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The Role of Credit Scoring in Increasing Homeownership for Underserved Populations

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Abstract

Credit scoring has helped to produce a robust credit environment and increase access to homeownership for millions of consumers. This paper examines the role credit scores have played in helping lenders extend credit, and in particular mortgage loans, to underserved populations. It explores the relationship between available data sources and credit scoring, and examines the impact to consumers and lenders of expanding—or restricting—the amount and quality of data available to scoring and credit decisions.

Credit scoring enables lenders to extend credit quickly at the right price, while safely managing their risk. Lenders have been able to offer more credit to borrowers, at lower prices, and underserved populations have been a major beneficiary. Credit scoring depends on both negative and positive data on consumers and restrictions on the credit bureau data available to scoring would make it harder for people to get credit. To expand the benefits of scoring for consumers, the credit industry, legislators and scoring providers should pursue more consumer education about scoring and credit, a standardization of additional information available for scoring, and ongoing innovation in scorecard development.

Section 1: History, Concepts and Benefits of Credit Scoring

Credit scoring grew out of the need to offer more credit, faster and without discrimination to an increasingly mobile population after World War II. It made lending processes faster, fairer, more accurate and more consistent. Loan decisions could be made in minutes versus days or weeks. The extension of credit could be based only on factors proven (not assumed) to relate to future repayment. Sophisticated scorecard models precisely weighted and balanced all risk factors – applying one consistent measure of risk to all applications regardless of the decision-maker. This made credit more accessible and affordable to millions of Americans. FICO® scores are accepted, reliable, and trusted to the point that even regulators use them to help ensure the safety and soundness of the financial system. (St. John, 2003)

The first commercial scorecard systems were developed by Bill Fair and Earl Isaac in 1958 for American Investment, a finance company based in St. Louis. Their initial projects successfully demonstrated the financial value of credit scoring. Scoring systems reduced delinquencies up to 20-30% while maintaining similar volumes; scoring systems could also be used to increase lending volume by 20-30% at the same level of delinquency.

Despite its obvious advantages, scoring was not widely embraced until the early 1970s. By then, bank credit cards had become well-established and Fair Isaac had successfully developed the first bank card scorecard system for Connecticut Bank and Trust. By the end of the 1970s, 60% of the nation's largest banks, 70% of finance companies, most of the larger national credit card issuers and all of the travel-and-entertainment cards employed quantified credit-scoring systems on one or more types of credit.[1]

Concepts of Credit Scoring

The credit decision is a prospective decision – that is, the important thing is how the borrower will behave in the future, not how they have behaved in the past. Past behavior and current status are useful indicators of someone's behavior pattern, and therefore signals of possible future behavior. The credit decision, then, relies on the premise that people will behave in the future, at least in the near term, very much as they have behaved in the recent past.

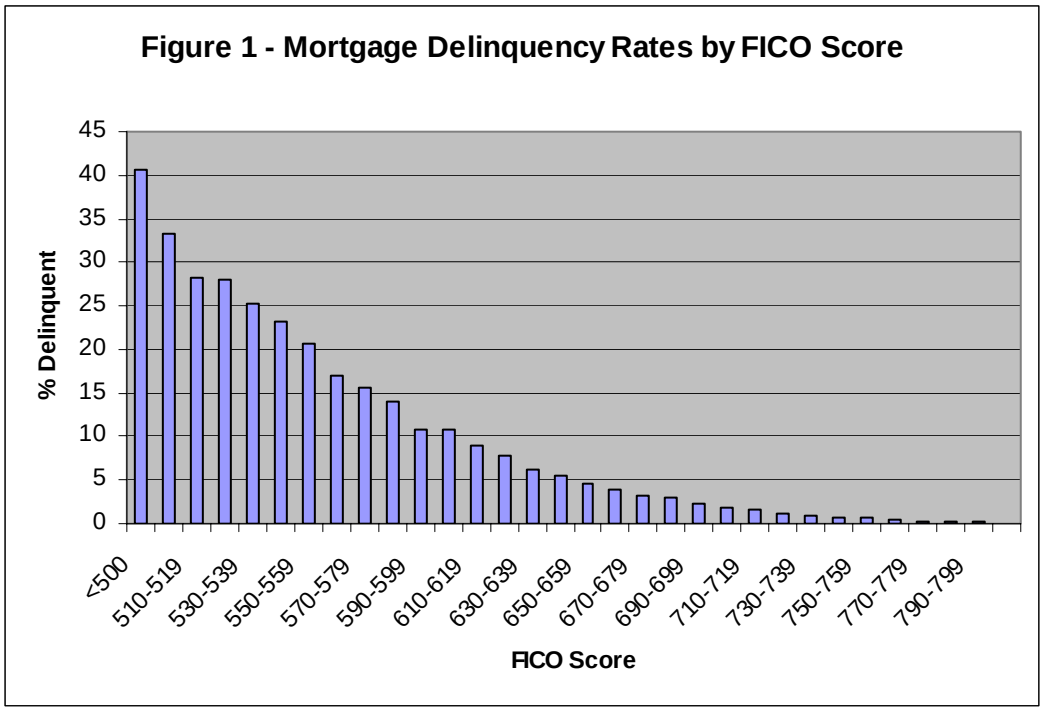
[1] A good Survey on the technical development of credit scoring can be found in 'A Survey of credit and behavioural scoring; Forecasting financial risk of lending to consumers,' International Journal of Forecasting 16, 149-172, (2000).

Credit decisions made without scoring rely on credit officers' knowledge of the relationship between past behavior and future performance—and this knowledge, even at its best, is very imprecise. Lender's rule-based systems for approving or denying credit applications—known as judgmental systems—are often a series of hurdles or "knock out" criteria. Every application must pass all the criteria to be approved. Because every factor is considered in isolation, there is no possibility for several "strengths" in an application to make up for one or more "weaknesses." In addition, a human being considering a loan application often ends up putting too much weight on different factors that represent essentially the same information. For example, younger borrowers are also less likely to have been at their job a long time or own their own home.

By contrast, a scoring system or scorecard performs a very thorough analysis of available data, and is based on a rigorous understanding of the relationship between past or present behavior and future performance. A scorecard analyzes all available *relevant* information to deliver a single score: a number that represents the risk—or odds of positive repayment--for a particular individual.

Using scores, a lender can rank-order borrowers according to the likelihood that they will default on a loan or become seriously "delinquent" (late in payments). For example, in a system where higher scores meant greater likelihood of repayment, people scoring 200 would be less risky than those scoring 180 but more risky than those scoring 220. (See Figure 1–Mortgage Delinquency Rates by FICO Score.)

Lenders typically establish a "cutoff' score representing the threshold of acceptable risk. For example, a lender might set a cutoff score at that score where, for that lender's portfolio, the odds of repayment are equal to or greater than 20 to 1. The lender rejects those applicants scoring below the cutoff while accepting those who score above it. Cutoffs can also be made to price loans according to the payment risk. (Because credit products and lenders' applicant populations differ, the odds at a given score will vary from lender to lender, from portfolio to portfolio, and over time. So while a given FICO score is not tied to a particular level of risk or odds of repayment, the scores will rank-order a lender's applicants or customers by risk, making cutoff scores and automated risk-based decisions possible.)



In a typical scorecard development, analysts may identify hundreds of` factors as having some predictive value on their own and probably 8 to 12 variables will find their way into the final scorecard. If each variable has an average of only three possible values, the possible combinations still run to tens of thousands. It would be impossible for a subjective or judgmental decision process to evaluate and weight that much complex information. The distinguishing feature of most credit scoring models is that they rely on an exhaustive statistical analysis of actual credit experience to determine which factors should be considered in the credit decision, and the weight that each factor should be accorded.[2] By using a consistent set of information, the same decision will be reached by thousands of lenders across an organization.

As noted, scorecards typically analyze only a small fraction of the data available—say 8 to 12 variables. This is because much of the available data does not have a reliable correlation with future payment behavior, and much that does is closely correlated with another factor. By analyzing this correlation and selecting the right factors, *scorecard developers can avoid using data which is likely to be frequently missing or unreliable, minimizing the impact of poor quality data far more than would be possible using manual underwriting.*

[2] For a more detailed treatment of the concepts of credit scoring see, An Introduction of Credit Scoring, by Edward M. Lewis

Unlike the series of knockout rules common to judgmental systems, scoring produces a balanced picture of an individual's risk. An individual may "lose points" in one area but gain them in another. The relationship between all the factors is studied, and each factor is weighted to take its relationship with others into account.

Scoring and judgmental approaches will not always produce the same decisions with respect to the same applicant. If the individual decisions were always the same, scoring couldn't produce the improvements that lenders typically see. However, the factors analyzed by a scoring system are likely to be very similar to those that would be considered in judgmental decisions. The principal difference is in the weights accorded to each factor, which account for the correlation between factors and the limited number of factors that are included.

The FICO Score

Initially, almost all credit scoring systems were developed on a custom basis for an individual lender. They used any data available in a systematized format and were optimized for their particular lending community. One limitation of these systems is that a lender would have very limited data about any person who was not a current customer—typically, only the application data the prospective borrower supplied, and no data on the individual's past credit performance at all.

Data from the national credit bureaus has the advantage of providing a broad view of consumers' past experience with credit: how long they have used credit, the type of credit available to them and their past performance. Scorecards built using this data enable a lender to accurately assess risk even when the lender has no prior experience with the consumer or when no additional information is available.

Score developers began tapping into credit bureau data in the late 1970s, initially to evaluate credit risk in direct mail solicitations. In 1987, Management Decision Systems (now part of Experian) introduced the first mass-marketed generic credit bureau scorecard models, aimed primarily at predicting bankruptcy (Chandler, 1998). In 1989 Fair Isaac released the first general credit bureau risk score for use in predicting all types of credit risks throughout the entire

customer life cycle. The credit reporting industry quickly dubbed it the FICO score after its developer.[3]

The FICO scoring system at each credit bureau contains ten separate scorecards. The wealth of information available from credit files allows development of a much finer segmentation than could be achieved when developing a scorecard from a single lender's data. A key step in the development of multiple-scorecard systems is aligning the scorecards so that the resulting scores correspond to the same odds of repayment, regardless of which scorecard was used.

Since its introduction in 1989, the FICO score has become the standard measure of consumer credit risk in the US. FICO scores provide a consistent measure of risk across different kinds of decisions, products, geography, and credit bureaus. Lenders, retailers, telecommunication firms and other businesses use FICO scores in billions of decisions each year. By providing a credit risk metric that crosses lenders and credit products, FICO scores facilitated the unprecedented growth in consumer access to credit and a unified market for consumer debt.

