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# RISK-BASED PRICING IN CONSUMER LENDING

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Staten has made invited presentations on consumer financial issues at workshops and events sponsored by the Federal Trade Commission, the Federal Deposit Insurance Corporation, the Federal Reserve Board, and Washington, DC think-tanks including the American Enterprise Institute and the Brookings Institution. Staten was a Visiting Scholar at the Federal Reserve Bank of Philadelphia's Payment Card Center from 2010–2013 and has testified numerous times on consumer finance issues before committees of Congress and various national commissions. He has worked on projects for the U.S. Treasury Department and the national Council for Economic Education to write learning standards and benchmarks for personal finance in grades K-12.

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## Executive Summary

In the good old days, you could not get a loan unless you didn't need a loan! Most consumers could not build a credit history, had trouble accessing credit early in their careers, and found it difficult to finance major purchases—everything from a new refrigerator to their children's dental work. What changed this? Credit providers developed better tools to determine the risk of each consumer and price credit accordingly. This data-driven risk-based pricing approach has been largely responsible for expanding credit access to tens of millions of American consumers since its introduction in the late 1980s. And it enabled a growing number of credit providers to compete for that business—lowering costs and fueling responsible innovation.

Risk-based pricing in consumer finance tailors the price and terms of a loan to a borrower's likelihood of repayment, allowing lenders to extend credit to more consumers. All creditors face a risk spectrum of potential borrowers. Each borrower has unique characteristics that influence the probability of default on a loan. Higher-risk borrowers are significantly more costly for lenders to serve than lower-risk borrowers. Risk-based pricing attempts to match the price a borrower pays to the cost incurred by the lender by adjusting the price of the loan to each borrower's probability of default. This paper describes how risk-based pricing has transformed consumer credit markets in the United States by increasing competition, lowering the price of credit for lower-risk borrowers, and broadening credit access to higher-risk borrowers.

Since the late 1980s, consumer lenders have relied on statistical credit scoring models to estimate a borrower's default risk and set loan interest rates appropriate for that risk. The dramatic expansion of credit to consumers in the United States over the past three decades occurred simultaneously with the widespread adoption of risk-based pricing by bank credit card issuer (beginning around 1988), automobile lenders (by 1992), and eventually mortgage lenders (starting in 1996). By tailoring its pricing to individual borrowers, a single creditor can effectively compete for low-risk customers at the same time it extends credit availability to higher-risk borrowers at higher prices. Compared with the one price fits all practice that was common in consumer lending in earlier decades, risk-based pricing lowers the cost of credit for the majority of borrowers but also expands credit availability to higher-risk borrowers and leads to a broader array of loan products available to all income groups.

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Consumer lending markets that employ risk-based pricing display attributes benefiting consumers and the macro economy.



***Fairness:*** The vast majority of credit decisions today are based on objective data regarding a borrower’s own past payment history and current obligations. The use of credit scoring and risk-based pricing have dramatically increased the consistency of a creditor’s lending decisions and the likelihood of equal treatment across tens of thousands of applicants. As a result, American consumers can get credit, insurance, and a host of other financial services based on their own credit records, not their family name or how long they have known their banker. In addition, they can rent apartments, purchase cell phones and cable television service, and rent automobiles without either large deposits or an established relationship with the service provider, all because their reputation for paying as agreed on is documented through their credit reports. Compared with a one-price-fits-all system, a borrower in a market characterized by risk-based pricing is also less likely to be paying for the costs imposed by someone else’s behavior. Further, risk-based pricing rewards borrowers who adjust their behavior. Borrowers can qualify for a lower-priced loan by improving their financial position and credit behavior.



***Financial Inclusion:*** Credit scoring and risk-based pricing triggered a massive expansion in credit opportunities for American consumers across the socioeconomic spectrum. Between the early 1980s and 2001, the lower half of the income distribution experienced 200%–300% increases in the percentage of households with access to general purpose credit cards and 30%–70% increases in access to other types of consumer loans. Broadly developed consumer loan markets are particularly important for householders early in the life cycle (ages 20–45) when the demand for housing, durable goods, and education is relatively high and incomes are relatively low but expected to rise over time. Yet access to credit is also important for households weathering temporary income disruptions or unexpected expense shocks. Over the past three decades, tens of millions of U.S. households have gained access to a credit “bridge” that can sustain them through temporary disruptions and declines in incomes.



**Innovation:** One of the virtues of credit scoring as a decision assistance tool is that new data improve the ability of these models to fine-tune a lender's assessment and pricing of risk. And competitive lending markets encourage an ongoing "champion-challenger" evolution that increases the accuracy of these tools. An excellent example is the recent inclusion of alternative consumer payment data from apartment rentals and utility payments. Incorporating these data into scoring and loan pricing is dramatically expanding credit availability to 30–55 million American consumers who were previously underserved by conventional loan markets. Rather than shutting these individuals out of the market, scoring and risk-based pricing have given lenders the tools and incentives that they need to say yes to loan applications from a far wider cross-section of the population than ever before.



**Economic Growth:** Over the past three decades, tens of millions of U.S. households have gained access to credit, helping finance the purchase of a car to get to work, a home to raise a family, or an education to give a child the skills to succeed. Small business owners use credit, even personal credit, to finance equipment or materials purchases, or even use the "float" to make payroll in a pinch. Responsible consumption, often using credit, is a key driver of economic growth. And these benefits are a direct consequence of competitive pressure in the lending industry to find more efficient decision tools for making loans.

Restrictions in the form of regulation that would limit the use of either credit report information or the various scoring and pricing tools that have been built with that data, or enforcement doctrines like disparate impact that implicitly challenge the use of objective criteria in lending and pricing, would stifle innovation, reduce the potential for improved models to bring their enormous benefits to consumers across the credit spectrum, and roll back many of the benefits already obtained. In short, without sophisticated risk-based pricing, many higher-risk consumers would lose access to conventional loans altogether.



## Introduction

Since the late 1980s, consumer lenders have relied on statistical credit scoring models to set loan interest rates appropriate for a borrower's risk. This practice, known as risk-based pricing, attempts to tailor the price and terms of a loan to a borrower's estimated likelihood of repayment. Borrowers who are less likely to become delinquent on a loan pay lower interest rates. It is no coincidence that the dramatic expansion of credit to consumers in the United States over the past two decades occurred simultaneously with the widespread adoption of risk-based pricing by bank credit card issuers (beginning around 1988), automobile lenders (by 1992), and eventually mortgage lenders (since the mid-1990s).

This paper describes how risk-based pricing transforms consumer credit markets. By charging lower-risk borrowers less, risk-based pricing lowers the cost of credit for the majority of borrowers.<sup>1</sup> But it also expands credit availability to higher-risk borrowers and leads to a broader array of loan products available to all income groups. In fact, regulatory agencies encourage lenders to adopt risk-based pricing to protect the safety and soundness of financial institutions as they broaden credit availability to include higher-risk borrowers. The following sections explain why this pricing method evolved, how it works, and the range of benefits to consumers, creditors, and the overall economy.

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<sup>1</sup> A Federal Reserve Board study conducted prior to the Great Recession found that 51% of all U.S. consumers had no record of delinquency of any kind on their credit reports during the previous seven years (the maximum length of time that a delinquency can remain on the credit report under current law). Nearly two-thirds of consumers had never been more than 30 days late on any account, and three-quarters of all consumers had not made a late payment in the past 12 months (Avery et al., 2004).

## What Is Risk-Based Pricing?

All creditors face a risk-spectrum of potential borrowers. Each borrower has unique characteristics that influence the probability of default on a loan. Higher-risk borrowers are more costly for lenders to serve than lower-risk borrowers. Risk-based pricing attempts to match the price a borrower pays to the cost incurred by the lender by tailoring the price of the loan to a borrower's probability of default. By tailoring its pricing to individual borrowers, a single creditor can effectively compete for low-risk customers at the same time it extends credit availability to higher-risk borrowers at higher prices.

