

Information Dynamics and CRA Strategy

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Congress enacted the Community Reinvestment Act of 1977 (CRA) to combat redlining, whereby lenders allegedly curtail the supply of mortgage credit to particular neighborhoods, discounting the creditworthiness of the applicants because the neighborhood itself is considered undesirable. Under the CRA's provisions, bank regulators are required to use their supervisory authority to encourage *each* depository institution—including those in low- and moderate-income communities—to help meet its community's credit needs consistent with safe and sound lending practices.

Not surprisingly, many lenders have become more aggressive at marketing and selling mortgages in neighborhoods they had previously not penetrated very deeply. They are finding creative means of reaching potential customers, and are investing in education programs that should enable those customers to become more successful applicants and borrowers. Nevertheless, amid the positive stories emerging from lenders' increased attention to underserved markets, many people have expressed dissatisfaction with CRA's implementation. Public interest groups have complained that the evaluations rely too heavily on process and too little on outcomes; both they and lenders agree that enforcement standards are too vague.

One aspect of the CRA that has caused particular concern is the degree to which *each* lender in a community is expected

to serve *all* neighborhoods in its assessment area. This point has been contentious because regulators and public advocacy groups want to promote competition and service, while lenders want to avoid situations in which they cannot operate profitably.

Bank regulatory agencies revised the CRA in 1995 to address these and several related issues. The revised regulations appear to offer a wider scope for lenders to adapt their business practices to the realities of their assessment areas. In particular, as long as no unexplainable gaps or arbitrary exclusions appear, lenders should now have greater flexibility to meet their CRA obligations without lending directly to all portions of their communities.

In this *Economic Commentary*, we look at how the quantity and source of information flowing to lenders can affect their credit decisions. Based on our findings, we encourage lenders to take advantage of the CRA provisions that allow them to address their obligations through joint-lending programs and qualified investments.

Our recommendation stems from our own inquiries regarding how lenders learn about the neighborhoods they serve.¹ Does the very small number of mortgage applications from some low- and moderate-income communities provide lenders with adequate information for their credit decisions? If not, will

Evidence shows that by focusing on certain neighborhoods, lenders can sometimes exploit economies of scale in the collection of information. They can also find themselves at a disadvantage in areas where too many lenders are competing for a limited number of qualified mortgage applicants. Current CRA regulations provide greater scope for lenders to pool their resources (through community development banks, loan consortia, and other institutional arrangements) and to achieve the critical mass of applications necessary to exploit economies of scale.

lenders tend to reject applications for properties in these locations more often than applications from higher-income neighborhoods, where the lending market is more active? Must lenders be independently active within a neighborhood to find good loan prospects and to increase their understanding of property values, or can they obtain this information from the activity generated by other lenders? The answers have different implications for the efficient design and enforcement of CRA regulations.

Based on our research, we conclude that in many low- and moderate-income neighborhoods, demand is too low to allow more than a handful of lenders to learn enough about the area to operate profitably. Thus, we encourage lenders to experiment with different vehicles through which they can concentrate their community lending efforts. Current CRA regulations smooth the way for establishing community development banks, loan consortia, or other institutional arrangements whereby lenders can pool their resources to specialize in neighborhood lending. Our research indicates that such specialization could increase overall lending in targeted neighborhoods.

■ Information and Mortgage Lending

Property location clearly affects mortgage credit flows and approval rates. Lenders worry that houses located in neighborhoods containing dilapidated and vacant properties and having low rates of owner occupancy and property turnover expose their collateral to undue risk of price depreciation. Obviously, lenders have an incentive to acquire information about the neighborhoods in their service areas, just as they do regarding information about applicants' ability to repay their loans. Because information about applicants and neighborhoods is expensive to collect and process, lenders also face incentives to collect only the amount and type of information that leads to efficient lending decisions.

