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Credit Scoring in Microfinance

Objective

This white paper provides an overview of credit scoring for microfinance organizations. The Opportunity Network is at the very beginning stage of exploring credit scoring. Opportunity Finance in South Africa currently uses it, and FORUS Bank in Russia and Opportunity International Bank of Malawi have undertaken feasibility studies to begin its implementation. This paper is based on their learning, as well as published best practice in the field. It conveys the benefits and risks of credit scoring and describes how it works. It also explores the basic stages of implementing credit scoring, and outlines the questions and guidelines that executives should consider prior to introducing it. The objective is to include the wider Opportunity Network in conversation and early learning about this promising tool.

What is Credit Scoring?

Credit scoring analyzes the characteristics and performance of past loans to predict the performance of future loans. The two most commonly used scorecards are application and behavior scorecards. Application scorecards predict the probability of first-time loan applicants defaulting at a future point based on demographic, business, and financial data, loan characteristics, and (if available) credit bureau data. The scorecard isolates characteristics that are statistically predictive of default based on the organization's recent experience, and uses those variables to predict the risk of new loan applicants.

Behavior scorecards predict the probability of an existing account going bad at a future point in time based on repayment information. They are used to define risk-based loan terms that reward good clients with lower interest rates and larger loans.

Scorecards have been used successfully with individual microfinance loan clients by a number of organizations. Opportunity is also exploring possible data capture for group loan

clients for use as they transition to individual loans. (See box on page 8).

What are the Benefits?

Credit scoring supports growth to reach more clients, helps manage default rates, lowers costs, enhances productivity, increases client retention and, when used wisely, can help us achieve our transformational objectives.

Supporting Growth

Microfinance organizations can use scorecards to protect their performance as they grow their programs. Scorecards create consistency in loan decisions which protects the quality of the portfolio during expansion efforts, including large scale branch roll-outs. Traditionally, loan officers have needed a substantial amount of time to develop the subjective experience necessary to make good loan decisions. Scorecards make the criteria explicit and reduce the role of subjectivity in the loan decision. For the many Opportunity partners with strong operational performance who are looking to grow, maintaining loan decision quality during growth will be the leading benefit.

Managing Default

For organizations struggling with arrears, using credit scoring lowers default rates by quantifying risk—it calculates the percentage of likelihood of default resulting in not only more consistent but better loan decisions.

For example, Credit Indemnity, a microfinance division of African Bank that serves 200,000 clients in South Africa experienced a drop in default when they started to use scoring (see

graph). This resulted in a \$2 million increase in profit the year after implementing behavior scoring.¹

Organizations may also use the predictive capacity of scorecards to experiment with credit policies that may slightly raise default, assuming the benefits, such as a substantial increase in the number of clients served, outweigh the costs.

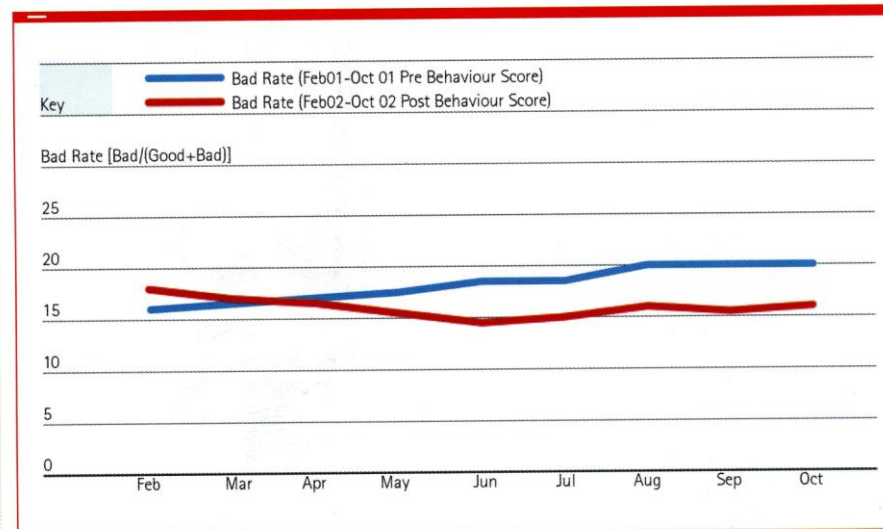


Figure 1: Performance of Credit Indemnity's behavioural scorecard

Source: Credit Risk International, July 2003.