Competitive pressures bring about this result. The alternative one-price-for-all strategy, commonly used in the pricing of many consumer goods, would effectively charge all borrowers a price that covers the average cost of providing loans to the entire group. But unlike purchasers of gasoline, hamburgers, or shoes, borrowers of larger priced items like washing machines, cars, or homes differ greatly with respect to how much it costs to provide them a loan product. Low-risk borrowers are demonstrably less costly to serve than high-risk borrowers because of their lower incidence of losses and the lower costs of servicing their delinquent accounts. If a creditor developed the risk management tools to sort low-risk from high-risk borrowers at the time of the loan application, it could identify and compete for low-risk borrowers by offering loans at lower rates but with tougher qualifying standards. To meet this competitive threat, an established creditor with a portfolio of loans must cut its own rate to its low-risk customers, or risk losing them to the competition. This process repeats across every risk group. As a result, a competitive lending market provides borrowers the best rate for their risk profile.

*By tailoring its pricing to individual borrowers, a single creditor can effectively compete for low-risk customers at the same time it extends credit availability to higher-risk borrowers at higher prices.*

Put another way, without risk-based pricing, higher-risk consumers will not be able to get loans at any price, because a lender whose portfolio includes too many high-risk customers will have to raise the average rate offered, and that will drive away the lower-risk borrowers.

To illustrate, suppose the average loss rate in a lender's credit card portfolio requires that the lender charge an average finance charge rate of 14%. But cardholders with good credit histories (e.g., no record of late payments and relatively low balances across other accounts) may qualify for a rate of 8% on their cards. Other cardholders with troubled credit histories (e.g., one or more accounts that are 90 days past due or high levels of other debt and credit card accounts with balances at or near their limits) pose a much higher risk of default, for which an interest rate of 20% or more may be appropriate. If the card issuer charges both borrowers an interest rate of

14%, one pays too much and the other too little, given their respective risk profiles. Moreover, the low-risk borrower who pays too much is likely to receive a lower-priced offer from another issuer. Lenders who succeed in tailoring their pricing to match the costs imposed by borrowers can more effectively compete for all borrowers by offering each of them the lowest possible price commensurate with the costs of providing them service.

This simple example highlights the inherent fairness to risk-based pricing. The price a borrower pays for a loan depends on that borrower's own financial situation and past payment behavior. Compared to a one-price-fits-all system, a borrower in a market characterized by risk-based pricing is less likely to be paying for the costs imposed by someone else's behavior. Interest rates on loans to low-risk borrowers can be lower because they do not have to cover the costs imposed by higher-risk borrowers who have more difficulty making their payments. In addition, risk-based pricing is fair because it rewards borrowers who adjust their behavior. Borrowers can qualify for a lower priced loan by improving their financial position and credit behavior.

## The Special Function Served by Credit Reporting and Credit Scoring in Supporting Risk-Based Pricing

No discussion of risk-based pricing is complete without incorporating two other market-driven developments that have evolved to improve a lender's risk assessment. The widespread use of risk-based pricing is critically dependent on (1) the availability of detailed consumer-level data contained in credit reports that support the risk evaluation underlying tiered pricing and (2) the development and widespread adoption of statistical models that translate raw material from credit reports and other sources into specific estimates of default risk, like credit scores. Credit reporting and scoring make risk-based pricing possible.<sup>2</sup>

### Role of Credit Reporting

All loans share a common feature. Each involves an intertemporal transaction in which the lender provides funds with the expectation that the borrower will repay at some future time. But lenders view applicants through a fog of uncertainty and it is costly to determine the risk posed by any given applicant. Credit reporting evolved in the market to reduce those costs.

Repayment risk stems from the twin threats of adverse selection and moral hazard that accompany every new loan application. Adverse selection poses a significant barrier to the entry of new lenders into credit markets. New entrants have no prior experience with local borrowers

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<sup>2</sup> Of course, these are also the features of risk-based pricing that give it high marks on fairness: the terms of the loan are tailored to the borrower's own individual characteristics.

to draw upon. As a result, they are likely to attract applications from higher-risk borrowers who have been rejected by established lenders. Information about borrowers' past credit experience that is shared across lenders through a credit bureau intermediary can reduce this problem.

Moral hazard presents lenders with a different problem. Once a loan is obtained, borrowers have a greater incentive to default when the expected future consequences are low. But a reputation for past default that is readily communicated to potential lenders can raise those costs, thereby boosting the borrower's incentive to repay.<sup>3</sup> Credit bureaus facilitate that information sharing.<sup>4</sup>

The emergence of the credit bureau as a third-party participant in credit markets institutionalized the sharing of consumer payment data, and in doing so, reduced the cost of assessing borrower risk. Economic research has shown that lenders benefit as a group if they commit to exchanging information about borrowers and create an enforcement mechanism that ensures accuracy of the information shared (Padilla and Pagano, 1997). The third-party credit bureau serves as both the clearinghouse and enforcer. The credit report helps lenders pierce the fog of uncertainty surrounding each new loan applicant. The result is a better match of borrowers to loans.

## Role of Credit Scoring

Credit scoring evolved to help lenders utilize the data in credit reports more efficiently. Until the mid-1960s, consumer lending decisions in the United States were made individually by thousands of loan officers who exercised their individual judgment with each application. Loan officers gathered information about the applicant and applied lessons from their personal lending experience to decide whether an application should be approved.

However, a number of factors combined to push the consumer credit industry away from this judgmental model of underwriting. The post-World War II boom in consumer lending increased the pressure on retailers and consumer finance companies to efficiently process a rising tide of loan applications. But a human-based judgmental approach to consumer loan underwriting was slow and labor-intensive. And the inconsistency inherent in a judgmental approach rendered a company-wide underwriting policy nearly impossible.<sup>5</sup>

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<sup>3</sup> Another variation on the moral hazard problem occurs when a borrower obtains credit from multiple sources. Each additional loan adds to total debt (relative to income) and so raises the probability of default, not only on the new loan but for all other existing loans. If lenders are unaware of the multiple loans, and do not take countermeasures, borrowers are more likely to overextend (Bizer and DeMarzo, 1992). Exchange of information about a borrower's existing loans helps lenders to curb the problem.

<sup>4</sup> Economist Daniel Klein (1992) observed that the credit bureau has the distinction of being "the most standardized and most extensive reputational system humankind has ever known" (p. 121).

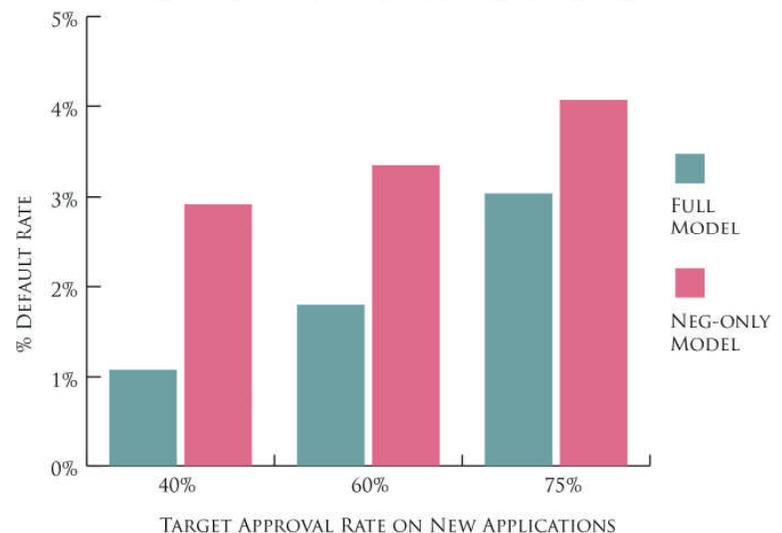
<sup>5</sup> Lewis (1992) observed that "management had no way of expressing a corporate policy such as: 'Accept only those applications whose risk is 13 to 1 or better.' As a result, each individual credit evaluator decided for himself what level of risk the applicant represented and what level of risk the enterprise as a whole should tolerate. In a

The advent of statistical credit scoring dramatically changed consumer loan underwriting. Credit scoring gave lenders a powerful tool for rapidly and consistently evaluating risk as well as summarizing it via a numerical score. The conceptual rationale for statistical credit scoring is essentially the same as for judgmental lending: patterns observed in the past are expected to recur in the future. Using multivariate statistical methods and data on tens of thousands of loans made in the past, credit scoring models are built to identify predictive relationships between a wide variety of variables and loan performance.