Initially used for credit marketing, account approval and account management, FICO scores were recommended for use in mortgage lending by Fannie Mae and Freddie Mac in 1995. With that encouragement, mortgage lenders increased their use of credit scoring at a fast and furious pace. FICO scores became the mortgage industry standard because they were widely available through all three major credit reporting agencies in the US and thus were accessible to all parties in the lending process – brokers, correspondent lenders, wholesale lenders, mortgage insurance companies, rating agencies and investors. Today, Fair Isaac estimates that more than 75% of all mortgage originations in the US involve the FICO score.

FICO scores are used in almost every sector of the nation’s economy: mortgages, credit cards, auto loans, retail store accounts, personal loans, even cellular phone service. Lenders use these scores not only to evaluate applications, but also to manage the credit needs of existing customers by extending additional credit or by helping consumers avoid overextending themselves. FICO scores are also used by lenders and securities firms to aid securitization of

[3] These scorecards, commonly known as the FICO scorecards actually have different product names at each of the three major credit reference agencies – EMPIRICA at TransUnion; BEACON at Equifax; and Experian/Fair Isaac risk Model at Experian.

credit portfolios. Securitization, in turn, gives lenders the capital they need to make credit available to more consumers. (See Figure 2)

Fair Isaac's latest risk score innovation, the NextGen FICO score, is the most powerful broad-based risk score available today. With a new design blueprint that includes refined segmentation, NextGen FICO scores offer lenders a more advanced alternative to Fair Isaac's "classic" FICO credit bureau scores.[4]

Figure 2: How FICO scores are used today

- Risk evaluation
- Accept/reject decisions
- Risk-based pricing
- Solicitation/pre-approval of new customers – determine what to offer (pricing, features) and to whom
- "Rating" portfolios considered for purchase or sale – evaluate credit quality and determine price
- Determine which purchases to authorize above open-to-buy
- Identify customers for cross-sell and up-sell promotions
- Credit line increase/decrease
- Timing and type of collection actions
- Customer service – "streamline" decisions for good customers
- Securitization
- Regulator exams to ensure fair lending
- Loss forecasting
- Capital allocation

[4] These models are also known as Pinnacle[sm] at Equifax, PRECISION[sm] at TransUnion, and Experian/Fair Isaac Advanced Risk Score at Experian are available at all three credit bureaus today.

Benefits of Credit Scoring for Users

Scoring provides multiple benefits to lenders and other users as compared to judgmental underwriting—benefits that result in making lenders more profitable while enabling them to make more credit available. The following are the chief benefits of credit scoring.

Accuracy

First and foremost, scoring provides a more accurate assessment of risk. As noted above, credit scores rank order individuals by their relative credit risk. A lender using scoring can choose the specific odds of repayment they are willing to accept. By raising or lowering the cutoff score, they can change the level of risk, their expected volume and expected profit. In a typical consumer credit portfolio, moving from a judgmental decision to credit scoring can reduce losses by 20-30% while maintaining the same acceptance rate, or increase the acceptance rate by 20-30% while maintaining the same loss level. In most instances, lenders choose a cutoff score that results in *both* a reduction in losses and an increase in volume.

Speed, efficiency and cost

Since the calculation of a credit score can be completely and precisely defined, scoring can be automated, enabling lenders to make decisions more quickly and more efficiently, which in turn leads to dramatic cost reductions. Some of the most dramatic improvements have come in the area of lending to small businesses and mortgage lending. In small business lending, scoring allowed lenders to reduce the time it took to underwrite a small business credit application from 8-12 hours to 30 minutes (Fair Isaac, 1995). In mortgage origination, scores are used to quickly qualify applicants for certain programs or streamline the process for better scoring loans. This includes processes such as requiring less verification, accepting W-2s rather than verifying income, and allowing drive-by appraisals versus full appraisals.

Fairness

Credit scoring is fairer than judgmental lending. Scoring doesn't consider factors such as gender, race, religion, nationality and marital status. In contrast, any of these factors can indirectly influence decisions in judgmental lending through a credit officer's conscious or unconscious bias. By using credit scoring, lenders focus only on facts related to credit risk. In

addition, older credit problems fade as time passes or are weighed against positive information, rather than serving as judgmental "knock-out" rules that automatically rule against an application.

Compliance

The increased objectivity and consistency of a credit scoring system means that creditors who use it are more likely to be in compliance with laws such as the Equal Credit Opportunity Act (ECOA), Fair Housing and other anti-discrimination regulations. In mortgage origination, FICO scores have provided “peace of mind” for regulatory compliance and have enabled originators to lend to a wider array of customers. The policy requirement to open the housing market to a larger proportion of the population has required originators to lend to a segment of the population with whom they had little or no previous experience. Credit scores allow lenders to safely assess and account for the risk of consumers who have no existing relationship with the lender, who have never entered the lender’s branches, and who may have been turned away in the past by other lenders.

Reliability

FICO scores have proven so reliable that even regulators, including federal bank examiners and security rating agencies, use them to help ensure the safety and soundness of the financial system. The focus of these regulatory exams tends to be on reliability and usage of credit scores, as well as fair lending/compliance concerns. Examiners review adherence of the loan officers to the cutoff and the percentage of overrides that occur, comparing these with policy and prior periods. Overrides—in which a credit officer takes a decision contrary to the institution’s score-based approval policy--contain the potential for biased lending. Excessive use of overrides or the use of multiple, judgmental criteria for overrides without explicit weighting often present red flags to examiners as these can indicate fair lending violations. Examiners pay particular attention to the potential for disparate treatment in how banks make decisions to approve/deny or price loans to their population of applicants. (Courchane, 1998)

Consistency

Regardless of which credit officer is making the decision, use of credit scores helps ensure that a consistent decision will be reached with regard to a particular applicant. This is a significant advantage over judgmental lending. FICO scores are unique among credit bureau-based scores in that the scorecards at all three credit bureaus are aligned during development, such that, say, a score of 680 from all three bureaus will represent the same level of credit risk. This allows users to develop strategies that can be applied consistently regardless of the bureau being used. Since FICO scores are a general risk predictor across all bureau files, the same scores can be used effectively regardless of industry, product, lender, decision or geography. This in turn allows them to be a valuable tool for the secondary markets.

Credit scoring also helps to minimize the impact of poor quality or missing information. Factors that are not present in all credit bureau files, or that do not have the same level of integrity as other factors, generally do not make it into the final scorecard because they cannot consistently predict the outcome of default. Experienced scorecard developers will try to minimize the impact of factors that are frequently missing or potentially erroneous by using other, more consistently available information that are highly correlated with the missing factor. For example, if the *date* of an activity is suspect, the *occurrence* of that activity can be used instead. Since credit scores must include precisely defined factors as input, they minimize reliance on information that can be unclear or misleading, such as occupation categories.

Figure 3: Scorecard Benefits

Reduces:	Increases:
• *Losses* • *Costs* • *Reliance on missing or incorrect data*	• *Accuracy of risk assessment* • *Profit* • *Consistency* • *Account volume* • *Speed of processing* • *Insight into customers* • *Management information*

Section 2: Benefits of Credit Scoring for Consumers

By enabling lenders to extend credit quickly while safely managing their risk, credit scores have made credit more accessible, at lower rates, to more people, including low-income and minority populations. More people can get credit because credit scores allow lenders to safely assess and account for the risk of consumers who are new to the lender, and who may have been turned away by other lenders. Scores make credit more affordable by reducing the cost of acquiring new accounts and managing portfolios, reducing loan losses, reducing marketing costs with prescreening, and cutting the cost of capital with securitization.

Greater Access to Credit

The beginning of the 21st century has seen an unprecedented level of consumer credit available in the U.S. (Cate et al., 2003), particularly compared with other parts of the world. For example, TowerGroup analyst Walter Kitchenman estimated that European consumers have access to 1/3 less credit as a percent of the gross domestic product (Kitchenman, 1999).

Credit scoring, based on a rich set of national data, has allowed US lenders to effectively lend to an increasingly mobile population. It has facilitated the development of interstate banking, encouraged competition and increased liquidity for additional lending through securitization. Interstate banking has increased over the past decades as has disaggregation, because a consumer can be assessed for credit without having an existing account relationship with the creditor. This makes capital more mobile, allows a consumer to shop for credit at a lower cost and allows banks to specialize in particular credit products, which improves competition (Kitchenman, 1999).

Nowhere has the growth of credit been more apparent than in the increased ownership and use of general purpose credit cards. Introduced in the mid-1960s as BankAmericard and Master Charge, by 1970 they were used by about one-sixth of families, and in three decades, a general-purpose card with a revolving feature had become the single, most widely held credit device. By 1998, almost three quarters of American families had one or more credit cards, up from about one half of a smaller population in 1970 (Aizcorbe et al., 2003). The explosive growth in credit marketing during the 1990s, particularly by the credit card issuers, was fueled in part by the practice of prescreening potential customers using FICO scores. Today prescreening is used not only for credit cards, but also for installment loan and home equity loan offers of credit.

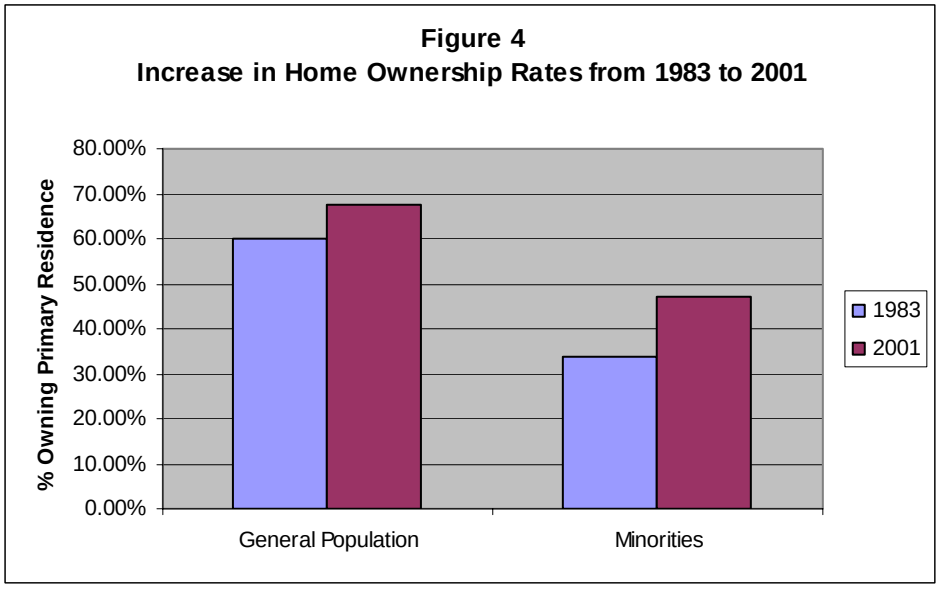
The increase in mortgage credit available to consumers has played a critical role in increasing the availability of housing. Mortgage credit has increased dramatically in recent decades, growing from 36 to 45 percent between 1983 and 2001. Over the same period of time, the percentage of families who own their homes increased from 60 to 68 percent (Turner, 2003). While home ownership has increased for each of these groups over this time period, it has increased most dramatically for minority populations. The use of credit scoring in mortgage underwriting has played a significant role in that increase.