Both pricing for the bad debt as well as the transformational impact would need to be taken into consideration.

Managers can see the effect that a scorecard will have on their default rate before they even roll it out. After the scorecard is developed managers can run a "historical test" to understand how varying credit policies would have changed their past arrears and financial performance.² Guided by their organization's mission, target group, and a clearer understanding of the implications of their credit policies, managers can more intentionally manage risk.

¹ Gilmour, James. *Capturing the Potential of the "Unbanked" Consumer.* Credit Risk International. July 2003.

² Schreiner, Mark. *Scoring Arrears at a Microlender in Bolivia.* Center for Social Development. Washington University in St. Louis. April 6, 2004. p.5.

Lower Costs and Enhanced Productivity

Credit scoring reduces costs by helping loan officers reduce and prioritize the time spent in collections. Information on the probability of default is provided for each loan, so loan officers can visit “risky” clients before they fall into arrears.³ FORUS Bank in Russia anticipates that credit scoring will be a significant factor in increasing loan officer productivity from 120 to targeted 200 clients per loan officer, helping the bank reach its goals of economy of scale and profitability. FORUS plans to reduce the amount of time loan officers spend in lending decisions and to refocus that time on other relational aspects that clients value more, including business advice. “We don’t want to lose the relational aspect, which has been a key distinctive in the market. We want to focus it so it is most productive,” explains FORUS Bank Chairman Stacie Schrader.

Improved Client Retention and Marketing Opportunities

Credit scoring enables risk-based pricing and loan terms, which improves the retention of good clients and enables clients to move out of poverty more quickly. Building on its experience with group loans, FORUS hopes to build the value of networks and references into its individual client scoring systems in the future, after it has successfully developed a basic application scorecard. Clients could receive reduced interest rates or other incentives for referring new clients to FORUS who successfully repay their loans. References would factor into the scores of the referred clients.

A Stronger Context for Transformation

Credit scoring helps ensure that microfinance organizations do not over-indebt their clients. It makes the loan decision process less subjective and more consistent, creating greater equality. And when partnered with tailored

³ Schreiner, Mark. *Benefits and Pitfalls of Statistical Credit Scoring for Microfinance*. Microfinance Risk Management and Center for Social Development, Washington University in St. Louis. December 23, 2004. p.8.

financial education, it can empower clients. Loan officers at Opportunity Finance in South Africa communicate credit scores to their clients and explain the exact reasons for their loan decisions and terms. This information helps clients understand how to improve their credit scores and builds their savvy and confidence as participants in the formal financial system. For more on how credit scoring may be used to enhance transformational impact, see *Appendix 1 Credit Scoring Viewed through the Transformation Lens*.

What are the Challenges and Risks?

The main challenge is developing the organizational will needed to carry the project through to a successful completion. Collecting the accurate and comprehensive data necessary to develop a scorecard is a lot of hard work. The investment in developing an MIS platform that can store the needed data and produce a result can be significant. External credit scoring consultants will be a key partner in this process. Scoring changes old, comfortable habits of field staff and much work is needed to achieve buy-in. FORUS Bank in Russia plans to heavily involve their regional managers and key loan officers in the development of the system, including informing factors to be included on the scorecard and developing the processes that accompany scoring. Once the scorecard is developed it has a chance to prove itself and to generate trust as branch staff members see how

Credit Scoring and Group Loans

While scoring has proven a useful tool for individual loans, scoring for group loans has not been undertaken for a number of reasons. Often group loans are recorded at the group level, partial payments are usually not accepted to enforce the mutual guarantee, and group risk is determined as much by the strength of the relationships of group members as it is by the characteristics of individual members.⁴ However, Opportunity International intends to explore the benefits of data capture for individuals within groups, with the goal of creating benefits further up from the client’s personal credit cycle, including faster graduation to individual loans.

the scores compare to their own decision-making process in predicting risk during the pilot period.

There are two key risks once credit scoring has been rolled out. Some loan officers have falsified data to create a desired approval result. However, changing a client’s risk on paper does not change their actual risk; it will be apparent which loan officers employ this strategy over time. Educating loan officers about this variance and then monitoring it as well as auditing the data will mitigate the risk.⁵ Other loan officers have relied too heavily on the scores and neglected the essential qualitative analysis and relationship building with clients. Training and supervision are needed to mitigate this risk as well.⁶

How Does Credit Scoring Work?

