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Credit Scoring Overview

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Credit scoring is an underwriting tool used to evaluate the creditworthiness of prospective borrowers. Utilized for several decades to underwrite certain forms of consumer credit, scoring has come into common use in the mortgage lending industry only within the last ten years. Scoring brings a high level of efficiency to the underwriting process, but it also has raised concerns about fair lending with regard to historically underserved populations.

In order to explore the potential impact of credit scoring on mortgage applicants, the Federal Reserve System's Mortgage Credit Partnership Credit Scoring Committee has produced a five-installment series. This first installment provides a context for the subsequent installments. An important goal of this series is to provide the industry and concerned groups and individuals the opportunity to comment on issues surrounding credit scoring.

This installment incorporates statements requested from the following organizations, selected because of their interest in and differing perspectives on credit scoring and fair lending:

Freddie Mac
A stockholder-owned corporation chartered by Congress to create a continuous flow of funds to mortgage lenders in support of homeownership and rental housing. It serves as a secondary market for mortgage loans by

purchasing mortgages from lenders across the country and packing them into securities that can be sold to investors.

Fair, Isaac and Company, Inc.
Originally an operations research consulting firm, Fair, Isaac and Company, Inc. introduced the use of credit scoring for risk management in the financial services industry. They apply statistical decision theory to business decisions through the development of predictive and decision models.

American Bankers Association
Based in Washington, D.C., the American Bankers Association (ABA) represents banks of all sizes on issues of national importance for financial institutions. The ABA's mission is to serve its member banks and enhance their role as pre-eminent providers of financial services.

Calvin Bradford and Associates
Calvin Bradford has been a fair lending, fair housing and community reinvestment consultant for over 25 years. His firm engages in research, training, program development and evaluation, and expert witness work for government, private industry, public interest and community-based clients. Representatives from each of these organizations received a request to comment on the following statement:

A variety of research studies, emanating from the Federal Reserve System, other regulatory and government institutions, and private research organizations, have suggested unexplained variances in mortgage acceptance rates and pricing between majority and minority mortgage applicants. Though not uniformly the focus of these studies, credit scoring is now a commonly used tool in the mortgage underwriting process. Credit-scoring advocates maintain that as an underwriting tool, credit scoring has allowed the underwriting function to be streamlined for highly creditworthy applicants, allowing human underwriters to allot more time to applications

where credit issues are present, and has reduced overall costs of underwriting. Detractors claim that factors considered within statistical credit-scoring models, even if not intended, favor majority applicants and create a new barrier to homeownership for minority mortgage applicants. Please describe, from your perspective, fair lending issues that might arise as a result of the use of credit-scoring technology in the mortgage underwriting process and what your organization does to address these issues.

Statement of Ellen P. Roche
Director of Corporate Relations
Freddie Mac

An increasing number of consumers have benefited from the speed, accuracy, and fair treatment provided by the use of credit scoring and automated underwriting over the last several years. In addition to summarizing these benefits, we describe how automated underwriting and credit scoring benefit the consumer during the mortgage application process. American families now enjoy more choice and opportunity in the mortgage market than ever. Home-buying families can choose a mortgage product that meets their specific financing needs and they can do so by telephone, on the Internet, or in a face-to-face transaction. Loan approval procedures, which once took many weeks, now take days. The once time-consuming credit review process now takes place in minutes, thanks to technologies that have automated the underwriting process.

Manual underwriting characterized the mortgage market before the 1990s. This slow process provided only a limited ability to analyze multiple risk factors and sift through layered risks. Without the ability to precisely measure distinctions in risk with speed and accuracy, lenders and investors developed guidelines that broadly defined creditworthiness. For decades

these guidelines served well the vast majority of mortgage borrowers in what came to be known as the prime market.

Over the years, easier access to credit and a rising bankruptcy rate meant that an increasing number of borrowers with blemished credit histories fell outside the mainstream that the industry's typical guidelines were able to address. Some did not get mortgages. Some resorted to the subprime market. In either case, potential borrowers could not take advantage of the efficiencies available in the prime sector.

Now, powerful tools are fundamentally changing the market's ability to assess and manage credit risk. Automated underwriting now makes it possible to extend the efficiency of the prime market to those who have until now been beyond its reach.

Instantaneous and Accurate Risk Assessment

Automated underwriting is one of the keys to opening new doors of opportunity, because it allows for the instantaneous and accurate assessment of a multitude of risk factors. Freddie Mac has led the development of this critical tool, by introducing the state-of-the-art automated underwriting service, Loan Prospectorâ (LP), in 1995.

