

Long-Run Price Elasticities of Demand for Credit: Evidence from a Countrywide Field Experiment in Mexico

Executive Summary

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I. SUMMARY

The initial promise of microcredit, including such accolades as the 2006 Nobel Peace Prize, has given way to intense debate about if and when it is an effective development tool. Interest rates are central to this debate. Policymakers and donors promoting financial development have variously encouraged microfinance institutions (MFIs) to cut rates to expand access (under the assumption of elastic demand), or to raise rates to decrease reliance on subsidies and attract more investment capital (under the assumption of inelastic demand). In light of this, the price elasticity¹ of demand for credit—the extent to which demand for credit changes in response to interest rate shifts—is of key interest to policymakers and practitioners.

Professors Dean Karlan (Yale University) and Jonathan Zinman (Dartmouth College) partnered with Compartamos Banco of Mexico and Innovations for Poverty Action to bring additional evidence to bear on this question in a new paper, “Long-Run Price Elasticities of Demand for Credit: Evidence from a Countrywide Field Experiment in Mexico.” The authors draw four main conclusions about the effects of a 10% decrease (also equivalent about to a 10 percentage point reduction) in the annual percentage rate charged on Compartamos’ group lending product.

1. Lower interest rates generates significantly more borrowing

- The price elasticity of demand for credit is elastic: outstanding loan balances and the number of loans each increase by more than 10% from the 10% reduction in the interest rate
- There is no evidence that increased borrowing from Compartamos crowds-out borrowing from other formal sources, as measured through credit bureau data

2. Lower interest rates improve outreach

- After three years of lower interest rates, cheaper loans bring in significantly more first-time borrowers
- After three years of lower interest rates, cheaper loans bring in significantly more borrowers regardless of education and income level

3. The amount of borrowing becomes more sensitive to price changes over time

- The price elasticity of demand is significantly more elastic in the third year after the price change than in the first year

¹ The price elasticity of demand is defined as the percentage change in quantity demanded divided by the percentage change in price. To say that the demand for credit is “elastic” means that the amount of credit demanded changes by a greater percentage than the percentage by which the price of credit changes when a shift in price occurs. For example, assume initial interest rates are 100% and drop to 90% (a 10% decrease), the demand for credit is elastic if the amount of credit demanded increases by more than 10% and inelastic if it increases by less than 10%.

4. Compartamos' profits, and return on equity, are not changed as a consequence of lowering interest rates.

- While the lower interest rate brings in more interest income for Compartamos, it also increases total costs (via both labor and the costs of funds). The net effect is no change in profits.
- The lower interest rates do not significantly alter delinquency
- These results suggest that Compartamos expanded impacts and outreach while keeping profits constant, thereby improving its “double bottom line.”

II. METHODS

The study uses a randomized controlled trial (RCT) to examine the impact of a reduction in the interest rate for a group microloan product on the demand for credit by existing and potential clients.

In an RCT such as this, study participants are randomly assigned to one of two groups: the treatment group, which here is offered a lower interest rate, or the control group, which here receives a higher interest rate. For this particular study, instead of assigning *individuals* to one group, the researchers randomly assigned 80 distinct *geographical regions*, composed of one or more sub-regional offices or “branches,” to one of two scenarios: a low interest rate (a 20% cut from Compartamos' standard rates), or a higher rate (a 10% cut). There were a total of 130 branches within the study, resulting in an average of 1.65 branches per region.

Random assignment ensures that the two groups are quite similar to each other on average. This allows researchers to identify the impact of the differences in rates among the treatment group members relative to a similar group of people, the control group. If any changes surface in the treatment group, but not in the control group, we can reliably conclude that the changes were caused by the differences in the interest rates. The use of both random assignment and a control group sets RCTs apart from other, less rigorous methodologies of estimating sensitivity to interest rates.