While credit availability has increased overall, it has increased at an accelerated rate for families who have traditionally been underserved. In a 2003 study by the Information Policy Institute, the authors cite an increase in home ownership for minority populations from 34% to 47% between 1983 and 2001. That is an increase of 38 percentage points, compared to an increase of 13 percentage points (from 60-68%) for the overall population. (See Figure 4) This

increase is strongly correlated with the pervasive use of sophisticated risk models and automated underwriting (Turner, 2003).

The positive impact of credit scoring on low-income and minority populations seeking mortgages was also reiterated by the Chairman of the Federal Reserve, Alan Greenspan. Speaking to the Mortgage Bankers Association of America, he said, “This technology [credit scoring] has aided the measurement and pricing of risk on low-down-payment loans to first-time homebuyers, and has accordingly broadened the potential market for homeownership. By tailoring mortgages to the needs of individual borrowers, the mortgage banking industry of tomorrow will be better positioned to serve all corners of the diverse mortgage market.” (Greenspan, 1999)

Figure 4
Increase in Home Ownership Rates from 1983 to 2001



Studies by both Freddie Mac in 2002 (Gates et al., 2002) and Fair Isaac in 1997 (Martell et al., 1997) demonstrated that credit scoring is effective for measuring credit risk in underserved populations. The study by Freddie Mac analyzed the percentage of lower-income borrowers and minority loans originated in 1993 or 1994 and purchased by Freddie Mac in 1995 as part of its affordable housing initiative with major lenders. The Fair Isaac study evaluated the performance of "low-to-moderate income" (LMI) loans, as well as those loans in a “high minority area” (HMA - as defined by zip codes in the US census).

Both the Freddie Mac and Fair Isaac studies indicate that a lender employing credit scoring can accept more underserved applicants without raising its bad rate, because credit scoring is a far more predictive screen for underserved applicants than is judgmental decision making. The 1997 Fair Isaac study compared acceptance rates for credit scoring versus judgmental underwriting for LMI applicants for a variety of credit portfolios, and assumed a cutoff set to maintain the same delinquency rates. Increases in acceptance rates were in the range of 60 percentage points, and in some portfolios the acceptance rate more than doubled. The study also found that the relative importance of variables that were predictive of risk did not vary between the LMI or HMA population and general populations, and neither did the patterns of risk. For example, variables such as the amount and recency of past delinquency were predictive regardless of the population being studied, and increased frequency of delinquency and more recent delinquency were associated with higher risk. Cate (Cate et al., 2003) noted that the use of credit scoring reduces redlining by providing more precise information on a borrower's *own* past experience as opposed to relying on geographic or census data. It also reduces redlining by facilitating entry and competition which stimulates the supply of credit and holds down the price.

Lower Price

Scoring permits credit processes to be automated (with scoring, financial institutions can automate 70-80% of consumer credit decisions), making the credit granting process more efficient and less costly for lenders. Scores also make credit more affordable in other ways: reducing losses, reducing the cost of managing credit portfolios, reducing marketing costs with prescreening, enabling the systematic use of risk-based pricing, encouraging competition, and cutting the cost of capital with securitization. These savings are passed along to consumers in the form of lower prices.

Scoring allows lenders to control for risk exposure and therefore to determine the pricing of loans. Risk-based pricing lowers the price of credit for lower-risk consumers, while increasing the price for higher-risk consumers to compensate for the additional losses they generate. This allows lenders to offer credit to a wider segment of the population and has the overall effect of reducing price.

Prior to using FICO scores, lenders used complex rule-based systems (using debt ratio analysis) to determine pricing. However, score-based systems predict future delinquency significantly better than do these rule-based systems and can thus more accurately be used to determine the price needed to compensate for the risk. Risk-based pricing has been used for a number of years in the auto industry where a FICO score is combined with factors such as loan-to-value ratio to determine pricing tiers. It is also used to determine pricing in mortgages. In recent years, scores have been used to drive risk-based pricing in the credit card industry as well.

Alan Greenspan, speaking at an annual meeting of the American Banker's Association in October, 1994 praised the concept of using scoring-based risk assessment to 'begin pricing properly for the higher-risk borrowers, rather than simply denying credit". Quantifying risk through scoring, he noted, would help banks securitize loans and diversify their loan portfolios (Greenspan, 1994).

The role of credit scores in reducing rates is also exemplified by the growth of monoline credit card companies such as MBNA, First USA, and Capital One. Through their use of bureau-based credit scores, they were able to identify and target low-risk borrowers for low-rate cards. They set pricing precedents which were then matched by other credit card issuers. The Information Policy Institute recently studied the importance of renewing the national uniformity provisions of the FCRA which were set to expire on January 1, 2004. As part of that study, the Institute found that consumer savings from the increased competition in the credit card industry to be about $30 billion per year from 1998 to 2002 (Turner, 2003).

FICO scores are also a critical part of the securitization process. Securitization started in the 1970s and 1980s with mortgage portfolios secured by residential real estate. It was eventually extended to consumer credit card portfolios, automobile loans, manufactured housing, student loans, second mortgages and home equity loans. Securitization results in lower cost of funds for lenders, producing savings that may be passed on to the borrowers in a competitive environment. Securitization also makes more capital available to lenders and therefore reduces the cost of credit (Cate et al., 2003). By providing a common measure of risk across all assets, FICO scores can be used to assess risk across lenders, and to assess risk over time for a particular lender.

The 2003 study by the Information Policy Institute also found a significant drop in mortgage costs. They attribute the reduced costs of mortgages to increased efficiency in underwriting, to more accurate risk assessment and pricing through the use of credit scoring

models, and to reduced costs of closing loans which are passed along to consumers. Its authors wrote, "For example, if spreads today were at their early 1980s levels, the interest rate on a 30 year fixed rate mortgage would be at least one percent higher than it is today. This translates into $54 billion in annual savings to consumers." (Turner, 2003)

While use of FICO scores has increased both acceptance rates and home ownership for underserved populations, more can be done to diminish the differential in homeownership between the general population and the underserved population. Most importantly, this includes the incorporation of additional data sources, and a focus on financial literacy and home ownership education. These will be explored in the next sections.

Section 3: How Added Data and More Predictive Scores Increase the Benefits of Scoring

Access to broad, easily accessible data is essential to the development of scoring models. Since FICO scores have been more widely used in the mortgage and telecommunication arenas, more data has been shared through the credit bureaus, which in turn has enabled the development of more predictive scores. The availability of positive information has contributed positively to the rise of the robust credit economy in the US and is an essential component of FICO scores. By increasing standardized access to wider sources of positive information, we can further enhance the ability to assess risk in today's underserved markets for home ownership.

Fair Isaac believes that the most predictive score is the best score for both consumers and lenders. As consumers become more credit savvy and better understand the role of scores in the lending process and the range of credit options available to them, they are demanding to be evaluated and priced accurately. Lenders want to price appropriately and lend safely, while making more credit available to more people. Lenders are mindful of increased consumer options and in turn are demanding more predictive tools both for better risk assessment and to stay ahead of consumer-driven governmental issues. As a result, consumer and lender interests are more aligned than not.

More predictive scores offer many benefits: They allow for finer gradations in risk assessment and pricing; enable greater, faster access to credit; ensure that credit is granted safely and that consumers aren't over-extended; reduce the 'cost of credit' by lowering the default rate which the good-paying majority must subsidize; and provide greater operational savings to lenders which (due to market competition) are passed along to consumers.

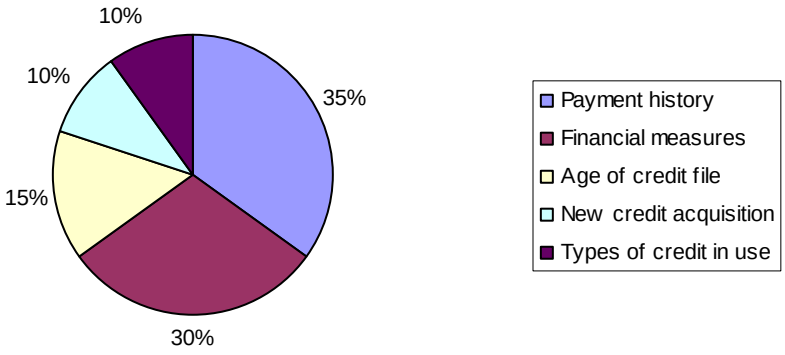
The Five Categories of Information in a FICO Score

Before examining how increased data can improve scoring's benefits, it's important to understand what information a FICO scorecard considers. FICO scorecards consider all information (both positive and negative) available in a credit report. Negative information includes information about past delinquency on credit obligations, public records, judgments or collection activities. Positive information includes how long credit has been used, the type and amount of credit currently being used, search for new credit, as well as payment history where no delinquency has occurred. ("Positive" information generally includes any information that is not the record of previous poor credit payment behavior.)

The source of the FICO score's predictive power is a complex analysis of all these factors, both separately and in relation to one another. Because the overall score takes into account the totality of information, it is impossible to precisely describe the importance of any single factor in determining a score. However, it is possible to describe the relative value of the types of information available from a credit report.

There are five main categories of information used to predict performance: payment history, financial measures, age of credit file, new credit acquisition and types of credit in use. Figure 5 shows the relative importance of these categories of information. Generally payment history is the strongest, and also the most obvious. However, this still represents only 35% of the information and other information is used to *refine* the decision making. The score optimally combines all categories for the most effective risk-assessment tool.

Figure 5
Types of information in FICO score



Payment history is evidenced by ratings, delinquency trends or payment patterns on a credit account or the presence of public records. Whether the past payment behavior is negative *or positive,* it is useful in estimating future behavior.

Delinquency information, present on only 30-35% of all files, is highly predictive of potential risk. Delinquency payment takes into consideration severity (degree of delinquency – e.g., 90 days late is a higher risk than 30 days late); recency or age of delinquency (e.g., recently reported is worse than a severe delinquency several years old) and frequency – the number of delinquent accounts present (e.g., delinquency on a single account is better than delinquency on multiple accounts). These factors need to be considered together. For example, a consumer who missed a couple of payments within the last two months may be a higher risk than someone with a much older but more severe delinquency.

If past problems were severe enough to initiate judgments, foreclosures or bankruptcy, these will be represented by public records and collections. While the presence of these items is very significant, they are considered within the context of the entire file. In the US, most public records and delinquency information is retained on reports for 7 years. (Chapter 11 bankruptcies are retained for 10 years.) Although such occurrences imply serious credit performance problems, a 6-year old item may not indicate high risk if everything else is paid as agreed.