Scorecards do not replace the essential work of loan officers and credit committees. Rather, scorecards are a tool to boost their efficiency and effectiveness. Statistical scoring can consider the numerous subtle and complex relationships of quantitative factors that will impact a client’s likelihood of repayment. These factors include basic demographics, type of business, business income and expenses, assets, repayment record, and the characteristics of the loan.⁷ (See Appendix 2 for a more complete list of the characteristics included on scorecards). Scoring cannot address qualitative issues such as client character or rapid changes in the market that are essential to microfinance.⁸

⁵ Schreiner, Mark. Interview June 19, 2008. Email: mark@microfinance.com

⁶ Mark Schreiner (Microfinance Risk Management) and Dellien, Hans (Women’s World Banking). *Credit Scoring, Banks, and Microfinance: Balancing High-Tech with High-Touch*. December 18, 2005. p.5.

⁷ Schreiner, Mark. *Scoring: The Next Breakthrough in Microcredit?* Paper prepared for the Consultative Group to Assist the Poorest. June 11, 2002. pp. 51-55.

⁸ Schreiner, Mark. *Benefits and Pitfalls of Statistical Credit Scoring for Microfinance*. Microfinance Risk Management and Center for Social Development, Washington University in St. Louis. December 23, 2004. p.18

Use of this tool varies. Some organizations maintain their previous loan evaluation process and use the scorecard as an additional source of information to make decision making more explicit and consistent. Others set policies and thresholds and automate part of the decision-making process, while still relying heavily on loan officer judgment and credit committee evaluation of borderline cases. Due to the critical role of loan officers in portfolio performance, any aspect of automation should be tested prior to roll out.⁹

Some organizations use scorecards purely for approve/decline decisions. (See box below). Opportunity Finance in South Africa uses a “Dual Application Scorecard” to set loan terms. The results of their own scorecard are placed on a matrix with credit bureau scores. Using the matrix the organization has mapped 5 levels of acceptable risk and established maximum loan terms, amounts, and interest rates for each level of risk.

Sample New Application Approve / Decline Decision Strategy

Score	Default Probability	Action
50 - 79	99%	Automatic Decline
80- 119	66%	Automatic Decline
120-149	33%	Refer to credit committee
150 - 179	25%	Refer to credit committee
180 - 199	10%	Automatic Accept
200 - 250	5%	Automatic Accept

Source: Adapted from sample application decision strategy provided by PIC Solutions. Scorecard Feasibility Study prepared for Opportunity International. January 31, 2008.

⁹ PIC Solutions. *Consumer Credit Scorecard Feasibility Study: A Report Documenting Readiness for Scorecard Developments*. January 31, 2008.

Stages of Implementing Credit Scoring

The flow chart below describes the key stages of implementing credit scoring:

<i>Phase 1:</i>	<i>Phase 2:</i>	<i>Phase 3:</i>	<i>Phase 4:</i>	<i>Phase 5:</i>	<i>Phase 6:</i>
<i>Data collection</i>	<i>System development</i>	<i>Scoring analysis</i>	<i>Policy development</i>	<i>Roll out</i>	<i>Monitoring</i>
Understand the data needed including: ¹⁰ 1) Client demographics, 2) Business demographics 3) Financial flows 4) Assets / liabilities 5) Repayment record 6) Characteristics of the loan Capture 18 months of needed data	Establish if and how the banking systems stores this data. If necessary, build system enhancements so that the 18 months of data is stored correctly on one platform.	An outside consultant statistically analyzes the data to produce the application and / or behavior scorecard models.	The scorecard allows management to quantify risk. Credit policy (cut offs, loan terms and sizes, and interest rates) can then be set to serve the target population, manage financial risk, and create competitive advantage.	The scorecard is run parallel to the current system for 6 months to demonstrate accuracy and achieve buy-in. Training is also a key part of this process.	The scorecard's performance is monitored on an ongoing basis. Risk management is necessary to determine when the scoring analysis needs to be updated to keep scorecards accurate.

¹⁰ Source: Schreiner, Mark. *Scoring: The Next Breakthrough in Microcredit?* Paper prepared for the Consultative Group to Assist the Poorest. June 11, 2002.