The predictive power of automated underwriting helps lenders and borrowers alike. It gives lenders the tools they need to make more mortgages and reach out to new borrowers. It gives consumers confidence that mortgages are evaluated the same way, every time, for every borrower, encouraging more borrowers to enter the housing finance system.

Automated Underwriting Revealed

Automated underwriting is necessary to provide a full picture of mortgage eligibility. Automated underwriting is faster and fairer than manual underwriting and provides a more precise evaluation of risk. Credit is a very

important part-but just a part-of the evaluation process. Credit scoring is the fastest and fairest way to evaluate credit. It has been proved predictive for all population groups. Credit scores evaluate previous credit performance, the current level of indebtedness, the length of credit history, the types of credit in use, and the pursuit of new credit.

Automated underwriting benefits consumers when applying for a mortgage in several different ways.

Access to the System: Consumers should not be rejected during a quick preapplication screening. Lenders should conduct a full analysis of their homeownership potential. Freddie Mac discourages lenders from using credit scores as a screening device because it does not provide a full picture of the borrower's ability to pay a mortgage. LP considers credit, collateral, and capacity but does not consider race, age, or marital status, and thus, it can provide a fair and thorough evaluation of the mortgage in a few minutes.

The proof of any underwriting system lies in its ability to assess risk-and LP has proved to be highly predictive of default for borrowers from all racial and ethnic groups and all types of neighborhoods. Whether a borrower is African-American, Hispanic or white, loans in the lowest-risk groups performed significantly better over time than those in higher-risk groups. Because it is blind to an applicant's race and ethnicity, LP promotes fair and consistent mortgage lending decisions. Moreover, LP predicts well across income groups and neighborhoods as well. Automated underwriting reduces the need to prescreen mortgage applicants.

Objective Sources of Information: Consumers should have access to credit counseling to help them understand the risks and rewards of homeownership and to assist them in getting their mortgage application approved. Freddie Mac supports AHECI, NAACP, and the national Urban League as well as other organizations that provide homeownership and financial literacy counseling.

Consumers can request their credit reports before applying for a mortgage to check the accuracy of their credit information. Consumers have the right to correct the credit information LP uses in evaluating credit history.

Full and Fair Information: Interest rate, payment amount, adjustable rates, late fees, and prepayment penalties need to be explained and understood. Freddie Mac requires lenders to follow fair-credit and fair-lending laws and also requires lenders to report when borrowers do pay their bills on time, so borrowers can get credit for a job well done.

Fair Lending Practices: If borrowers are eligible for "A" mortgages, lenders should charge "A" mortgage rates. Freddie Mac's LP provides the lender with the lowest-risk mortgage rate regardless of the lender' classification of the mortgage.

Explanation for Mortgage Denial: Lenders should provide borrowers with information that can guide them to improve their chances for acceptance. LP does not deny a mortgage application. On higher-risk loans, LP requests additional support documentation and requires the lender to share some of the higher risk. Alternatively, LP offers to purchase the loan with additional fees to compensate for the additional risk. In any case, LP provides the lenders with feedback to guide them in improving their application. For example:

- If tax returns are used to document source of income or to verify income, obtain signed IRS form from borrower;
  or
- Use stated income for qualification and obtain most recent year-to-date paystub to verify employment for borrower.

In addition Fair, Isaac scoring products also provide up to four reason codes, in order of importance, that indicate why a score is not higher. For example,

"derogatory public record or collection filed," or "amount owed on accounts is too high."

While the techniques for evaluating risk have advanced, the general rules for improving your credit and your ability to obtain a mortgage remain the same:

- Pay your bills on time;
- Keep your credit card balances low; and
- Make sure your credit records are accurate.

Using credit scoring as part of automated underwriting helps more borrowers get mortgages because of the speed, accuracy, and fair treatment inherent in these tools. If the alternative is manual underwriting, there is no comparison.

Statement of Paul Smith
Senior Counsel
The American Bankers Association

Actually, our bankers tell us that credit scoring, in fact, gives greater access to mortgage credit rather than creating new barriers for minority mortgage applicants. The use of credit-scoring models to better predict whether an applicant might default allows the lender more flexibility in making traditional home loans. During the last 10 years, the banking industry has greatly expanded its efforts to make credit available to less qualified applicants. For example, the housing mortgage secondary market agencies, Fannie Mae and Freddie Mac, have broadened their underwriting criteria to accept alternatives to the traditional qualifications. Banks have started lower interest-rate or no-fee affordable housing programs, created first-time homebuyer programs in which borrower training replaces some of the

missing qualifications of the borrower, and expanded the list of qualifications for potential borrowers.