Financial measures provide a reflection of the amount of credit in use. In general, those who use a lot of credit are riskier than those who use less. For example, one extremely predictive piece of information is the proportion of credit actually in use, relative to the available credit. Whether someone is using *all* of their available credit is a strong indicator of risk. The frequency of accounts with a balance and the amount of outstanding balance are also good risk predictors. The amount of an installment loan still owed compared with the original loan amount is also important – paying down installment loan debt is a good sign that someone is able and willing to manage and repay debt.

New credit acquisition considers whether someone is actively seeking additional credit and to what degree. This category includes: the number of new accounts; time since new accounts were opened; and the presence of good recent credit history following past payment problems. If there are many inquiries but few new accounts, the consumer is riskier than someone without any inquiries. If someone has a record of credit for 20 years without many outstanding balances, several inquiries or one or two newly opened accounts would not represent inordinate risk. However, if her history is short (e.g., 2-3 years) and her file contains a group of recently opened new accounts, it would be a reason for lenders to be cautious, particularly if balances are building up quickly or there are early indications of mild delinquency.

Age of credit file or how long an individual has had credit established is used to determine the importance of other information. Older, more established reports generally indicate lower risk. For example, credit histories with accounts open for 10 or more years with few outstanding balances and one or two newly opened accounts would not be considered a high risk, but a shorter credit history with one or two newly opened accounts would represent a higher level of risk.

Types of credit in use include obligations that a consumer has sought and acquired in the past. For example, a file with a breadth of credit in use – revolving as well as installment - will score higher than one without. A file will also score higher if there is more than one bank card account (versus none), although not too many. While this category is generally secondary to the others, it may be used as a tie-breaker. [5]

[5] For more detailed information see 'Understanding your Credit Score,' A Fair Isaac pamphlet. This information can also be found at http://www.myfico.com/Offers/RequestOffer.asp

The Value of Positive Information

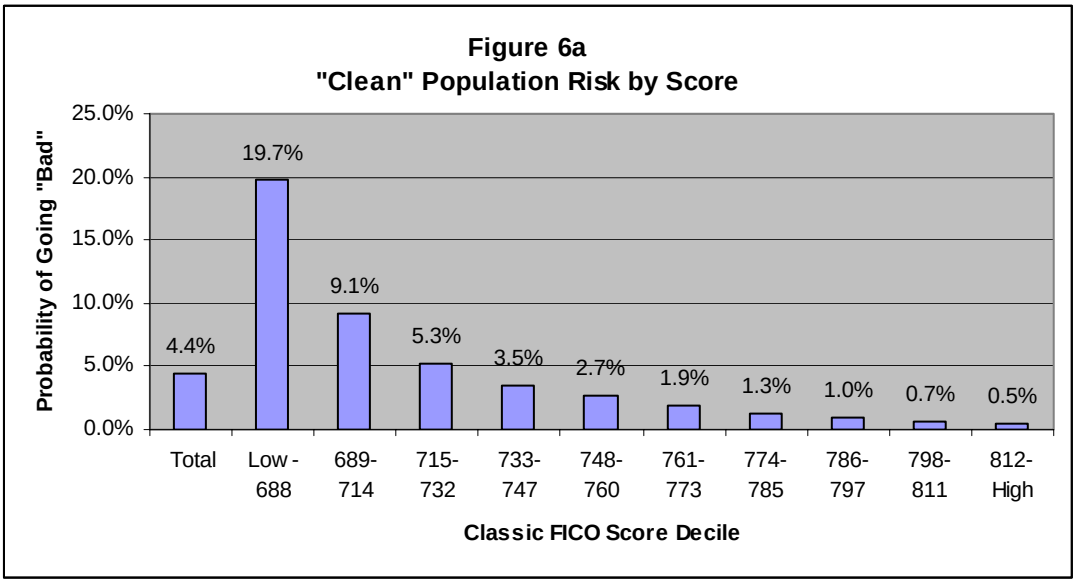
In many countries across the world, shared credit information is limited to negative information – i.e., past payment problems. A number of studies have demonstrated the beneficial impact of positive information on the predictiveness of credit scoring systems and the subsequent influence on credit availability and pricing. For example, in a study by John Barron and Michael Staten comparing US credit reports with Australian credit reports (Barron and Staten, 2000); they estimated the following impacts if data were restricted to negative-only information: consumer credit would be less available, credit rates would escalate, and competition would be reduced. They also noted that reduced information would give rise to alternative measures for assessing the likelihood of repayment, measures which could be more invasive and less objective than factual payment history.

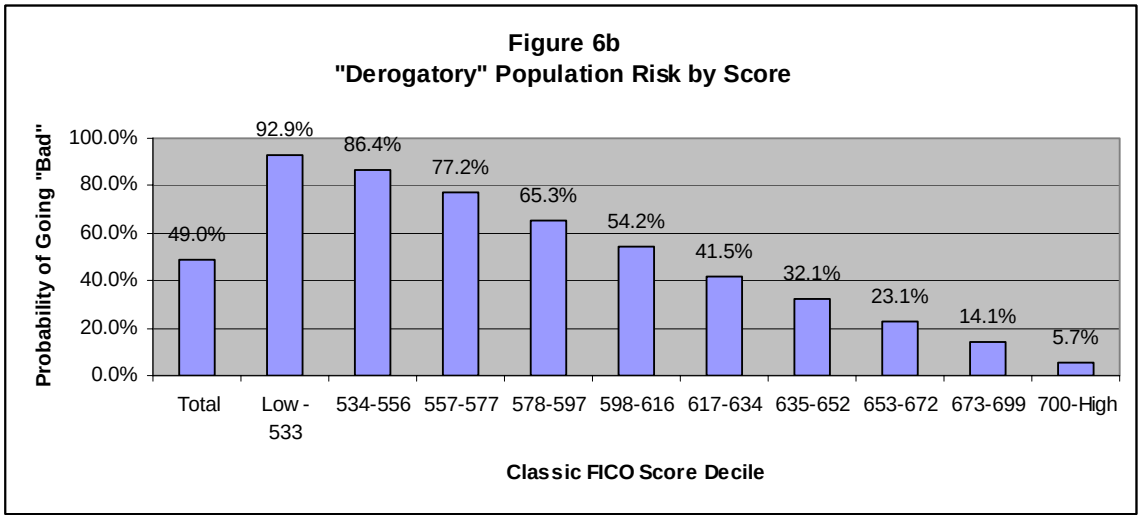
In research conducted by Fair Isaac in 1996, (Fair Isaac, 1996) we created two subpopulations (based on data provided by TransUnion) with an overall "bad" rate of 12.8% (a bad equals an account that resulted in a 90+ days delinquent payment, charge-off, default, bankruptcy or judgment within the two years following when it was scored). The first subpopulation was "clean" (no previous delinquency when scored; overall bad rate of 4.4%) and the second was "derogatory" (previous delinquency on file when scored; overall bad rate of 49%, or 11 times riskier than the clean population).

A scorecard was developed using only "positive" information (ignoring information on delinquencies). We used this score to rank the clean subpopulation into 10 deciles that ranged from 0.5% to 20% probability of going bad. (See Figure 6) In other words, the riskiest segment in the clean population was 40 times riskier than the best segment – a distinction available only through the use of positive information.

This scorecard was also used to segment the derogatory subpopulation more finely into deciles with the probability of going bad ranging from 5.7% to 92.9% — a factor of 16 times.

The significant thing to note is that, without the use of positive information, the "derogatory" population would be presumed to pose greater risk than the "clean" population, because people in the first group had exhibited at least one instance of poor credit payment in the past. But using positive information, we could sharpen our focus on risk. In fact, the lowest two deciles of the clean subpopulation performed *worse* than the best decile of the derogatory subpopulation.





This has critical importance for segments of the population with damaged credit, since the positive information can be used to mitigate past credit problems. Without positive information, the existence of *any* negative information would be used as a "knock-out" rule for declining credit applications.

More Information is Available Now

Over the past decade, a number of interrelated factors have influenced the data available at credit reporting agencies in North America. This has led to some general trends in consumer credit reports. At its 1998 and 2002 client conferences (Van Dijk and St. John, 1998; St. John, 2002), Fair Isaac reported on research that showed changes in credit files. More creditors were reporting consumer credit information (e.g., mortgage originators, utility companies, telecommunication firms). Government agencies had expanded their reporting on family-support obligations. Home equity lending had expanded dramatically. There was increased competition among lenders seeking new markets and new products, such as in credit card marketing and balance transfer services. The number of new accounts per consumer had increased as consumers opened and closed accounts more frequently, a result of several factors including historic lows in interest rates, increased mortgage refinancing, attractive sales-finance deals, and pre-approved bankcard offers with low teaser rates.

One impact of these changes was an increase in the number of reported accounts for many consumer credit files. Both the average number of accounts per file had increased (from 10.2 to 12.2 between 1992 and 1998), and there were more files with a large number of bankcard accounts (the average number of bankcards per file increased from 2.9 to 3.9 over the same period). The number of mortgage accounts on file at one of the major US credit reporting agencies increased 35% between the first quarter of 1995 and the third quarter of 1997.

At the same time, lenders in the auto, mortgage and bankcard industries were competing for new business in the higher-risk subprime market. As a result, more consumers with previous credit problems (subprime) were able to open new accounts. For example, between the first quarter of 1992 and 1994, the percentage of consumers with prior bankruptcies opening new accounts increased from 18% to 24%, while the percentage of consumers opening a new bankcard increased from 10% to 18%.

As we have seen, the addition of positive and negative data makes scoring more predictive. Not only does this data give scores such as the FICO scores more predictive power, it also creates a much richer data pool for the development of new scores.

A More Predictive FICO Score

The increased information in credit bureau files, along with innovations in scoring model development, allowed Fair Isaac to develop a more predictive set of credit bureau scores, known as the NextGen FICO scores. Although based on the same credit reports that FICO scores evaluate, NextGen FICO scores provide a stronger risk assessment across the entire risk spectrum, which allows for better, more accurate risk pricing decisions.

While the new generation of scores provides value to all industries, there is significant predictive lift for consumers with prior derogatory credit references. This consumer segment is of particular interest to those seeking to widen the availability of consumer credit and thus increase home ownership. NextGen FICO score's increased focus on the population with previous delinquency allows the score to better separate those with less serious past-payment problems from consumers with collections, charge-offs or prior bankruptcies on their credit reports. We were also able to draw greater distinctions between consumers with respect to file age or thickness of the file, and to consider new factors such as credit usage as the basis for subpopulations.

