CREDIT SCORING AND THE Revolution in Debt

How a number changed lending (and got some Americans in over their heads)

BY DAVID A. PRICE

Whether you're applying for a mortgage, signing up for a credit card, or thinking about how to finance a small business, you'll quickly come face to face with one of the transformative developments of the digital age: the credit score. It doesn't enjoy the glamorous image of the social network or the smartphone — but much as those tools have spread access to information, the credit score has been a powerful catalyst in broadening access to credit.

Credit scoring is a process for analyzing a borrower's credit risk — the likelihood of repaying the loan — using a computer model and expressing that risk as a number. Creators of scoring models statistically analyze the records of a large number of consumers, perhaps more than a million, and determine the extent to which different factors in those records were associated with loan repayment or default. Those factors then become the basis for calculating scores of future borrowers or prospective borrowers. Lenders use the scores to solicit customers (for example, to select individuals to target with credit card offers), to decide whether to grant credit, and to determine the interest rate that a borrower will be offered. Studies have found that credit-scoring systems outperform the judgment of human underwriters, on average; moreover, they do so at a fraction of the cost.

Perhaps because credit scoring is a process innovation, rather than a product that is highly visible to consumers in its own right, its role in the growth of credit has been little heralded. Without it, however, today's financial system in many ways would be unrecognizable.

Emergence of Credit Scoring

Credit scoring has its roots in local credit bureaus that started in the 1830s to help firms decide whether to extend trade credit — that is, credit to a business customer, such as a retailer buying on credit from a manufacturer or wholesaler. Until then, the nature and scale of trade in the United States had made it reasonable for suppliers to rely on letters of recommendation in determining a customer's creditworthiness. When credit bureaus came into the picture, they offered hard data on the customer's payment record shared by other businesses in the community. Companies manually evaluated the information from credit-bureau files together with the contents of the customer's credit application.

Consumer credit bureaus followed later in the century, many of them established by groups of merchants or an area's chamber of commerce. A handful of them banded together in 1906 to share information, forming an organization known as Associated Credit Bureaus. To meet increasing demand for credit information on out-of-town and out-of-state consumers, bureaus joined the association at a rapid pace; according to a 2005 history by Robert Hunt of the Philadelphia Fed, its membership grew from fewer than 100 in 1916 to around 800 in 1927 and 1,600 in 1955.

The ensuing decades saw consolidation among the credit bureaus. Additionally, in the 1950s, a new tool with possibilities for the credit information industry arrived: the computer. All the ingredients for automated credit scoring were now in place.

"What made credit scoring possible was three things," says Fed economist Glenn Canner. "One, you needed data. The data became widely available in the 1950s through the emergence of larger credit bureaus. Two, you needed computing power. And three, you needed someone with bright ideas."

The bright ideas came from William Fair and Earl Isaac, an engineer and a mathematician who had worked together at Stanford Research International (SRI), a think tank, where they created mathematical models on computers for the military. They came to believe that the combination of the new digital machines and their own mathematical talents could be the basis for a profitable consulting firm serving the private sector. In 1956, investing $400 apiece, they left SRI to start Fair Isaac Corporation.

As they explored various directions for the business, inspiration struck, and they began trying to interest consumer credit companies in the concept of credit scoring. They sent letters in 1958 to the 50 largest consumer lenders in the country and received only one reply. But a single client was all they needed to show the value of their idea; that year, a finance company, American Investments, had them create the first credit-scoring system.

For the next decade, use of credit extended by retailers continued to dominate over use of general-purpose charge cards and credit cards. Accordingly, national department store chains, rather than banks, led in the adoption of the new technology. "Unsecured consumer credit from financial institutions did not appear in any significant amount in the United States until the late 1960s," says Richmond Fed economist Kartik Athreya.

By 1978, however, banks and retailers held around the same amounts of revolving credit, according to the Philadelphia Fed study — and by 1993, revolving credit balances at banks totaled more than three times the balances at retailers. Credit card issuers and major automobile lenders, who needed a reliable measure of credit quality for a nationwide pool of customers, began relying on credit scores during this period.