Many bankers also have said that credit-scoring models have been crucial in permitting banks to approve more borrowers' applications than traditional underwriting criteria would have. All of them said that today they make home loans with the use of credit-scoring systems that they could not have made or sold to the secondary mortgage market in the past. None of the bankers consulted for this comment reported that they used a credit-scoring system exclusively, but rather, as part of the overall mortgage underwriting process. In a home mortgage loan, the property's appraised value, the loan-to-value ratio, the available resources for closing costs and down payment, the applicant's disposable income, and other underwriting standards all must be factored into the credit decision. Nonetheless, use of a credit scoring system in the mortgage process is increasing-not only because of the customers' demand for faster underwriting decisions but also because of bankers' interest in expanding credit availability. For example, a higher-than-required credit score might allow the bank to accept a higher loan-to-value ratio than its general lending policy permits. This would permit the applicant to make a lower down payment, and thus, make up for having fewer financial resources than the traditional applicant. This kind of increased flexibility in underwriting by bankers and the secondary market agencies has led to a significant expansion in the access to mortgage credit during the 1990s.

Bank compliance officers also have said that the use of a validated credit-scoring system by the bank reduces the subjectivity of the final credit decision and allows compliance officers to better monitor fair-lending compliance. One example of that is described in the 1999 settlement between the Department of Justice and Deposit Guaranty Bank (www.usdoj.gov/crt/housing/caselist.htm#lending). Although the bank was said to be using credit scoring, the crux of the case was that lending officers

were allowed to freely override the credit score, that is, either granting a loan that should not have been granted according to the score (a low-side override) or not granting a loan that should have been granted according to the score (a high-side override). Thus, the fair-lending violations were not in the credit-scoring model but in the ignoring of the credit scoring as a factor in the lending decision. The settlement also describes in detail how the successor bank to Deposit Guaranty ensures fair-lending compliance through several mechanisms, including using a credit-scoring system. Key to that bank's program (and many other banks' programs) is the use of credit scoring to ensure standard treatment of applicants, the limitation of authority to override credit scores, and reviews of any such overrides as well as reviews of many of the denied applications-to determine if the bank has an alternative loan product or program for which the applicant could be qualified.

Besides these and many other steps by banks to ensure fair lending and fair use of credit scores, the bank regulatory agencies have detailed fair lending examination procedures that require bankers and examiners to review credit-scoring models for validity and fairness. These examination procedures are available for review by the public at www.ffiec.gov/fairlend.pdf with the Appendix on Credit Scoring Analysis at www.ffiec.gov/fairappx.pdf. All of these steps and others have been taken to address issues of the fairness of credit scoring and to enlarge the access to mortgage credit for low- and moderate-income individuals. And, we believe that these steps have succeeded.

Statement of Calvin Bradford
President
Calvin Bradford and Associates, Ltd.

The wide-scale use of credit scoring represents a significant efficiency in the competitive world of mortgage finance. Both the Federal Reserve, by its

regulations, and lenders who use credit scoring refer to it as an objective process as opposed to judgmental systems. The largest purveyor of credit scores, Fair, Isaac and Company, has continually maintained that its scores could not be discriminatory because they do not contain race as an explicit variable. All of these statements appear to support a confidence in the fairness and equality in the use of credit scoring that is, in fact, unwarranted.

Credit scoring has not been intentionally discriminatory in its typical uses. Nonetheless, regulators, researchers, and the developers of credit-scoring systems have all recognized that, on average, minorities have lower credit scores than majority populations. Therefore, the use of credit-scoring systems will frequently have an overall discriminatory effect. Such an effect, however, is not illegal if it is based on an overriding business necessity and if there is no less discriminatory way to achieve the underwriting goal.
With the understanding that all credit-scoring systems need to be calibrated to the particular population of each individual lender and re-evaluated periodically, I offer several representative examples of fair-lending issues.

Most Rejected Applicants Are Not Expected to Default
Consider the example, which I have made extreme for the sake of clarity, of a lender who finds that 100 percent of the loans predicted to go into default under its scoring system fall below the score of 620. This lender would assume that using this scoring model is a great business benefit because he could be reasonably confident that the system would exclude all borrowers who might default. Therefore, let us assume that the lender rejects, or "cuts off," all applicants with scores under 620.

