

Interest Rates and Informational Issues in the Credit Market: Experimental Evidence from Brazil

CLAUDIO RIBEIRO DE LUCINDA
University of São Paulo, Brazil

and

RODRIGO LUIZ VIEIRA*
Getulio Vargas Foundation, São Paulo, Brazil

Summary. — This paper utilizes Brazilian data to investigate interest-rate sensitivity and informational issues associated with the credit demand of the middle-income class in a large emerging economy. This study's data were collected from an experiment in which credit offers with randomized interest rates were sent to recipients. The results indicate that credit constraints and informational issues are important for both the lower middle-class and higher middle-class income groups. Interest rate reductions may be more effective for higher income groups.

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1. INTRODUCTION

In both developing and developed countries, credit demand has been studied frequently by researchers who employ a variety of techniques and data types. However, the literature on credit demand and related informational issues is scant with respect to emerging markets, which feature certain characteristics that might shed new light on a number of unsettled issues. Such emerging market countries occupy an interesting type of “middle ground” between developed countries that are characterized by institutions supporting the operation of credit markets and developing countries with weak institutional support and tightly restricted access to credit.

Thus, credit markets in emerging economies present an interesting opportunity to address questions involving the strength of credit constraints at various income levels, i.e., until what level of income are credit constraints important to household consumption decisions? What role do informational issues (specifically, adverse selection) play at different income levels in the same institutional setting?

This paper attempts to address such questions by examining the credit market for middle-income groups in Brazil, a large emerging economy. The analysis utilized a database from a large Brazilian credit card issuer in connection with an experiment in which pre-approved credit offers were sent to two different consumer groups. The first, the Premium group, consisted of customers with a median income of USD 20,000 (approximately 22,000 PPP USD), whereas the second, the International group, consisted of consumers with a lower median income of USD 8000 (approximately 9100 PPP USD). In 2009, which was the year that the experiment was conducted, Brazilian GDP per capita was USD PPP 10,389.¹ A separate experiment was conducted for each group in which various interest rates were randomly offered to customers. These customers were followed for 12 months after the experiment. These data were used to identify the interest-rate sensitivity of credit demand at both the extensive and intensive margins,

in addition to informational problems such as adverse selection on observables (Ausubel, 1999).

Studies on emerging markets also provide opportunities to reconcile certain disparities in the empirical results found in the literature. For instance, studies focusing on the operation of microcredit institutions in developing countries tend to reveal an interest-rate-inelastic demand for credit.² However, studies that consider data from developed countries tend to find higher interest-rate elasticities (e.g., Alessie, Hochguertel, & Weber, 2005; Gross & Souleles, 2002). Only Alan, Dumitrescu, and Loranth (2011), who utilized data on subprime borrowers in the United Kingdom, find an interest-rate-inelastic demand for credit. There are substantial institutional differences between the countries in which the microcredit experiments were conducted and the developed countries studied by Gross and Souleles (2002) and Alessie *et al.* (2005). There are also considerable differences in income levels, and both of these differences pose difficulties for the meaningful comparison of these results and determining at which income level one should expect low interest-rate elasticity. Thus, utilizing a large emerging market in which there are substantial income differences within a single imperfect institutional setting as a sample might serve as a useful middle ground for such analysis, besides the relevance of the estimated elasticities and of the extent of the selection problems themselves, which are quite rare for such countries.

Brazil is an interesting example of this type of “middle ground” that emerging markets represent. Moreover, its level of credit development is comparable to such levels in other emerging market countries, with domestic credit as a percentage of GDP at 56.6 in 2011,³ which is higher than comparable figures for Russia and India. Brazil also exhibits a much larger interest rate spread between the interest rates for interbank loans and for personal credit—in March 2012, the interest rate

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for interbank loans was 9.65% per month and 185% per annum for account overdrafts. The government took note of these high interest rates and unilaterally pushed for decreases in credit interest rates for government-owned commercial banks.

Despite recent initiatives, these values indicate a high intertemporal discount rate and a large number of credit-constrained households⁴—although not as many as in lower-income countries. The degree of institutional development is also important to these characteristics; in Brazil, making the repayment histories of borrowers public was illegal before August 8, 2013. Before this time, only information on customers' default histories could be made publicly available. This type of restriction increases the degree of information asymmetry in this market, which affects both interest rates and the strength of household credit constraints. Measures of the strength of the adverse selection problem in Brazil are also important to assess the likely effects of this measure.

Various economic fields confirm that the interest-rate elasticity of credit demand has implications for the intertemporal rate of income substitution, the competition (or lack thereof) in financial markets and even for the relevance of policies designed to increase access to credit.

