E. Burns, "Credit Scoring and the ECOA: Applying the Effects Test," **Yale Law Journal**, 88(7), June 1979; pp. 1450–1486.

5. The General Accounting Office, for example, in a recent study of the enforcement of several consumer credit laws, was critical of the agencies' monitoring of substantive compliance or compliance with the "basic principles of the law." The GAO complained that few detailed analyses were conducted on the data available. Although the study refrains from drawing conclusions on CRA enforcement (since CRA was new at the time), we can probably apply the agency's findings to CRA as well. Comptroller General of the United States, **Report to the Congress: Examinations of Financial Institutions Do Not Assure Compliance With Consumer Credit Laws**, U.S. Government Printing Office, January 2, 1981.

6. Comptroller of the Currency, Federal Deposit Insurance Corporation, Federal Home Loan Bank Board and Federal Reserve Board, **Community Reinvestment Act Examination Procedures**, November 1978, p. 5.

7. Federal Reserve Bank of St. Louis, news release, November 30, 1979.

8. See Diewert, W. E. "Intertemporal Consumer Theory and the Demand for Durables," **Econometrica**, May 1974, pp. 497–516; Dunkelberg, W. L., and Stafford, F. P., "Debt in the Consumer Portfolio: Evidence from a Panel Study," **American Economic Review**, September 1971, pp. 598–613; Hess, A. C., "A Comparison of Automobile Demand Equations," **Econometrica**, April 1977, pp. 683–701; Mishkin, F. S., "Illiquidity, Consumer Durable Expenditures, and Monetary Policy," **American Economic Review**, September 1976, pp. 642–54; and Sandmo, A., "The Effect of Uncertainty on Saving Decisions," **Review of Economic Studies**, July 1970, pp. 353–360.

9. The data are from continual follow-up surveys of 5,000 American families in each of the nine years 1968-1976 conducted by the Survey Research Center of the University of Michigan (the Michigan Panel Survey). Our sample, however, involves only families in which the married couple which headed the household remained together over all the years of the survey.

10. The equations for the charts took the forms $s = a + bY + cY^2$ (for Chart 1) and $I = a + bY + cY^2$ (for Chart 2), where S = the savings variable as described, I = income variability, and Y = permanent income. Source of the data used is described in footnote 9.

11. The importance of the factors presented in the theoretical discussion was demonstrated in a regression of home-

ownership on various homeowner attributes (Michigan Panel Survey data). For example, level of permanent income and level of savings show a statistically significant relationship to home ownership. Increased income variability, on the other hand, reduces the probability of home ownership for the families in the sample. Because of the obvious relationship between home ownership and mortgage indebtedness, the findings suggest that these same variables would affect the pattern of mortgage indebtedness, although we cannot distinguish whether the factors are supply or demand related.

12. New York Public Interest Research Group, "Take the Money and Run," New York, 1976.

13. The HMDA was amended in 1980 and now requires disclosure of the number and value of mortgage loans made by census tract only. Zip code can no longer be used as a designation of neighborhood.

14. See **Hearings**, footnote 2, pp. 132–147.

15. Federal Reserve Bulletin, "Bank Holding Company and Bank Merger Orders issued by the Board of Governors," March 1980, pp. 238–242.

16. The Department of Housing and Urban Development, in its CRA guidebook, **Assessing Community Credit Needs** (August 1979, p. 13), recommends that community groups use census tract data, coupled with HMDA data, to help determine demand as well as to explain possible discrepancies in loan volumes between two dissimilar census tracts.

17. With regard to the use of real estate transfer records to compensate for demand, evidently there is not always a one-to-one relationship between mortgages and transfers of real estate. The use of private or mortgage bank financing, the practice of assuming existing mortgages, and other factors will make this link a loose one. It is also very possible that real estate transfers are a reflection of the mortgage market, not vice versa—people may demand fewer homes because they have difficulty finding mortgages.

18. The survey method of analysis has also been tried (for instance, a study of redlining in Rochester, N.Y. by George Benston). Because this method has not been used widely and does not seem to improve upon the market models and applications analysis, we do not discuss it in the text.

19. Peter M. Hutchinson, James R. Ostas, J. David Reed, "A Survey and Comparison of Redlining Influences in Urban Mortgage Lending Markets," **AREUEA Journal**, 5, Winter 1977, pp. 463–472.

20. Harry W. Richardson and Peter Gordon, "Measuring Mortgage Deficiency and Its Determinants," **The Annals of Regional Science**, November 1979, 13:3, pp. 25–34; and Robert Schafer, **Mortgage Lending Decisions: Criteria and Constraints**, Cambridge, Mass. 1978.

21. See footnote 11.

22. Of course these studies assume that no pre-screening is taking place prior to the actual application process.

23. Robert Schafer and Helen Ladd, **Equal Credit Opportunity Accessibility to Mortgage Funds by Women and by Minorities**, Volume 1–3, U.S. Department of Housing and Urban Development, U.S. Government Printing Office, Washington, D.C., 1980.

24. In California, only state-chartered savings and loan associations were involved. In New York, data were obtained from savings and loan associations, commercial banks and mutual savings banks.

25. The Federal Reserve Bank does not require regular reports on this subject, but the other three agencies must collect such data on a regular basis as a result of a federal lawsuit.

26. A. Thomas King, "The Loan Application Register: A Tool for Examiners," **Federal Home Loan Bank Board Journal**, August 1980, pp. 8–13.

27. One exception was the higher rate of denials among Blacks and Hispanics. However, even if this conclusion is valid, it is a violation of the Equal Credit Opportunity Act rather than CRA, and hence is not addressed in this paper. Furthermore, we cannot say whether this finding is conclusive evidence of discrimination, since race could be correlated with certain risk factors not compensated for in the study.

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