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Mathilde Bauwin

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THÈSE DE DOCTORAT

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Préparée à l'Université Paris-Dauphine

Microfinance and Gender Issues: Reducing or Reproducing Inequalities ? Achievements and Challenges in the Tunisian Case

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GENERAL INTRODUCTION

I. THE MICROFINANCE MODEL TODAY: SAME OBJECTIVES, NEW STAKES

In 2006, the Nobel Peace Prize was awarded to Muhammad Yunus, the founder of the Grameen Bank in Bangladesh: this event reminded the huge hopes and expectations aroused by microfinance, which had been considered for a long time as a cure for poverty. It also consecrated the Grameen Bank as the embodiment of the microfinance model, based on ambitious objectives on the one hand, and on specific means to fulfil them on the other hand. The core idea is that access to credit, or financial inclusion in more recent versions of the model, “would support entrepreneurship and economic development, empower women, and alleviate poverty by generating higher incomes and employment” (Ledgerwood, Earne, Nelson, & World Bank, 2013, p. 6). Such a project has to be carried out by specific organizations that are commonly called microfinance institutions (hereinafter MFIs): the emblematic MFI has a non-governmental organization status and targets vulnerable people excluded from the traditional banking system because of their lack of resources and collateral. Because women have been particularly poor, vulnerable and excluded from financial services on the one hand (Narayan-Parker, 2002), but tend to show better repayment rates than men on the other hand, they have become the exclusive targets of the pioneering MFIs such as the Grameen Bank, as well as Pro Mujer and BancoSol in Bolivia. Whether the original justifications were social or financial, middle-age women running income generating activities have quickly embodied the typical targets of MFIs. In accordance with the original main principle of microfinance, such vulnerable clients are supposed to be granted microcredits without any individual guarantee being required; to make it work, MFIs rely on group lending instead: a credit is granted to a group of borrowers, whose members are responsible for making the other members repay.

Indeed, as any credit organization, microfinance institutions face information asymmetries which can take the form of adverse selection (hidden information ex-ante leads MFIs to select riskier borrowers) or moral hazard (hidden action by the borrower ex-post results in default), as theoretically developed by Stiglitz & Weiss (1981). Even though such information asymmetries may be hard to identify and disentangle in practice (Karlan & Zinman, 2009), they may lead to inefficiency, and solutions to circumvent the problem must be found. Whereas traditional banks use individual collateral as an incentive for borrowers to repay to avoid moral hazard, the typical model of microfinance uses the threat of social sanctions (Bond & Rai, 2002) and group pressure: in lending groups, joint-liability may be a way to reduce adverse selection and moral hazard issues (Ghatak, 1999), since social capital and social norms play the role of traditional loan officers, and

hence reduce screening, monitoring and enforcement costs for lenders (Karlan, 2007). However, these costs remain substantial because of low loan amounts, which leads MFIs to charge higher interest rates than traditional banks; an additional difference is that these rates are fixed by by-product, and do not differ according to individual clients, contrary to the traditional banking system.

Nonetheless, today, the Grameen Bank does not represent the typical microfinance institution any longer, as microfinance has become much more complex and diverse: first, MFIs have started to move from group lending to individual lending, possibly because of the too time-consuming weekly repayment meetings and too strong social pressure involved by joint-liability (Attanasio, Augsburg, De Haas, Fitzsimons, & Harmgart, 2015). Thus, even the emblematic MFIs started to grant individual credits, such as ASA in Bangladesh, BancoSol in Bolivia, or even Grameen Bank II which has been created in this respect. As a consequence, collateral has come back as a main incentive to repay.

