



# Analysis of Federal Reserve Research on Behavioral Scoring:

## *On "Report to the Congress on Reductions of Consumer Credit Limits Based on Certain Information as to Experience or Transactions of the Consumer"*

CRL Research Comment

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A provision of the Credit CARD Act of 2009 requires that the Federal Reserve issue a report examining whether credit card issuers have reduced credit limits or raised interest rates on credit card accounts based on consumers' patronage of merchants by geographic location or the type of merchant or transaction conducted (also known as "behavioral scoring").

A lawsuit filed by the FTC against the credit card issuer Compucredit alleges consumers who received marriage counseling or frequented bars and nightclubs were viewed as high risk and their credit line was reduced accordingly.<sup>1</sup> Shopping at Walmart was allegedly counted against consumers in other issuers' risk scoring model.<sup>2</sup>

### ***Concerns Related to Behavioral Scoring***

The use of behavioral scoring can raise several concerns. Use of merchant locations to define risk can result in a form of redlining that disparately impacts minority groups. Merchant or purchase type can lead to similar outcomes. Additionally, many consumers may also argue that their privacy is invaded when issuers utilize their purchase information in this manner. Some who are aware that credit card issuers have transaction data and even use purchase information to look for patterns that suggest fraud, may feel differently about detailed purchase information being used by their credit card company to judge whether they are a good risk.

The Federal Reserve released a report in May 2010 on a survey of 175 issuers, including the 100 largest issuers, and 75 additional issuers randomly sampled from each of three smaller size categories of issuers. Each credit card issuer was asked whether it had raised rates, reduced credit lines, or closed accounts based on behavioral scoring-related data during the three-year period from November 30, 2006, through November 30, 2009. Those issuers that had taken action were further asked if they had engaged in those same practices specifically in the month of November 2009. They also were asked about the number of cardholders affected or potentially affected by three specific adverse actions due to these practices.

The report confirms that some of the largest issuers in the country continue to use behavioral scoring tactics. The report documents that one in every seven credit card accounts is held by two issuers that used behavioral scoring broadly in November 2009, and a third large issuer is also reported to use the tactic regularly.<sup>3</sup> This implies that as much as half of American households with credit cards may currently have at least one of their credit card accounts evaluated based on behavioral scoring.<sup>4</sup>

**However, the report likely understates the prevalence of behavioral scoring, does not examine the full range of negative outcomes associated with the practice, and leaves unexamined a range of possible adverse impacts on minority and low-income consumers.**

### ***General Underreporting***

The study likely underreports the prevalence of behavioral scoring for a number of reasons:

- The Federal Reserve specifically instructs issuers to only include consumers as having been subject to behavioral scoring if they received an adverse action notice letter referencing behavioral scoring as the reason for an interest rate increase, line reduction, or account closure. It is possible that some issuers were not specific enough or accurate in their adverse action letters for the conclusion to be reached.<sup>5</sup>
- The report emphasizes that only two issuers used behavioral scoring in November 2009 – one of two time frames studied – to reduce lines, close accounts, or raise APRs. However, line reductions and APR increases are often done by issuers in waves and other issuers may simply have not have taken such steps in that particular month.

The researchers did find in a follow-up interview that at least one additional large issuer continued to employ the practice on an ongoing basis, but simply did not reduce lines or raise APRs for this reason in November. Based on the survey questions, researchers cannot definitively determine whether respondents are not using behavioral scoring or simply did not use the practice in November 2009.<sup>6</sup>

- As noted in the report, the largest banks tend to create their own customized risk assessment systems. Of the six banks that acknowledged using behavioral scoring, five were among the 25 largest banks. Yet at the same time, the report also reveals that there are two major vendors selling behavioral scoring risk models.<sup>7</sup> These models have been available for years and continue to be marketed to credit card issuers. This strongly suggests there is a market for these products. It seems likely that many of the product buyers are medium-sized credit card issuers that for some reason did not acknowledge their use of this data. The report does not reflect any substantial investigation into the users of this data.