We recently examined how information about a neighborhood affects the level of lending activity in it. Our investigation concerns two aspects of the CRA debate. First, does the overall goal of increasing lending in low- and moderate-income neighborhoods improve the efficiency of the mortgage market, and second, does the requirement that *each individual lender* be active in these neighborhoods provide the most efficient means of increasing total lending? We find that the more applications a lender processes within a neighborhood, the lower is that lender's neighborhood denial rate.² When individual lenders take only a few applications from specific low-income and minority neighborhoods, they apparently do not acquire enough neighborhood-specific information to reduce their relatively high denial rates in those areas.

We also find that when the volume of applications in a neighborhood rises because of a larger number of lenders, denial rates do not fall. In fact, the presence of many lenders in a neighborhood is associated with an *increase* in denial rates, suggesting that excessive competition may hamper some lenders' efforts to reach a critical application mass.

■ Information as a Public Good

It is well known that lenders may incur a loss when borrowers default on a property that is overvalued, but do not share in the gains when a house is undervalued. Hence, greater uncertainty about home values induces lenders to deny more applications. Information about property values may be a public good: When one lender increases lending in a neighborhood, it generates information that is beneficial to all potential lenders there.³ For example, each transaction produces information on local home values that all lenders can use in their property appraisals. Thus, when information is a public good, appraisals become more precise as the total number of transactions increases. This reduces each lender's uncertainty about property values and may lower mortgage denial rates.

According to this view, all lenders can use information from one another's transactions in a neighborhood—an external effect.⁴ However, a (perhaps significant) part of the benefit from the transactions completed by any particular lender (including appraisals) accrues to other lenders in the area.⁵ Because individual lenders do not capture the full value of the information contained in their own transactions, they will spend less time and money collecting data on the neighborhood than they would otherwise. Hence, the number of loans made in neighborhoods with few loan applications will also be lower than otherwise. By encouraging lending activity in these neighborhoods, the CRA boosts efficiency in the lending market. Furthermore, it doesn't matter if all lenders increase lending or if just a few do, because the information generated by the transaction is available to all. Therefore, under the view of information as a public good, the CRA's requirement that all lenders be active in these neighborhoods could be an efficient means of boosting lending.

■ Information as a Private Good

Alternatively, the information generated by the transaction may be a private good, accruing only to the lender actually engaged in the transaction.⁶ As lenders increase their activity in a neighborhood, they gain information that they can use in processing subsequent applications for properties in the same area, lowering per-unit processing costs. If lenders cannot charge different prices in different neighborhoods, they will tend to reject more applications in neighborhoods where per-unit costs are higher (that is, areas from which they receive fewer applications) than in neighborhoods where they are more active.

This effect is internal to the lending firm: The per-unit cost of information falls as the number of applications processed by an individual lender rises.⁷ Thus, given a neighborhood's loan demand, per-unit costs will be lower when a smaller number of lenders are active there. Under this view, it is especially important that there be *fewer* lenders in a neighborhood with a low number of potential borrowers. This suggests that if CRA regulations

