

Credit Scoring, Banks, and Microfinance: Balancing High-Tech with High-Touch

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Abstract

Latin American banks make consumer loans based on “high-tech” automated credit scoring, whereas microfinance lenders make microenterprise loans based on “high-touch” individualized analysis of cash flows and personal character. What can these two approaches learn from each other? In the next five years, downscaling banks will adopt a more personalized approach to collect data for scoring, and growing microlenders will add scoring as a complement to loan officers’ analysis. The increasing importance of scoring for all types of loans will create incentives for better credit bureaux.

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1. Introduction

Credit scoring is an explicit, quantitative way to evaluate repayment risk. A scorecard assigns points to the attributes of a loan applicant, and the sum of the points is the “score”, with more points meaning more risk. For “type of business”, for example, a carpenter might get 10 points and a corner grocery store 5 points. Likewise, each additional \$1,000 of “cash-on-hand” might be -1 points, so \$0 is zero points and \$3,000 is -3 points. In this simple example, a carpenter with \$3,000 cash-on-hand is more risky ($10 - 3 = 7$ points) than a corner grocery store with no cash-on-hand ($5 + 0 = 5$ points). A scorecard’s points are derived from an analysis of experience and/or data.¹

Experience in high-income countries shows that scoring—properly used—decreases arrears while increasing profits, numbers of clients, and numbers of poor clients. Scoring also provides the quantitative, historically grounded measure of risk that is the foundation of Basel II risk management standards.

Because of these benefits, Latin American banks are adopting scoring for consumer loans. Their salaried borrowers have a steady (and verifiable) income, they may have savings accounts, and they probably show up in a credit bureau.

¹ See Mark Schreiner, 2002, “Scoring: The Next Breakthrough in Microfinance?” Consultative Group to Assist the Poorest Occasional Paper No. 7, Washington, D.C., http://www.cgap.org/docs/OccasionalPaper_07.pdf.

In contrast, few microlenders use scoring. In fact, consumer lending's automated, "high-tech" approach based on credit-bureau data for salaried borrowers is the antithesis of microlending's individualized, "high-touch" approach based on loan officers' analysis of the cash flows and personal character of microenterprise owners.

Banks and microlenders will benefit from learning from each other. If banks want to reach microenterprises, their scorecards cannot rely only on credit-bureau data and paycheck stubs. Instead, banks will have to mimic microlenders' labor-intensive techniques to get data directly from the applicant. For microlenders, scoring holds great promise as a complement for loan officers.

Scoring has several strengths vis-à-vis microlenders' "high-touch" approach, as it:

- Assesses risk explicitly and consistently (rather than implicitly and variably)
- Produces quantitative (rather than qualitative) risk forecasts
- Uses the experience of the whole organization (rather than only the loan officer)
- Allows "low-risk" attributes to compensate for "high-risk" attributes (rather than pass/fail rules)

Scoring quantifies risk. This permits risk-based pricing, risk-based collateral, risk-based credit limits, and, in general, risk-based decision-making. Better measurement of risk is a win-win for lenders and borrowers.

This article discusses how banks can adapt scoring to microenterprise loans and how scoring can be adapted to microlenders. It also discusses the process of introducing scoring in a microlender, drawing on experience from an IDB-funded project with affiliates of Women's World Banking in Colombia and the Dominican Republic.

2. Adapting scoring to microlending (and vice versa)

Scoring depends on data. Consumer lending can be automated because borrowers' income and credit history are both documented and powerfully predictive of future repayment performance. Other predictive indicators (home ownership, phone ownership, age, and occupation) are inexpensively available in the written application.

In contrast, the self-employed poor cannot document income and credit history. To compensate, microlenders send out loan officers to applicants' homes and businesses where they work up financial statements and visit with the applicant, family, neighbors, employees, suppliers, and customers. Financial ratios are checked against pass/fail filters (for example, monthly installments cannot exceed 30 percent of free cash flow). Once past official credit-policy hurdles, the loan officer judges whether—based on qualitative impressions—the applicant will repay as promised.