We incorporated three key design modifications when we developed NextGen:

Expanded segmentation of consumer credit profiles across a broader risk spectrum. The NextGen FICO model has 18 scorecards, compared with 10 in our "classic" FICO scoring systems. This enhanced segmentation isolates important sub-groups of accounts. Its scorecards focus on populations such as consumers with a prior bankruptcy, consumers with a delinquency on new accounts (we call these the "Rocky Start" segment"), and consumers with limited use of credit or limited reported credit.

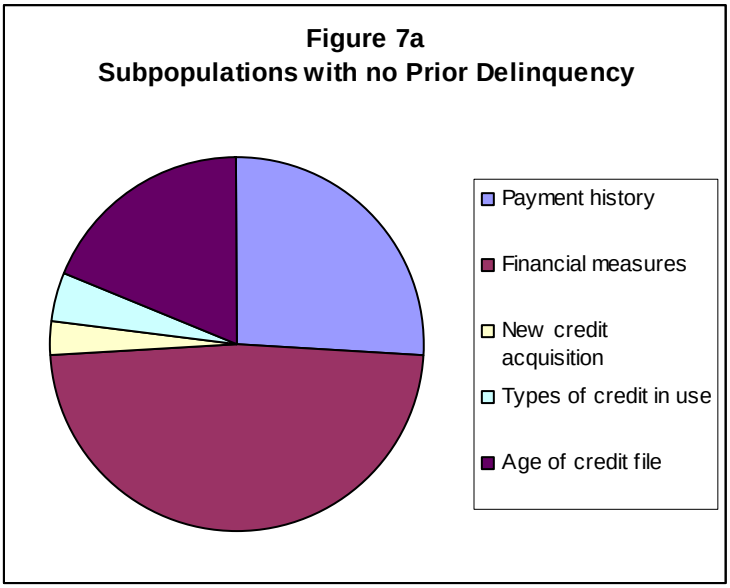
Multi-dimensional predictive variables that capture key interactions in the data. These more sophisticated predictors are called "mini-models." These mini-models evaluate the relationship between multiple dimensions within a credit report. For example, among recently opened credit accounts, the mini-models address how many credit accounts have already shown delinquency.

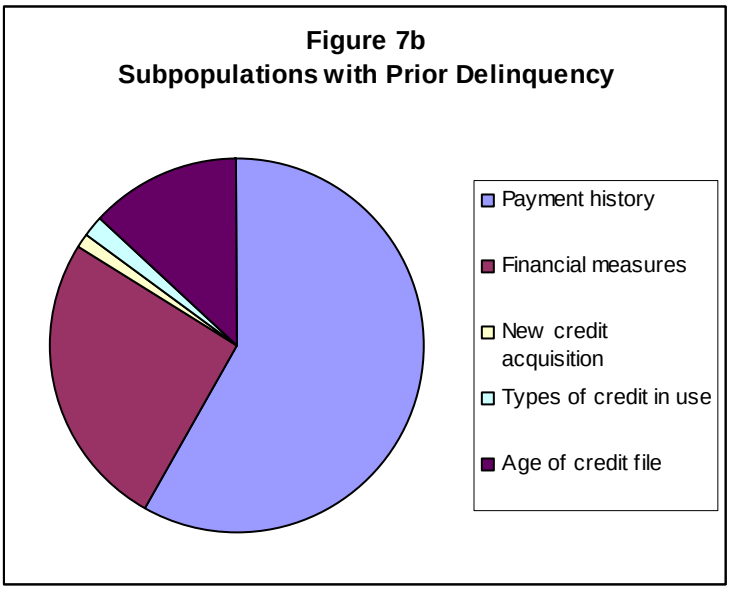
New refined performance-outcome classification. In Classic FICO scores, good or bad performance is based on the worst delinquency or derogatory status on any obligation over two years. The new performance definition in NextGen FICO is more tiered. It is classified by the "degree of positive or negative performance across all credit obligations." That is, a consumer who is delinquent on two out of ten open accounts will represent a different level of unsatisfactory outcome than someone who is delinquent on all ten accounts. This benefits consumers who have had some difficulty in the past but have successfully paid down existing credit obligations.

Segmented scoring systems offer users qualitative and strategic benefits as well as refined risk prediction. For example, when reviewing accounts with prior delinquency, if one were using a single overall scorecard, the account would be evaluated as high risk. A special scorecard for that segment can determine who is most likely to become seriously delinquent again rather than stay in good standing. That is, one can find the hidden low-risk accounts that might not have been identified by a single scorecard.

For example, in a derogatory sub-population, the timing, severity and persistence of past payment behavior is dominant while other factors are somewhat less important. On the other hand, in a non-derogatory sub-population, credit account, financial information and history, inquiries, and the mix of credit are proportionately more important (See Figure 7). These differences will be reflected in the variables used in the models and the magnitude of the scorecard weights, and will have a direct bearing on the precision of the scorecards.

Figure 7: Comparison of Value of Information for Subpopulations with and without Prior Delinquency





In the NextGen FICO scores, we were also able to refine the importance of file age or thickness and consider new factors such as credit usage as the basis for sub-populations. For example, two situations provide a limited amount of information available for analysis – consumers who have used credit for only a short period of time but have varying number of accounts ("short time in file") and consumers who have very little credit – i.e., only one or two accounts, but may have used credit for a long period of time ("limited credit"). Consumers in each case are widely recognized as having profiles quite different from consumers with well-established credit, but they are also quite distinct from each other (See Figure 8).

For example, for "limited credit" files, the time that credit has been in use is an important predictor, while the types of credit used are relatively meaningless given the small number of accounts available. On the other hand, for "short time in file" populations, the time that credit has been in use is not predictive since it was only recently established, but variables that measure the account balance are more powerful than for either "limited credit" *or* well-established accounts. In the most recent redevelopment of NextGen FICO scores, we were able to expand by approximately 2% the portion of the population for which a score can be calculated. This particularly benefits the underserved markets that have little credit experience.

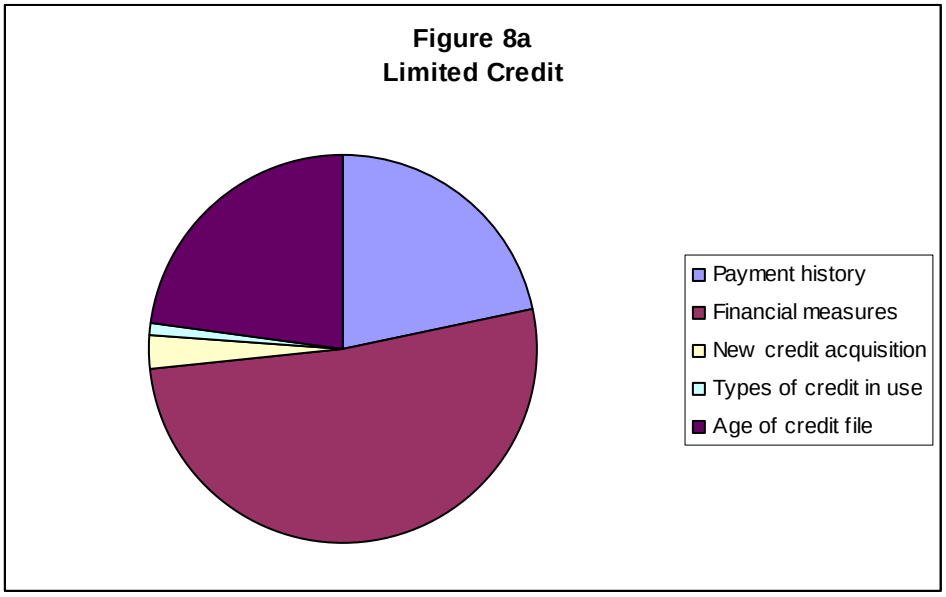


Figure 8b
Short Time In File

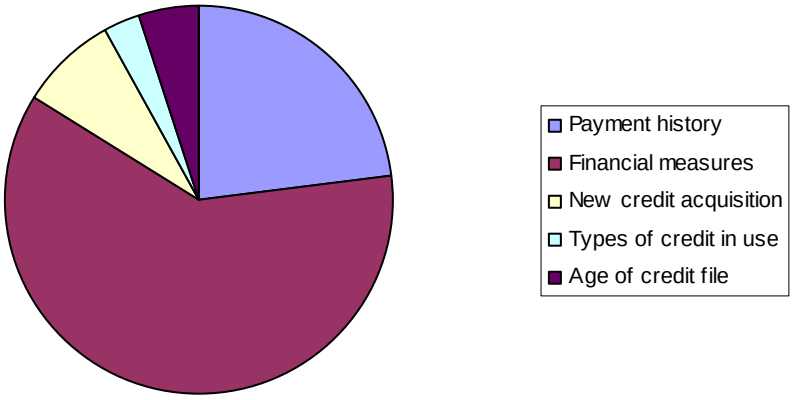
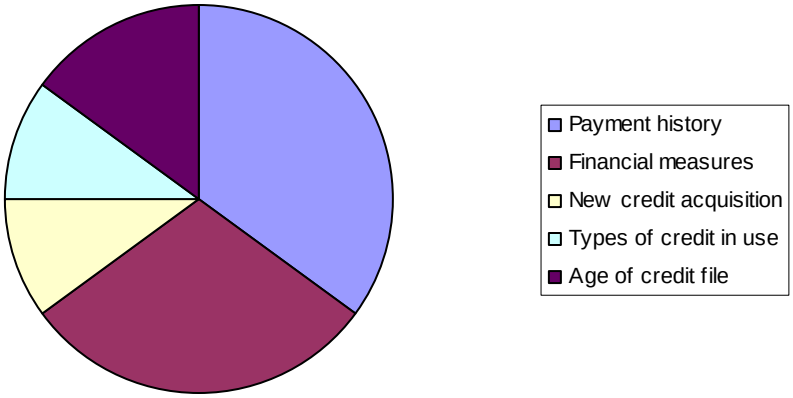


Figure 8c
Well-established Credit



In our most recent re-development of NextGen FICO, we were able to further refine variables that caused concerns for consumers in the past. For example, the greater predictive power of NextGen FICO allowed us to exclude the variable "number of finance company credit accounts," from the model. It had been a source of concern because specific cultural groups have demonstrated a higher tendency to use this form of financing in the past. This change is consistent with the findings of a report by the Federal Reserve Board which stated that the differences between risk segmentation by banks and finance companies with regard to the personal loan market had disappeared by the end of the twentieth century, and the risk profiles of these two groups were far more overlapping (Durkin and Elliehausen, 2000).

Additional Data Sources Could Improve Prediction

Fair Isaac expects the predictive power of FICO scores will continue to increase through the addition of new credit file data as well as continued technological innovation. However, the best way to increase predictive power is through the addition of new *sources of data*. For example, most special CRA programs include other methodology to assess creditworthiness, such as requiring twelve months of on-time rent, utility (electricity, gas, cable, phone), telephone, insurance (car and life), or health-care payments.