By the 1980s, the published studies of scoring were reporting significant reductions in loan losses with little or no sacrifice of loan volume.<sup>6</sup> How was this possible? Simply put, credit scoring allows a better match of borrowers to loans. Simulations using actual credit report data and selectively withholding information from a scoring model have repeatedly shown that more information available to the model (providing a sharper picture of the borrower's experience) dramatically improves the model's ability to estimate risk.

Barron and Staten (2003) provide a good example as part of a World Bank project to explore the role of credit reporting infrastructure in developing economies. Their report offers a set of simulations that demonstrate the benefits of increasingly comprehensive information about a borrower's credit profile. One simulation is described below, comparing a reporting environment in which full-file (both positive payment experience as well as delinquencies and other negative items) information is available for risk assessment vs. an environment in which only negative information is available.<sup>7</sup>

FIGURE 1: A SCORING MODEL BASED ON FULL INFORMATION (POSITIVE AND NEGATIVE) CUT DEFAULT RATES IN HALF, FOR THE SAME NUMBER OF ACCEPTED BORROWERS



Source: Barron and Staten (2003)

nationwide loan company with, perhaps, one thousand offices, there might be as many as two to three thousand people defining overall corporate policy" (p. 2–3).

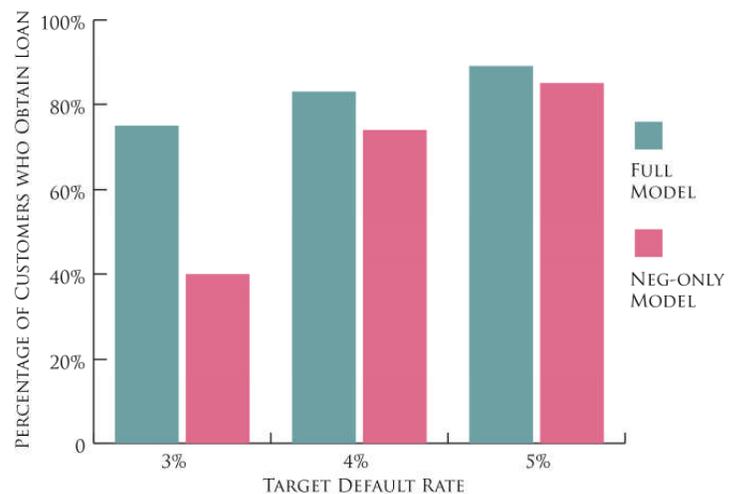
<sup>6</sup> See Rosenberg and Gleit (1994) for an interesting review of published scoring studies and a catalog of the variety of statistical techniques that had been applied to the consumer loan scoring problem as of the early 1990s.

<sup>7</sup> By using a large set of credit report data elements from U.S. credit reports to build a predictive credit scoring model, and then removing particular data fields that in other countries are either banned by regulation or unavailable due to limitations in local credit reporting systems, the simulation identified the reduction in predictive power attributable to the missing information. This methodology has been repeated by other researchers to illustrate the effects of restrictions on information available to credit scoring models. For a review of several studies, see Turner and Varghese (2010).

Figure 1 illustrates the change in predictive power associated with expansion in the information available to the credit scoring model. Under each of the scenarios depicted in the table, the model was used to calculate individual credit scores for each borrower in a sample. Individual borrowers were ranked according to their credit score (which corresponds to a default probability). The authors then picked various loan approval rates (e.g., approve 60% of applicants starting with the least risky and continuing until 60% of the sample is accepted) and reported the corresponding percent of borrowers who would likely default (defined as reaching 90 days past due) on their newly opened accounts within two years. At a targeted approval rate of 60%, the model built on only negative information about borrowers produced a 3.36% default rate among accepted applicants, compared with only a 1.95% default rate for applicants approved with the full-file model. In other words, the default rate under the negative-only reporting rules is 72% higher than if the full set of credit report information was available to creditors.

Next, consider the implications of more complete information on the lender's approval of loans. Suppose the economics of the lender's operation require no more than a 3% default rate for the loan portfolio to be profitable. Figure 2 shows that the negative-only reporting model could approve only 39.8% of applicants without exceeding the target default rate. However, under the full-file system, 74.8% of applicants could be approved. In other words, for every 10,000 applicants, the full-file system would approve 3,500 deserving borrowers that the negative-only system would have rejected.

FIGURE 2: THE FULL-INFORMATION MODEL SHARPLY INCREASES THE NUMBER OF APPLICANTS WHO GET LOANS



Source: Barron and Staten (2003)

How can this be? The reason for the improved performance of the full-file model is intuitive: when risk assessment tools have less information available to them, creditors have greater difficulty piercing the fog of uncertainty that surrounds new borrowers. Consequently, creditor efforts are less effective at matching loans to borrowers who will repay as agreed. For any pool of approved loans, more of the loans go to borrowers who will default, and more borrowers are rejected who would have repaid.<sup>8</sup>

<sup>8</sup> The negative impact on worthy borrowers is greatest for those who are young, have short time on the job or at their residence, have lower incomes, and are generally more financially vulnerable. These are precisely the borrowers for whom the ability to see successful handling of credit on the credit report is most important, to offset attributes that otherwise make them appear to be higher risk. This theme will be repeated later in this report.

To summarize, the use of credit scoring to evaluate loan applications can reduce processing costs and expand a lender's portfolio without raising loss rates, relative to judgmental lending. And credit scoring gives lenders a valuable planning tool to forecast losses as well as a consistent decision tool for giving equal treatment to tens of thousands of applicants.

## Risk-Based Pricing: A Natural Extension of Credit Scoring

An important but sometimes overlooked point explains why scoring models and risk-based pricing are used so intensively across the industry. Creditors evaluate applicant risk in order to reduce subsequent losses in their loan portfolios. But loss reduction by itself is not the goal. Creditors want to make loans, and make them profitably. Loss reduction by itself could easily be achieved by raising the acceptance standard to the point that only a few highly qualified borrowers are able to get loans, but in doing so, a creditor would turn down many potentially profitable loans. For a given pool of loan applicants, a creditor wants a risk evaluation tool that will identify higher-risk borrowers so that loans can be made to them at an appropriately higher price to cover the additional risk.

Credit scoring models generate specific predictions about probability of default. Rather than reject applicants who posed default risk of, say, 5% or even 10%, creditors could accept them and charge an appropriately higher price for the loan to cover the extra risk. When this capability developed in U.S. loan markets, it dramatically expanded the pool of borrowers who it was economically possible to serve. The foundation for risk-based pricing—and ultimately a dramatic expansion in credit availability in the United States—was a by-product of a tool that was originally intended to help lenders more efficiently accept or reject loan applications.

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Between 1980 and 2000, judgmental credit decision systems in consumer and mortgage lending were gradually replaced with empirically derived, demonstrably and statistically sound scoring systems. This dramatic change in risk evaluation technology largely automated the underwriting process and greatly reduced the subjective nature of the lending decision. The consumer lending industry migrated to the use of statistical scoring of loan applications first for credit cards and eventually for automobile loans and virtually every other type of consumer loan by the early 1990s.<sup>9</sup> Last to accept scoring was the mortgage

<sup>9</sup> By the mid-1980s, the benefits of credit scoring as a risk management tool for credit card lending had become compelling, but the development of a customized application scoring system required large numbers of accounts and was relatively expensive. Small credit card issuers (e.g., community banks and credit unions) typically lacked the scale and account base to develop their own. In response, FICO and other scoring system developers (including the

industry, but by mid-1996, credit scoring was endorsed as a valid tool for evaluating mortgage applications by the Federal Reserve (Avery et al., 1996) and by the government-sponsored enterprises Freddie Mac and Fannie Mae. By the end of the decade, automated underwriting of mortgages using credit scoring had become the industry standard (Stracka, 2000). Risk-based pricing had become common practice across consumer lending.

## Evidence on the Impact of Risk-Based Pricing

### Competition and Pricing in the U.S. Credit Card Industry

Risk-based pricing for consumer loans in the United States made its debut on a national scale during the early 1990s. Massive entry of new card issuers into the general-purpose credit card market created intense competition for both existing and new cardholders. Newly available risk scoring tools gave lenders the ability to sort customers according to the risk (cost) of serving them. Differential pricing was the competitive response.