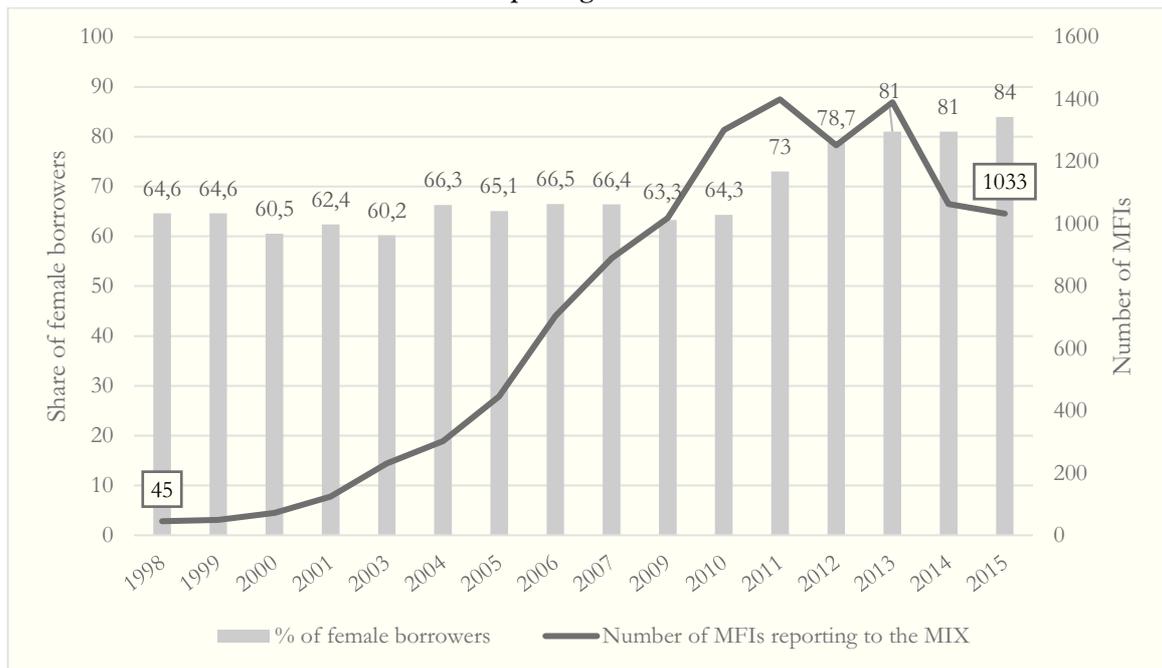
Additionally, if women represent 84% of MFIs' clients in 2015, this average number hides huge disparities worldwide: women are almost the exclusive target of MFIs in South Asia (92%), and East Asia and the Pacific (94%), but it is not the case everywhere, as the share is of 66% in Africa as well as in Latin America and the Caribbean, 60% in Middle East and North Africa (MENA), and 46% in Eastern Europe and Central Asia (Khamar, 2017). These numbers show that the high global average is pulled up by South and East Asia, which represents a substantial share of the market; however, the microfinance model in South Asia seems specific to the region, and is not representative of microfinance in the world. Elsewhere, women remain a priority target (except in Eastern Europe and Central Asia) but obviously not the exclusive one.

Furthermore, if the share of female borrowers has been constantly increasing since MFIs report to the MIX Market¹, so has the number of MFIs reporting to the MIX (figure 1); as a consequence, it remains difficult to know whether the evolution in reported numbers corresponds to an actual evolution in the field or is due to the annual changes in the sample of reporting MFIs. Additionally, the first MIX report dates back to 1998²; before this date, the global average share of female borrowers remains unknown.

¹ The MIX Market is a non-profit organization based in the United States collecting information from MFIs worldwide to provide key insight on the financial inclusion sector. MFIs are free to decide to report to the MIX Market. However, MIX is one of the main information sources for professionals, policy makers, and investors in the microfinance sector, and MFIs do have a real interest to report their information to MIX

² The Microcredit Summit Campaign also publishes outreach reports, but the oldest one dates back to 2000.

Figure 1. Evolution of the share of female borrowers and number of MFIs reporting to the MIX Market since 1998