FIGURE 1: ACTUAL AND ADJUSTED DENIAL RATES BY MEDIAN FAMILY INCOME

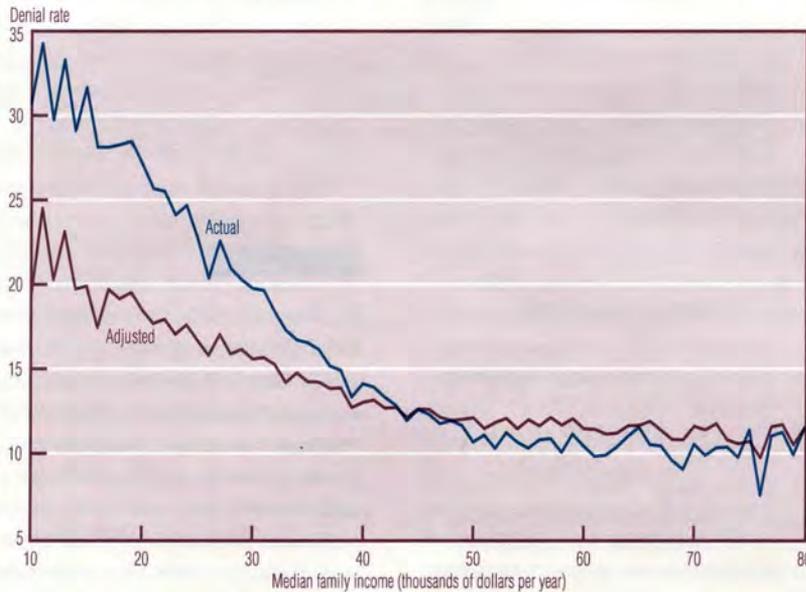
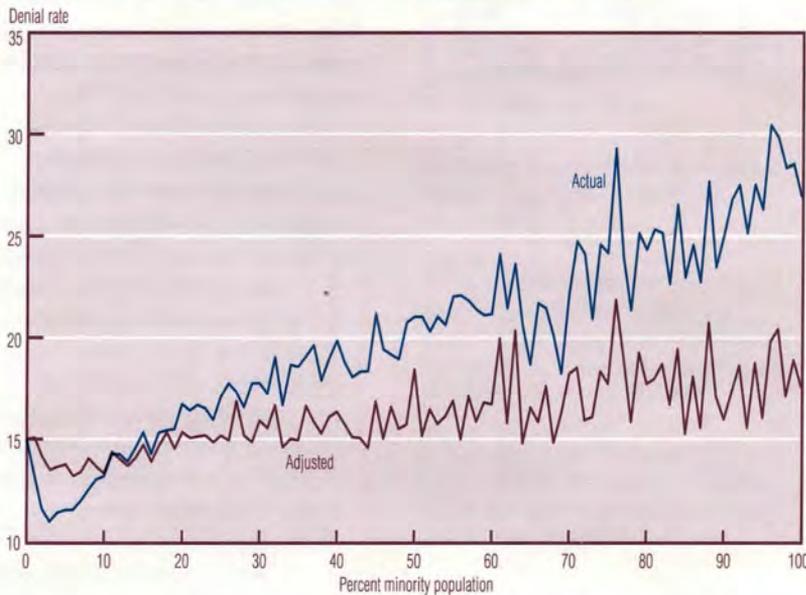


FIGURE 2: ACTUAL AND ADJUSTED DENIAL RATES BY PERCENT MINORITY POPULATION



SOURCE: Authors' calculations.

encourage all lenders to be active in *all* neighborhoods, they may *increase* the costs of lending in neighborhoods with thin loan demand.^{8,9}

■ The Evidence

We tested both of these perspectives on information's role using national home mortgage lending and neighborhood data.¹⁰ Lenders attract applicants

with different personal and financial characteristics, which in turn are related to their creditworthiness.¹¹ After adjusting for these characteristics, we constructed application denial rates for each lender and within each neighborhood in which the lender operates. This generated lender-neighborhood denial rates that vary for reasons other than applicant characteristics.

Figures 1 and 2 display the actual and adjusted denial rates arrayed by income and racial composition of the neighborhoods.¹² Note that the adjustment reduced the disparities in denial rates considerably, although differences remain: The gap between denial rates in the lowest- and highest-income neighborhoods fell from 19 percentage points before adjustment to 8 percentage points after, whereas the difference between the all-white and all-minority neighborhoods dropped from 12 to 3 percentage points.