A final step in spurring widespread adoption of credit scoring was their adoption by the behemoths of the mortgage market, Freddie Mac and Fannie Mae, which began requiring credit scores for their new automated mortgage underwriting systems in the mid-1990s.

Changing Consumer Lending

Today, all three major consumer credit-reporting agencies — Experian, Equifax, and TransUnion — use credit-scoring models created for them by the company that Fair and Isaac founded, now known as FICO. The scores that the agencies report may include not only generic scores (that is, scores not keyed to a particular type of financial product), but also educational scores (the ones provided to consumers) and industry-specific scores for auto loans or bank cards. In addition to FICO-based scores, the agencies also offer VantageScores, which are calculated using models created by VantageScore Solutions, a FICO rival that the agencies jointly own. (FICO scores are generally on a scale from 300 to 850; the VantageScore scale is 501 to 990.)

The now-universal use of credit scores in consumer lending has had a number of effects. In addition to the obvious one, faster and cheaper processing of applications, it has changed the way credit is priced. Several studies have found that the rise of credit scoring has been associated with an increase in the dispersion of interest rates — that is, an increase in the variations in rates charged to different consumers. One of these studies, published in *American Economic Journal: Macroeconomics* in 2012 by Athreya, Xuan Tam of the City University of Hong Kong, and Eric Young of the University of Virginia, found that the variance in credit card interest rates more than tripled from 1983 to 2004. Researchers attribute this trend to the improved ability of lenders to distinguish borrowers with different levels of credit risk; risky borrowers are paying more interest on their balances and safe borrowers are paying less. Within the credit card industry, the value of this information has been further increased by regulatory changes that have reduced restrictions on credit card rates.

The question of whether this is good or bad is up for grabs. In one sense, risk-based pricing is more equitable, rewarding consumers for responsible management of their finances. At the same time, there are distributional implications that may be troubling to some. (A weak credit history may also prove costly in the homeowners and auto insurance markets, where companies look at "insurance scores" based on credit information to estimate a consumer's risk of loss.)

Credit scoring may also affect other terms of a loan. Such effects were highlighted in a recent study of a large auto finance company by Liran Einav and Jonathan Levin of Stanford University and Mark Jenkins of the University of Pennsylvania. In a 2013 article in the *RAND Journal of Economics*, they looked at the adoption of credit scoring by the unnamed company, which specializes in lending to consumers with low incomes or poor credit records; they found that with credit scores, the company offered higher loans to low-risk borrowers and required larger down payments from high-risk borrowers. The result: an increase in profits of over $1,000 per loan, on average.

With the ability to distinguish risk levels of borrowers has come a greater amount of consumer lending overall. The more lenders know about borrowers, the more confident they are in their ability to price credit profitably. Juan Sánchez of the St. Louis Fed noted in a 2010 working paper that the credit card balances of consumers — credit card balances and other credit lines, but not including secured debt — rose as a share of income from 2.6 percent in 1983 to 4.2 percent in 2004, nearly a 50 percent increase. Even these figures, moreover, do not include the dramatic rise in home equity lines and cash-outs from mortgage refinancings during the later years of the period.

One might assume that if lenders have more information about borrowers, the result will be fewer defaults. But that has not been the case: The widespread adoption of credit scoring by the financial services industry coincided with a rapid rise in consumer bankruptcies. Bankruptcy filings increased more than fivefold from 1983 to 2004, and far faster than the growth of consumer credit. Not only have bankruptcies become more frequent, they have become larger.

Those changes are no accident, researchers have found. Better information, by enabling greater access to large amounts of credit, appears to be giving more borrowers the rope, so to speak, with which to hang themselves. The study by Athreya, Tam, and Young estimated that the availability of more information about borrowers accounts for around 46 percent of the increase in bankruptcies.

Like other developments of the digital revolution, credit scoring can prove either helpful or damaging from one person to another, from one situation to another. "There has been a democratization of credit," says Canner. "It's true that more people will go bankrupt. On the other hand, more people will have had access to credit to do lots of things that are very productive for them, including going to school and starting businesses. There's a lot of upside." **EF**

Readings

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