1 Introduction

This thesis is dedicated to microcredit mechanisms. It focuses, on one hand, on the credit officer's role - namely in client selection and audit - in order to deal with asymmetric information problems and, on the other hand, on a possible gender-specific treatment in loan attribution turned plausible by credit officers' relative autonomy.

In recent years, Brazil has brought its inflation under control and then experienced a strong economic growth. At the same time, poverty and inequalities are decreasing (de Barros et al. (2007); Ravallion (2010)). Nevertheless, Brazil remains one of the world's champions in terms of inequalities (Soares (2008)). Microfinance in Brazil is not as widespread as in its neighboring countries, but emerges as a potentially powerful tool to fight against poverty and inequalities, especially in the current healthy economic Brazilian context.

Microfinance pools heterogeneous actors who offer a set of financial services to humble people with little or no access to the traditional financial system. Services provided include credit and saving with microcredit and cooperatives, insurance and other complementary services such as accounting training amongst others. Microfinance became a relevant tool-set to fight against poverty (Neri (2008); Karlan (2010)) by enabling poor people to seize economic opportunities. Microcredit focuses on *productive* loan provision for people excluded from the traditional banking system in order to create or to develop their own business.

By nature, lending money is a bet on the borrower's capacity and willingness to repay the loan in the future. As mentioned in the theoretical literature, information asymmetry is a general problem faced by lenders. Stiglitz & Weiss (1981) distinguish three main problems generated by information asymmetry faced by the lender about the borrower. First, the adverse selection (the lender does not know if the borrower is able to handle the project), second, the moral hazard (the lender does not know if the borrower will actually handle the project for which he took the loan) and third, even if the project is successful, the lender faces a problem of enforcement if the client is not willing to repay. Stiglitz and Weiss explain why a rise in interest rate is not a solution to compensate losses due to information asymmetry. Modalities to mitigate these problems are well documented in theoretical frameworks and used in classical banking. We can mention for example, screening (Stiglitz & Weiss (1981)) and collateral requirement (Bester & Hellwig (1987)).

Poverty alleviation target, claimed by microfinance institutions (MFI), does not exclude the sustainability concern. Being a non or for profit, MFI's face a central problem of risk management. Information asymmetry issue, already experienced by usual lenders, is strengthened by the lack of collateral. Thus, alternative mechanisms to physical guarantees has to be experimented. For example, group lending (Stiglitz (1990); Banerjee et al. (1994); Besley & Coate (1995)), has been made famous by the case of Grameen bank and the Peace Nobel Prize received by its founder - Muhammad Yunus - in 2006. Rural, and some urban institutions, including, for example, the MFI *São Paulo Confia*, choose to follow this methodology.

Group lending requires a relatively homogeneity in loan size, repayment schedule, and project type. Subsequently, it is poorly suited to urban areas in Latin America, where individual loans are significantly more frequent (Micro-Credit Summit Campaign 2007). Microcredit services provision also includes individual loans and call up a set of incentive mechanisms beyond group liability: direct monitoring, regular repayment schedules, non-refinancing threats (de Aghion & Morduch (2000)), and dynamic incentives (Morduch (1999); de Aghion & Morduch (2000)).

Vivacred is a Brazilian Microcredit NGO settled in the Rio de Janeiro slums (favelas) and poor neighborhoods since 1997. In this context, collateral issue is more a question of legality than of shortage (Soto (2003)). Even if the house of a favela resident is registered by the resident's association, it is not considered valuable collateral under the law. Moreover, durables potentially owned by the clients are difficult to seize and thus are not considered as a potential collateral in the case under study. Vivacred has been providing individual productive loan coupled with a guarantor involvement, most of the time. This choice make the institution more like a traditional bank than a Grameen-like MFI. However, it distinguishes itself clearly in terms of the approach. On one hand, there is a careful analysis of the applicant's project and the household well-being potential. On, the other hand, branches are located inside favelas in proximity to the population.

The credit officer, largely neglected in the literature, is an important player to collect valuable information on the client, track the projects funded, and audit the business in case of repayment problem. The months I spent in the favelas with the credit officers, allowed me to understand in details their practice as well as the database used in this thesis. Actually, a favela is a city within the city with its own organization and community "public" services. Credit officers' expertise, appears as a potentially relevant tool to lead with asymmetric information. The effectiveness of their supervision can also stem from their personal knowledge about the living environment of their clients.

On another side, since officers are called to play a crucial role in granting and monitoring loans, subjectivity can sometimes be harmful, in this instance, through prejudices. The existence of discriminatory practices in mortgage and small businesses lending is a well documented phenomenon in the United States where data, necessary to implement the econometric tests, are available (Blanchard et al. (2008); Blanchflower et al. (2003); Blau & Kahn (2000); Cavalluzzo & Cavalluzzo (1998); Cavalluzzo & Wolken (2005)).

In microfinance, a discrimination contingency may seem more surprising as it claims to contribute to women empowerment. However, the credit officer's relative autonomy coupled with social representations, lend plausibility to this hypothesis (Aubert et al. (2009); Amin et al. (2003); Storey (2004); Blanchard et al. (2008)). Labie et al. (2010) point clearly credit officers' discrimination towards disable people in Uganda.

