Credit Scoring

Daniel G. Salazar, with contributions from CGAP Staff and eChange, LLC

Scoring technology analyzes historical client data, identifies links between client characteristics and behavior, and assumes those links will persist to predict how clients will act. The technology can help a microfinance institution (MFI) analyze how its clients have behaved in the past to make more reliable loan application decisions, devise more effective collections strategies, better target marketing efforts, and increase client retention. For example, an MFI's *credit scoring* model might find that its borrowers without business experience have been more likely to default on loans. When the MFI's loan officers use a *credit scorecard* to evaluate new applications, prospective borrowers without business experience would be given a lower score, making them less likely to qualify for a loan from the institution. Scoring technology systems can be a foundation for advanced capabilities, such as pricing loans based on individual client risks and more accurately provisioning against loan losses.

Who Should Consider Credit Scoring?

MFIs that want to supplement subjective loan officer decision-making with data-driven analysis may want to consider scoring. MFIs that implement scoring are typically large, well-managed institutions that have several years of historical client data stored in a central database. However, scoring is generally not as suitable for MFIs that use joint-liability and village banking methodologies because the behavior of clients in these groups is often driven more by group interactions than individual client characteristics.

How Does Scoring Work?

Scoring develops a scorecard that loan officers use by inputting client data to create "scores" that predict several types of client behavior. CGAP's Occasional Paper No 7, *Scoring: The Next Breakthrough in Microfinance?* by Mark Schreiner, describes different scorecards developed for specific purposes:

- **Credit scoring:** Automates the application approval process by predicting the likelihood that the applicant will develop repayment problems.
- **Visit scoring:** Enables loan officers to prioritize their efforts on clients most likely to respond to the MFI's marketing effort.
- **Collections scoring:** Maximizes the effectiveness of the arrears recovery process by assigning collection strategies based on the client's profile.
- **Desertion scoring:** Identifies customers most likely to leave the institution, enabling an MFI to proactively manage its customer relationships.

Scoring typically uses the judgment of experts or statistical techniques to identify the links between characteristics and risks:

- **Judgmental scorecards (expert system):** Experienced lenders identify key client characteristics and determine their importance to a particular client behavior. This model has lower predictive power than statistical scoring, in part because it develops a scorecard that only indicates how risky clients are relative to each other. However, it is an option when there is not enough client data to support statistical scoring.

- **Statistical scorecards:** Client data is first extracted from an MFI's central database. Software packages such as *SAS, S+*, and *SPSS,* then run statistical analyses using techniques such as *linear* and *logistic regression* to identify the importance of certain client variables to behavior. The statistical scoring model generates a scorecard that indicates the probability of default, desertion, or other behavior, based on these unique characteristics. This can provide a foundation for more advanced credit-risk management applications. Statistical scorecards predict client behavior more accurately than judgmental scorecards, but require much more data, staff time, and expense to develop.

Requirements for Credit Scoring

- Centralized database of relevant client information
- Database dedicated to scoring information
- Management commitment to project implementation
- Management commitment to fostering organizational and cultural change
- Resources and staff from technology and credit departments to integrate, maintain, and refine scoring applications

Benefits and Costs of Credit Scoring

Benefits

- Improves the efficiency of loan evaluations, recovery of arrears, and customer retention
- Frees staff to spend more time on the subjective "gray areas" of decision-making
- Offers a basis for variable pricing by including individual client risk in lending decisions
- Lays a foundation for more sophisticated risk management and marketing applications

Costs

- Outsourced project management of scoring implementation can range from as little as several thousand dollars to as much as US$ 50,000.
  - Scorecard development can range from US$ 10,000 to US$ 60,000, depending on the type of scorecard and the vendor.
- Advanced software for reporting and scoring analysis (On-line Analytic Processing or OLAP) can range from several thousand dollars to as much as US$ 65,000.
- Additional software may be necessary to support the arrears scorecard and contact management for marketing initiatives such as customer retention.
- Initial and periodic training for loan officers, to reinforce scorecard use, is an additional expense.

Some scorecards, such as a collections scorecard, may require special programming of the information system to develop input screens and reports. Additional costs may include upgrades to the MFI's information systems to ensure that client data is updated regularly. Using a dedicated server will ensure that score calculation does not impede the performance of operational systems.

Microfinance Implementations

The use of credit scoring in microfinance is in its infancy. Network organizations have taken the lead in introducing this technology to affiliates. ACCIÓN International has worked with BancoSol, Mibanco and Banco Solidario; and Women's World Banking (WWB) has worked with affiliates in Colombia including CMM Medellín, WWB Cali, FMM Bucaramanga, CMM Bogotá, and FMM Popayán.

BancoSol (Bolivia)

BancoSol implemented a collections scorecard to increase the effectiveness of its loan recovery efforts. Although the results of its recovery procedures have improved, loan officers have been resistant to the process of capturing and recording information from each client visit. This data is crucial to monitoring and refining these collection strategies, but achieving full compliance remains difficult.