Compared with consumer lenders, microlenders must work with data that is both more costly and less predictive of risk. Both types of lenders know how applicants repaid their past loans to the same lender, but only consumer lenders know about performance elsewhere (via a credit bureau). Both lenders use “family demographics” (*e.g.*, age, education, and household size) and “business demographics” (*e.g.*, years in business, type of activity, and number of employees), but only microlenders must gather detailed data on the finances of the family and business.

A consumer scorecard might have 10–20 indicators and be dominated by credit-bureau items (current and past arrears elsewhere, number of inquiries, and utilization of

credit lines). In contrast, a microfinance scorecard might have 50–80 indicators. Each indicator is less powerful, so more indicators are required, and no single class of indicators dominates. In an IDB-funded project with affiliates of Women’s World Banking in Colombia and the Dominican Republic, the most powerfully predictive indicators were (in rough order of importance):

- Days in the longest spell of arrears in the previous loan
- Length of time as a client
- Type of business
- Age of applicant
- Identity of the loan officer
- Telephone ownership
- Household structure
- Years in business
- Cash-on-hand
- Number of scheduled installments
- Years in the current residence
- Number of installments in arrears in the previous loan
- Number of installments paid-off early in the previous loan
- Experience of the loan officer
- Number of businesses run by the household
- Days of delay between application and disbursement
- Total assets
- Days of rest after paying off the previous loan
- Accounts receivable
- Home ownership
- Debt/equity ratio

Scoring is more power for repeat borrowers (who have a history with the microlender) than for new borrowers.

What can microlenders and consumer lenders learn from each other? To reach microenterprises, consumer lenders need to assemble financial data on the household and business. This is costly, but they cannot rely solely on credit-bureau reports.

For their part, microlenders should keep their current processes and, in addition, quantify risk with scoring. While scoring is less powerful for microlending than for consumer lending, it can still detect many high-risk cases that slip by loan officers. Of course, scoring will not replace loan officers; only loan officers can gather the data that feeds scoring, and only loan officers can screen out dishonest applicants and other special cases that scoring, using purely quantitative data, cannot detect.

In this sense, scoring is a third voice in the credit committee, helping the loan officer and credit manager finalize decisions on cases that, without scoring, would be approved. In microfinance, scoring does not approve applicants who, without scoring, would have been rejected. Rather, scoring highlights cases that are riskier than the credit committee thought, leading to in-depth review and perhaps changes to the loan contract. Some very high-risk cases are rejected, and very low-risk cases are rewarded to improve loyalty (for example, with a line of credit or reduced interest rates).

Scoring may also allow microfinance loan officers to specialize, with some collecting quantitative financial data and others detecting qualitative red flags. Right now, loan officers are like one-person mobile branches, each one responsible for sales, analysis, loan approval, and collections (Figure 1). This all-in-one arrangement is necessary for incentive reasons. With personalized, qualitative processes, loan officers' effort and use of judgment is—of necessity—unsupervised. To ensure that loan officers do their best before disbursement to attract and approve low-risk clients, they are made responsible for monitoring repayment after disbursement.

In contrast, banks making consumer loans use standardized processes. Because there is little room for judgment and because effort can be measured as the number of standardized tasks completed, consumer lenders can divide tasks among specialized staff. This not only increases efficiency but also mitigates the risk of employee fraud. It works, however, only if credit bureaux allow most clients to be assessed via scoring.

How can banks to downscale to microenterprises and how can microlenders adopt scoring? If data is key, then strengthening credit bureaux is a priority. More and better data about more people would allow microlender's to rely on scoring more. More comprehensive credit bureaux would also allowing banks to downscale without having to completely overhaul their processes.² Better data solves a host of issues and has democratized credit in high-income countries.

² See Mark Schreiner, 2005, "Can Scoring Help Attract Profit-Minded Investors to Microcredit?", http://www.microfinance.com/English/Papers/Scoring_Helps_Attract_Profit_Minded_Investors_to_Microcredit.pdf.

3. Introducing scoring in a microlender

This section discusses a few broad lessons from an IDB-funded scoring project with affiliates of Women's World Banking in Colombia and the Dominican Republic. The overall project goal was not to centralize and automate decisions but to strengthen the decentralized risk-assessment process in the branches.