This type of information can potentially overlap a number of the categories of information used in the current FICO scores. It is most relevant to the category of payment history since a complete record of payments on these obligations would mimic the payment history currently present on the credit bureau. At a minimum, *negative* information about missed payments would be predictive. Ideally this would include not only that a payment was missed, but how recently, how often and to what degree of severity (i.e., number of days or months). However, this information would be far more valuable if it also included the *positive* information about payments made on time for all the reasons previously discussed in the value of positive information.

Positive information would also contribute to the “age of credit.” This is particularly important for those segments of the population who have been averse to using credit from banks and other financial institutions, preferring to rely on family members. When these individuals apply for a mortgage and have no previous credit history at the credit bureau, it is impossible to calculate a FICO score and they have difficulty obtaining a mortgage. However, were the FICO

score to be enhanced by information about these other payments, a more accurate reflection of the time "credit" has been in use could be obtained. Finally, should *all* of these categories of information be available – rental, utility, insurance, health care, telecommunication, etc – the breadth of 'credit' being used could also be assessed and contribute to the category of 'types of credit in use.'

Additional sources of data can be used to benefit two segments of the population – those with previously damaged credit and those with little credit experience. I've already described the value for those with little credit experience since this information could supplement the information currently available at the credit bureau. For those with previously damaged credit, additional *positive* information could be used to offset the previous credit problems.

Two other sources of information may prove to be predictive. The first is the provision of a "letter of explanation" for past credit problems. While there have been qualitative indications from consumer advocacy groups that this can be predictive, this information would need to be available in a quantitative format that includes subsequent performance in order to assess its real predictive power. The second piece of information that would likely prove to be predictive is the consumer's completion of a counseling and education program, particularly on mortgages. A recent study by the Credit Research Center demonstrated that the successful completion of counseling and education programs lowers risk (Staten et al., 2002). This conclusion has also been supported by conversations with mortgage lenders. Again, the successful completion of 'approved' programs would need to be accessible in a consistent manner for it to be included in a scorecard.

Lenders who want to take advantage of this information today must ask the consumer to obtain the information manually and return it to the lender. In most instances, when faced with this request, the consumer never returns to the bank. Even where consumer advocacy groups are involved and help the consumer obtain the necessary information, the lender must undergo a slow and costly manual process to evaluate the information.

Unfortunately, there appears to be no systematic way to access this type of information, and the cooperation and format varies considerably across the agencies who supply it. While a number of efforts are underway to try to access rental information (e.g., Pay Rent, Build Credit), existing rental information is scattered and inconsistent. Likewise, utility information is difficult to obtain. In some instances, states may actually prohibit access to this information. For lenders

to capitalize on the value of this information, it must be available in a consistent format from a small number of repositories. The data must then be summarized in a score to successfully integrate with today's automated underwriting systems. Finally, it is essential that such a score be one that aligns seamlessly with today's FICO score to achieve its full potential benefits for mortgage lending.

Section 4: Threats to the Availability and Quality of Data for Credit Scoring

Complete, consistent data make scorecards 'smarter' or more predictive and smarter scorecards benefit consumers and lenders. Removing information from credit reports, or even varying reported information from state to state, would make the process of obtaining credit difficult for consumers to understand and take charge of their credit health. While the quality of credit reporting agency data has increased considerably over the past decade, credit risk assessment (and the concomitant increase in available credit) could be further enhanced by continuing to improve the accuracy of information used in credit scoring systems.

The most recent threat to the availability of data for credit scoring occurred in 2003, when the so-called "national uniformity provisions" of the Fair Credit Reporting Act (FCRA) were nearing a sunset date of January 2004. In December 2003, President Bush signed into law the Fair and Accurate Credit Transactions (FACT) Act, which amended the FCRA and made permanent seven existing FCRA provisions that, in part, preempt states from making laws that govern the content and use of credit files.

If national uniformity provisions had been allowed to expire, states could have imposed their own restrictions on credit scoring, including reducing the length of time that negative information may be included on credit reports. This and other changes could have driven some financial institutions to provide only partial information or to stop reporting information to the credit bureaus completely.

While the passage of FACT removed these threats, it is worth considering the impact that even well-meaning legislation may have when it reduces the data available to credit scoring. Some of the research presented while Congress debated the FCRA amendment demonstrates this impact.

The Impact of Constraining Data

The 2003 Information Policy Institute report examined the impact of four scenarios simulating the changes in available information that could be expected to result from proposed state laws or simply from the expiration of the FCRA preemption provisions. Two of the scenarios model the impact of imposing additional liabilities on data furnishers which could cause some data furnishers to stop supplying information to the credit reporting agencies.

One scenario assumes a random 13% of credit card issuers stop contributing, the other assumes that eight major credit suppliers, representing 21% of all data (including revolving and non-revolving credit) stop supplying information. The other two scenarios consider restrictions on the kind of information that can be retained at a credit reporting agency. One is more moderate and one more severe, but both simulate the impact of laws that would restrict the timing with which late payments are reported, when negative information would be purged, and how inquiries can be used (Turner, 2003).

For each of these four scenarios, the authors examined the impact on performance of six commercially available scoring models including the FICO score – four of these were generic and two were customized to a particular lender. They also examined the impact of these scenarios on consumers, in aggregate, and for particular demographic groups with respect to the cost and availability of credit. Their model resulted in the following findings:

Acceptance rates would decline or delinquencies would increase under all four scenarios. For example, under the most severe scenario, holding acceptance rates constant would increase delinquencies by 70%, costing consumers $22 billion per year. Alternatively, if delinquency rates were maintained, under this scenario, 30% of those consumers currently receiving general-purpose credit cards (41 million people) would be denied credit card access. This percentage would be even higher for minority groups – 40% for Hispanics and 33% for African Americans. Likewise lower-income and younger consumers would experience larger declines. “Indeed, the results obtained for minority, lower-income and younger borrowers strongly suggest that the removal of, or modifications to the strengthened preemptions would undermine recent progress in extending credit to underserved segments of the population used (Turner, 2003).

Under each of the four scenarios, approximately 88% of consumers would see a change in their credit score.

The predictiveness of credit scoring models would decline. This decline could be up to 10-15% under the most severe scenario restricting access to delinquent performance information used (Turner, 2003).

Fair Isaac has also researched the impact that reduced data availability would have on the predictiveness of the FICO scores. Specifically, we have examined issues concerning the length of time derogatory information is retained, the retention of public records and the value of inquiries in predicting risk.

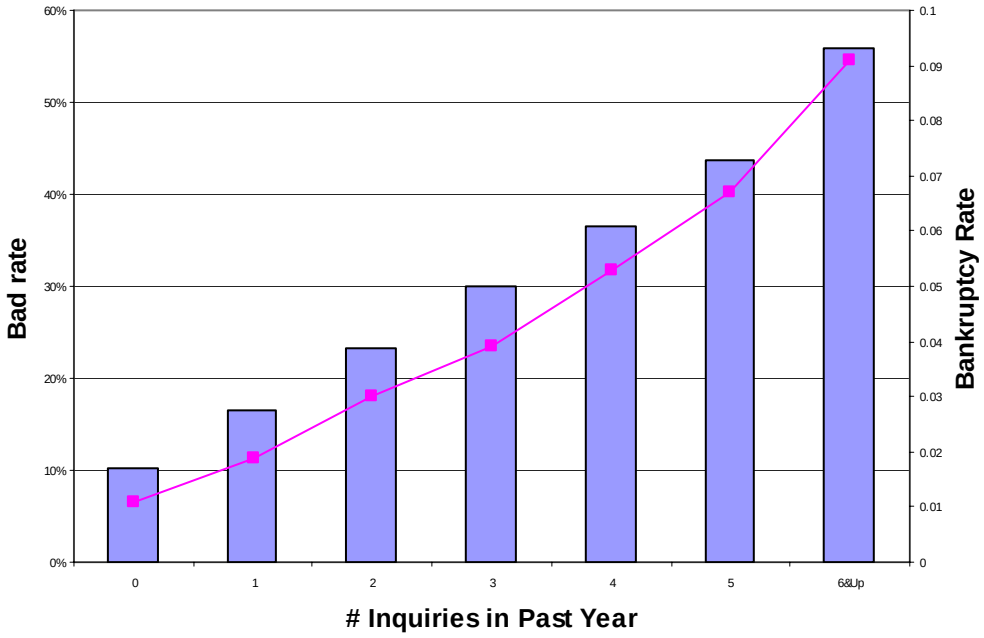
In 1990, Fair Isaac conducted a research project (using data supplied by Equifax) commissioned by the Credit Data Industry Association (CDIA), (Fair Isaac, 1990) then known as Associated Credit Bureaus. The study was a response to proposed legislation on accelerated deletion of certain derogatory information from credit bureau reports. Fair Isaac concluded that the presence of derogatory information, even when older than 72 months, *does* help to distinguish levels of credit risk.

This issue resurfaced in the face of proposed legislation by various states to permit *only* terminal delinquency or current delinquency information to be retained. As a result, Fair Isaac updated this research in 2003 and its conclusions remained unchanged. In all cases, while older delinquencies indicate lower credit risk than more recent delinquencies, the older information is still predictive. For example, even very old instances of 60- or 90-day delinquencies indicate a higher-risk borrower than a borrower with no delinquencies ever at that level. On the other hand, the risk indicated by a very old 30-day (less severe) delinquency can be offset by having other accounts that have performed well over a number of years. We also examined the impact of only allowing terminal delinquencies to be considered. Consumers with more than four accounts that had been delinquent but not terminal were about five times as likely to become "bad" as were consumers with no delinquent accounts.

Another issue that is frequently questioned is whether public records should be bypassed due to problems with duplication. The bad rate for borrowers with three or more adverse public records on their file is almost five times as high as that for borrowers with no public records, which demonstrates the predictive value of this information. To mitigate the problem of potential duplications, however, Fair Isaac generally tries to avoid using the number of public records or collections.

Many lawmakers continue to question the predictive value of credit inquiries. As mentioned earlier while describing the types of information used in the FICO score, "new credit acquisition" represents approximately 10% of the value of the FICO score. While this category looks holistically at recent credit including the opening of new accounts and their performance, an important component is the presence of inquiries for additional credit. By itself, a large number of inquiries are not necessarily negative. As has been explained, the various information categories can compensate for one another. As a result, a consumer with a high number of inquiries who has a well-established file demonstrating successful repayment will not be negatively impacted. Consumers actively seeking new sources of credit with no compensating history can be demonstrated to be higher risk because it generally means that they are having difficulty handling their existing debt load already and are seeking additional credit to compensate. *Overall, consumers with six or more inquiries are almost five times as likely to go bad and eight times as likely to go bankrupt than are consumers with no inquiries* (See Figure 9).