- A control group is important because it allows the researchers to control for macroeconomic environmental factors that might have affected borrowers even if they had not received a lower interest rate. For example, if an economic contraction causes a higher rate of delinquency among all borrowers, but lower rates on average decrease delinquency, a comparison of before to after would mistakenly conclude that the lower rate had no impact, when in fact it decreased delinquency. Comparing outcomes of borrowers assigned to low interest rates versus high interest rates, where both sets of borrowers experienced the same macroeconomic condition, avoids this problem.
- Random assignment to treatment and control groups is a key second step, beyond that of merely having a control group. Alternative approaches, for example comparing demand for two products with two different interest rates, raises potential problems. How else do these products differ, for example? Are they marketed differently, do they have a different client history? Randomly assigning the loan rate, but keeping all else constant, ensures that clients in the two groups are similar on average.

III. THE INTERVENTION

A. The Product: *Crédito Mujer*

The study randomized the interest rate on *Crédito Mujer*, Compartamos' group microloan product. Compartamos is the largest microlender in Mexico with 2.3 million borrowers. It was founded in 1990 as

a nonprofit organization, converted to a commercial bank in 2006, went public in 2007, and has a market capitalization of US\$2.2 billion as of November 2012.

As of 2012, 71% of Compartamos clients borrowed through *Crédito Mujer*. Loan amounts during the study period ranged from M\$900-M\$24,000 pesos (US\$75 – US\$2000),² with larger amounts subsequently available after repayment of previous loans. Loan repayments were made in 16 equal weekly installments, and were guaranteed by the group. Group sizes ranged from ten to fifty. Aside from these personal guarantees there was no collateral on the loans.

The standard interest rate is 3.9% per month, calculated “add-on:” over the original amount of the loan. Including value-added tax and required simultaneous savings, the cost of borrowing in APR terms is 110%, calculated without compounding.³ For loans of this size, these rates are in the middle of the market for both non-profit and for-profit lenders in Mexico.⁴

B. Study Design & Data Collection

The research team worked with Compartamos to identify 80 geographic regions in Mexico which could be randomly assigned to either the low or the high interest rate scenario. All branches within each region received the same scenario. The interest rates applied only to Compartamos’ core group lending product.

The motivation for randomizing at the regional level, as opposed to a more granular level like branches or credit groups, is twofold. First, it enables the study to integrate consumer learning and responses from competitors within a large geographic market, as opposed to a more limited market of the branch. Second, region-level assignment facilitates compliance with the randomization in a group lending setting by ensuring that contiguous groups or contiguous branches (which would normally draw some borrowers from overlapping geographic areas) are assigned the same rate.

The experiment engineered prices that were about 10 percentage points lower (in APR units) in “low-rate” regions than in “high-rate” regions. Starting on May 15, 2007, low-rate regions received 20 percentage point cuts relative to pre-treatment rates (which averaged about 100% APR). High-rate regions received 10 percentage point cuts. These prices were presented to borrowers as “permanent” in the sense of the “new normal”: they were not promotional rates. The bank kept these rates in place permanently in all the branches participating in the study.

The study uses administrative data from Compartamos and data from credit bureaus for up to 29 months after treatment began to measure demand under the low-rate scenario relative to the high-rate scenario.

IV. RESULTS

The results shed light on several questions relevant to the microfinance community:

² 12 pesos, denoted M\$, = US\$1

³ Borrowers must make an upfront deposit totaling 10% of their loan amount into a personal savings account, and contribute at least 10 pesos weekly for the remainder of the loan cycle. This “forced savings” component at either zero or low interest is not claimed as collateral, but rather meant to instill a “culture of regular deposits,” and generate a signal of the client’s ability to generate and manage cash flow that can be used for the lending decisions described in the next sub-section. The forced savings is not necessarily held by Compartamos, making it a cost to the borrower but not necessarily a source of capital or collateral to Compartamos. In other words, the effective APR paid by the borrower is higher than the effective APR earned by Compartamos. Mexican law does not require that the official rate reflect the forced savings and the value-added tax (16%); thus the rate advertised and publicly disseminated as per Mexican regulations is 78% APR.

⁴ See http://blogs.cgdev.org/open_book/2011/02/compartamos-in-context.php for a more detailed elaboration of market interest rates in 2011 in Mexico.