The effects of the interest-rate elasticity of demand on competition in credit markets concern the perceived market power of credit suppliers and the perceived competition faced by these companies (as in Ausubel, 1991). In development economics, the interest-rate sensitivity of credit demand underpins the discussion on the necessity of subsidies for microcredit lenders to increase access to credit or whether such lenders are able to finance themselves through increased interest rates (Armendariz & Morduch 2010).

In a widely cited paper, Ausubel (1999) argues that credit card interest rates are stable and that the most important American issuers consistently earned three to five times the usual rate of return of commercial banks from 1983 to 1988. Although these returns are not uncommon in imperfectly competitive markets, the author lists various characteristics that make the American credit card market one of the most competitive in the world. According to Ausubel, then, there must be a reason beyond the lack of competition to explain these returns.

In addition to other possible causes, Ausubel contends that adverse selection plays a role: because credit cards are an expensive form of credit, it should be expected that most customers do not intend to finance their expenditures with credit cards (although this is occasionally the case). Ausubel further exploits the issue of asymmetric information in another paper from 1999, which studies the responses of pre-approved offers to credit card customers. The main hypothesis of this article was the so-called Adverse Selection on Observables, which implied that customers who accepted the offer were worse credit risks than those who did not; furthermore, those accepting offers with less favorable terms (higher interest rates, for instance) are even worse credit risks than those accepting better terms. In the same paper, Ausubel also investigates what he termed Adverse Selection on Unobservables, whereby customers who accepted worse offers were more likely to default⁵ after controlling for available information.

Since this study, the literature on personal credit has grown substantially because of the availability of additional data and new experimental techniques. The most common approaches analyzed databases from microcredit lenders in developing countries. A Google Scholar search query on "Microcredit interest elasticity experiment" returns 1950

hits on the subject, including Dehejia, Montgomery, and Morduch (2005), Salazar *et al.* (2010), Karlan and Zinman (2008, 2009), Annim (2011) and Gine and Karlan (2009). All these papers estimate the interest-rate sensitivity of demand; most indicate that such interest-rate sensitivity is inelastic, but this finding depends on which margin—intensive or extensive—is studied.

Moreover, papers as Gross and Souleles (2002) and Alessie *et al.* (2005) also using microdata, analyze the interest-rate sensitivity of credit demand in developed countries and find that it is elastic. Using a database on subprime borrowers in the United Kingdom, the experimental results presented by Alan *et al.* (2011) do not support an interest-rate-elastic demand for credit.

More specifically concerning interest-rate elasticity, Salazar, Turvey, Bogan, and Cubero (2010) find an interest-rate loan elasticity of -0.97 among their experimental subjects, but they report that elasticity decreases as income rises; higher income groups (for a microcredit institution) are interest inelastic. Dehejia *et al.* (2005) report an elasticity of -0.73 when they include controls for preference heterogeneity and also find that wealthier customers are less interest-rate sensitive. Karlan and Zinman (2005) obtain the lowest elasticities among the literature reviewed here: -0.28 for the take-up of the loan and -0.13 for loan size.

Because the lower income group considered in the present study has a higher median income than the highest income groups in studies discussed above, a possible explanation for these non-identified coefficients is that credit demand is not interest-rate sensitive, which would support these results.⁶ Regarding the Premium group, more relevant results are reported in Alessie *et al.* (2005) that presents interest-rate elasticities between -1.5 and -1.9 and Gross and Souleles' (2002) findings of somewhat lower elasticities between -0.8 and -1.3 .

The papers discussed above also examine other issues in addition to the interest-rate sensitivity of credit demand. Prior studies using microdata, such as Ausubel (1999), focused on informational issues, such as moral hazard and adverse selection. The more recent literature regarding microcredit, such as Karlan and Zinman (2008, 2009), has maintained that focus on informational issues, whereas the more recent research on developed countries has investigated questions regarding liquidity constraints.

In light of the literature discussed above, the present paper focuses on credit demand in a large developing country and investigates two sets of hypotheses. The first set seeks to fill a gap in the literature by attempting to quantify the interest-rate sensitivity of the demand for credit among the middle-income population with respect to both the extensive and intensive margins. The second set concerns the importance of adverse selection discussed above. The adverse selection on observables considered by Ausubel (1999) will be the subject of a separate analysis.⁷ This paper consists of four sections, with this introductory section as the first. The second section describes the experiment, and the third focuses on the data analyses and hypotheses testing. The final section concludes. Before presenting the analyses, the experiment and the credit line characteristics are described in the following section.

2. THE EXPERIMENT

The experiment was conducted by one of the largest credit card issuers in Brazil and consisted of offering an additional

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