Figure 9
National Consumer Credit Sample
Bad & Bankruptcy Rates by 'Number of Inquiries in the Past Year



Since number of inquiries as a predictor continues to be a sensitive topic for some observers and the value of this predictor changes as consumer and lender behavior changes, Fair Isaac continually evaluates the manner in which inquiries are used in credit scores. For example, certain inquiries are not included: inquiries from employers; consumer requests for their own reports; or lender requests for reports to review an account or prior to issuing a pre-approved offer of credit. The FICO score also only considers inquiries made within the previous 12 months. Fair Isaac updated our logic for calculating inquiries used in the FICO score in 1995 when mortgage and automobile lenders were dramatically increasing their use of scores. We further refined the way we handle inquiries in 1998 and in the later redevelopment of the NextGen FICO score. This approach distinguishes individuals who are shopping for a single large loan from individuals attempting to establish many new sources of credit. The NextGen FICO score treats multiple, mortgage- and auto-related inquiries within any 45-day period as a single inquiry. (This is currently being changed from a 14-day de-duplication window.) Fair Isaac also uses a "buffer period" such that the score ignores all mortgage and auto-related inquiries made during the 30 days prior to scoring.

Current Concerns with Data Quality

Consumers and consumer advocacy groups have expressed concerns with the quality of the credit data on which scores are being calculated and decisions are being made. This is reasonable, since scores can influence whether a consumer receives a pre-approved offer for credit or a low interest rate for an auto loan or mortgage. A number of recent studies have investigated the quality of data at the three credit reporting agencies, and hypothesized about its potential impact on scorecard development and score consistency across all three agencies.

In December 2002, the Consumer Federation of America (CFA) and the National Credit Reporting Association issued a report that challenged the accuracy of credit scoring by pointing out differences between scores at the three national credit reporting agencies (Consumer Federation of America, 2002). The CFA report acknowledged that the most important contributor to score differences was the difference in consumer credit data held at the three national credit reporting agencies. The report pointed out a number of inconsistencies in their data sample of 1,074 credit reports:

- Some regional lenders reported to only one or two of the three agencies
- The timing in which information was loaded to credit files created short-term differences between files
- One in five consumer files had contradictory data concerning the date of last activity
- A high percentage of files had conflicting information regarding the number of times a consumer had been delinquent on a particular credit obligation

While the CFA report emphasized data inconsistencies across the credit reporting agencies, a recent study by the Federal Reserve Board (Avery et al., 2003) focused on incomplete or inaccurate data at a single agency. Their study concluded, "Overall, research and creditor experience has consistently indicated that credit reporting company information, despite any limitations that it may have, generally provides an effective measure of the relative credit risk posed by prospective borrowers." Although credit reporting agency data is extensive, it is *not* complete. The report lists a number of examples:

- Some small retailers, mortgage companies, finance companies and government agencies don't report consumer credit data at all. Neither are loans by individuals, employers, insurance companies or foreign entities reported.
- Some lenders don't report or update previous reports when payments are consistently made on time.
- Credit limits for revolving accounts are sometimes not reported. Creditors might not notify credit reporting agencies when an account is closed or undergoes other material changes.
- Credit reports are sensitive to the date on which the information is forwarded. For example, if the information is forwarded just prior to the billing date, it may not reflect that month's payments.
- Personal information may be incomplete or incorrect, although it is important to note that personal information is *not* used in FICO scores.
- The reporting of public records and collection agency accounts is inconsistent, and rate shopping by consumers impacts the number of inquiries posted in their credit files.

- It is worth noting that the credit reporting agencies have a series of protocols to address each of these issues.

Figure 10: Summary of Data Quality Problems

Inconsistent data across credit reporting agencies

Timing of when information is sent to each bureau impacts consistency

Duplication or inconsistency of public records and collection information

Lack of reporting by smaller lenders

Credit limits for revolving accounts not always reported

Occasional failure to notify credit reporting agencies when accounts are closed

Incomplete or incorrect personal information

Significantly, all of the recent studies on credit data agree that consumers need to take a more active role in ensuring the accuracy of their credit reports, checking them periodically and using the dispute process established in the FCRA to correct errors or omissions. Periodic checks are especially important if consumers are in the market for new credit, if they have been denied credit, or if a creditor has changed the terms of an account based on credit report information.

The good news is that there is growing consumer awareness of the importance of credit reports. Consumers now have more opportunity than ever to correct information in their credit reports and to understand how the information in their reports impacts their scores. Millions of consumers have already used tools available through Fair Isaac's consumer Web site, www.myFICO.com, and other sites to take better control of their credit. For example, in January 2002, Fair Isaac launched the first three-bureau credit report product designed for consumers that includes their FICO score, making it easy to review and correct the underlying credit information at all three agencies. The newly passed FACT Act will also make it easier for consumers to review their credit reports and credit scores, and to correct errors in their credit data.

Mitigating Data Quality Concerns when Building Scorecards

Through its years of scorecard development, Fair Isaac has acquired a depth of knowledge about bureau data that makes us more likely to understand the problems associated with data quality. Analysts building FICO scores routinely downplay or ignore types of data or "fields" that are deemed inconsistent. Inconsistent fields may be those that are not commonly found across all credit reports, or those where the values may represent different things in different reports. Generally, data that is inconsistent is less predictive and does not end up in scorecards. As Fair Isaac described in our written response to the CFA report (Fair Isaac, 2003), FICO scores minimize the impact of data discrepancies because they don't focus on a single piece of information, but evaluate dozens of types of predictive information in combination (a major advantage of scoring systems compared with judgmental review). This also has the result of reducing the impact of errors and omissions in single data elements.

Whenever possible, Fair Isaac also explicitly avoids whenever possible the use of data that might be incorrect or incomplete. For example, FICO scores evaluate the date of last activity only in rare cases. We frequently avoid "number of" variables to reduce the impact of data duplications ("presence of" or "time since" tend to be more predictive). We use a variety of utilization calculations to minimize the impact of missing credit limits. We use balance information only if it is recently reported. Fair Isaac has also developed a methodology to handle data issues in the development process, such as fragmented or duplicate files. The company's scorecard developers apply their tremendous experience in analyzing credit data to avoid placing weight on unreliable data.

Finally, in building scorecards, Fair Isaac's first priority is to develop the most predictive scorecard possible. Our second priority is to make the scorecards consistent across the credit reporting agencies. In our development work, we derive the most value from a given agency's unique data strengths. In general, this increases the accuracy of the scorecards for *each* agency. Identical scoring systems, ignoring data differences and data integrity, would make the scorecards less reliable and wouldn't necessarily reduce score differences. As a consequence of increasing scoring accuracy for each agency, the scores are often not exactly alike at each credit reporting agency for a specific consumer.

Although Fair Isaac has been able to anticipate and mitigate many of the data concerns raised by such studies, we enthusiastically support all efforts by the credit reporting industry to improve data quality and consistency. We believe it will improve the quality of the lending process, particularly for individuals of marginal creditworthiness. We recommend that lenders report complete information on a monthly basis to all three credit reporting agencies, and we encourage lenders to take the time to verify the accuracy of their reporting process. Fair Isaac also endorses the credit reporting agencies' continued efforts to advance data aggregation processes and improve the integrity of the data they house and share with clients.

Section 5: The Future of Credit Scoring

As we enter the twenty-first century, consumers are far more aware of the impact credit scoring has on their ability to gain access to credit. What does the future hold for credit scoring? We believe that credit scores will continue to increase in predictiveness and effectiveness to the benefit of all consumers, but especially for underserved populations who have had difficulty in gaining access to credit for home ownership in the past. This increase will come as a result of broadly improving consumer education on the importance of properly managing credit; creating standardized access to additional sources of data; and continuing innovation in the area of credit decisioning. As consumers increase their understanding of responsible credit use, access to credit (and therefore home ownership) will increase and credit rates will decrease as consumers demonstrate lower risk behavior.

Consumer Education and Empowerment

The importance of consumer education on credit management cannot be overemphasized. Consumers are increasingly savvy today about credit options and availability. They are demanding that they be evaluated and priced fairly and are requesting information about the role of scores in the lending process. The demand for information is most acute in the mortgage industry, where brokers sometimes disclose lenders' cutoff scores as well as the consumers' own scores. Typically consumers not only want to know their score, but what they can do to improve it to gain access to the most favorable pricing.

Consumers' interest in scoring information can be gauged in part by the success of Fair Isaac's consumer Web site, www.myFICO.com in March 2001. Within a year of its launch in

March 2001, over one million consumers had accessed their FICO scores and Equifax credit reports. At www.myFICO.com today, consumers can access their current FICO score and credit report from any of the three credit reporting agencies, as well as a personalized explanation of their FICO score and suggestions for improving their particular FICO score over time. They can also access a FICO score simulator to see how specific actions would affect their score and receive tips on how to improve it over time. In-depth information on FICO scores is also available on the site, including a full list of the factors evaluated by FICO scores, information updated daily on average interest rates for home and auto loans for different FICO score ranges, the national distribution of FICO scores, and sound advice for managing credit health.

Fair Isaac has researched consumer attitudes on a broad range of credit and credit scoring topics. These surveys had showed a moderate awareness of credit reports, but little knowledge of credit scoring beyond a notion of a 'credit rating'. Most consumers believed they could improve their rating, but often had no knowledge of how to do it or had information that was incorrect and could be harmful if acted upon. On its myFICO site, Fair Isaac makes a number of specific recommendations to consumers, summarized in Figure 11.

Figure 11: Tips for Improving Credit Scores
(From www.myFICO.com)

- DO gain access to credit if you have not used it in the past so a FICO score can be calculated
- DON'T open a lot of new accounts too rapidly
- Re-establish credit history by opening new accounts carefully and handling them responsibly subsequent to credit problems
- Pay your bills on time, every time
- See a legitimate credit counselor if you're having trouble
- Keep balances low on revolving credit accounts and pay off debt versus moving it between accounts
- Apply for and open new accounts only as needed
- Do your rate-shopping for automobiles or mortgages within a 30-day period if possible

In a survey performed by Opinion Research Corporation International in July of 2003 in which they surveyed 1,000 adult Americans, they found that most Americans rate their knowledge of credit reports and credit scores as "fair" or "poor" (50% for credit reports and 61% for credit scores). These numbers are even higher for lower-income (less than $35,000) Americans (60% for credit reports; 70% for credit scores). In surveying actual knowledge about credit reports and credit scores, only 25% of respondents (< 20% of low-income) knew what their credit score was. Twenty-seven percent incorrectly believe their credit score mainly measures their knowledge of consumer credit, vs. their credit-worthiness (ORC International, 2003).