A scoring system is able to predict, for any cutoff score, the percentage of applicants at or below that score who are likely to go into default (the odds of defaulting), but it is not able to precisely identify which specific individuals will default. While 100 percent of those predicted to default may have scores

under 620, there also are many other applicants with scores under 620 as well. Indeed, in our example and in reality, whenever a lender chooses a particular cutoff score, most of the applicants with scores below the cutoff are, in fact, not predicted to default. In fact, in our example, it is fair to assume that the odds of any particular applicant with a score below 620 defaulting might be only 10 percent. That is, 90 percent of those with scores below 620 would not be predicted to default.

Credit-Scoring Systems Disproportionately Reject Minority Applicants

Most lenders and secondary investors, as well as those who develop and market scoring systems, agree that, overall, minorities do have lower credit scores than whites. Suppose that all minority applicants in a given market, but only some whites, have scores that fall below 620. Obviously, all minority applicants would be excluded by a 620 cutoff. The lender, however, would argue that this clearly disproportionate impact on minorities is not unlawfully discriminatory because it is a justifiable business necessity.

To clarify further, let us suppose that 3 percent of all people with any score will default. Out of 100,000 applicants, this would be 3,000 applicants. Now suppose that, of those 100,000 applicants, 30,000 had scores under 620. If our system predicts that 10 percent of all applicants under 620 will default, then these 30,000 applicants would include the 3,000 who will default, as well as 27,000 others who will not.

In our example, if the entire population of applicants included 10,000 minorities, all 10,000 would have scores under 620. There also would be 90,000 whites in the population. Of these, 20,000 would have scores under 620, making up the total of 30,000 applicants with these scores that we have specified in our example. There also would be 70,000 whites with scores at or above 620. If the 3,000 borrowers who will default were spread proportionately between whites and minorities in the group with scores

under 620, then 2,000 whites (10 percent) and 1,000 minorities (10 percent) would be predicted to default. There would also be 18,000 whites and 9,000 minorities with scores under 620 who would not be predicted to default.

In this case, 90 percent of all minorities would be rejected even though the scoring system predicted that they would not default. But, of the total of 90,000 whites, only 18,000 with scores under 620 will be rejected, even though the model predicts that they will not default. The disparate impact is clear. If all applicants under 620 are rejected, 90 percent of the minority population, but only 20 percent of the white population, will be rejected when the model predicts that they will not default on their loans.

TABLE I: *Summary of Calvin Bradford's Example*

	Total Borrowers	Rejects (scores <620)	10% Will Default
Whites	90,000	20,000	2,000
Minorities	10,000	10,000	1,000
	90% Not Default	**% Rejected Based on Score but Not Default**	
Whites	18,000	20%	
Minorities	9,000	90%	

Obviously this is an extreme example, but in reality, the difference is only one of degree. If the Equal Credit Opportunity Act regulations permit using a credit-scoring system-if it is statistically reliable, but prohibit a discriminatory impact, absent a clear business necessity-then where should the "necessity" threshold be set? In other words, what level of differential impact of rejected good minority applicants to rejected good white applicants is acceptable and what level crosses over into discrimination? Would it be acceptable in our example to reject all applicants with a score below 620 because of the ability to weed out all applicants expected to default, even if 90 percent of the rejected minorities would not be expected to default? Or,

on the other hand, do we decide that unless a credit score can achieve a less discriminatory impact, it has not achieved enough validity to be accepted? Should we, for example, disallow systems having a discriminatory impact unless they at least predicted that more than 50 percent of those with scores below the cutoff would be likely to default? At present, in the real world of credit scoring, the cutoffs used in prime lending are nowhere near that level of separation; they are much closer to the 90 percent rejection of predictably good loans used in our example.

Current Systems Measure Default in Discriminatory Ways

Credit systems actually are based on the prediction of early default, not lifetime default. While early default is important, it generally does not explain most of the loans that go into default over the life of the loan because most defaults and foreclosures take place several years into the loan, not during the first 6 to 18 months. Therefore, not only do the present scoring systems have a discriminatory effect, but they are based on a default of only a few months against loans that typically last for several years-and that last even longer for minorities who buy, sell, and refinance less often than whites.

As a measure of early default, credit scores do not incorporate many of the factors that research suggests cause most defaults: job loss, temporary or long-term unemployment, divorce, and so on. Because these factors are rarely part of credit bureau databases used in scoring models, such factors are not part of the scoring process. Of course, these events and factors often are not items that could be used in a score at the time of application because they are events and activities that have not yet happened. The result is that the scoring models actually are not predicting default altogether, but only that part of default that can be related to data stored in credit bureaus, and then only inasmuch as the defaults show up very early in the life of the loan.