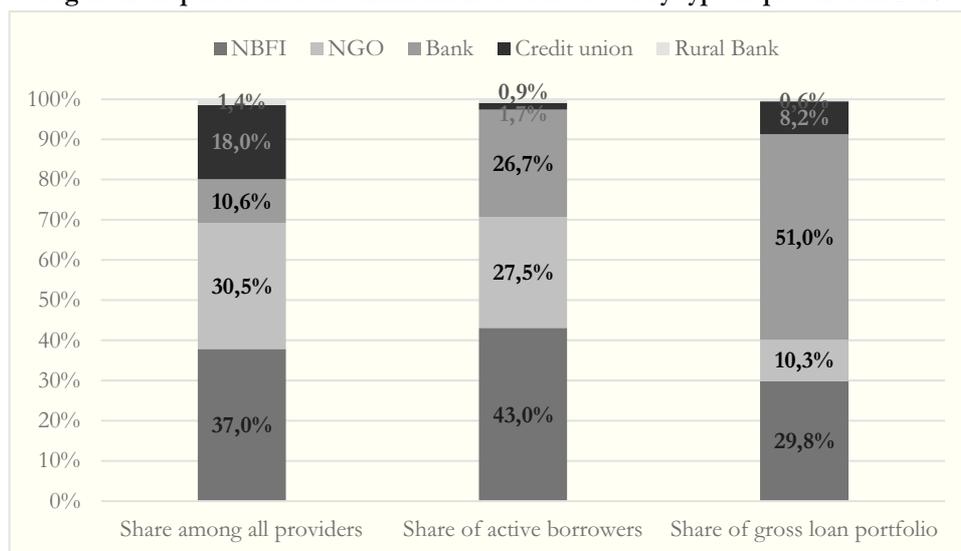


Note: all data come from annual reports by the MIX Market, the first one available dating back to 1998. The data from 2002 and 2008 are missing (only median values were reported in annual benchmarks).

With regard to legal status, the NGO status is far from being the only one among the organizations providing financial inclusion services. The MIX Market distinguishes between five different statuses: non-bank financial institutions (NBFIs) are the more numerous, since they represent 37% of financial service providers in 2014 (figure 2); they are private but licensed under a different category from banks and usually submitted to another legislation; NGOs come in second position (30,5%), followed by credit unions or cooperatives (18%), banks (10,6%) and rural banks³ (1,4%). However, banks come in third position in terms of number of active borrowers, and even in first position in terms of gross portfolio. This reflects the different targeting policies of the various types of providers, with NGOs probably targeting poorer clients and banks less vulnerable clients able to repay higher amounts.

³ Rural banks are banking institutions that target clients who live and work in non-urban areas and who are generally involved in agricultural-related activities.

Figure 2. Repartition of the financial inclusion sector by type of provider in 2014



Source: author's calculations using data from the 2014 MIX Market report by Khamar (2016).

Finally, since NGOs represent a decreasing part of financial service providers, also because some of them turned into private companies after a few years, the funding system of MFIs has also changed: whereas NGOs were mainly funded with government subsidies, non-bank financial institutions rather follow a commercial approach and work under the financial system principles, so do banks. Such commercialization led to the booming of interest rates within some MFIs, which has been particularly illustrated by the Compartamos Banco scandal, a Mexican MFI charging its clients with 100% interest rates while generating returns on equity of 53%⁴. The financial pressure endured by MFIs also pushed some of them to apply aggressive credit selling and/or recovery policies, sometimes resulting in over-indebtedness crises such as the highly publicized one which broke out in 2010 in Andhra Pradesh and ended up in a wave of suicides. These salient cases gave insight into the possible bad consequences of commercialization, which led observers and scholars to wonder about the possible “mission drift” of microfinance for the 2000s (Christen, 2001; Dichter, Harper, & Practical Action (Organization), 2007; Mersland & Strøm, 2010; Rhyne, 1998). They also highlighted the need for more rigorous impact analyses, in order to go beyond the ideological debate (Mersland & Strøm, 2010).

As a consequence, the last two decades were marked by an increasing number of impact studies: a recent review of peer journal articles on microfinance impacts, sustainability and outreach counted more than 300 articles on this topic between 1997 and 2011, half of which being strictly identified as “impact studies” (M. Rahman, Luo, Hafeez, & Sun, 2015). The review concludes that

⁴ In 2014, average return on equity of the MFIs reporting to the MIX Market was 14,1% (Khamar, 2017).

results of these impact studies are still mixed: some works find positive effects of microfinance (Dunford, 2001; Morduch, 1999; Nawaz, 2010) whereas others find no impact or negative ones (Kondo, Orbeta, Dingcong, & Infantado, 2009; Simanowitz, 2000; Weiss & Montgomery, 2005). These mixed results contributed to the disillusionment with regard to microfinance, leading sometimes to clear skepticism as voiced by Bateman with his book entitled *Why doesn't microfinance work?* (Bateman, 2010).