As senior leaders consider adopting credit scoring at their microfinance organizations, the following questions and guidelines are offered for each stage of implementation:

Phase 1: Data Collection

Do you need to expand the data you capture?

Scorecards work because they measure a large number of characteristics on a large number of clients over time—and then determine which of these characteristics predict risk. Appendix 2 provides a baseline for recommended data points to capture. Each microfinance institution may add other characteristics it considers to be predictive of risk and the scorecard will also drop the characteristics that are not statistically significant.

Do you have a large enough sample of “good,” “bad,” and “rejected” clients to generate an accurate scorecard?

In order to build a robust application scorecard, industry norms suggest that there need to be 1,800 good accounts, 1,800 bad accounts, and 1,800 rejected applications over an 18-24 month period.¹¹ Because the lending performance of most Opportunity partners is so high, few organizations in our network would be able to provide a sample of 1,800 bad accounts. Very few microfinance institutions have stored data on their rejected applications. But where these volumes of good, bad, and rejected accounts are not available it does not mean that scorecards cannot be developed but rather that the approach adopted is tailored to suit the nature of the data that is available. Loan decision processes using scorecards built with less data will require a heavier emphasis on subjective people-based judgment.

What is the quality of the data?

The data used to produce scorecards needs to be accurate to create accurate results. However, it doesn't need to be perfect. According to

¹¹ PIC Solutions. *Consumer Credit Scorecard Feasibility Study: A Report Documenting Readiness for Scorecard Developments*. January 31, 2008.

credit scoring expert Mark Schreiner, “microcredit data—like all data—always have some dirt (errors) and noise (random variation around the true value). For example, the value of fixed assets is noisy because it is difficult to appraise. It is also sometimes dirty because the loan officer may manipulate the appraisal so that an application that he or she deems worthy satisfies the financial ratios required in the lender’s evaluation policy. The statistical work in scorecard construction filters whatever signal (the link between risk and a characteristic) it can from the dirt and noise... In many cases, data that is known to be dirty and noisy still contain usefully strong signals.”¹² Credit scoring consultants statistically analyze the data to ensure it is good enough for use in developing a

Case Study: Revising the Loan Application Process in Preparation for Credit Scoring

As Opportunity International Bank of Malawi (OIBM) began to evaluate its data with the help of credit scoring consultancy PIC Solutions, it discovered that it needed to revise its loan enquiry and application process. Previously, loan applications were only inputted in the banking software system by the loan officer once he/she had done an initial appraisal on the client and felt comfortable presenting the application to credit committee. The majority of clients are rejected by loan officers before any formal application is processed. In order to implement credit scoring, all loan enquiries and applications need to be inputted in the system to track the characteristics of those that are rejected in comparison with those that are accepted. It also became aware of the need to change how application data is captured in the MIS system. For example, when clients apply for a subsequent loan the information that is inputted overwrites the data from the previous loan. However, application scorecards require data from the original application. OIBM is working with Opportunity’s Africa Regional Office to develop a common approach for Africa partners to capture data for the 18-24 month period required for scorecard development.

reliable scorecard. If the data is not optimal the loan decision can be weighted towards subjective evaluation until the data quality is sufficiently improved.

Phase 2: System Requirements / Development

Most Opportunity partners will need external assistance in evaluating system-readiness for credit scoring. A robust MIS platform is critical to capture and analyze the data. The Opportunity Network can provide assistance on selecting a consultancy that can help CEOs, CFOs, and heads of IT answer the following questions:

- 1) Is the relevant data for scoring captured accurately?
- 2) Is the data stored correctly for the purposes of scorecard development?
- 3) Can the system take the information captured at application and run it through the scorecard in real-time?
- 4) Does the system have the functionality to allow the user to set up the scoring parameters? Can these be developed? At what cost? If not, can a third party system be used that links in with the banking system?
- 5) Can the system drive some of the credit policy associated with the scorecard – can it approve/decline, set the interest rate, set the maximum loan, and set the maximum term?
- 6) How does the user utilize the scoring output on the system? Is it user-friendly?

In many cases, new information technology systems will need to be built and integrated with the banking system.

Phase 3: Scoring Analysis

Unless there is in-house expertise in scorecard development, the statistical analysis is conducted by an external consultant who produces the scoring model.

