# Comments on "Race, Redlining, and Residential Mortgage Loan Performance"

DENNIS R. CAPOZZA
*Department of Finance, University of Michigan, 701 Tappan Street, Ann Arbor, MI 48109*

This provocative paper hypothesizes that "systematic racial discrimination owing to lender bias may result in lenders holding minority applicants or applicants from minority neighborhoods to loan qualification standards well in excess of those required by objective assessments of default risk. . . . This implies that discriminatory behavior may result in higher returns to home loans, as evidenced by lower default rates or smaller dollar losses, among minority borrowers or neighborhoods than those observed for other borrowers." The authors find that "the results are opposite to this prediction, and they are robust with respect to numerous stratifications of the sample, model specifications and methodology."

The paper is twice controversial: The topic of discrimination in mortgage lending is politically charged and the results are inconsistent with strongly held priors. The paper is twice puzzling: If discrimination is widespread in our culture, why is there no evidence of it in mortgage lending? If the one price law of markets holds, why is there strong evidence of reverse discrimination? I believe that to resolve these conundrums we must delve into the black box of mortgage credit scoring and explore optimal default decisions for mortgage loans.

Let's begin with the strongly held priors. As members of a modern multicultural society we have all learned from experience that prejudice, bias, and discrimination are endemic to our culture. We are all members of some minority whether it be based on race, religion, ethnicity, or gender. In a world where one-up/one-down is a favorite game for people to play, it is impossible not to be on the one-down side some of the time. Racial discrimination is easily practiced because the targets are readily identifiable. Therefore I start from the premise that we live in a society that practices discrimination, albeit less blatantly than in decades past. Why then is there no evidence of discrimination in this data set on mortgage lending practices?

For an economist, a second equally strongly held prior would ordinarily provide the answer. Mortgage lending is a highly competitive business with thousands of suppliers. Economic discrimination in competitive markets is impossible because even if some individuals are prejudiced; free entry and transactions costs place an upper bound on the ability of any one group to penalize another economically. If just one supplier of a product or service is not biased, all groups will receive the service for about the same price. Alternatively groups that are discriminated against can form their own cooperative or corporation to supply the service at competitive rates. But the results of this study are inconsistent with this prior as well. There is evidence of reverse discrimination and it is statistically significant.

## Mortgage Lending and Mortgage Default

Mortgage lending practices and mortgage default are linked by the black box credit-scoring system that lenders have developed. The credit scoring system that lenders use focuses on some standard features like debt service and loan-to-value ratios but may include some features unique to a given lender. Mortgage securitization and mortgage insurance have tended to increase standardization of lending practices. The underwriting standards have evolved from past experience and predict default reasonably well, but they are not infallible. In addition some causes of default are not readily predictable from the array of borrower and property characteristics lenders typically have access to. The result is that there are systematic patterns to loan defaults. For example, this study and several others have found that loans to families with more dependents have higher default rates.

## Optimal Default

Modern mortgage finance has shown that the decision to default is a decision to exercise a put option where the exercise price is the outstanding balance of the loan. The decision must consider possible future outcomes of the stochastic process for interest rates and for house prices. It is now widely recognized among researchers that the most important variable is the current loan-to-value ratio (not the LTV at origination) and that optimal exercise does not occur as soon as the house price falls below the outstanding balance. This arises from the multiperiod nature of the decision. It may be better to default next period when house prices are even lower (Kau and Kim, 1994).

What is less well understood is that in some situations optimal multiperiod default is not possible and the borrower must make a one-period decision. The optimal one-period default decision is much simpler than the multiperiod decision and involves defaulting if the recovery value of the property is less than the outstanding balance of the loan. Why do borrowers make one-period decisions? The industry refers to these situations as *trigger* events. Common trigger events are divorce and unemployment, but medical emergencies may play a role as well. Analysis of loan defaults by metro area (Thomson, 1994) confirms that trigger events are a significant determinant of default. An important aspect of trigger events is that they are not easily predicted from the information available at loan origination in standard credit scoring.

Another overlooked aspect of the mortgage default decision is that exercise of a put is more likely on a security with a high dividend rate. This follows because the flip side of a high dividend rate is a low expected appreciation rate. Therefore rent-to-price ratios play a role in determining default probabilities as confirmed by Thomson (1994). I know of no lender that tries to model this aspect of mortgage default.

## The Racial Component in Default

We may now be able to resolve the conundrum. Suppose there is racial discrimination; however, in the competitive mortgage markets discrimination cannot be sustained. Instead

discrimination appears through restrictions on the locational and employment choices of blacks. Many blacks live in older central city housing where rent/price ratios are high and expected appreciation rates are low. If lenders fail to adjust for the low expected appreciation—and indeed they may be legally prohibited from doing so—then loans in those high rent/price areas where blacks are overrepresented will default more often.

Similarly we know that the duration and incidence of unemployment are higher for blacks than for other groups. Unemployment is a trigger event that can convert the multiperiod decision into a one-period decision. The higher incidence of trigger events among blacks implies they will default more often.

## The Econometrics

The intuitive argument above also has an econometric component. The data in the sample are censored data—censored by the credit-scoring system used by lenders. The assumption of the analysis of the paper is that the filter operates equally effectively on all subgroups. If this is not the case, as argued above, then the function that converts the credit score into a default probability $D(C)$, must be specific to each subgroup, and the statistical argument in equations 1–6 no longer holds.

The typical credit-scoring system is not able to screen based on expected appreciation and expected unemployment. It is as if we designed a mesh to filter stones of only a certain size or less, but the mesh is imperfect and lets some larger stones through. The imperfections in the mesh admit large stones of a specific kind.

## Specifics

In the reporting of the logit results there is no measure of goodness of fit, and the relative importance of the independent variables is not indicated. In most default regressions LTV and age of the loans dominate all other variables. Staged addition of blocks of related variables also helps the reader gain insight into the importance of different factors.

The analysis includes dummy variables for the 50 states. Inclusion of a larger number of location dummies may be causing some loss of efficiency. If the dummies are there to control for differing state foreclosure laws, it would be more parsimonious to simply construct variables for judicial states and one-remedy states.

The explanatory variables are all drawn from the origination of the loan. Default is a result of adverse realization. Some definition of current variables, e.g., current LTV, may improve the results.

It should also be noted that the sample is primarily loans with LTV over 95%. These borrowers are the most fragile borrowers. In a sense almost the entire sample is "marginal." Therefore this is an excellent sample for the test the authors have done.

## Conclusion

This is a thought-provoking paper that reaffirms the merits of competitive markets. The mortgage market is a competitive market in which it is difficult to argue that an applicant who is rejected by one lender because of racial discrimination cannot eventually be accepted by another lender. It should not be interpreted, however, as providing evidence that racial discrimination does not exist. Indeed one interpretation would argue that the results arise from discrimination elsewhere in the socioeconomic structure of the country.

The authors have provided solid scientific evidence on a politically charged issue. This study should help to allay the concerns that lenders are not fully discharging their social responsibilities.

## References

Kau, J. and T. Kim, "Waiting to Default," forthcoming, *Journal of the American Real Estate and Urban Economics Association*, 22(3), 1994.

Thomson, T. "A Regional Analysis of Loan Default," paper presented at the ASSA meetings, Boston, MA, 1994.