



# Microcredit in South Africa



**BY DEAN KARLAN**

**B**y revealing how actual consumers respond to real-world situations, field experiments in economics can shed new light on fundamental questions in economic theory. In a unique experiment in South Africa we sent more than 57,000 loan offers via direct mail to past customers of a major consumer microfinance lender, or “The Lender”. Each letter was randomized with an interest rate and a set of marketing features, allowing us to test sensitivity to price as well as the effectiveness of marketing strategies relative to price. The experiment further allowed us to look for evidence of credit market failures generated by asymmetrical information between borrowers and lenders.

## The Market for Credit

The consumer credit market in South Africa contains a large, for-profit industry segment that extends cash loans to working poor with verifiable employment but who lack the credit history or collateral necessary to secure loans from traditional sources. These lenders offer small, high-interest, short-term credit. A typical loan is for one month at 30% interest—an extraordinarily high rate by industrialized country standards. It is estimated that 65% of consumer credit in South Africa is delivered by such lenders and retail stores, whereas only 3% of credit to these individuals is provided by non-governmental organizations (NGOs). Commercial banks and credit cards provide the remaining 32%.

Our cooperating Lender has been in business for over 20 years and is one of the largest micro-lenders in South Africa. The Lender's median loan size of 1,000 Rand (\$150) is roughly one-third of its median borrower's gross monthly income. Unlike most cash lenders operating in this segment of the South African market, the Lender's standard loans are for four months, with interest rates of 7.75% to 11.75% per month. The Lender does not place restrictions on the use of the loans.

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## Price and Maturity Elasticity of Demand for Credit

To measure the sensitivity of demand we mailed over 57,000 “pre-qualified,” two- to six-week limited-time offers to all former clients of the Lender in 86 rural branches who had borrowed from the Lender within the past 24 months, were in good standing, and did not have a loan outstanding in the 30 days prior to distribution of the direct mailing. The offers contained randomized interest rates ranging from 3.25% per month to 14.75% per month, 96% of which were lower than the Lender's standard rate. Slightly more than 1% of the offers were higher than the normal rate and 3% were at the normal interest rate. Former clients eligible for maturities longer than four months also received a randomized example of either a four-, six- or 12-month loan.

In our sample frame, 4,540 clients out of 53,810 applied for a loan at the offered interest rate, for an 8.4% take-up rate. We found that a 100-basis-point decrease in the monthly interest rate increased take-up by 3/10 of a percentage point, a rather small effect given the average take-up of 8.4%. This implies that take-up would only increase by only 31% for a price decrease from the maximum (11.75%) to the minimum (3.25%). Raising rates, however, has a much larger effect, with a price sensitivity six times as great.

We found that borrowers were much more sensitive to the maturity of the loan. Though they would ultimately pay much more interest with

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longer loans, poorer borrowers increased their loan size when given a longer maturity loan. The non-poor in the sample (defined as above-median income within our sample), on the other hand, did not increase their loan size when offered a longer maturity loan. This is indicative of liquidity constraints for the poor. On a similar note, the individuals with above-median income are more sensitive to interest rates than those below median.

## Testing Credit Market Failures

Do borrowers default more at higher interest rates because high rates create a repayment burden that makes it difficult to make their payments (moral hazard), or because only riskier clients are willing to borrow at high rates (adverse selection)? We disentangled these effects by offering some clients a surprise lower rate only after they had accepted the offer at the higher rate.

This allows us to compare the repayment rates of two individuals who have identical contracts, but one agreed to borrow at a high rate and the other at a low rate. We can attribute any difference in repayment to selection. On the other hand, we also compare two individuals who both agreed to borrow at high rates, but one randomly received the “surprise” lower rate. We know that any difference in repayment between these two individuals is not due to selection, since they both “selected” at the same interest rate. Instead, we can attribute any difference in default to the repayment burden or moral hazard.

We identified a moral hazard component of the repayment burden by giving some randomly selected clients an extra incentive to repay – offering them their lower interest rate for all loans for a year, so long as they remained in good standing. To the extent repayment increased based on this incentive we could determine that default was within clients' control and not based on unwieldy monthly payments.

We find strong evidence for moral hazard and weak evidence for adverse selection. Disaggregating these findings reveals evidence of moral hazard among male borrowers and adverse selection among female borrowers. Our results indicate that adverse selection and moral hazard explain about 20% of default in our sample.

Separating out adverse selection and moral hazard is important not just for answering an age-old question in economics. It is imperative for policy to know *why* we have credit market failures. If the problem lies with adverse selection, it suggests that policy initiatives that help screen clients and identify good and bad borrowers will help improve credit markets. On the other hand, if the problem is moral hazard it suggests that interventions that mitigate moral hazard may hold promise for encouraging lenders to deepen their outreach to the poor. Naturally, merely knowing that one problem or the other exists is not sufficient for forming a policy prescription. However, it should guide us towards the policies that are more likely to be effective. We then need to test those policies to see if they are effective in helping banks profitably lend to the poor.