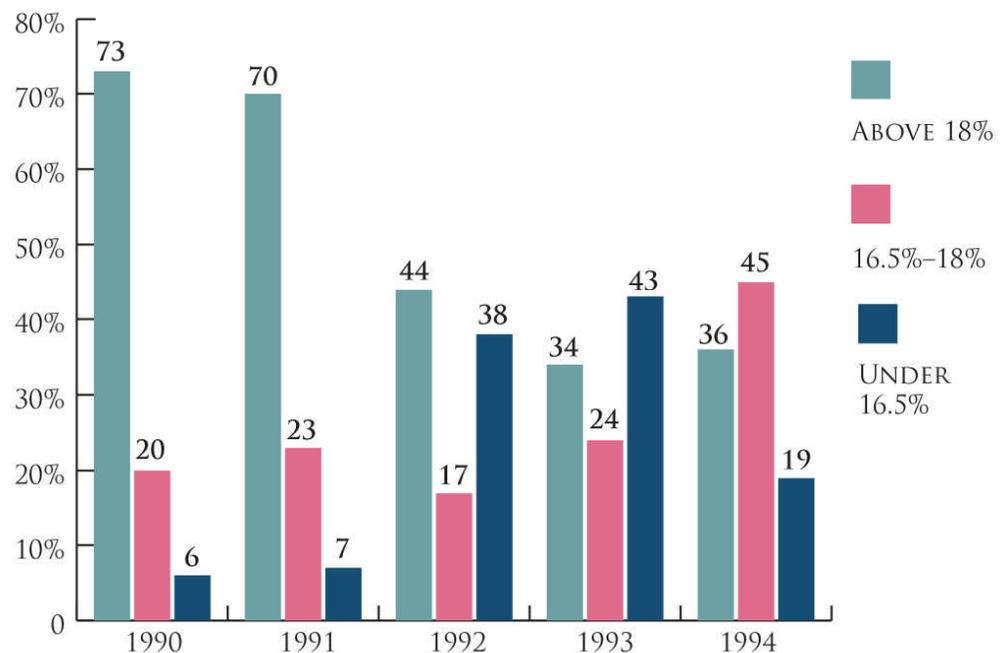
Through the late 1970s, most credit card holders in the United States acquired their general-purpose credit cards through their local financial institutions, often by picking up applications at a branch. Choice was limited to issuers who happened to offer a credit card product through a local bank or other financial institution. Customers in smaller towns had fewer choices than residents of large cities. Few banks issued credit cards to customers outside their charter state. Because local institutions faced little threat of entry, there was little variance in either credit card prices or product features (Knittel and Stango, 2003). Credit card applicants were either accepted or rejected for a card, and the price was essentially the same across cardholders.

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major credit bureaus with their VantageScore product introduced in 2006) created “generic” credit report-based scoring models. Generic scoring models are commercially sold for use by multiple creditors. Because the models are intended for use by many creditors, they utilize only credit bureau data fields that are available to all creditors (as opposed to application data that in most cases is unique to a specific creditor’s loan product and customer base). Generic scoring models opened up credit scoring technology to the entire industry (Chandler, 2004, p. 13).

All of this began to change by the mid-to-late 1980s. A key court decision in 1978 gave banks the ability to launch national credit card marketing programs without being constrained by cross-state differences in the legal limits on pricing.<sup>10</sup> The nationwide availability of detailed credit histories for potential cardholder prospects made it possible for credit card issuers to enter new geographic markets. Many banks launched national marketing campaigns. Over the course of the next decade, the opportunity to market credit cards nationally through the mail without a network of brick-and-mortar branches spawned the entry of branchless, “monoline” credit card specialists (e.g., Sears Discover card; MBNA). Retailers and manufacturers (e.g., General Motors, AT&T, and General Electric) also began introducing their own “co-branded” bank credit cards as unique alternatives to the traditional Visa and MasterCard products being offered by established banks. Entry often occurred with astounding speed.<sup>11</sup> The use of credit report data and credit scoring to prescreen borrowers and target desirable prospects provided the jet fuel for an acceleration in card offerings and competition.<sup>12</sup>

FIGURE 3: CREDIT CARD BALANCES THAT CHARGED MORE THAN 18% PLUMMET AFTER THE INTRODUCTION OF RISK-BASED PRICING\*



\*Proportion of outstanding bank credit card balances in the United States. Data derived from survey of 100 top issuers representing 93% of the U.S. bank card receivables. Source: CardTrak, RAM Research, March 1995

introducing their own “co-branded” bank credit cards as unique alternatives to the traditional Visa and MasterCard products being offered by established banks. Entry often occurred with astounding speed.<sup>11</sup> The use of credit report data and credit scoring to prescreen borrowers and target desirable prospects provided the jet fuel for an acceleration in card offerings and competition.<sup>12</sup>

<sup>10</sup> Marquette National Bank of Minneapolis v. First of Omaha Service Corp., 439 U.S. 299, 310 (1978). The following discussion draws heavily on Staten and Cate (2003).

<sup>11</sup> Following its introduction in 1992, the General Motors MasterCard product established 2 million accounts and more than \$500 million of balances in its first 60 days on the market, making it the most successful credit card launch in U.S. history. See Dickson (1992, p. 26).

<sup>12</sup> The annual number of direct mail credit card solicitations soared from 1 billion in 1989 to 2.4 billion in 1994 (Stango, 2000).

The wave of new entrants to the credit card market put increasing downward pressure on the finance charge rate and annual fees charged by existing issuers. Incumbent credit card issuers saw attrition soar, particularly among their lower-risk customers.<sup>13</sup> Competitors knew no geographic boundaries and their offers reached consumer mailboxes from thousands of miles away. Risk-based pricing was the competitive response to protect existing customer relationships. Risk-based pricing effectively eliminated the industry practice of packing the costs of handling delinquent accounts for a small number of customers into higher interest rates for all customers, and interest rates dropped precipitously (Knittel and Stango, 2003). The proportion of all revolving balances in the United States being charged an APR greater than 18.0% plummeted from 70% to 44% in just four years (Figure 3) (Board of Directors of the Federal Reserve, 2001).<sup>14</sup>

*The largest increases in card ownership (200%–300%) occurred in the lower half of the income distribution, consumers who had not qualified for cards under the one-price-fits-all policies of the past.*

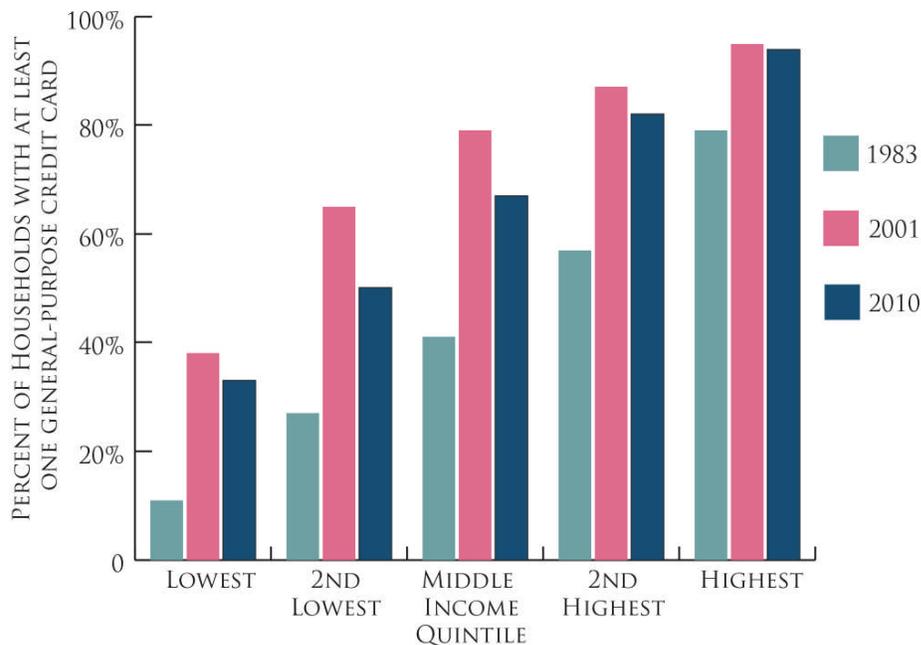
A report from the Federal Reserve Bank of Philadelphia in 2003 found that “the discount that lower risk customers receive on their APR has increased significantly since the early days of risk-indifferent pricing. The lowest risk customers, who once paid the same price as high-risk customers, now enjoy rate discounts that can reach more than 800 basis points. At the other end of the risk spectrum, these strategies have enabled issuers to grant more consumers (e.g., immigrants, lower income consumers, those without any credit experience) access to credit, albeit at higher prices” (Furletti, 2003, pp. 7–8). Figure 4 illustrates the resulting dramatic increase in the percent of U.S. households owning at least one bank card between 1983 and 2001.<sup>15</sup> The largest increases in card ownership (200%–300%) occurred in the lower half of the income distribution, consumers who had not qualified for cards under the one-price-fits-all policies of the past. Even after the large pull-back by lenders consequent to the financial meltdown in 2008, consumers in the lower half of the income distribution still retained access to bank credit card products in far greater numbers than was the case prior to risk-based pricing.