Phase 4: Setting Policy

Once the model has been developed management develops credit policies, including

Case Study: Opportunity Albania Finds Credit Scoring Model that Successfully Predicts Defaults with 97% of Clients

Opportunity Albania began developing a credit scoring model for its loan portfolio which consists entirely of individual loans. When the project began in mid-2007, there was no reliable nation-wide information on clients credit history. Albania's model had to rely on such individual characteristics of clients as age, income, type of business, or residential location. The bank also studied the risk inherent in different types of loans and interest rates.

The only financial information Opportunity Albania included in its scorecard was income level, which it divided into groups of low, middle, and high. Other types of data used to predict repayment included the type of business the client in which was engaged, residence, and type of identification and contact information provided.

After looking at 22,714 loans provided between 2003 and 2007, Opportunity Albania found a number of non-financial characteristics were predictive in client repayment. Higher incomes, certain businesses such as construction and services, urban residences and certain cities, contact information that made it easy to find a client, and the use of a passport instead of other forms of identification were all associated with higher rates of repayment.

Opportunity Albania CEO Robert Hart sought to develop a model that could predict client behavior without using financial data, which was either unreliable or unavailable in Albania. The model is now being piloted, and tests indicate it is 97.3% accurate.

During the second half of 2008, Opportunity Albania worked on implementing the technological infrastructure and plans to roll out the program in the first quarter of 2009. Hart says the credit scoring system will provide a more predictable portfolio risk profile as well as lower the costs of making high-volume small loans.

accept / decline thresholds, and if applicable, pricing, loan size, and terms. This discussion includes addressing the question, “How many good loans would you sacrifice to avoid a bad loan?”¹³

Risk and Poverty Targeting

Opportunity International’s mission is to provide opportunities for people in chronic poverty to transform their lives. Credit scoring measures risk and sheds light on the financial implications of the depth of poverty outreach. Managers then take this information, along with their organization’s mission and poverty-targeting criteria, and set loan terms and cutoffs that will allow them to have the greatest sustainable impact in their context. Human leadership, not the scorecard, makes the determination to move up-market or target a poorer population. And because scorecards are based on historical information, the attributes of clients served in the past serve as the benchmark for assessing future clients. Scorecards can also signal when a client would be over-indebted by a microfinance loan—protecting members of the poorest population who would have been better off if they had not received the loan.

In calculating the profits from a good loan and the cost of a bad loan, the microfinance institution can set thresholds it considers acceptable. The scorecard can create competitive advantage by helping the microfinance institution separate the “good” borrowers from the “bad” borrowers better than other lenders in the market and offer the appropriate loan terms associated with the risk. This improves financial sustainability and also improves the ability to control risk exposure. It also helps to identify the right clients for up selling, cross selling and down selling.

¹³ Schreiner, Mark. *Benefits and Pitfalls of Statistical Credit Scoring for Microfinance*. Microfinance Risk Management and Center for Social Development, Washington University in St. Louis. December 23, 2004. p.8

Human leadership, not the scorecard, makes the determination to move up-market or target a poorer population.

Phase 5: Pilot and Roll Out

The largest challenge to scoring is the possibility that the system will be unused. The best way to generate trust is to implement the scorecard parallel to the current system for six months to demonstrate the outcomes of actual decisions compared to the performance of the scorecard. Reports that provide personalized feedback for loan officers are essential.¹⁴ End-user training that covers the concept, implementation, and results also generates strong buy-in. Microfinance organizations that use credit scoring to develop more sophisticated differentiation in loan terms and interest rates for clients will need to manage this change process for clients. Some organizations disclose the 2 or 3 most important reasons for the loan decision (while this information can be empowering for clients, it may also be used for future abuse). Other organizations educate clients more generically about the factors that affect risk assessment.

Phase 6: Monitoring

Monitoring the performance of the scorecard needs to be assigned to one member of the management team, usually a risk manager. Given constantly changing external environments, scorecards need to be updated periodically (possibly as often as every one to two years to ensure accuracy).

Next Steps for Opportunity International

The Opportunity Network is currently in the early design stage for developing a strategy for credit scoring. Funding is currently being sought to support this initiative and a meeting will be held for network stakeholders to exchange learning and develop a shared plan.