Change management. In any project, the central challenge is change management. Scoring is a radical break from the current approach, so microlenders are skeptical. Until now, loan officers have been the rock stars of microfinance, sallying forth alone to divide the sheep from the goats. Naturally, they doubt that scoring can improve on their judgment. If it ain't broke, why fix it?

Change management must be grounded in careful planning, repeated training, and long-term follow-up. Members of the credit committee must be convinced that scoring works, that it will benefit them, that it is based on the microlender's own data and experience, and that its quantitative measures of risk complement (not contradict) loan officer's qualitative judgment.

For example, loan officers want to know exactly what indicators are in the scorecard. While they might use this knowledge to "cook" data to make scoring match their judgment, they cannot be expected to trust their jobs to a magic box.

Our approach is to give users a complete description of the scorecard and to make adjustments based on their feedback. Furthermore, loan officers get a report showing each of their loans and scoring's risk forecast. They can then compare

predictions with performance for themselves. The report also shows how scoring would have affected arrears, portfolio size, and the loan officer's monthly bonus.

Successful change depends less on getting the scorecard perfect (although, of course, it must quantify risk accurately) and more on bringing users on-board. In high-income countries, about half of scoring projects fail, not because the scorecard is inaccurate but rather because no one uses it. Most of the lessons below reflect attempts to ensure that a microlender and its employees do use scoring and use it properly.

Scorecard testing. Tests of predictive accuracy before roll-out aim to ensure that scoring really does work, and—if it does—to demonstrate that fact to users.

The “back-test” checks how scoring would have performed in the past. In technical terms, this should be the most convincing test. In human terms, managers are less than convinced, perhaps because the results are at the portfolio level. Back-testing is still useful, however, for setting policy cut-offs. For example, it tells how many “bads” and “goods” would have been rejected in the past (and probably will be in the future) if scoring policy were to reject all cases with predicted risk of more than 50 percent.

The “extreme-risk” test looks at the 100 lowest-risk cases and the 100 highest-risk cases. Technically, this is weaker than the “back-test” because fewer loans are tested. The results, however, are presented loan-by-loan, and users can see right away that the lowest-risk cases rarely have any arrears and that many—if not most—of the highest-risk cases have severe arrears. The “extreme-risk” test clearly shows users that scoring can detect high-risk cases that the credit committee missed.

Preserve existing processes. Our approach runs counter to the hope (drawn from how scoring is used in consumer lending) that scoring will allow microlenders to stop visiting clients' homes and businesses. Scoring simply cannot detect cases who look fine on paper but who are risky due to dishonesty, marital problems, or overdue informal debts.

Microlenders should maintain their evaluation process. The credit committee should not consult scoring until *after* a case has been provisionally approved the traditional way. Most cases have low or average risk and proceed to disbursement as usual. A few cases (maybe 15 percent) have borderline risk and receive further review or modifications (smaller disbursements, greater guarantees, shorter terms). Finally, perhaps 5 to 10 percent have very high risk and are rejected.

For high-risk or borderline cases, the committee reviews a report that shows *why* risk is high. For example, risk might be high because the case is a carpenter with no cash-on-hand. Knowing this, the committee can override scoring policy if they believe there are compensating factors that the scorecard does not consider. Even if carpenters as a group are risky, perhaps this one is exceptional, or perhaps the loan officer's visit suggested that new sources of cash are forthcoming. More important, the report helps users see scoring as a reasonable, transparent, non-arbitrary tool, and it empowers users to focus on those aspects of the case that matter most for risk.

The case file also includes a report that shows how risk would change if the committee were to change the loan amount, number of installments, or guarantee

requirements. The idea is that scoring does not dictate decisions but rather empowers the credit committee with better tools to manage risk.

Minimize “extra” work. Users are more likely to accept scoring and use it properly if they do not see it as “extra” work. On the most basic level, this means that scores and scoring reports are automated and integrated in the existing computer system. In Colombia, nothing changes for front-line workers until the last step of the credit committee: loan officers collect the same data, the same data are keyed in as before, and reports are generated automatically.