■ The Impact of Applications Volume on Lending Efficiency

To examine the role played by the volume of applications taken by lenders in a neighborhood, we statistically tested for whether the lender-neighborhood denial rate is systematically related to the volume of applications received by a given lender in a particular neighborhood (to capture the internal effect), or to the volume of applications received by all lenders in that neighborhood (to capture the external effect).¹³

We found convincing support for the internal (private) information hypothesis: Holding all else constant, denial rates are significantly lower for lenders that process more applications from a neighborhood.¹⁴ The denial rate for a lender processing 30 or more applications is 3.1 percentage points lower, on average, than that of an otherwise identical lender processing fewer than three applications.¹⁵ Stated another way, the small scale of activity undertaken by certain lenders in specific low-income and minority neighborhoods apparently does contribute to the relatively high denial rates in these areas.

We did not find evidence supporting the external (public) information effect. On the contrary, increases in applications processed by other neighborhood lenders slightly raise the denial rate of a given lender, holding constant the number of applications processed by that lender.^{16, 17}

FIGURE 3: INTERNAL AND EXTERNAL EFFECTS ON DENIAL RATES BY MEDIAN FAMILY INCOME

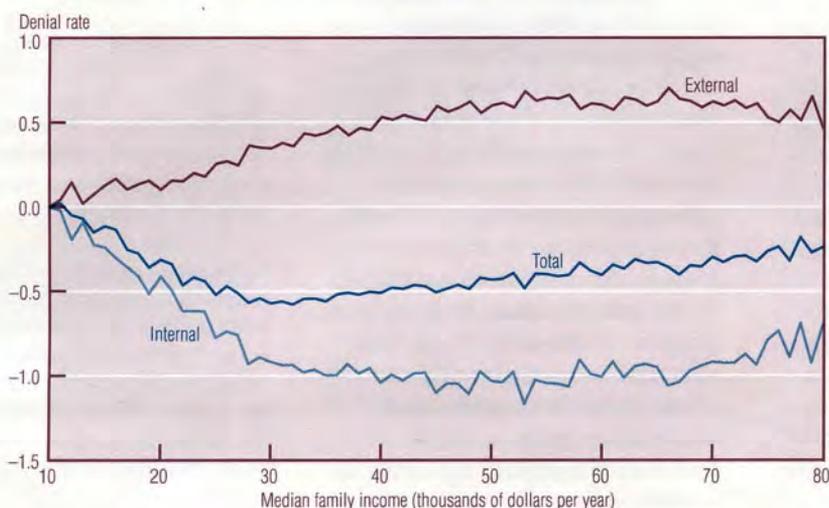
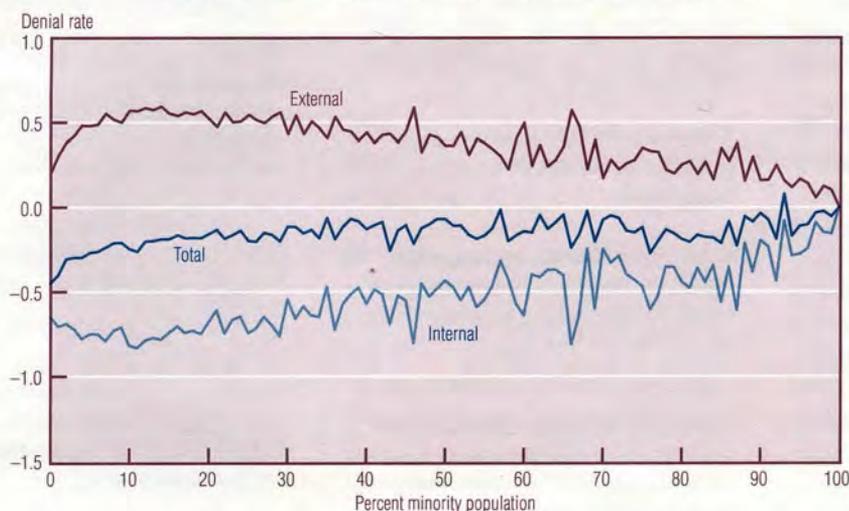


FIGURE 4: INTERNAL AND EXTERNAL EFFECTS ON DENIAL RATES BY PERCENT MINORITY POPULATION



SOURCE: Authors' calculations.