<sup>13</sup> In late 1991, American Express became the first major issuer to unveil a tiered pricing structure for its Optima credit card product to slow customer defections. The company’s best cardholders (i.e., cardholders with high charge volume and no delinquency in the previous 12 months) received a low 12.5% rate on their revolving balances, well below the average 18%–20% rates typically charged. Shortly thereafter, Citibank announced a similar pricing structure for its Classic cardholders, who had been paying 19.8%. Citibank officials estimated that by the end of 1992, nearly 10 million Citibank Classic cardholders had benefited from the new-tiered rate structure. For a description of the attrition pressures that eventually led to steep rate cuts by incumbent issuers, see Hilder and Pae (1991), Spiro (1991), Pae (1992), and *Credit Card News* (1992).

<sup>14</sup> “The Profitability of Credit Card Operations of Depository Institutions,” is an annual report by the Federal Reserve Board research staff submitted to the U.S. Congress pursuant to Section 8 of the Fair Credit and Charge Card Disclosure Act of 1988. The report also notes that “credit card interest rates fell sharply from mid-1991 through early 1994 after being relatively stable for most of the previous twenty years” (Board of Directors of the Federal Reserve, 2001, p. 6). The decline in the average “most common interest rate” on issuer credit card plans between 1991 and 1994 was 244 basis points.

<sup>15</sup> Figure 4 derives from data contained in the Federal Reserve Board’s Surveys of Consumer Finances for the years 1983, 2001, and 2010, as reported in Durkin et al. (2014).

FIGURE 4: INCREASE IN BANK CREDIT CARD OWNERSHIP  
GREATEST FOR LOWER INCOME HOUSEHOLDS



Source: Federal Reserve Board Surveys of Consumer Finances, as reported in Durkin et al. (2014).

## Risk-Based Pricing and Expanded Credit Availability Across All Consumer Loans

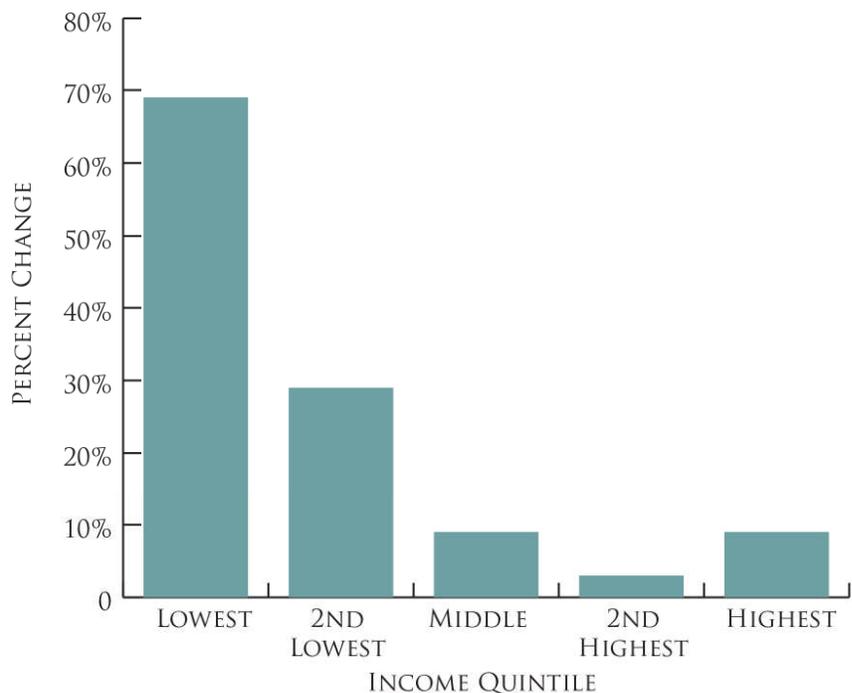
Credit cards were the first major consumer lending product to experience risk-based pricing, but by the late 1990s, the practice was common across all consumer loan products. Using Federal Reserve Board survey data, Edelberg (2006) and Athreya et al. (2012) found evidence of widespread risk-based pricing and its impact on consumers. By 1998, there was clear and consistent evidence of a steeper pricing gradient correlated with higher risk on consumer loans as compared with earlier years. Edelberg found evidence of a sharply higher interest rate adjustment in response to bankruptcy risk: for every .01 increase in the probability of bankruptcy, the corresponding interest rate increase tripled for first mortgages, doubled for automobile loans and rose nearly six-fold for second mortgages, as compared with loan pricing

relative to risk in the late 1980s and early 1990s.<sup>16</sup> In addition, loan activity rose in predicted ways as a result of wider use of risk-based pricing. In terms of dollar amounts of loans outstanding, borrowing activity increased most for low-risk households who saw their relative borrowing costs fall. But in terms of proportion of households actually using credit, the most dramatic increases were observed for lower-income households who gained access to credit during the period (Figure 5).

A remarkable series of studies from economists at Stanford and the University of Pennsylvania (Wharton) illustrate how credit scoring and risk-based pricing helped a lender mitigate both adverse selection and moral hazard through the adjustment of both interest rates and loan terms based on borrower risk (Adams et al., 2009; Einav et al., 2012, 2013). The studies utilized data from an auto finance

company that specializes in automobile loans<sup>17</sup> (mostly for used vehicles) for the low-income, high-risk consumer market.<sup>18</sup> The company’s customer base varied substantially in default risk, with the top third of borrowers ranked in terms of predicted risk about 20 percentage points more likely to default than the bottom third. Both moral hazard and adverse selection were readily

FIGURE 5: DRAMATIC INCREASE IN ACCESS TO NON-MORTGAGE CREDIT BY LOWER-INCOME HOUSEHOLDS  
(Proportion of U.S. households using non-mortgage credit, 1970 vs. 2001)



Source: Federal Reserve Board, Surveys of Consumer Finances.

<sup>16</sup> Comparing data from 1983 and 2004, Athreya et al. (2012) found that the average interest rate paid by households with any past delinquency was more than 200 basis points higher than was the case for households with no past delinquency.

<sup>17</sup> Legally speaking, the vast majority of credit provided for automobile purchases is made in the form of “retail installment sales contracts” as opposed to “consumer loans.”

<sup>18</sup> During the period covered by the studies, the company’s average loan applicant had an annual household income of about \$28,000. Almost one-third of applicants had no bank account, and only 14% owned their own home. A large majority of applicants had a FICO score below 600. During the six months prior to their loan application, more than half of the company’s applicants were delinquent on at least 25% of their debt. Cars purchased as a result of loan transactions were typically five to seven years old with odometer readings in the 65,000–100,000 mile range.

apparent in the loan data. The authors found that for borrowers in the portfolio, a \$1,000 increase in loan size increases the rate of default by 16 percent. And borrowers who were observably at high risk of default were precisely the borrowers who desired the largest loans. Consequently, the value to screening borrowers to more precisely identify default risk was high. The authors noted that lending to this group “requires separating consumers with transitory bad records from persistently bad risks, as opposed to simply identifying red flags in a consumer’s history” (Einav et al., 2013, p. 255).