Many "Predictive" Factors Used in Systems May Have No Causal Connection with Default

In social science research, the critical issue of the explanatory power of statistical models relates to the linkage between correlation and causation. Credit-score developers try to squeeze all the correlation they can out of the limited set of factors stored at credit bureaus. In a general sense, they may seem to match correlation with causation, such as in the apparent logic between linking future credit performance to past performance. Still, many correlations raise serious questions of causal relationships. For example, where there is a correlation between the number of inquiries and later default-for some applicants-this may reflect attempts by a person with poor credit habits searching for an acceptance. For others, numerous inquiries may represent the impact of discrimination that forces borrowers to contact more lenders in search of a fair loan.

In one historical file, I saw an applicant with a low score where the main factor was listed as too many open lines of credit. After the person had consolidated his debts, credit bureaus continued to generate low scores on the basis that he now had too few credit lines. Although debt consolidation often is recommended by credit counselors, the result in this case was lower scores, even though this applicant had never had a delinquent account. Credit-scoring companies, lenders, and investors often respond to such examples by insisting that their models are complex and not subject to simple understanding. We need to ask, however, as a matter of policy, whether-if we accept a scoring system because of its claimed statistical reliability-are we really accepting correlation without requiring a sound basis for causation? Why should we accept a process with a clearly discriminatory effect when it fails to meet the social science test of having a demonstrable linkage to causation?

Scoring Models Based on Non-Mortgage Credit Are Not Likely to Predict Mortgagor Behavior as Well

Most credit-scoring models are not geared to mortgage loans but to all credit. Minorities stay in their homes longer than whites. Many lenders, counselors, and other players in the home sales market have perceived that a home is treated differently by many moderate-income and lower?income buyers-who also are disproportionately minority-than by higher-income buyers. The home is more than a commodity that can be replaced, for these buyers. More sacrifice may be made to keep the home than to protect other forms of credit from default. This is an example of just one aspect of lending that may separate the treatment of home-loan credit from other forms of credit that minorities use. Credit scoring used in mortgage loans needs to be based on mortgage loans, and perhaps even loans for the same type of mortgage product, in order to develop patterns that truly reflect mortgage risk.

Credit Scoring Ignores Change in Borrower Behavior

Scoring systems do not account for the ability of interventions to change behavior. For example, many lenders and special loan programs have discovered that pre-purchase counseling (when done well) and post?default counseling or interventions (when done rapidly at the point of first delinquency) can substantially reduce the likelihood of default or the likelihood that a default will result in foreclosure. Since these types of programs have been targeted disproportionately to minorities (usually either by the effect of geographic area or income targets), the failure to account for this ability to change predicted behavior results in credit scores imposing a discriminatory effect even though less discriminatory alternatives exist. This undermines the business necessity argument for the use of credit scores in an environment where they have a discriminatory effect.

Industry Claims That Scoring Frees Time to Spend on Applicants with Problems Are Unrealistic

The speed and economy of using credit scores allegedly frees up lenders to spend more time with those whose credit histories need more work. But, in a

market of extreme competition and with a growing range of products for all credit scores, lenders are less likely to use the system to devote real time to problem scores than they are to simply divert those with low scores to higher-cost loan programs. They are, for example, not as likely as in the past to review the accuracy and basis of credit issues or even to ask borrowers to verify that derogatory information in their accounts are, indeed, the applicant's accounts and that they are correct. Lenders also are not as likely-as with non?scoring underwriting-to ask for explanations of credit issues. Therefore, credit blemishes that previously were considered acceptable because they were not the fault of the borrower or were considered temporary-such as a death in the family, medical bills, or temporary unemployment-may now simply be counted against the borrower just as a voluntary disregard for credit would tarnish the borrower's credit history. We know from socioeconomic studies and health studies, for example, that minorities suffer loss of job and serious medical bills more often than the majority population.

Correcting bad information can be hard and time-consuming. The lender also may be concerned that the investor purchasing the loan will not have access to the corrected information or may secure a score from another credit bureau that does not contain the corrected information. Therefore, in a random quality control audit or in a review if the loan goes into default, the lender may face negative ratings or even the requirement to repurchase the loan. Because derogatory credit ratings happen most often with minority loan applications, the lender may want to find ways to respond to the application that avoid having to verify and correct bad credit. This may lead to rejecting the loan or to encouraging the applicant to withdraw the loan at the earliest time during the application process. Alternatively, when faced with low credit scores, a lender may introduce a judgmental system of overrides, which can introduce discrimination into the system.