Finally, we investigated the practical significance of these information effects on neighborhoods with different income and racial compositions. To what extent do the internal and external effects, taken separately and jointly, explain the observed differences in denial rates across neighborhoods? We calculated the total internal effect for a neighborhood by adding up the separate internal

effects accruing to each lender accepting applications there.¹⁸ The external effect was obtained directly from the total number of applications taken within a neighborhood by all lenders.

Figure 3 plots the percentage-point differences in adjusted neighborhood denial rates arising from the sum of the internal effects of all lenders in the area

against neighborhood median family income.¹⁹ It also plots the percentage-point differences in adjusted denial rates attributable to the total number of neighborhood applications processed. The total effect is the sum of the external and internal information effects.²⁰

According to figure 3, the internal information effect becomes more powerful—that is, it leads to a lower adjusted denial rate—as median family income increases up to \$30,000, and is relatively constant beyond that amount. For example, figure 1 shows that adjusted denial rates drop from 19.3 percent in neighborhoods with a median family income of \$10,000 to about 15.6 percent in those with a median family income of \$30,000. About 1 percentage point of this 3.7-percentage-point decline is accounted for by the internal effect on lenders, because each of them processes more applications in the wealthier neighborhoods. Contrary to theoretical predictions, the external effect actually operates to increase denial rates slightly as median family income rises.

In figure 4, the external and internal information effects are arrayed by the percent minority population in the tract.²¹ While the percentage-point difference in adjusted denial rates between all-minority and all-white neighborhoods is 2.6—smaller than the gap for median family income (see figure 2)—the internal information effect becomes more powerful as the share of minorities in the neighborhood decreases (it accounts for 0.65 percent of the 2.6-percentage-point difference). Again, the external effect actually elevates denial rates as the percent minority population increases. However, because this effect tends to be less significant, neighborhoods with a smaller minority population exhibit lower denial rates on the strength of the internal effect.

■ Conclusion

The CRA was a response to concerns that certain neighborhoods, primarily low-income and minority areas, were being underserved by lenders. Our study is not designed to evaluate the effectiveness of the CRA as a whole. As we note in the introduction, the CRA has clearly focused attention on underserved markets and has most likely increased credit availability to many low- and moderate-income individuals. Rather, we have chosen to concentrate on a geographic aspect of CRA implementation. Before the Act was revised in 1995, enforcing agencies tended to take a strict view regarding each lender's obligation to be directly active in all portions of its assessment area. Our finding of economies of scale in neighborhood lending accruing to individual lenders suggests that this approach may not be in the best interest of the most underserved communities, where there are relatively few transactions.

Based strictly on the role of information and the costs of generating it, public policy would be improved by allowing individual lenders more scope to specialize so that they could achieve the critical mass of applications necessary to exploit economies of scale in neighborhood lending. However, when designing the compliance mechanism for CRA, regulators need to weigh the potential efficiency gains from having a few specialized lenders in an area against the potential losses if these lenders acquire and exploit monopoly power and limit the number of loans to the neighborhood. Our evidence about the size and significance of internal scale economies for individual lenders suggests that it may be worth considering alternative mechanisms that permit their operation.

Institutional arrangements that enable lenders to pool their resources are one such alternative to (or supplement of) direct lending in low- and moderate-income neighborhoods. Whether organized as a commercial bank, development corporation, or loan consortium, these institutions can operate in local areas to provide housing, consumer, and neighborhood development finance. By specializing in collecting and analyzing local market data, they might, in certain situations, stand a better chance of generating economies of scale than would direct financing by individual lenders. Since CRA regulations now accord lenders greater latitude to address their obligations through such activities, we encourage them to take advantage of these resource-pooling arrangements in their overall community lending strategies.²²