Manage expectations. Microlenders typically expect scoring either to have nothing to offer or to do everything. As discussed above, scoring can help some, but it will not go to replace loan officers nor make microlending a cakewalk.

Downscaling banks in particular are tempted to try to rely solely on scoring and avoid learning the traditional, labor-intensive approach. But when scorecards developed for consumer loans have been applied to microloans, the result has been a bankrupted lender and a damaged microfinance market.³ Scoring is a useful tool, not a shortcut.

Keep it simple. The main challenge of a scoring project is to win users’ acceptance and trust. To this end, the project should stay simple, focused on a single scorecard, without requiring additional data collection. Once lenders try scoring, they will probably fall in love with it, and then there will be time for refinements.

³ See Damian von Stauffenberg, 2001, “How Microfinance Evolves: What Bolivia Can Teach Us”, *Microenterprise Development Review*, Vol. 4, No.1.

For example, some projects install three scorecards: one for new applicants, one for repeat applicants, and one for outstanding loans. While lenders like the idea of three scorecards instead of one (and vendors are happy to sell three), the added complexity increases the chances that the project will bog down before any “live” cases are scored. A single scorecard can serve all three purposes and simplify the project.

For example, the pre-disbursement score—whether for new or repeat borrowers—is an excellent predictor of the risk that an outstanding loan that become overdue today will reach 30 days. Thus, loan officers can use pre-disbursement scores to prioritize collections efforts.

In general, the pre-disbursement score has a wealth of uses. For repeat applicants, it could be run before the field visit. If risk is very low, and if there was a field visit for the previous loan, then the loan officer’s visit might be reduced to a phone call (or a less high-powered employee might be dispatched to verify that the business still exists). Likewise, very low-risk clients might be offered lines of credit or long-term loans. In all these examples, scoring saves loan officers—and clients—time.

Once scoring is in place and accepted, additional scorecards can predict drop-out risk (so that safe-but-potentially-disloyal clients can be offered incentives to repeat) and the likelihood that a client is poor (to track depth of outreach).⁴

⁴ For drop-out scoring, see Mark Schreiner, 2003, “Scoring Drop-Out at a Microlender in Bolivia”, *Savings and Development*, Vol. 27, No. 2, pp. 101–118. For poverty scoring, see Mark Schreiner, 2005, “Fichas de puntaje de pobreza para México y AlSol”, report to Grameen Foundation U.S.A., mark@microfinance.com.

4. Conclusion: Benefits of scoring

Scoring for microfinance reduces arrears and conserves loan officers' time, increasing profits and improving outreach. It does this by bending microlender's "high-touch" approach closer to banks' "high-tech" approach to consumer loans. At the same time, banks using scoring to downscale must, like microlenders, collect detailed financial data from the household and business.

A "back-test" from Colombia illustrates scoring's potential benefits. A scorecard was built with cases paid-off up to March 2004 and then applied retroactively to 7,618 cases paid-off from April 2004 to July 2005. About 22 percent (1,666 loans) were "bad", defined as ever being 30 days late or averaging 7 days of arrears per installment.

If the microlender had rejected all applicants with a risk above 50 percent,⁵ it would have rejected 697 cases that, in reality, were approved. Of these high-risk cases, 48 percent (338) indeed went "bad". Thus, scoring would have reduced the number of disbursements by 9 percent and the number of "bads" by 20 percent. In simple terms, the cost of avoiding one "bad" loan was losing one "good" loan.

How would this affect profits? Based on an ABC costing exercise, it was estimated that avoiding a "bad" saved \$362 and losing a "good" cost \$187. With 338 "bads" avoided and 359 "goods" lost, the net financial effect is about \$55,000.

Most of the benefit is loan officers' spending less time on collections and more on new applicants. In Colombia, loan officers spend about 2 days per week on evaluations,

1 day on office work, and 2 days in collections. If scoring reduces “bads” by 20 percent, it increases time for evaluating new applicants by about 3 hours per week. In turn, this should increase disbursements enough to more-than-compensate for lost “goods”. In this way, scoring can both increase portfolio size and reduce arrears.