In their list of features and services provided, both products fail to state anything about providing specific reasons for a high risk rating to issuers. Moreover, FICO's model is reportedly based on a neural net. Neural nets have advantages over traditional statistical models in forecasting outcomes, but one important disadvantage of neural nets is that they function as a black box. In other words, using a neural net makes it nearly impossible to specify what particular variable caused a consumer to receive a high risk score.<sup>8</sup> Therefore, it is reasonable to assume that at least one of these commercial behavioral scoring products (and possibly both) do not offer detailed reasons for use in adverse action letters. This implies that consumers judged based on these models are excluded from the report's analysis because they did not result in an adverse action letter that specified behavioral scoring.

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- Surveys in general may yield different results than supervisory examinations given known limitations to surveys and the difference in consequences for inaccurate responses. In particular, economists have long acknowledged the potential for “strategic bias.” When this bias is operative, respondents act in their own interests rather than providing objectively accurate information. Here the potential for strategic bias is pronounced since respondents are sophisticated, understand the true purpose of the survey, and may have a strong economic interest in influencing results. Strategic bias in this case would result in undercounting the incidence of behavioral scoring.

### ***Unexamined adverse events***

The study adopts a narrow definition of “adverse action” leaving unexamined additional areas of potential concern:

- The affected population is likely larger than the report specifies because the actions that result in an adverse action letter are quite limited (in this case limited to line reductions, account closures, and interest rate increases). Many important issuer decisions that are adverse to the consumer do not fall into this category. For example, Compucredit’s behavioral scoring actions that resulted in settlement with the FTC concerned line increases that the initial solicitation implied the consumer would receive. These line increases were often not given to consumers due to behavioral scoring models that suggested the customer may be high risk. Since this technically was not a line decrease, it is quite likely that no adverse action letter was generated. Issuers regularly decide whether to raise lines on consumers or offer special promotions, including rate reductions. In these common cases, consumers are adversely affected but no adverse action letter is generated.

In addition, when consumers call to request a fee be waived or other action taken, internal risk and profit scores often drive the outcome again leading to adverse outcomes outside the scope of this study. There are numerous other important uses for behavioral scores. For example, FICO and Experian literature on their behavioral scoring products suggests that the risk scores be used in other ways such as in customer retention decisions, payment modification, identifying cross-sales opportunities, and customer treatment in the delinquency and collections process. Each of these factors may result in the number of consumers adversely affected by behavioral scoring being significantly underestimated in this report.

- Beyond the narrow scope of adverse events studied here, a larger set of concerns is relevant. For example, if behavioral scoring is viewed as a privacy issue, then anyone judged based on behavioral scoring models is part of the affected population.<sup>9</sup> In other words, even consumers whose account terms were not changed due to a behavioral scoring evaluation may be concerned about their card issuers judging them by where they shop, or by where they might make purchases in the future.

### ***Effects on minority and low-income consumers left unexamined***

In addition to underreporting behavioral scoring, the report does not thoroughly examine the affect of these practices on minority and low-income consumers. In the end, the report essentially concludes that these groups could not have been affected too much since behavioral scoring affected what it characterizes as relatively few people (it reports that over 300,000 people were affected).

The Federal Reserve researchers state that they did not have the information necessary to analyze the impact on minority and low-income consumers. Two additional strategies researchers might consider using to further explore these questions include the following:

- Researchers could follow-up with the issuers who report judging borrowers based on merchant type, location, and other relevant factors and ask them for details of what specific merchant categories and locations they flag. Then an analysis of the use of these merchant types and locations in general could be performed to see if the mix of consumers using these goods and services are likely to be disproportionately minority or low-income.
- Researchers could attempt to obtain additional information from the credit bureaus by pulling or estimating a credit score.<sup>10</sup> They then could identify consumers who have a strong credit score or no evidence of recent decline (such as many recent inquiries, new accounts or recent derogatory information) as well as no evidence of violating the account agreement with the issuer who took the adverse action. These cases could be isolated as consumers with a heightened likelihood that an adverse action was due to transaction data.<sup>11</sup>
- Researchers could have issuers identify accountholders that experienced an adverse action based on behavioral scoring. A follow-up survey would then allow researchers to explore the demographics of this sub-population.