Until 2001, the company relied on uniform (subprime) loan pricing and traditional judgmental methods for screening borrowers. Beginning in 2001, the company adopted credit scoring. Two distinct benefits resulted from the use of credit scoring: the improved ability to screen out high-risk borrowers and the ability to target more generous loans to lower-risk borrowers. The authors found that adoption of credit scoring increased profits by roughly \$1,000 per loan on a portfolio with an average loan principal of about \$9,000. How was this achieved? “First, credit scoring allowed the lender to set different down payment requirements for different applicants. High-risk applicants saw their required down payment increase by more than 25%, creating a hurdle to obtain financing. Close rates for this group fell notably, and also default rates, consistent with the idea that higher-risk borrowers were screened out by the higher down payment requirement.” In contrast, “required down payments and close rates changed little for lower-risk applicants. Instead ... we observe that car quality and average loan sizes increased substantially. Default rates did not change much, and hence the larger loans had a substantial (positive) profit impact due to the high interest rate charged in this setting.”<sup>19</sup>

The authors concluded that strong adverse selection effects in this population of potential borrowers were mitigated by the adoption of risk-based pricing: “observably risky buyers end up with smaller rather than larger loans because they face higher down payment requirements. This finding is notable because the development of sophisticated credit scoring is widely perceived to have had a major impact on consumer credit markets. Here we document its marked effects in matching high-risk borrowers with smaller loans” (Adams et al., 2009, p. 51).

The key point is that credit scoring gave this lender who specialized in the higher-risk segment of the automobile loan market the ability to more accurately identify the risk posed by individuals and tailor the loan terms to individual risk. Following the adoption of credit scoring, the highest-risk applicants borrowed less (and less frequently), mostly because of the higher down payment hurdle. Lower-risk borrowers in the applicant pool, on average, were able to borrow more to purchase higher-quality (lower-mileage) cars. More credit flowed, and loans

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<sup>19</sup> Prior to adoption of credit scoring, there was dramatic variation across dealerships served by the finance company in terms of loan profitability, related primarily to differences in default rates and matching of cars to borrowers. “The advent of credit scoring compressed this variation. ... Although almost all dealerships became more profitable, the relative improvement was greater for dealerships that previously had higher default rates and less pronounced matching of cars to borrowers of different risks, the two dimensions that credit scoring tried to address.” The authors found that, relative to setting a uniform down payment requirement, risk-based financing can increase profits by 22 percent.” (Einav et al., 2013, p. 251).

were more suitable for individual borrowers relative to the outcomes obtained without credit scoring.

To summarize, there is overwhelming evidence that when credit scoring techniques are used to implement risk-based pricing of loans, consumers are evaluated based on their own history of handling credit-related obligations and receive a better match of loan terms to their circumstances than would be the case in the absence of scoring (i.e., under a more subjective, judgmental system of lending). As a direct result, more credit is available to borrowers across a broader risk and income spectrum than would be the case in the absence of risk-based pricing.

## **Allegations of Bias and Disparate Impact Associated with Scoring and Risk-Based Pricing**

Despite the clear evidence that risk-based pricing has played an important role in expanding credit access to borrowers across the credit spectrum, critics of credit scoring have periodically over the past 30 years alleged that scoring models actually have an adverse effect on certain demographic groups, including those protected under the Equal Credit Opportunity Act (ECOA). ECOA (as implemented through the Federal Reserve Board's Regulation B) prohibits lenders from treating one applicant less favorably than any other based on prohibited factors that include the applicant's race, color, religion, national origin (ethnicity), sex, marital status, receipt of income from public assistance programs, or good faith exercise of rights under the Consumer Credit Protection Act. Scoring models for use in loan application and pricing decisions must not utilize those characteristics prohibited under ECOA.

The question of whether some legally permissible variables in scoring models produce an unlawful disparate impact on certain demographic groups has been studied extensively by Federal Reserve Board researchers. In a 2007 Report to Congress on the impact of credit scoring, the Federal Reserve study concluded that:

- Credit history scores (those based purely on credit report data, such as the FICO and VantageScore products) are predictive of credit risk for the population as a whole and for all major demographic groups.
- Credit characteristics in credit history scoring models do not serve as substitutes, or proxies, for race, ethnicity, or sex.
- Credit scoring, as a cost- and time-saving technology, likely has contributed to improved credit availability and affordability over the past quarter century. The increase in credit availability appears to hold for the population overall as well as for major demographic groups, including those of different races and ethnicities.
- It is true that different demographic groups have substantially different credit scores, on average. Blacks and Hispanics have lower credit scores than non-Hispanic whites and Asians. Individuals under age 30 have lower credit scores than older individuals. But there is no compelling evidence that any particular demographic group has experienced

markedly greater changes in credit availability or affordability than other groups due to credit scoring.<sup>20</sup>

The Federal Reserve report also reiterates that the use of credit scoring helps creditors to establish loan prices that are more consistent with the actual risks and costs inherent in extending the credit. Consequently, the use of risk-based pricing “discourages excessive borrowing by risky consumers while helping to ensure that less-risky customers are not discouraged from borrowing as much as their circumstances warrant.” The report also notes that “risk-based pricing expands access to credit for previously credit-constrained populations, as creditors are better able to evaluate credit risk, and, by pricing it appropriately, offer credit to higher-risk individuals” (Board of Governors of the Federal Reserve System, 2007, p. O-5).

Some critics of credit scoring, including those within the Consumer Financial Protection Bureau (CFPB), the Department of Housing and Urban Development (HUD), and the Department of Justice (DOJ) point out that variables permitted for use in scoring models can themselves be correlated with protected group characteristics. They contend that use of such variables produces an impermissible disparate impact based on race, gender, or other off-limits characteristics, and therefore violates ECOA.<sup>21</sup>

*The Federal Reserve report notes that “risk-based pricing expands access to credit for previously credit-constrained populations, as creditors are better able to evaluate credit risk, and, by pricing it appropriately, offer credit to higher-risk individuals”*

Use in credit scoring of the characteristics identified in ECOA is and should be strictly prohibited. And all variables used in credit scoring must be justified based on a demonstrated, and logical, predictive relationship between the variable and the credit risk determination. But the critics’ broad-brush attack based on a simple correlation is unrealistic and ultimately counterproductive.

The Federal Reserve study recognized that different demographic groups have substantially different credit scores. It therefore is inevitable as a simple matter of statistics that many

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<sup>20</sup> Board of Governors of the Federal Reserve System (2007, pp. S-1–2). In a separate report, the authors provided expanded analysis and found no evidence of disparate impact by race, ethnicity or gender stemming from the use of credit history scores in lending (Avery et al., 2012).

<sup>21</sup> Avery et al. (2012, p. 3) provide a helpful illustration of how this might happen: Suppose a particular demographic group experiences more frequent bouts of unemployment than other groups, leading to higher incidence of loan defaults. Negatively scoring a loan applicant based on membership in that demographic group would be prohibited under ECOA. But, further suppose that members of this group tend to utilize a particular type of credit, say, finance companies, more often than other groups. If a scoring model happened to include the number of finance company accounts held by a consumer as a predictive variable, then that variable could be serving as a proxy for group membership, and could be deriving its predictive power solely based on it being a proxy for the higher risk present in the group, and not as a proxy for credit risk. If that were the case, inclusion of that variable (correlated with higher default rates) could unlawfully penalize members of the protected group.

variables that have predictive value for credit risk will often also be correlated with demographic characteristics. Barring use of all such variables in credit scoring on the ground that any correlations to protected characteristics are evidence of discrimination would undermine completely the use of credit scoring. Risk-based pricing, by its very nature, leads to disparities based on credit characteristics, and if those discrepancies are deemed impermissible, and lenders are pushed to flatter pricing, the very consumers the government seeks to protect—high-risk borrowers—stand to lose the most.

## Bias Against Underserved and Unbanked Consumers

A more recent criticism of lenders' reliance on credit scoring (and the companion use of risk-based pricing) is that millions of U.S. consumers lack sufficient credit histories to generate a score from the widely used commercial scoring models (e.g., FICO, VantageScore), and millions more have only limited history with conventional credit products.<sup>22</sup> As of 2006, an estimated 35–54 million American adults had limited or nonexistent credit files (Turner et al., 2006). Most of these consumers in what the industry calls the 'thin file/unscoreable population' are new to or completely outside of the credit-granting system, either because they are young consumers with short history of credit transactions, are recent immigrants, or have simply operated on a cash basis or through nontraditional sources of credit (family, friends, payday loans, etc.). Their lack of traditional credit history makes them appear to lenders (especially those who rely heavily on automated underwriting systems) as high risk when, in fact, they are often not.