¹⁴ Schreiner, Mark. Interview June 19, 2008. Email: mark@microfinance.com

Conclusion

Credit scoring can be a powerful tool to improve a microfinance institution's management of credit risk. While it does not replace the work of the loan officer and credit committee, it can significantly enhance the efficiency and effectiveness of the loan decision process. Implementing credit scoring is a rigorous and sometimes arduous process. However, the benefits of collecting a wide range of accurate data and developing systems that help the microfinance institution understand the client base are tremendous. The end result is lower default, reduced costs, improved client retention, and the ability to serve more clients.

Opportunity International

Opportunity International has more than \$900 million in assets serving poor families with micro loans, savings, insurance and training in 30 countries in Africa, Asia, Eastern Europe, and Latin America. Opportunity builds, owns and operates microfinance banks and the first wholly-owned microinsurance company. With Supporting Partners in Australia, Canada, Germany, the United Kingdom, and the United States, Opportunity manages investment divisions and a Loan Guarantee Fund.

***Our mission** is to provide opportunities for people in chronic poverty to transform their lives.*

***Our commitment** is motivated by Jesus Christ's call to serve the poor.*

***Our core values** are respect, commitment to the poor, integrity, and stewardship.*

***We serve** women and men of all faiths and no faith.*

Author Bios

Manfred Kuhn

Manfred Kuhn has worked in the microfinance industry for the last eight years focusing on the areas of credit risk management and financial technologies that improve access of financial services to low-income individuals. He began his career in the microfinance industry as risk manager and later worked in a senior management capacity as Head of Credit overseeing credit risk, credit operations, and data analytics at Credit Indemnity, a leading microfinance organization in South Africa. Manfred also held the position of Head of Credit at Nedbank Consumer Credit overseeing credit risk, profit modeling, credit marketing, Basel II and Fraud departments before taking up the position of CEO at Opportunity Finance. Manfred has a BSc Agricultural Economics and an MSc Agricultural Economics from the University of Natal. He completed his Ph.D. focusing on credit risk and best practice financial technologies in the South African microfinance sector in 2003.

ManfredK@OpportunityFinance.co.za

Alexis Beggs Olsen

Alexis Beggs Olsen is a consultant that specializes in developing capacity building tools and resources for organizations that address poverty. She has written and edited numerous resources for the Opportunity International Network, including the *Loan Officer Training Tool Kit*. She previously served with the Network as a Technical Advisor and Senior Program Manager with the Women's Opportunity Fund.

alexisbeggsolsen@earthlink.net

Editorial Input

Beth Houle

Beth Houle is Head of Global Services for the Opportunity International Network. Beth is responsible for knowledge management, global business planning, and marketing/brand. Beth worked in India with the Ford Foundation and with Salomon Brothers, Inc private investment in New York. She has an MBA from the Kellogg School of Management at Northwestern University. She is an advisor to the One Acre Fund in Africa and on the Board of Women Advancing Microfinance (WAM) International.

bhoule@opportunity.org

Contributions & Acknowledgements

Contributors

Stacie Schrader

Stacie Schrader is the Chairman of the Board of Directors of FORUS Bank. She began Opportunity International's work in Russia in 1994 and has led the organization through growth as a not-for-profit organization and now a bank. s.schrader@forusbank.ru

Claudia McKay

Claudia McKay is Head of Microfinance Banking at Opportunity Bank of Malawi, the only commercial bank in Malawi dedicated to serving unbanked and underbanked Malawians. Prior to working with Opportunity Bank in Malawi, Claudia was the Asia Program Manager at Opportunity International United Kingdom. She has a background as a management consultant with the Boston Consulting Group (BCG) and holds an MBA from Oxford University and a BA from Claremont McKenna College in California, USA. cmckay@oibm.mw

Colin McCormack

Colin has spent most of his career in Commercial Banking built up over nearly 25 years with Barclays Bank. He was Managing Director of DFCU, a development and commercial banking group in Uganda and immediately prior to that was Managing Director of Barclays Bank in Egypt. Prior to that he was the Risk Director of Barclays Bank of Zimbabwe and a Lending Director of Barclays Bank in the City of London. He comes with a wide exposure to General Management, Risk Management, Relationship Management, Project Management and many other areas of banking. He is currently the Managing Director of the Africa Region for Opportunity International where he oversees growth and development of the owned regulated microfinance institutions.