### ***Conclusion***

While the Federal Reserve study provides valuable information on behavioral scoring, it likely underestimates the number of consumers affected by the practice, examines a relatively narrow range of potential adverse effects, and leaves relatively unexamined the question of disparate impact on minorities or low-income consumers. Consequently, much work remains to be done to understand the use and effects of behavioral scoring. In addition, given the potential for bias among survey respondents and the potential for disparate impacts on minority borrowers, it might prove useful for bank examiners to evaluate the use of behavioral scoring in fair lending examinations.

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<sup>1</sup> Complaint, Federal Trade Commission v. CompuCredit Corp., 1:08-cv-01976 (N.D. Ga. June 10, 2008).

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<sup>2</sup> Chris Cuomo, Jay Shaylor, Mary McGuirt, and Chris Francesceni, “GMA’ Gets Answers: Some Credit Card Companies Financially Profiling Customers,” ABC News, January 28, 2009, (available at <http://abcnews.go.com/GMA/TheLaw/gma-answers-credit-card-companies-financially-profiling-customers/story?id=6747461> ).

<sup>3</sup> According to the report, the two issuers conducting the practice in November had roughly 50 million accounts and their study was based on approximately 350 million accounts.

<sup>4</sup> Based on 50 million accounts at the two large issuers and roughly 105 million households, with 73% of these households having a credit card according to Brian K. Bucks, Arthur B. Kennickell, Traci L. Mach, and Kevin B. Moore, “Changes in U.S. Family Finances from 2004 to 2007: Evidence from the Survey of Consumer Finances,” Federal Reserve Board, February 2009, (available at <http://www.federalreserve.gov/pubs/bulletin/2009/pdf/scf09.pdf> ). The overlap in the 50 million accounts in terms of how many are held by a single household is unknown. However, a third large bank with an unknown number of accounts also conducts behavioral scoring on an ongoing basis, bringing the potential size of this population to well over half of credit card-carrying households of about 80 million.

<sup>5</sup> There is reason to believe that banks may not be specific regarding behavioral scoring-related reasons in adverse action letters. A guide to compliance in adverse action letters to consumers supplied by bankersonline.com (available at <http://www.bankersonline.com/tools/adversereasonschart.pdf> ) does not have reasons related to merchant/purchase type or location in its list of reasons but does say regarding using “other” reasons and specifying these that issuers “should exercise caution in using other reasons for denial. Most credit underwriting situations can be covered by other reasons listed above. Consider contacting compliance officer before using this reason.”

<sup>6</sup> Survey questions are available in an appendix to the report at <http://www.federalreserve.gov/BoardDocs/RptCongress/creditcard/2009/consumercreditreductions.pdf>

<sup>7</sup> The two reported were BankruptcyPredict by Experian in partnership with Visa and FICO Transaction Scores.

<sup>8</sup> For more discussion of this issue as applied to lending risk assessment, see Murray Bailey, “Not all scorecards are the same,” Windsor CME, (available at <http://www.windsorcme.co.uk/resources/Scorecardtechniques.pdf> ).

<sup>9</sup> Coverage of the topic in the media suggests that privacy issues are certainly at least part of the cause of public outcry over the practice. For example see Isabel Velasquez, “Lenders Watching Credit Cards and how Consumers Use Them,” Personal Money Store Moneyblog (available at <http://personalmoneystore.com/moneyblog/2010/03/06/106-lenders-watching-credit-cards/> ).

<sup>10</sup> If the Federal Reserve is unable to legally obtain credit scores, their access to credit bureaus allows them to create a proxy for credit scores based on the factors that are known to make up a credit score; something that has been done in other studies.

<sup>11</sup> This is far from a perfect screen. For example, a number of recent line reductions targeted inactive accounts regardless of risk which may often not be screened out by this method. But it would still be superior to what was used. In addition, it may be quite possible to identify inactive accounts on the bureau and screen these out as well.