## Pricing the Effect of Marketing

When designing this experiment we realized that we did not know what inspires individuals to borrow at any particular time from this Lender. Was the price of the loan the most important determinant? Or does the marketing also influence this decision? If the marketing is influential, what is its relative importance in the decision-making of the individual? Along a similar line of inquiry, we noted that the psychology literature has much to say about what may or may not work to

generate higher take-up, but much of this evidence is from psychology laboratory experiments conducted on college undergraduates without real stakes. Many economists have doubted the generalizability of these results, and in particular questioned their magnitude in the real world. So we ask, how large are these effects in the real world? By taking advantage of the randomized interest rates, we can test side-by-side the effectiveness of psychology-inspired marketing treatments relative to changes in the interest rate. For each psychology treatment, we can then answer the question: “How much would the Lender have to drop interest rates in order to generate the same increase in borrowing that was generated by a particular marketing treatment?”

The marketing manipulations included four broad categories of psychological features: the description of the offer, the comparison of the offer to competitors’ rates, subtle features (e.g., photos on the mailer), and suggestion effects (priming potential borrowers with suggestions of what they might do with a loan). None of the marketing treatments changed the economic terms of the loan offer.

One of our simplest manipulations had one of the profoundest effects. We found that mailers displaying a small table with only one example loan generated a 0.6 percentage point higher take-up than those displaying a large table with several choices. Results suggest that employing a simple description for the offer has roughly the same effect on take-up as decreasing the interest rate by 2.3 percentage points. This seems very hard to rationalize with traditional economic reasoning. Under the view that consumers have to pay some costs to analyze the value of different potential loans and are trading off the value of their time with the expected value of the loan, one would, if anything, predict a higher take-up under the richer description of the offer, as part of this possibly costly computational work has already been done for the consumer.

We know from the work of Nobel Prize-winning economist Daniel Kahneman that the difference between stating cost savings as a gain - money you will save by borrowing from us - or a loss - money you would lose if you borrow from them - can have an enormous effect on the decision-making process. This “loss aversion” effect, in which people dislike losses more than they like equal gains, has been proven time and again in labs, but we wanted to test it in the real world. We examined the impact of a gain/loss expressed in monthly Rand, monthly percent, total Rand, or the interest rate itself. We found that, overall, the addition of a rate comparison has no statistically significant effect; similarly, whether this comparison was framed as a gain or loss does not appear to affect take-up. However, for payments expressed in Rand per month, the gain frame was far less effective than the loss frame at inducing take-up. Rand per month is the calculation clients in this setting are most used to seeing, which suggests that the loss frame is quite powerful at increasing take-up, but only when expressed in terms with which most people are familiar.

We also randomized the mailers to include one of nine photos of a pleasant, smiling face that were randomly assigned to “match” or “mismatch” clients along the lines of race and gender. We found no effect of the race on the photo included in some of the mailers, and no effect of a match between the race of the photo and the client. With respect to gender, our results suggest a very powerful effect on male clients of seeing a female photo on the mailer; the increase in take-up is equivalent to the increase in demand from dropping the interest rate 4.5 percentage points.

Finally, 25% of mailers included a promotional giveaway for which the small announcement “WIN 10 CELLPHONES UP FOR GRABS EACH MONTH!” appeared.

We found that for more recent borrowers, the presence of the promotional feature, which represents a real cost for the Lender, is equivalent to increasing the interest rate by nearly 4 percentage points. This is compatible with findings from the literature that endowing an option with a feature that is intended to be positive but in fact has no value for the decision maker can reduce the tendency to choose that option.

## Market Failures and the Role of Policy

The results of our experiment clearly demonstrate that marketing, often at no cost, can have large effects, equivalent to sizeable financial incentives. As much of public policy requires some component of promotion, this is an important lesson not just for business but also government and non-profit organizations interested in providing services to the public. While several of the psychological manipulations we attempted affected demand, several did not. This suggests that psychological effects are very context-sensitive and may require further experimentation to pin down. Where they work, the magnitude of these psychological effects is large, with each statistically significant intervention equivalent to decreases in the monthly interest rate ranging from 1% to as high as 4%. While the implications of these findings are directly relevant to the marketing of consumer goods and services in the for-profit sector, we believe that many of the insights gained in this experiment are also relevant for the design of socially oriented programs.

Regarding the credit markets, we found evidence that poor borrowers are severely liquidity constrained. Evidence that the poor are credit constrained suggests that lending to marginal borrowers could be welfare-improving and provides additional motivation for testing the welfare effects of expanding access to credit. The evidence found for adverse selection, and even more so for moral hazard, provides credence to beliefs that credit market failures exist in developing countries and that interventions to mitigate these information asymmetries are necessary to expand access to credit to the poor. Much work remains to be done, however, to learn exactly what lending methods can help reach more poor people. Current microfinance programs, though widespread, still leave too many poor individuals without access to desirable credit. What financial services can satisfy their needs, while still being profitable for firms? ■

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The working papers from this project are available at the Yale University Economic Growth Center website, and are titled “Observing Unobservables: Identifying Information Asymmetries with a Consumer Credit Field Experiment” (#911), “What’s Psychology Worth? A Field Experiment in the Consumer Credit Market” (#918), and “Elasticities of Demand for Consumer Credit” (#926), and are also all available on Karlan’s website, <http://aida.econ.yale.edu/karlan/>