Rather than reject a loan with credit issues, a lender may steer the borrower away from prime conventional products toward FHA or subprime products, rather than try to deal with investigating a low credit score or correcting bad information. This would have the effect of imposing higher rates or more onerous terms on the borrower, or it could contribute to concentrations of FHA loans in minority areas-which have historically been shown to have an adverse effect on both the borrowers and the community. Recent studies indicate a similar concentration of subprime lending in minority communities, with similar adverse impacts.

These are some examples of how credit scores, both directly and indirectly, may have a discriminatory impact or may lead to differential treatment. The potential for discrimination and liability should not be ignored, either as an internal part of the scoring system or in the manner in which it is applied.

Ellen Roche

Response to Statement of Calvin Bradford

In his essay, Calvin Bradford poses an important question when he asks where the line should be drawn between approval and rejection. However, we must be careful not to oversimplify our consideration of this important issue.

Credit scores represent a leap forward in efficiency and access to the mortgage market compared to manual or judgmental underwriting. We should not be satisfied with our current achievements and should continue to work toward increasing the speed and fairness. However, in our efforts to critique the current arrangements, we should consider the alternatives. If we set an arbitrary standard for scoring systems, lenders might be forced to return to manual underwriting-a slower and more subjective approach to underwriting. We want to move forward and improve the current systems.

Fortunately, scoring systems will improve over time, because competition will drive lenders and investors to develop more accurate risk assessments.

Statement of Peter L. McCorkell
Executive Vice President & General Counsel
Fair, Isaac and Company, Inc.

During the 1970s and 1980s, credit scoring and automated underwriting became widely accepted for most forms of consumer lending, other than mortgages. Mortgage lenders began using credit scoring much later, starting around 1995. Lenders have widely accepted scoring technology because it allows for expanded lending while maintaining or even reducing loss rates. During the years that credit-scoring technology was being developed, there were few, if any, serious concerns on the part of regulators or consumer activists that scoring might somehow restrict access to credit for any significant subset of the population. However, during the past four or five years, such concerns have been raised more and more frequently.

Consumer and Regulatory Concerns
Most regulators and consumer activists accept the claims of lenders and scoring-system developers that credit scoring provides an effective and cost-efficient decision tool for the general population of borrowers. But, when it comes to traditionally underserved segments of the population, they may become very skeptical. Most of these concerns can be grouped into a few broad categories:

How can a statistically based system deal with segments of the population that are unrepresented or underrepresented in the historical data?
This is a reasonable question, but it is premised on a hidden assumption. The assumption is that when underrepresented groups seek mainstream credit, the factors that predict good and bad performance will be different for them than what has proved predictive for past borrowers. Clearly, there are

some differences in what is predictive for various subpopulations. However, more than 40 years of experience in developing credit-scoring systems for lenders in 60 countries have demonstrated that the similarities in what is predictive of credit performance outweigh the differences. The same question can be applied to individual applicants: "If an applicant has little or no mainstream credit history, how can a scoring system evaluate such an applicant?" Again, the question has a hidden premise that satisfactory performance with nontraditional obligations will predict satisfactory performance with traditional credit obligations. Since there is little, if any, systematic collection of nontraditional credit histories, no one really knows whether that premise is correct.

Credit-bureau-based scoring systems require a minimum amount of reported credit history in order to produce a score. An "unable to score" code should trigger a judgmental evaluation, but that may not always happen. Bureau scoring systems also may employ separate scorecards for "thin file" populations, and special application scorecards have been developed for "no hit" populations¾those with no credit bureau history.

Don't inaccuracies in credit bureau data result in inaccurate scores?

Of course inaccurate data will cause inaccurate scores, but inaccurate data also affect judgmental credit decisions. However, the current use of scoring in mortgage lending does produce some real differences. For example, prior to the use of credit scores in mortgage origination, when an applicant disputed information in the credit report the underwriter could choose to disregard that information. Alternatively, the provider of the merged credit report usually used in mortgage lending might have been willing to change the data in that report, even though the credit repositories had not made a corresponding change.

Now that the credit-bureau-based score is the primary tool for evaluating the credit history of mortgage applicants, the score will not change unless and until the data in the underlying repository report are changed. The

major secondary market lenders¾principally Fannie Mae and Freddie Mac¾as well as scoring developers have advised originators that they can and should ignore scores based on inaccurate data. However, some underwriters may not make the effort needed to document such cases to satisfy a potential investor.