There are two simultaneous and different objectives of microfinance institutions that are often confused. They are the fight against poverty and women empowerment. This confusion is potentially harmful (Guérin et al. (2009)). If microfinance does provide female entrepreneurs an access to loans, they are generally smaller than those given to men. In addition, women are shown to be poorer than men (Medeiros & Costa (2008)). Single women withstand houhold needs alone, meanwhile married have less access to household resources. Thus an over-simplistic link is made between these two facts justifying differences in loan size among gender by relative female poverty. Meanwhile, women show better profiles of repayment. Thus, the female poverty argument can hide other reasons for gender-gap in loan size such as discriminatory practices. Vivacred distinguishes itself from the mainstream by not being women-focused, and thus provides a perfect case (balanced sample) for testing the existence of gender-specific attendance.

All the empirical results presented in this thesis are built on a unique database which includes 34,000 loan applications from Vivacred, complied over an eleven-year period from 1997 to 2007. In addition to the existing information collected by the credit officers, I have completed the database with precious information about credit officers profile and career evolution using paper files kindly provided by administrative staff.

This thesis is composed by the following parts. Chapter 2 presents how the microcredit sector emerged and developed in Brazil. It depicts the specific case of Vivacred through its history and methodology.

Chapter 3 studies the role played by the credit officer in loan performance. A structural model of loan provision considers explicitly the potential credit officer's ability at the selection stage and audit stage if necessary (state verification). The estimation of the model shows a substantial heterogeneity among credit officers in loan performance. Moreover, their ability matters much more at the selection stage than at the audit stage. Even if the probability of detecting misreporting varies between 66% and 82%, this does not seem to make any difference for the probability of misreporting. The probability of success is more widespread among credit officers, as it ranges from 59% to 99.8%.

Furthermore, results suggest that officer's ability is correlated with internal experience but not with the previous one. Neither the professional experience length (years), nor the age at which the officer was hired, or the education dummy (superior grade), are relevant for the estimated ability. The number of months worked for the institution and the number of contracts attended are positively related to the estimated ability. According to the model, the ability estimates, on one hand, the subjective part of selection efficiency and, on the other hand, misreporting detection capacity. Thus, a learning-by-doing process is probably at stake and uncover the pertinence of an adapted human resources policy.

The importance of credit officers in loan performance reveals a real autonomy from the institution's rules and methodology. Their ability is mainly relevant at the selection phase, and one wonders whether this autonomy is always used in an efficient and fair way among clients. The next three chapters are parts of a same set studying the difference of treatment between male and female clients and its potential origins.

Chapter 4 empirically examines the loan allocation process taking place in Vivacred and documents that women benefit from a fair access to credit, but suffer from loan downsizing comparing to their male counterparts. Partial Least Squares (PLS) regression is used in order to measure each protagonist's responsibility in gender-specific treatment in loan size, distinguishing between institution's decisions and applicant's request. All industries and socio-economic variables are included in the controls. We detect no gender-specific practice in the approval rate, but uncover a gender-sensitive loan size determination. Gender-gap in loan size is attributable to prejudiced credit officers (27.3%) and credit committee (7.4%), but also, and principally, to the women themselves (65.3%) as, all things equal, they request significantly smaller loans than men.

Chapter 5 studies the nature of this gender-specific treatment in loan size that is not due to a difference of requirement. After summarizing the state-of-the-art on assessing discrimination in lending, with a special focus on gender, we compare repayment behaviors between genders in terms of delay, default, and loss. Controlling for all screening variables used by the MFI, repayment is better for female than male borrowers in these three dimensions while the female receive worse credit conditions (loan size) than the male. We cannot exclude that face-to-face interviews bring additional gender-related information absent from our database. Nevertheless, gender-specific treatment does not seem economically justified.

In order to strengthen our results, we show that the gender-gap in loan size is not tampered by relationship. While women continue to repay their loans better than men, they continue to receive less than men, even when all other variables remain equal (including requested amount). Information asymmetry reduction brings no remedy to the handicap of being a woman. This conclusion is reinforced by taking into account the gender of other people committed to the loan (spouse and/or external guarantor) - say guarantors. A male guarantor generates extra credit from the lender, while a female guarantor has no significant impact. Given those results, we tend to attribute the observed gender-gap to cultural habits. Businesswomen lack credibility.

Chapter 6 examines non linearities of gender-gap in loan size. A Beckerian model shows that taste-based gender discrimination may lead to three types of lender's behavior depending on discrimination intensity: 1) denial of all female applications, 2) unfair downsizing of the highest female requests only, or 3) no impact. The inclusion of a quadratic term for the requested amount in the loan size regression reveals that women suffer from loan downsizing, especially when they apply for financing larger projects. Empirical evidence confirms the theoretical prediction (case 2), that the most ambitious women face the highest penalty. The presence of a glass ceiling (harder credit rationing for larger loan size) faced by the most ambitious female entrepreneurs is highlighted.

At first glance, credit officers' gender seems irrelevant for gender-gap in loan attribution. Male credit officers tend to offer larger loans, but female applicants are treated in an equally unfair way by male and female officers. This finding do not support the "gender affinity" hypothesis in the spirit of the "cultural affinity" theory tested for in mortgage lending (Hunter & Walker (1996); Bostic (2003)). However, female credit officers tend to reduce the female downsizing comparing to male credit officer, in the case of small projects. Considering larger loans, female officers penalize more female borrowers than their male counterparts. This result is in accordance with Borghans et al. (2009) survey on financial psychology, where it is stated that woman are more risk adverse both in their personal and professional life which includes business activities and decision making by a bank manager.