

Information and Credit Markets

A Practitioner View

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The following was written as the author’s contribution to the Microfinance Impact and Innovation conference, held in New York from 21 to 23 October, 2010, where he was invited to comment on two topics being presented during the Information and Credit Markets session.

Psychometric Credit

Topic: Use of psychometric and other tests as part of credit application process
Presenter: Asim Ijaz Khwaja (Harvard University)

Introduction

The presenter put forward an extremely novel approach to assessing the credit risk of microenterprises, by introducing new types of data—in particular the use of a combination of intelligence, business aptitude, and psychometric tests. These are not things that have ever been attempted for in a commercial environment, and could provide great value where other data is either missing or woefully inadequate. Given the economic importance of the entrepreneurial class in Africa, it creates significant improvements in these communities. My own interest is not only as a credit risk professional, but also as an employee of a major bank currently piloting its use in Kenya. It is a purely commercial venture, but one by an organisation that strives to be relevant and contribute to the societies within which it operates.

Credit Scoring for Microfinance

Credit scoring is a an operations research technique used by lenders to harness data and make decision making easier, which over the past 50 years has expanded the availability and lowered the cost of retail credit, and has supplanted traditional judgmental 5C assessments (capital, capacity, character, conditions and collateral). It is best used in high-volume low-value environments where automation achieves its greatest benefits, especially for consumer credit.¹ For business lending it has more recently been used to assess the principals of small- and micro-enterprises (SMEs) in first-world countries. It was a watershed innovation in the 1960s, but has matured to the point that people wonder what the next big thing will be.

The data used to develop most scorecards usually falls into three categories: 1) application data, which is easy to come by but lacks depth; 2) account performance of existing customers, which applies only to a subset of customers and requires some infrastructure to accumulate; and 3) bureau data, which includes account performance anywhere, which has even greater infrastructure requirements.

The issues for microenterprises are two-fold: a) if the applicants have never borrowed before, there is no credit history; b) even if they have, the infrastructure is usually insufficient to turn the data into

¹ As size increases the focus shifts to reviews of trade creditors, financial statement analysis, full fundamental analysis, and an analysis of traded securities (where traded on liquid markets).

meaningful information. As a result, microfinance has developed using concepts like group liability, individual development accounts, and community/village banks. There also seems to be an acceptance of the need for a focus on savings mobilisation, rather than just credit provision.

In southern Africa, a distinction is made between “Microfinance” and “Microlending”, the former having some social end and the latter being purely commercial (and often predatory). In both cases, lenders are now required to share data via the credit bureau, which has required significant investments in infrastructure and risk assessment models, and improved access to lower cost credit for those who have avoided spending splurges gone wrong. Most of the borrowers are salaried employees, who can present payslips indicating they can afford a loan. Unfortunately, financial inclusion does not automatically translate into financial sophistication, and the recent economic rollercoaster has resulted in many having court judgments taken against them.

It is similar in countries to the north, where almost all personal lending by mainstream banks is to people in formal employment. The difference is that credit risk continues to be addressed by a web of policy rules and high margins, as the lack of data infrastructure (own or bureau) inhibits greater sophistication. This includes the lack of unique nationally-accepted identification numbers. Where scorecards have been developed, the biggest contributors have been the strength of the existing banking relationship and delinquencies on current or past loans, and their use has been limited to identifying a few super-goods or super-bads. Little or nothing exists to assess new-to-bank customers, especially microenterprises.

Beyond the lack of data, lending to microenterprises is complicated by a variety of other factors.

- 1) Lenders are wary of their uncertain incomes and treat them like the poor cousins of their salaried counterparts, if treated at all. The people who have it easiest are those where at least one family member is in formal employment, and they can borrow against that salary.
- 2) Micro-enterprises work from day-to-day and week-to-week (traders), or season-to-season (agriculture), while lenders tend to structure monthly repayments.
- 3) The loans tend to be low-value and short-term, such that once the costs of making the loans are included the resulting interest rates seem usurious (APRs of 50%+), even though they are totally affordable to the people wanting the loans.
- 4) The enterprise and the individual are usually one, and statistical analyses are distorted by extraneous factors for which no data is collected, such as the support of extended households and income from their other enterprises or formal employment.
- 5) Lenders want to apply similar rules to those for larger businesses yet: i) the self-employed are too busy running their businesses or do not have the necessary knowledge to provide that information (e.g. financial statements); and ii) where available, the same ratios can take on much different meanings for SMEs.
- 6) Borrowers tend to be price insensitive, as their primary interest is in whether their net revenues can repay the loan and still give them a fair margin.
- 7) Traditional 5C assessments could be done but are not very cost-effective, especially for banks that charge relatively thin margins.

As a result, microenterprise lending tends to be dominated by non-bank lenders who often specialise in this market, and rely upon a combination of intuitive 5C assessments (often involving

site visits), policy rules, and interest rates at least sufficient to cover costs and provide a fair return. Even then, penetration by lenders is extremely low.

The Pilot!

As of yet, our bank does not have any results to show from its Kenyan pilot, as we are only now issuing the first loans at some of the major markets in Kenya. There have been the expected challenges, in particular:

- a) customer and staff education;
- b) accommodation of the tool within our existing structures (process, product, etc.);
- c) determining the maximum loan size and pricing;
- d) adjusting processes, loan sizes, and pricing for concerns of different sizes;
- e) accommodation of weekly instead of monthly repayments;
- f) addressing potential fraud or embellishment.