Aren't there inequities in overrides, quality of assistance, and so on?
Even in a situation where a scoring system encompasses substantially all of the available information and can account for most of the final decisions, there is still room for human intervention. An override occurs when the final decision is contrary to that indicated by the scoring system. Scoring developers would argue that overrides are not a scoring problem but rather a problem caused by ignoring the scoring system. The September 1999 complaint and consent decree by the U.S. Department of Justice against Deposit Guaranty National Bank supports the argument of scoring developers that overrides¾that is judgmental decisions¾may be more vulnerable to discrimination claims than decisions that follow the scoring system.

Similarly, there have been many claims that the "quality of assistance" offered to minority borrowers is systematically inferior to the assistance offered to white borrowers. While substantively that issue is no different in a scored environment than in a judgmental environment, the scoring system nevertheless may be perceived as the culprit by rejected minority borrowers.

Don't scoring systems reject many applicants who would have performed well and accept many who go delinquent?
The short answer to the question is, "Yes." But the question should be whether credit scoring or human judgment does a better job of accepting "good" borrowers and turning away those who would, if accepted, eventually perform badly. Here the evidence is clear: The use of scoring consistently produces 20 to 30 percent improvements¾either in reduced delinquency

rates or increased acceptance rates¾compared with judgmental evaluation. In addition, the available data suggest that similar or even greater improvements can be obtained by applying scoring to traditionally underserved segments of the population.

Doesn't scoring result in higher reject rates for certain minorities than for whites?

Again, the short answer is, "Yes," but it is the wrong question. The question ought to be: "Does credit scoring produce an accurate assessment of credit risk regardless of race, national origin, etc.?" Studies conducted by Fair, Isaac, and Company, Inc. (discussed in more detail below) strongly suggest that scoring is both fair and effective in assessing the credit risk of lower-income and/or minority applicants.

Unfortunately, income, property, education and employment are not distributed equally by race/national origin in the United States. Since all of these factors influence a borrower's ability to meet financial obligations, it is unreasonable to expect an objective assessment of credit risk to result in equal acceptance and rejection rates across socioeconomic or race/national origin lines. By definition, low-income borrowers are economically disadvantaged, so one would not expect their score distributions to mirror those of higher-income borrowers.

Is Scoring "Fair" to Minority and Low-Income Borrowers?

Since scoring systems are designed to provide the most accurate possible assessment of credit risk¾regardless of race, national origin and so on¾they will never satisfy critics who believe "fair" means the elimination of all discrepancies in both acceptance and rejection rates. If, however, fair is defined as "assesses credit risk consistently regardless of race, national origin, or income" then the available data strongly suggest that credit-scoring systems are fair when applied to these borrowers. Two research

studies conducted by Fair, Isaac and Company, Inc. early in 1996 support this finding.

The first study used data from more than 20 credit portfolios to look at score distributions and differences in characteristics between low- and moderate-income ("LMI") applicants and the general population. This study (hereinafter, the "LMI study") also compared the acceptance rates and default rates for LMI segments resulting from actual judgmental underwriting on eight of these portfolios with the results that could have been obtained using scoring.

Not surprisingly, the score distribution of the LMI segment was lower than that of the general population. Thus, at any given cut-off score, the LMI population would have a lower acceptance rate. However, the score-to-odds relationships of the LMI and general populations were virtually identical (especially in the range where most cutoff scores would be set). To the extent there were any differences in the score-to-odds relationships, those discrepancies consistently favored the LMI applicants. That is, at any given score, the risk for LMI applicants is the same as or slightly greater than the risk for other applicants.

The second half of the LMI study produced some very interesting results. For the eight different portfolios, we compared acceptance and delinquency rates for LMI borrowers that had resulted from judgmental underwriting with the results that would have been obtained if credit scoring had been used to evaluate the same applicants. In every case, scoring could have produced a significant increase in the acceptance rate for LMI applicants if the bad rate were held constant, or a significant decrease in the bad rate if the acceptance rate were held constant.

The second study (hereinafter, the "HMA study") compared credit bureau scores and characteristics of consumers living in zip codes with high

concentrations of blacks and Hispanics (the "HMA zip codes") against those of consumers living in other zip codes. Zip code was used as a surrogate for race/national origin simply because direct race/national origin information was not available. The average household income (as indicated by census data) in HMA zip codes was only about two-thirds that for the non-HMA zip codes. Once again, while the score distribution for the HMA zip codes was lower than for the non-HMA zip codes, the score-to-odds relationships were very similar across populations. As in the LMI study, what discrepancies did exist in the score-to-odds relationships consistently favored the HMA population: At any given score, HMA borrowers present the same or greater risk as non-HMA borrowers receiving the same score.