With many of the worst loans avoided, portfolio-at-risk (defined as the balance of any loan in arrears) also decreases. In the Colombian “back-test” (Figure 2), scoring with a 50-percent cut-off would have reduced portfolio-at-risk by about 13 percent, generating additional financial benefits from reduced loan-loss provisions.

⁵ This is a simple example; actual scoring policy is, as discussed earlier, more nuanced.

Figure 1: Division of labor in consumer lending by banks and by microenterprise lenders

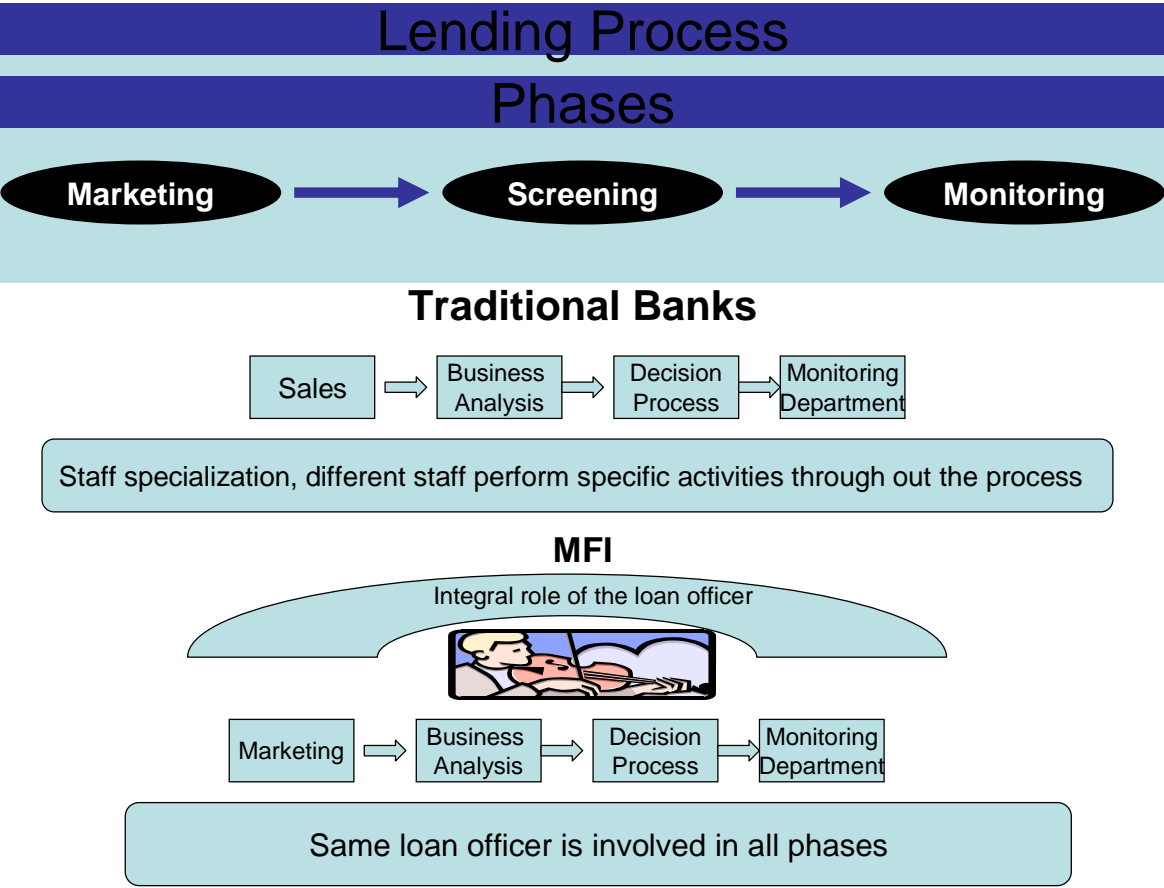


Figure 2: Effect of scoring on month-end portfolio-at-risk with 50% cut-off