On the final point, embellishment of credit applications can occur anywhere, and this should be no exception here—applicants will probably tell us what they think we want to hear, to improve their chance of getting the loan. Even so, initial results indicate this is an irritation and not a deal breaker.

Although early in the cycle of testing, expectations are high. And even if the initial results are sub-optimal, there are ways of tweaking the models. The initial models were based upon interviews of existing borrowers, with the worst cases only being 60 days past due, and no expectation of a further loan (i.e. no embellishment). Once there is sufficient data, it will be possible to tailor the model for a through-the-door population of real-life microenterprise loan applicants.

At the same time, I recognise the potential for this tool in other environments (modified to suit of course). Existing credit scoring focuses primarily upon what people have already done to predict what they will do; this tool achieves the same end by instead focussing on what they believe and their potential to achieve. Its value would be greatest in thin-data environments where customers lack credit histories, e.g. youth/students and low-income lending. Second, and no less important, would be to supplement thick data environments where the applicants are looking for credit outside of existing parameters, such as entrepreneurs seeking significant capital injections without having already strong capital bases. The challenge will be the tailoring of questionnaires to allow adequate assessment of these individuals' potential for credit in those markets.

Fingerprinting Credit

Paper: Identification Strategy: A Field Experiment on Dynamic Incentives in Rural Credit Markets
Authors: Xavier Giné, Jessica Goldberg, and Dean Yang

The paper presents the results of an experiment where fingerprinting was used as part of the credit application process, in an environment renowned for being data poor. The test was applied to small farmers in Malawi who grew paprika as one of many crops, and were provided credits with an agricultural supplier for inputs such as seeds and fertiliser. The results showed that the 20% of applicants who were least likely to pay responded by: 1) asking for lower loans; 2) putting greater resources into paprika production (land and inputs); and 3) exhibiting better repayment performance, at least partially due to the lower loans. It was as though they were more honest,

when they realised they could be identified through their fingerprints and that non-payment would limit their ability to get finance the next time. In academic speak, the results were a reduction in moral hazard on the part of the borrowers (acting differently once the money is in hand) and adverse selection by the lenders (making offers different from other market participants due to data deficiencies).

Current Situation in most of sub-Saharan Africa

The authors comment that this is “the first randomized field experiment” examines the effectiveness of dynamic incentives in a credit market, which presumably includes the introduction of any other forms of national identification numbers (NINs), which are sorely lacking in most of sub-Saharan Africa. Some countries have them, such as South Africa, Namibia, and Kenya, where they are broadly used by government and businesses. Where fingerprinting is used, it tends to only be available to the authorities and not lenders, which leaves the latter open to fraud. In contrast, Nigeria and Kenya have no government issued NINs, but are using both numbers and biometrics for their fledgling credit bureaux.

For the rest, the issue of identifying customers is a complicated matter of checking a variety of different pieces of information. Name and address are the most obvious, but suffer from different spellings and presentations. Thereafter one can look at things like passports, drivers licenses, employee numbers, cell phone numbers, income tax reference numbers, and so on.

Ultimately though, all of these pose problems because they are unstable; either documents are reissued with new numbers, or people’s contact and employment details change over time. Once these links are lost, the lender loses any and all recourse to that individual and the task of preventing further loans to those same people becomes next to impossible. The end result of all this is that lenders, especially banks, focus heavily on loans to people who are existing customers in stable employment. This makes credit provision especially difficult in societies where people are geographically mobile, for both lenders and borrowers.

Ultimately, the best situation is where credit data can be shared via credit bureaux, but these are either non-existent or in their infancy outside of southern Africa. Many countries recognise the potential benefits, but there is a great deal of suspicion that such powerful tools can be abused for political ends (especially those that have been ravaged by war or have suffered from significant human rights abuses), and there is a lack of sufficient political will and economic impetus to carry it through. In the English-speaking first world it was retailers who fostered the development of consumer credit not long after the start of the industrial revolution, and small credit bureaux formed to protect their interests. These are now national enterprises that allow people to take their good credit histories with them from one lender to the next, both within and across between intra-national geographies. In contrast, retailing in sub-Saharan Africa is still cash-based, and most credit is provided by banks who only wish that they could have access to an efficient bureau.

Practical Application of Results

The results of the paper are unquestionable, and to my mind there is little doubt that there is value to be had in similar environments. The question is how to apply such a tool to a much broader population at minimal cost, in environments where infrastructure is lacking. While it might be easy

to check fingerprints against a small database, what happens when the number of individuals on file is in the millions? What are the odds of a false match? How are identical twins dealt with? Can we ensure that the correct fingers are recorded? Can the fingerprints always be recognised? Are there objections to being fingerprinted? Is there a standard algorithm used for recording and searching for fingerprints?

Some of the answers were presented in another paper by the same authors. The ridges on fingerprints become less prominent over time, especially for individuals who work with their hands. Loss of limbs, arthritis, and skin pigmentation have an impact. Even so, in their experiment the number of mismatches were practically non-existent, but it still poses an issue. As such, it cannot be used in isolation and has commonly been used on a photo ID. Some people associate fingerprinting with being caught by the police, or are afraid the information can be misused, yet this does not seem to be an issue to most people wanting credit, as they understand the purpose.

I could foresee a situation where a fingerprint is represented as a character string (20 characters or less), and both the fingerprint and the string are shown on a photo ID. Any fingerprint reader could then automatically check that the fingerprint and string match, and the string is then easy to transmit and eases the search for matches on any database. Perhaps the same could even be done on faces, using facial recognition technology. Blue-sky thinking? Hmm...