Conclusion

In short, these studies indicate that scoring is both fair and effective when applied to LMI and minority populations. These findings are consistent with results reported by others, including Fannie Mae and Freddie Mac (where direct race/national origin information is available from HMDA data). Moreover, the LMI study indicates that scoring can produce substantial improvements in the quality of decisions when compared with judgmental underwriting.

Despite guidance from secondary market investors and scoring developers, at least some mortgage lenders are overly reliant on credit scores. The scores most often used in mortgage lending are generic bureau-based scores that consider only credit history information, and were not designed specifically to assess mortgage risk. Ignoring other relevant information in the mortgage decision process is not in the best interests of either borrowers or lenders. And in cases where the lender is satisfied that inaccuracies exist in the underlying credit information on which the score is based, it is irrational to continue to rely on the score. But, there is evidence that many lenders do not make the effort to manually review and document these cases.

These problems may be exacerbated if overrides and assistance also are not dispensed evenly; higher-income white borrowers may be approved despite marginal credit scores, while low-income and minority borrowers with similar scores are turned away. Such practices would better be described as the misuse of scoring, but the rejected applicant is still left with the perception that the credit scoring system is unfair.

Calvin Bradford

Response to Statement of Peter L. McCorkell

The response from Fair, Isaac and Company, Inc. made reference to specific studies that supported its claim that minorities were not unfairly disadvantaged by credit scoring systems. Since Fair, Isaac is asserting that their research is sound in a statistical and social science context, one needs to assess whether their studies measure up by these standards.

For example, in the above-referenced LMI study, we are told only that the data are from several unnamed lenders for some unnamed type of installment loans from 1992 to 1994. Are these mortgage loans, auto loans, personal loans, home equity loans, student loans? Different loan types attract different types of applicants. The study reviews characteristics taken from credit applications and credit bureau information, but it provides no definitions of any of these characteristics. We are not told if all the lenders used compatible application forms with common definitions for each characteristic. We are provided with tables (in the referenced LMI study) that indicate which applicant and credit bureau characteristics made "large differences," "moderate differences," and "negligible differences." We are given numbers, but we do not know if these numbers are from tests of significance, differences in raw percentages, or some other collection of measures.

The comparison of the outcomes for the judgmental and credit scoring system was actually done in a separate study based on data from lenders seeking to replace their judgmental system. This is a clearly biased sample. Were these judgmental systems among the most subjective and least structured in the industry? The indication is that the lenders already saw them as failures.

The above-referenced HMA study of minority differences was based on ZIP codes, where all residents of the ZIP code were treated as either minority or not. Yet the minority composition of the ZIP codes ranged from 40 percent to 90 percent, with the report data based on ZIP codes that were more than 70 percent black and Hispanic. We are not told what percent of all minorities live in such ZIP codes. Such a grouping is not specific with respect to the race of individuals. Only large segregated minority populations would be included in such definitions. This is likely to exclude the majority of Hispanics and most higher-income minorities. We are not told the time period for the data in this study. The markets are constantly changing. Subprime lending, which was seen in these studies as related to personal finance companies, now relates to a large and rapidly growing industry of subprime lenders providing everything from home purchase loans to auto title loans. Therefore, one historical study is not adequate, even if it was sound at the time.

Fair, Isaac's response emphasizes the need for a broad range of studies by researchers from different perspectives and disciplines. Until this happens, the Fair, Isaac claims of a neutral, or even favorable, treatment of minorities should be treated with skepticism. Fair, Isaac, like Freddie Mac, needs to seek out a broader range of perspectives for its own reviews. The true test for credit scoring, however, will lie in the continuing review of many different systems by many different researchers.

This concludes the introductory installment of *Perspectives on Credit Scoring and Fair Lending: A Five-Installment Series.* The Federal Reserve System's Mortgage Credit Partnership Credit Scoring Committee would like to thank the respondents for their participation. The next article will explore the interrelated issues of lending policy, credit-scoring model development and model maintenance.

Editor's Note: The term score-to-odds relationship refers to the relationship between any given credit score and the degree to which applicants with that score are likely to exhibit the risk that the scoring system is designed to predict. For example, in a system designed to predict the likelihood-or "odds"-that an applicant will default in a loan within two years, a score of 700 might relate to or predict a 1 percent likelihood of default, while a score of 660 might relate to a 3 percent likelihood of default. In such an example, the default risk "odds" would be 1 in 100 for a score of 700 and 3 in 100 for a score of 660.