Fair Isaac believes that the ability to check the credit risk score used by lenders, along with the underlying credit report and a detailed, personalized explanation from experts, will empower consumers to responsibly increase their score by changing their credit behavior. To test this belief, Fair Isaac investigated the performance of 27,000 consumers who bought their FICO scores at www.myFICO.com more than once in a six-month period. Although this research is still underway, preliminary results indicate that this population did improve their FICO scores between their first and second visits, and did so at a faster rate than consumers typically migrate to higher scores. The primary reasons for this increase include cleaning up incorrect information on credit reports, paying down balances, and limiting new credit to essentials.

Educating consumers about the importance of credit and the basics of sound credit management is an important first step in empowering consumers to take more control of their access to credit. However, while sites such as www.myFICO.com serve an important function for much of the population, there is a need for more widespread education that is available in a variety of forms. An early survey of the myFICO audience showed them to be generally well-educated home owners with higher incomes and actively engaged with their lenders.

The 2002 study by Freddie Mac on the impact of automated underwriting on minorities (Gates et al., 2002) also cited the need to close the current gap in financial literacy. It specifically suggested attempting to eliminate the differential in Internet access across income, racial and ethnic groups to enable easier access to mortgage and home-buying information. Therefore a continuing need exists for more and varied sources of education, particularly to reach underserved populations. Education should begin in high school if not earlier, teaching youngsters of all population groups how to access and use credit responsibly.

A critical component of special CRA programs is counseling and education, both during the loan process and after the participants become homeowners. As described earlier, at least one study has demonstrated that the successful completion of counseling and education programs lowers risk (Staten et al., 2002) Performance of loans booked through special mortgage programs indicates that these approaches are successful in identifying applicants of acceptable risk. A Federal Reserve Board survey found that CRA special mortgage programs performed better (i.e., loans extended through them had lower delinquency and net charge-off rates) than overall CRA-related home purchase and refinance lending (Avery et al., 2000).

Efforts to educate and empower low-income and minority segments of the population on how to establish credit, use it responsibly and recover from past problems, will result in a significant increase in the ability of these consumers to obtain mortgages. Effective education will also assist consumers by helping to ensure that the data held at the credit reporting agencies is accurate and complete. All of the studies on data quality agree that consumers need to take a more active role in ensuring the accuracy of their reports.

The Need for Additional Standardized Sources of Data

The entire US credit industry, including consumers, must continue to improve the quality of consumer credit data currently being shared for credit lending. Additional sources of data are available today as described earlier, and will enable better risk assessment for populations with little credit experience or who have been credit challenged. These data include nontraditional verification of creditworthiness including rental, utility and insurance payments. Letters of explanation for past problems with credit may also prove predictive, as could the certification of successful completion of education and counseling programs.

The performance of consumer loans made under programs such as ACORN and Project Hope have demonstrated the value of these data for assessing the creditworthiness of the households they serve. Unfortunately, there is no consistency in either the format of these data or the method for accessing them. To be useful in credit risk scoring, these data must be collected in a more complete, accurate and standardized manner before the benefits they offer can be realized. A number of organizations such as the Ford Foundation are trying to create such databases. (Nathan, 2003) Unfortunately, it is likely to take some time before these are available in a form convenient for automated credit risk assessment.

More predictive scores are better for consumers, lenders and the overall economy. Advances in scoring technology will continue to increase the benefits that scoring provides. While details on recent advances in scoring technology are out of the scope of this paper, they include the ability to summarize and incorporate the preferences of consumers in lending decisions (Fair Isaac, 2002) and the ability to optimize various credit decisions under a set of constrained objectives (Fishelson-Holstine, 2002)

Conclusion

Credit scoring is fast, fair and consistent. This has resulted in more credit being available at a better price to consumers than would otherwise be possible. By enabling lenders to extend credit quickly while safely managing their risk, credit scores have made credit more accessible to more people. Credit scores allow lenders to safely assess and account for the risk of consumers who are new to the lender, and who may have been turned away by other lenders. While credit availability has increased overall, it has increased at an accelerated rate for families who have traditionally been underserved.

Just as credit scoring is more effective than judgmental lending, more predictive credit scores, such as Fair Isaac's NextGen FICO models, are even more effective at increasing the availability of credit at a fair price to a wider segment of the population. Increased predictive power comes from a variety of sources. Those interested in increasing access to home ownership should actively support those initiatives that will lead to more predictive scores. These include the addition of new sources of predictive data in standardized formats, the continuation of efforts to increase the quality of available data, educating and empowering consumers to use credit responsibly, and defending the need for unrestricted access to shared data coupled with responsible use of that information.

Home ownership rates could be increased by standardizing and increasing the availability of nontraditional data sources used to assess creditworthiness. For these sources to be used in credit scoring, nontraditional data needs to be collected in a more complete, accurate and standardized manner. Although additional information about rental or utility payments can be obtained by asking consumers to provide this information themselves, this results in a negative customer experience, so most customers are unwilling to supply the additional information and ultimately do not receive the benefit the additional data could supply.

While the quality of credit reporting agency data has increased considerably over the past decade, this improvement (and the concomitant increase in available credit) could be further enhanced by continuing to eliminate sources of missing or incorrect data. Consumers should be encouraged to take a more active role in ensuring the accuracy of their credit reports, checking them periodically and using the dispute process established in the FCRA to correct errors or omissions. Consumers should review their reports periodically, especially if they are in the market for new credit, if they have been denied credit, or if a creditor has changed the terms of an account based on credit reporting agency information.

Consumers are demanding that they be evaluated and priced fairly. They also are requesting information about the role of credit scores in the lending process. Sites such as www.myFICO.com have increased consumer knowledge and have empowered consumers to take actions that improve their access to credit at the best possible price. More types and forms of education are needed in order to reach all parts of the population, particularly the underserved segments. As consumers increase their understanding of how to use credit responsibly, access to credit (and therefore home ownership) will increase and prices will decrease as consumers demonstrate lower risk behavior.

Complete, consistent data makes scorecards more predictive, benefiting both consumers and lenders. Removing information from credit reports would make the process of obtaining credit more difficult for consumers.

More predictive scores are better for consumers, lenders and the overall economy. Credit scores have played an essential role in increasing home ownership for underserved populations. Balanced legislation, broad access to high-quality data, responsible use of information, and consumer education and empowerment will increase the benefits that scoring brings to consumers, lenders and the overall US economy.

References

Aizcorbe, Ana M., Arthur B. Kennickell, and Kevin B. Moore, 2003. Recent Changes in U.S. Family Finances: Evidence from the 1998 and 2001 Survey of Consumer Finances. Federal Reserve Board Bulletin.

Avery, Robert B., Raphael W. Bostic, and Glenn B. Canner. 2000. CRA Special Lending Programs. Federal Reserve Board Bulletin. November: 711-731.

Avery, Robert B., Paul S. Calem, and Glenn B. Canner. 2003. An Overview of Consumer Data and Credit Reporting. Federal Reserve Board Bulletin. February: 47-73

Barron, John M. and Michael Staten. 2000. The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience. Credit Research Center.

Cate, Fred H., Robert E. Litan, Michael Staten, and Peter Wallison. 2003. Financial Privacy, Consumer Prosperity, and the Public Good: Maintaining the Balance. AEI-Brookings Joint Center for Regulatory Studies.

Chandler, Gary G. 1998. *Generic and Customized Scoring Models: A Comparison*. Dearborn Publishers.

Consumer Federation of America (CFA). 2002. Credit Score Accuracy and Implications for Consumers, December 17, 2002. Consumer Federation of America National Credit Reporting Association

Courchane, Marsha, Ken Mueller, and Sharon O'Connor-Clarke. 1998. The Three Faces of Small Business Regulatory Exams. Presentation at InterACT 98 conference, June 7-10, San Francisco, CA.

Durkin, Thomas A., and Gregory Elliehausen. 2000. Interinstitutional Competition for Consumer Credit at the End of the Twentieth Century. Credit Research Center.

Fair Isaac. 1990. Study Completed for Associated Credit Bureaus. *ViewPoints Newsletter*. Volume 15, Number 1.

Fair Isaac. 1995. First pooled-data scorecards available for small-business lenders. *ViewPoints Newsletter* Volume 19, Number 2.

Fair Isaac. 1996. Value of Positive Credit Bureau Information. *Bureau Scores Today*. Volume 5, Number 3.

Fair Isaac. 2002. Web as "Lab" Shrinks Credit Card Offer Test Costs. *ViewPoints Newsletter*. Volume 26, Number 1.

Fair Isaac. 2003. What the CFA got Right-and Wrong about Credit Scoring. *ViewPoints Newsletter*. Volume 27, Number 1.

Fishelson-Holstine, Hollis. 2002. Using Decision Analysis to Improve Strategy Design. *Bank Accounting and Finance*. Volume 15, Number 4.

Gates, Susan W., Vanessa G. Perry and Peter M. Zorn. 2002. Automated Underwriting in Mortgage Lending: Good News for the Underserved? Housing Policy Debate. Volume 13, Issue 2.

Greenspan, Alan. 1994. "Remarks at American Banker Association annual conference"

Greenspan, Alan. 1999. Remarks at the Mortgage Bankers Association. Washington DC, March 8, 1999. Available from http://www.federalreserve.gov/boarddocs/speeches/f1999/199909082.html accessed 12/3/2003

Kitchenman, Walter F. 1999. US Credit Reporting: Perceived Benefits Outweigh Privacy Concerns. *Tower Group Report.* January Issue.

Martell, Javier, Paul Panichelli, Richard Strauch, and Sally Taylor-Shoff. 1997. Effectiveness of Scoring on Low-to-Moderate Income and High Minority Area Populations. Fair Isaac.

Nathan, Michael. 2003. A Conversation with Nathan Michael CEO of Pay Rent, Build Credit.

ORC International. 2003. Credit Report Survey prepared for Consumer Federation of America. July 18.

St. John, Cheri. 2002. Changing Face of Scoring: How the Use of CB Data is Evolving. Presentation at InterACT 2002 Conference, May 12-15, San Francisco, CA.

St. John, Cheri. 2003. Testimony to the House Financial Services Subcommittee on the Renewal of FCRA Preemption. June 4, Washington D.C.

Staten, Michael E., Gregory Elliehausen, and E. Christopher Lundquist. 2002. The Impact of Credit Counseling on Subsequent Borrower Credit Usage and Payment Behavior. Credit Research Center.

Turner, Michael. 2003. The Fair Credit Reporting Act: Access, Efficiency and Opportunity. The Economic Importance of Fair Credit Reauthorization. Information Policy Institute.

Van Dijk, Luke, and Cheri St. John.1998. New Directions in CB Data and Risk Prediction, Conference Session #47. Presentation at InterACT 98 Conference, June 7-10, San Francisco, CA.