Mibanco (Peru)

In the first year of deploying credit scoring, Mibanco reduced loan origination costs by about ten percent by automating the loan approval process. Additional savings of 10–20 percent are expected as the scorecards are applied to a broader range of products, and loan officers are required to make fewer manual decisions. Mibanco has successfully used credit scoring to maintain loan portfolio quality during a period of rapid growth. With assistance from ACCIÓN, Mibanco is now preparing to use this system to develop more advanced credit-risk management applications and improve targeted customer-loyalty and re-acquisition initiatives.

Women's World Banking (Dominican Republic and Colombia)

WWB is currently rolling out a complete scoring solution to its affiliates in Colombia and the Dominican Republic. After scoring was field-tested in its Colombian affiliates, WWB developed a complete software package that could be integrated with any affiliate management information system (MIS). Although this makes initial installation more complicated, the resources needed per affiliate to support a scoring system will be reduced. A single set of models can be rolled out to all of their Colombian affiliates, and thus spread fixed costs among all participants. WWB is currently in implementing the scoring in its affiliates and expects to begin evaluating benefits in the second half of 2003.

Unibanka (Latvia)

Prior to introducing scoring, Unibanka, a commercial bank, viewed microfinance loans as too costly to deliver. With the assistance of Bannock Consulting, Unibanka instituted a judgmental credit-scoring system because sufficient data was not available to develop a statistical model. Branch staff now use scorecards to evaluate microfinance loan applications quickly, which has reduced the cost of review and made microfinance lending profitable for Unibanka.

Lessons for Implementation

Ensure high quality data

Maintaining high quality data is challenging because MFIs often do not capture key modeling variables in electronic format, and the data captured frequently omits some observations or is inconsistent. Management must stress to operations staff the importance of accurate and complete electronic capture of key client variables for effective scoring.

Consider building automatic data collection tools

The collections scorecard is attractive as an initial foray into scoring because it can generate benefits quickly by reducing delinquency rates. However, loan officers often resist scoring because it requires them to capture and input information on all client visits into the management information system. With Enlace Informatico, ACCIÓN and Banco Solidario developed a special arrears module that integrates directly with the Banco Solidario's loan tracking system. This helps the MFI better apply collections strategies, capture and record client data, and generate crucial reports on demand.

Monitor scorecard effectiveness

Operational reports are required to ensure the effectiveness of scoring technology. Credit scorecards require MFIs to produce reports, such as a *population stability* report, *characteristic analysis* report, *scorecard effectiveness* report and *dynamic delinquency* report, to monitor and validate scorecard performance. Advanced users may track Kolomogrov-Smirnov statistics monthly to ensure that the scoring model is separating "goods" from "bads" as expected. For visit scorecards, this statistic measures the success of customer "treatments." As MFIs become more accustomed to the use of OLAP query tools, they will find it easier to produce reports to track and measure credit and visit scorecards.

Make full use of the potential of scoring

Scoring enables an MFI to segment its clients along the lines of likely behavior. Once clients are segmented, the MFI can develop strategies, processes, and products to best serve each segment, although additional MIS functionality may be required to support a segmented approach. MFIs should develop a plan for the organization to take full advantage of the increased level of client understanding and data available.

General guidance

- Scoring is a long-term commitment to a fundamentally different method of decision-making, undertaken simultaneously with the development of risk management and marketing capabilities.
- Senior management must be hands-on and demonstrably supportive to spur the necessary organizational and cultural changes required within the MFI.
- Simpler methods of developing scorecards (e.g., judgmental scoring) can be the foundation for introducing more sophisticated techniques.
- Loan officers are likely to show tremendous resistance to scoring. Tying loan officer compensation to the use of scoring will encourage adoption and demonstrate management's commitment.

To Learn More

Scoring providers

Most MFIs do not have the internal expertise to implement scoring or develop software to support scoring processes and reporting. Consultants and vendors can help manage these projects and customize off-the-shelf software to suit the MFI's needs.

Consultants who have developed statistical scorecards for microfinance include:

- Microfinance Risk Management **www.microfinance.com**
- LiSim **www.Lisim.com**

CGAP has not reviewed their offerings nor does it endorse them in any way.

International credit bureaus interested in the microfinance market include:

- Consumer Data Techologies **www.cdt.co.il**
- Experian **www.experian.com**
- Fair Isaac **www.fairisaac.com**

Organizations surveyed

Statistical credit scoring:

- ACCIÓN International, **www.accion.org**
- BancoSol
- Mibanco
- Banco Solidario

Judgmental scoring

- Unibanka in Latvia
- Bannock Consulting **www.bannock.co.uk** (consultant)

Women's World Bank,
www.womensworldbanking.org

- CMM Medellín
- WWB Cali
- FMM Bucaramanga
- CMM Bogotá
- FMM Popayán

Other resources

"Scoring: The Next Breakthrough in Microcredit?" CGAP's *Occasional Paper Series,* January 2003, available at **http://www.cgap.org/docs/OccasionalPaper_07.pdf**.

World Resources Institute's *Digital Dividend Project,* **www.digitaldividend.org**