But the problem for consumers here is not that lenders use credit scoring and risk-based pricing. The real problem is that the information lenders obtain from credit reports doesn't represent as complete a picture as one would like of a consumer's experience in handling recurring payment obligations.

One of the virtues of credit scoring as a decision assistance tool is that new data improve the ability of these models to fine-tune a lender's assessment of risk and offer an appropriate risk-adjusted price to a borrower. An excellent example is the improved predictive power of scoring models resulting from inclusion of alternative payment history data such as monthly payments on utility bills or apartment rentals. Turner et al. (2006) utilized a sample of 8 million credit files from one of the three major credit bureaus (TransUnion) that contained nontraditional data in the form of utility and telecommunications payment information. Focusing especially on consumers whose credit reports were considered thin or unscoreable by conventional scoring models, the study incorporated the new payment data into the models and assessed any gain in predictive power using payment outcomes during the following year. The study found that the risk profiles of consumers in the thin or unscoreable segments improved substantially after inclusion of

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<sup>22</sup> For example, the 2007 Federal Reserve Board Report to Congress found that "recent immigrants have somewhat lower credit scores than would be implied by their performance. This finding appears to derive from the fact that the credit history profiles of recent immigrants resemble those of younger individuals, whose credit performance tends to be poor relative to the rest of the population" (Board of Governors of the Federal Reserve System, 2007, p. S-2).

alternative payment data, with estimated probability of serious default falling by more than 20%. Remarkably, credit files for nearly two-thirds of consumers in the thin-file sample became scoreable after inclusion of the utility and telecommunications payment data. Minorities and lower income consumers benefited most. Using a model with expanded data and a 3% target default rate, acceptance rates rose by: 22% for Hispanic borrowers; 21% for African-American borrowers; 14% for those aged 25 or younger; 15% for those earning between \$20,000 and \$30,000 per year.<sup>23</sup>

The intuition behind these surprisingly large gains is straightforward. Consumer credit reports with no conventional credit accounts provide no positive payment experience for scoring models to interpret. The inclusion of even one account with a positive payment history allows the model to go to work and generate a statistically valid score that estimates default probability. The research question over the past decade has been whether payments on a non-credit account—but one that represents an ongoing monthly obligation on the consumer’s budget—are predictive of successful handling of a credit account. Increasingly, studies are showing that alternative payment data does exactly that.

Experian released a study in 2014 that provides a detailed look at the impact on credit scores of the reporting of on-time rental payments for residents of subsidized housing. The study incorporated rental payment data from Experian’s RentBureau database on 20,000 leases initiated between 1994 and 2013 (Experian Information Services, 2014). Lease payment information was added to conventional credit report data from Experian’s national credit report database for consumers in the sample to simulate the impact on each consumer’s VantageScore 3.0 credit score. Key results included the following:

- Before inclusion of rental data in their credit files, 11% of consumers in the sample had credit files with no monthly account payment (tradeline) information. All of these consumers became scoreable after inclusion. Remarkably, 59% of this group earned VantageScore 3.0 scores that put them into the desirable prime credit risk category, demonstrating that a dramatic change in risk profile (and access to conventional credit products) can occur with the addition of data about how borrowers handle financial obligations (Table 1).
- Among the 89% of consumers who were already scoreable, the inclusion of rental data increased their scores by an average of 29 points.
- As a result of the inclusion of rental data, about 12% of consumers in the sample would move out of the subprime category and into the nonprime and prime risk categories, allowing them to qualify for significantly lower interest rates and more favorable loan terms (Figure 6).

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<sup>23</sup> For another early study documenting the positive impact of alternative payment data on the predictive power of commercially available risk score models (including the FICO Expansion Score and RiskView from Lexis-Nexis), see Schneider and Schutte (2007).

# RISK-BASED PRICING IN CONSUMER LENDING

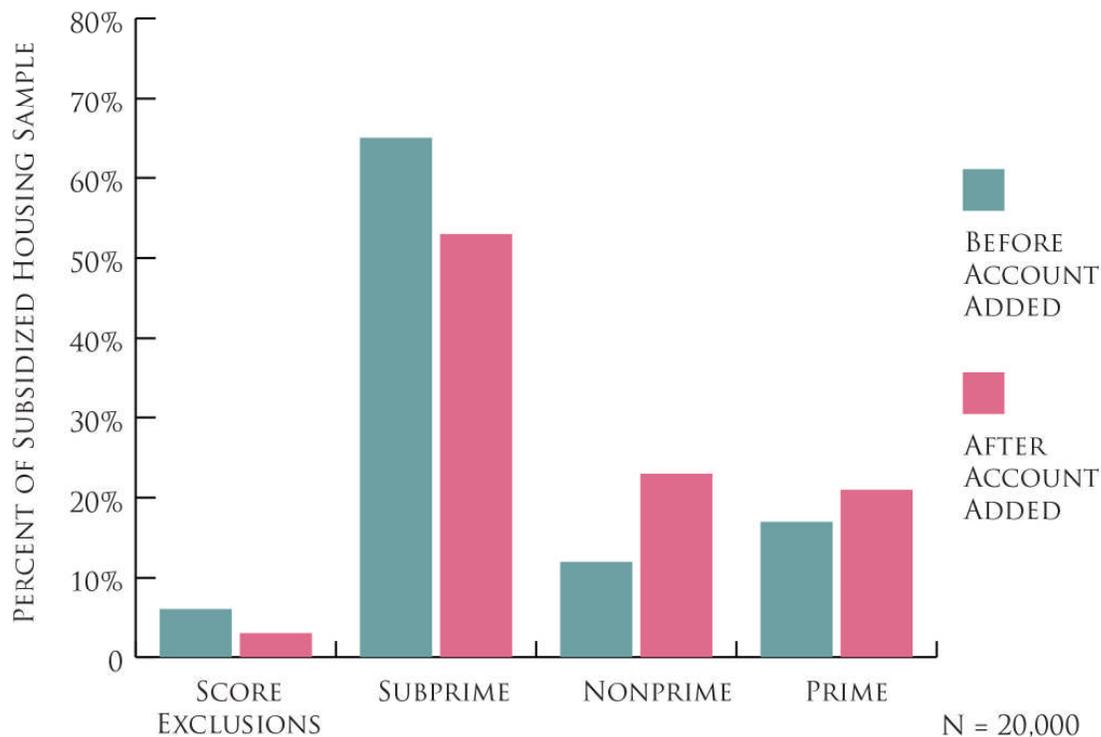
TABLE 1: NO-HIT POPULATION BECOMES SCOREABLE AFTER INCLUSION OF RENTAL PAYMENT DATA

*(Breakdown for the 11% of subsidized housing sample with no credit report)*

RISK SEGMENT AFTER RENTAL DATA INCLUDED	PERCENTAGE OF NO-HIT POPULATION	AVERAGE VANTAGESCORE 3.0 AFTER INCLUSION
PRIME	59%	688
NONPRIME	38%	649
SUBPRIME	3%	586
<b>TOTAL</b>	<b>100%</b>	<b>670</b>

Source: Experian Information Services (2014).

FIGURE 6: INCLUSION OF RENTAL PAYMENT DATA IMPROVES THE RISK PROFILE OF MANY SUBPRIME BORROWERS



Source: Experian Information Services (2014).

The predictive power of alternative payment data has been clearly demonstrated. These new data give creditors the ability to score and evaluate millions of consumers with thin or no credit report files, generating a disproportionately positive impact on low-income applicants and/or people of color. With the potential to reach 35–54 million American adults who are under-served with respect to conventional credit products, creditors are increasingly looking to utilize data on recurring payments made by these consumers to determine creditworthiness.<sup>24</sup> The major credit bureaus, new entrants to the credit reporting industry, and established credit scoring vendors are all exploring how to collect, verify, store, and score monthly bill payment data on a large scale.<sup>25</sup> Approximately 40 million U.S. households rented their residence in 2013, and the majority of these payments are not yet reflected in credit reports.<sup>26</sup> Utility and telecommunications sources of data show the most promise for expanding positive payment histories, as studies estimate that 90% or more of the thin file/unscoreable population has one or more such accounts.