Robyn Robertson

Robyn Robertson, director of transformation, is a policy, research, and development practitioner with an 11 year track record. Robyn has held a range of policy, clinical, and operational positions in government, not-for-profit, and international organizations. Since 2004, Robyn has consulted for Opportunity International, leading the transformation capacity development pilot with Growing Opportunity Finance India. Robyn is author of "Ordinary Women, Extraordinary Lives" 2006 and produced the televised mini documentary "International Women's Day 2006."

rrobertson@opportunity.net

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Appendix 1: Credit Scoring Viewed through the Transformation Lens

Dignity:

- Equality is built through a more standardized and less subjective process.
- Eligibility and resulting successful repayment by client contributes to a deeper understanding by client of their personal capacity fostering self worth and dignity.
- Enables the client to graduate faster to more tailored financial solutions, building client confidence, sense of self respect, and deeper understanding of their unique value.

Authority:

- Enables clients to see their scorecard and determine changes in their own life required to realize their own vision for their future and family's future.
- Empowers clients (when combined with financial literacy programs) toward capacity to exercise greater initiative and engage in financial decisions with a sense of informed choice.

Security:

- Protects clients from experience of "debt trap."
- Reduces the risk to the client in the loan decision process of human subjectivity, alternate motivations, approval, or entitlement inconsistencies, and exclusions especially during periods of rapid aggressive institutional outreach or market penetration.
- Consistency in behavior toward clients increases client perception and experience of institutional predictability, transparency, and integrity, resulting in increased financial access.
- Reduces uncertainty during the loan application process, which reduces anxiety, stress, and fear during the approval waiting time. This enables greater capacity for setting realistic expectations and client ability to plan accordingly.

Adequate provision:

- Ensures clients with requirement and capacity to repay can access adequate financial resources and tailored financial products.
- Allows institution to grant the appropriate loan amount made possible through more sensitive and accurate screening tool.
- Provides capacity for the poor to experience self-sufficiency, translating into enhanced confidence related to financial authority, security, and dignity, which increases their capacity to adequately provide for their families now and over the longer term.

Purpose, hope, and meaning:

- Reduces the risk to the client of being granted loans on inappropriate terms that contributes to repayment difficulties and defaulting as a consequence robbing them of opportunities to transform their business, family, or community.
- Provides clients who are declined eligibility with concrete meaningful steps to take.

Freedom and appropriate boundaries:

- Allied loyalty programs assist clients to honor their obligations with the incentive of additional freedoms for successful repayment.

Authentic relationships and love:

- Minimizes the worker's role in making value-judgments, earning greater trust from the client toward the staff and organizations, which provides greater capacity for deeper and more authentic relationships between staff and clients.
- Greater experience by clients of an organization that genuinely is no subjective, discriminatory, inconsistent, or unreliable.
- Enhances the amount and quality of time able to be invested by field or other staff into authentic relationship investment rather than application or transactional efforts, strengthening staff capacity to identify and respond in a timely way to clients at their point of greatest need.

Appendix 2: Characteristics Commonly Included in Microfinance Scorecards

Demographics

Gender
Year of birth
Marital status
Last grade completed in school

Contact information

Phone number to contact at home (may be a neighbor's phone)
Phone number to contact at business (may be a neighbor's phone)

Business Demographics

Sector (manufacturing, services, trade, agriculture)
Specific type of business
Year starting this specific enterprise

Financial flows of the household / enterprise

Business revenue
Household income from salaries
Household income from other sources
Business expense for goods purchased
Business salary expenses
Other business expenses
Other household expenses

Stocks of the enterprise

Total assets
Fixed assets
Inventory
Cash and bank accounts
Total liabilities
Informal debts
Formal debts

Repayment record (derived from MIS)

Longest spell of arrears
Day of arrears per installment
Number of installments paid late

Characteristics of the loan

Date application submitted
Date loan disbursed
Date paid in-full
Amount requested
Amount disbursed

Amount of installment
Number of installments
Frequency of installments
Interest rates
Fees and commissions
Grace period
Rescheduled status
Purpose of loan
Type of guarantee
Appraised value of guarantee

Characteristics of the lender

Branch
Loan officer

Source: Schreiner, Mark. "Scoring: The Next Breakthrough in Microcredit?" Paper prepared for the Consultative Group to Assist the Poorest. June 11, 2002.

www.microfinance.com/English/Papers/Scoring_Breakthrough.pdf