■ Footnotes

1. These results are based on a lengthier study of ours. See "Neighborhood Information and Home Mortgage Lending," Federal Reserve Bank of Cleveland, Working Paper No. 9620, December 1996.
2. This rate is defined as the percentage of rejected applications from a given neighborhood.
3. For a more thorough treatment of this hypothesis, see William W. Lang and Leonard I. Nakamura, "A Model of Redlining," *Journal of Urban Economics*, vol. 33, no. 2 (March 1993), pp. 223-34.
4. Generally, when a third party gains (or loses) as a result of a transaction between two parties, the benefit (or cost) accruing to the third party is called an externality.
5. The benefit is the useful information generated about home values and the applicant's creditworthiness.
6. This hypothesis is developed in William C. Gruben, Jonathan A. Neuberger, and Ronald H. Schmidt, "Imperfect Information and the Community Reinvestment Act," Federal Reserve Bank of San Francisco, *Economic Review*, Summer 1990, pp. 27-46.

7. In the language of economics, this is known as increasing returns to scale, an effect that is internal to the firm.

8. Limiting the number of lenders in an area may also reduce efficiency if these lenders are able to exploit monopoly power and limit the number of loans to the neighborhood. The potential gains in efficiency from having few lenders in an area must be weighed against this potential loss.

9. Empirical support exists for both (public and private) perspectives. See, for example, Paul S. Calem, "Mortgage Credit Availability in Low- and Moderate-Income Minority Neighborhoods: Are Information Externalities Critical?" *Journal of Real Estate Finance and Economics*, vol. 13, no. 1 (July 1996), pp. 71-89. Calem finds lower denial rates in communities with thicker markets, that is, more home sales. While this may be interpreted as evidence of information's external effects, it probably captures both the external and internal effects, since total home sales are likely to affect an individual lender's ability to exploit internal economies of scale, as well as the amount of information available to all lenders in the neighborhood.

10. The national home mortgage lending data used in our study were collected in 1990 and 1991 by lenders covered by the Home Mortgage Disclosure Act (HMDA), and data on neighborhood information were taken from the 1980 and 1990 decennial censuses. Our sample includes more than 12,000 lenders making nearly 2.5 million loans in about 36,000 separate census tracts in 1990 and 1991.

11. This finding is based on an earlier study of ours. See "Underserved Mortgage Markets: Evidence from HMDA Data," Federal Reserve Bank of Cleveland, Working Paper No. 9421, December 1994.

12. The figures are constructed so that the actual and adjusted denial rates are equal in neighborhoods with either a median family income of \$80,000 or more or a minority population of less than 1 percent.

13. We first adjusted for neighborhood-specific characteristics that may affect denial rates independently of the volume of applications received.

14. The effect of lender-specific applications volume in lowering denial rates is both statistically and economically significant.

15. In the sample, about 15 percent of all applications were denied.

16. These results suggest that increased activity by a lender imposes costs (negative externalities) on other lenders in the neighborhood.

17. It should be noted, however, that our analysis was conducted using a fairly narrow definition of *neighborhood* (neighborhoods are equated with census tracts). We did not test for information externalities at a broader market level.

18. When calculating the total internal effect for the neighborhood, each lender's internal effect is weighted by its share of total applications there.

19. Recall that earlier, denial rates were adjusted for applicant characteristics. Figure 3 shows the fraction of the adjusted denial rates accounted for by lender-specific application volume (the internal effect) and total neighborhood application volume (the external effect).

20. We constructed these measures to begin at zero for neighborhoods with a median family income of less than \$10,000.

21. In this case, we constructed the measure to have a value of zero in neighborhoods inhabited solely by minorities.

22. See Charles W. Calomiris, Charles M. Kahn, and Stanley D. Longhofer, "Housing-Finance Intervention and Private Incentives: Helping Minorities and the Poor," *Journal of Money, Credit, and Banking*, vol. 26, no. 3, part 2 (August 1994), pp. 634-74. The authors explain the value of joint-lending organizations as stemming from informational economies of scale. They also discuss appropriate incentive systems for the operation of these indirect lending organizations.

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