Do Lower Rates Improve “Outreach”? Yes. By the third year, the low-rate scenario regions were bringing in significantly more new borrowers and more borrowers with both high and low education each month relative to regions under the high rate scenario.

Is Borrower Demand Price Elastic? Yes. Reducing the rate both increased the number of loans taken out and the overall amount of loans taken out each month by a greater percentage than the percentage by which the rate changed. The estimated 29-month price elasticity is -1.9, which indicates a very strong sensitivity of loan demand to price changes. Moreover, as time from the interest rate change passed, demand became more elastic.

Does Delinquency Fall with Price? No. Decreasing the interest rate does not generate detectable effects on moderate delinquency (any lateness in repaying loans) or on severe delinquency (more than 90 days late in repaying loans). This is true for the whole sample of borrowers, newly-formed groups of borrowers, and groups with more than 75% new borrowers.

Are Rate Cuts Profitable and/or Financially Sustainable for Compartamos? Yes. Overall, there is no change in profits and thus on return on equity from lowering the interest rate. This result stems from an increase in interest income—driven by a greater amount of lending—and an accompanying increase in personnel costs and costs of funds (using a 10% cost of debt estimate for cost of funds). The results during the third year after the rate cut provide some suggestion that the lower rate might be profitable in the long-run, but they are too imprecise to provide strong evidence. The trend over the three years, if continued, would lead to an increase in profits, and return on equity, from lowering interest rates.

Rate Cuts in Equilibrium: Do Borrowers Change Other Borrowing Behavior? Do Competitors Respond to the Cut? No. There is no evidence from available credit bureau data that borrowers substitute Compartamos credit for other formal sources; that is, the evidence suggests that the demand response for Compartamos credit is the net response by borrowers. Nor is there evidence that competitors match Compartamos’ rate cut; if anything, data gleaned from mystery shoppers suggests that competitors respond by raising prices.

As with many studies, the conclusions of the study are limited contextually. The results accurately capture the impact of a reduction in the interest rates for this range of rates for the Crédito Mujer loan product in Mexico, but a similar reduction implemented with a different product or in a different market could produce different results. This motivates further theory and evidence on whether and how price sensitivities of demand for credit will vary across contexts.

V. CONCLUSION

The study explores the long-run (up to 29-month) effects of a 10% interest rate reduction using a field experiment implemented in 80 geographic regions in Mexico. The researchers find that demand for Compartamos loans is elastic, and the elasticity increases over time. There is no strong evidence that clients substitute Compartamos loans for other credit sources or that competitors match Compartamos’ rate cuts. In addition, the lower rates do not change profits for Compartamos.

The results suggest an absence of economies of scale at Compartamos’s existing scale. Further analysis of the cost structure for large microcredit firms could shed insight into how to absorb increase in demand without an offsetting increase in personnel costs. Technological advances—e.g., in information management, communication, and money transfer—hold promise.

The authors conclude by evaluating how these results fit with findings from a recent study on the impact of access to credit from Compartamos. That study found that access to credit is on average beneficial: clients who received access to Compartamos credit used it for a mix of business expansion and consumption smoothing (Angelucci, Karlan, and Zinman 2013). Combined, the two studies provide important insights into how Compartamos can pursue a “double bottom line” mission of maximizing

profit and the social welfare impacts of its programs. To the extent that lower interest rates increase interest revenue enough to keep profits stable with the higher costs of lending, maximizing access to credit via lower interest rates is one solution to Compartamos' "double bottom line" mission of maximizing profit and social welfare.

A natural line of further inquiry is why firms didn't already charge lower rates. One possibility worth exploring is that experimenting with lower rates is risky: a lower rate may reset customer expectations of a fair/market rate. Karlan and Zinman (2008 AER) find evidence along these lines in South Africa. If this dynamic holds, then cutting rates may reduce or eliminate the option to increase rates in the future (e.g., if it turns out that the lower rate was not as profitable as the initial rate). In this case policymakers might consider various interventions to spur learning about pricing.