*...ongoing innovation in both credit scoring and the application of risk-based pricing has dramatically expanded credit availability to millions of consumers who were previously underserved by conventional loan markets.*

Other innovations in scoring technology extend to reexamining the assumptions of established credit scoring models regarding traditional credit-usage behavior. A recent example is in the recognition that some of the collection activity data present in credit reports turn out not to be as predictive as once thought. FICO announced in August 2014 that it would stop including in its FICO score calculations any item reported by a collection agency if the item was also reported with a zero balance (i.e., had been paid), and it would give less weight to unpaid medical bills that are reported by a collection agency.<sup>27</sup>

In another example of constant reengineering of scoring models to improve predictive power, a 2014 report from VantageScore indicates that its VantageScore 3.0 product was redesigned so that a total of 30–35 million consumers unscored by earlier versions of the model could now be scored and assigned an estimated probability of default. The gain in scoreability derived from focusing the model especially on the observed behaviors of consumers with new accounts (less than six months old), and infrequent users of credit (no account updated within the

<sup>24</sup> FICO estimated in 2005 that reaching just 3% of this market would put into play an additional \$2.3 billion for mortgage lenders, \$750 million for automobile lenders, and \$113 million for credit card issuers (Horan, 2005).

<sup>25</sup> Since 2010, Experian's RentBureau product has been collecting rental payment data nationally from property management companies and electronic rent payment services. Continuous on-time rental payment data are incorporated into Experian credit reports, and individual rental payment history reports are available to consumers. Trans Union also incorporates both rental and utility payments into its credit report products. In 2014, Trans Union reported results of an internal study that showed that incorporating rental payment history into VantageScore 2.0 credit scores led to score increases for 80% of subprime consumers after only one month's reporting of positive payments on an apartment lease.

<sup>26</sup> Experian's RentBureau database is the largest repository of rental payment data, covering 12 million consumers nationwide (Experian Information Services, 2014, p. 8).

<sup>27</sup> Andriotis (2014). VantageScore announced in 2013 that its newly released VantageScore 3.0 product was ignoring paid collection items.

past six months; little or no activity in the credit report within the prior 24 months). The report noted that the credit reports of 9.5 million Hispanic and African-American consumers gained scoreability through the VantageScore 3.0 product, with 2.7 million of these consumers scoring sufficiently high to achieve near-prime status or better (VantageScore, 2014).

The recurring theme here is that ongoing innovation in both credit scoring and the application of risk-based pricing has dramatically expanded credit availability to millions of consumers who were previously underserved by conventional loan markets. Rather than shutting these individuals out of the market, scoring and risk-based pricing have given lenders the tools and incentives they need to say “yes” to loan applications from a far wider cross-section of the population than ever before. All of this is the direct consequence of competitive pressure in the lending industry to find more efficient decision tools.

## Conclusion

*...risk-based pricing have given lenders the tools and incentives they need to say “yes” to loan applications from a far wider cross-section of the population than ever before.*

Credit scoring and risk-based pricing have moved the U.S. consumer loan industry away from a one-price-fits-all model and dramatically expanded credit and opportunity across the board. By evaluating and pricing loans based on each applicant’s own characteristics and payment history, scoring and risk-based pricing triggered a massive expansion in credit opportunities for American consumers across the socioeconomic spectrum that continues today.

The vast majority of credit decisions today are based on factual data regarding a borrower’s own past payment history and current obligations. Credit scoring has replaced face-to-face attempts to evaluate character and capacity (common a generation ago) with a more equitable (and less invasive) assessment based on documented behavior. At the same time, a lender’s use of credit scoring improves the accuracy and speed of lending decisions, and dramatically increased the consistency of those decisions and likelihood of equal treatment across tens of thousands of applicants.

The case for risk-based pricing is as much a story about economic growth and resiliency at the macroeconomic level as it is about fairness and opportunity at the micro level. Well-developed consumer credit markets allow households to transfer consumption from periods where household income is high to periods where income is low. This is particularly important for householders early in the life cycle (ages 20–45) when the demand for housing, durable goods, and education is relatively high, and incomes are relatively low but expected to rise over time. But it is also important for households weathering temporary income disruptions or unexpected expense shocks. A trio of factors including (1) detailed credit reports, (2) sophisticated scoring models, and (3) risk-based pricing has allowed creditors in the United

States to extend loans and establish lines of credit for a broad segment of the population, compared with other countries.

Over the past three decades, tens of millions of U.S. households have gained access to a credit bridge that can sustain them through temporary disruptions and declines in incomes. The availability of consumer credit to bridge income disruptions has important macroeconomic implications. Cross-country studies have found that credit availability and consumption fluctuations are linked. Consumer spending is more sensitive to changes in income in countries with less-developed consumer credit markets, especially during periods of tighter credit constraints (Bacchetta and Gerlach, 1997). Credit markets that make loans accessible to large segments of the population provide a cushion that neutralizes the macroeconomic drag associated with temporary declines in income, lowering the risk of outright recession and reducing the magnitude of downturns when they do occur (Kreuger and Perri, 2002).

Well-developed consumer loan markets also give consumers greater mobility. There is less risk associated with severing old relationships and starting new ones hundreds or thousands of miles away because objective information is available that helps U.S. residents to establish and build trust in new locations more quickly. From a labor market perspective, the ability of lenders to tap and utilize the detailed information in our credit reporting system has increased the mobility of the U.S. population. As a result, structural shifts within the economy can cause temporary employment disruptions without crippling long-term effects.

In contrast, more restrictive credit reporting laws in Europe prevent consumers in the European Union from taking full advantage of their complete credit histories. The fact that credit information is not mobile restricts the mobility of consumers, especially across borders, because of the resulting difficulty of obtaining credit from new institutions. As a result, consumer lending in Europe tends to be concentrated among a few major banks in each country, each of which has its own large customer databases.<sup>28</sup> European consumers, although they outnumber their U.S. counterparts, have access to one-third less credit as a percentage of gross domestic product (Morgan Stanley Research, 2001).

These studies imply that the United States and other countries with well-developed consumer credit markets enjoy a macroeconomic growth advantage. The intuition is straightforward. Detailed personal credit history data give lenders confidence in assessing the risk associated with new borrowers. They allow lenders to design and price products to meet the credit needs of previously underserved populations. Because of the underlying credit reporting network, U.S. consumers can get credit, insurance, and a host of other financial services based on their individual credit records, not their family name or how long they have known their banker.

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<sup>28</sup> A 2000 report from the U.S.-based consulting firm The Tower Group found that in Europe consumer financial services are provided by one-tenth the number of institutions that serve U.S. households, despite the fact that the pan-European market has almost one and one-half times as many households. In France, the European Union country with some of the strictest financial privacy laws that restrict personal data transfers, seven banks control more than 96% of banking assets. In particular, French law does not permit “positive” credit reporting. Consequently, unless a borrower has had past payment difficulties, he has no credit history at all. See Kitchenman, (2000).

In addition, they can rent apartments, purchase cell phones and cable television service, and rent automobiles without either large deposits or an established relationship with the service provider, all because their reputation for paying as agreed is documented through their credit reports.

Contemporary critics of the use of scoring and risk-based pricing argue that these well-established practices penalize those consumers with unconventional credit usage or no credit usage at all. But, this is not really a criticism of the tools; it is rather a critique that the tools fail to utilize a more complete (and hence more accurate) compilation of the borrower's prior behavior.

One of the virtues of scoring as a decision assistance tool is that new data improve the ability of these models to fine-tune a lender's assessment of risk. And competitive lending and scorecard development markets encourage this ongoing "champion-challenger" evolution that increases the predictive power of these tools. The emergence of VantageScore over the past decade as a competitive alternative to the FICO score is an excellent example. Development of reliable and low-cost sources of alternative payment data and the realignment of scoring models to accommodate these data is enabling consumers who have operated outside of mainstream credit markets to gain increased access to credit and credit-related products that are priced according to their own risk profiles and circumstances.

Regulation that would limit the use of either credit report information or the various scoring and pricing tools that have been built with that data, or invoke doctrines like disparate impact that implicitly challenge the use of objective criteria in lending and pricing, would stifle innovation, reduce the potential for improved models to bring their enormous benefits to consumers across the credit spectrum, and roll back many of the benefits already obtained.

# RISK-BASED PRICING

IN CONSUMER LENDING



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