Therefore, the media coverage of these impact studies has rather given a negative slant to their results, implying that microfinance fails to fulfil its initial objectives. Even though some researchers complained about the oversimplifications and inaccurate negative interpretations of their works that can be found in the press (O'Dell, 2010), the diversity of results does tend to show that the potential positive effects of microfinance are not automatic. This may be due at least partly to the fact that microfinance is a collection of different tools, implemented by diverse types of organizations, in a multiplicity of different contexts where various rules and regulations are enforced.

For this reason, the question “does microfinance work?” does not make much sense and should rather be reformulated this way: “what are the conditions under which microfinance better works?” If one rather wants to understand the absence of positive outcomes or even the existence of negatives ones, an alternative perspective could be: “what hinders microfinance from fulfilling its objectives?” This research work takes this perspective, by focusing on one specific objective of microfinance, which is the reduction of gender inequalities.

II. MICROFINANCE IN THE “GENDER AND DEVELOPMENT” APPROACH

One of the main aims of microfinance is indeed to contribute to women's empowerment. However, the first issue arising is that there is no clear and consensual conception of the notion of “empowerment”. According to the World Bank's book *Empowerment and Poverty Reduction: a Sourcebook*, the poor lack power, and a way to fight against poverty would be to give them back some power (Narayan-Parker, 2002). Hence, “empowerment is the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives” (Narayan-Parker, 2002, p. vi). If there is no real debate about the objectives, there is no clear-cut view of how to fulfil them (Guérin, Palier, & Prévost, 2009). In particular, a well-known typology developed by Csaszar (2005) distinguishes between four categories making up empowerment: “power with”, “power to”, “power within”, and “power

over”. The fourth category reflects a conflictual dimension of empowerment, since it implies to include some people in decisional processes from which they were previously excluded. In other words, if the social and economic dimensions of empowerment are usually not discussed, the political one implies a change in power relationships, which may be more conflictual and hence less consensual. Since all dimensions of empowerment are linked, achieving empowerment may finally create more conflicts (Woolcock, 2005).

With regard to women’s empowerment, the same issues apply but require referring first to the notion of “gender”. Ann Oakley is often considered as the one who introduced this notion into social sciences; in her book *Sex, Gender and Society* (Oakley, 1972), she states that sex roles and identities are linked to social stereotypes and family models, and are therefore for a major part produced by culture. To that extent, gender is different from sex, sex being considered as biological and gender as social, cultural and psychological. Social stereotypes relative to gender are descriptive and prescriptive, meaning that they refer to how men and women are but also to how they are expected to be (Heilman, Wallen, Fuchs, & Tamkins, 2004) or what they are expected to “do” (West & Zimmerman, 1987). These gender stereotypes would be assimilated by women as well, transmitted from a generation to another and would contribute to maintain and reproduce inequalities between men and women, such as sexual division of labor or sex segregation in employment, as also found by some economists (Becker, 1993; Farré & Vella, 2013; Fernández, Fogli, & Olivetti, 2004).

The consideration of these gender issues are at the core of the “Gender and Development” approach developed by Moser (1993), which has inspired the agenda of international institutions about gender issues over the last two decades. Indeed, a “Gender Empowerment Measure” was introduced in the United Nations Development Program (UNDP) in 1995; in 1994, the World Bank published a policy paper on Gender and Development, focusing on the institutional constraints maintaining disparities between genders; it then adopted in 2007 a Gender Action Plan for three years, followed by the “Three Year Road Map for Gender Mainstreaming” for 2010-2013, and finally published a report entitled “World Development Report 2012: Gender Equality and Development” in 2012. Finally, the promotion of gender equality and women’s empowerment was set as the third Millennium Development Goal in 2000, and as the fifth Sustainable Development Goal in 2015. All these initiatives illustrate the growing interest of international institutions into the role of women in economic development and fight against poverty: the idea is that more investment in women and gender equality would result in higher returns of investment in development. However, to be fully able to play this role, women have to be empowered. For this reason, the promotion of gender equality and women’s empowerment became a priority objective.

Microfinance is one of the development tools expected to contribute to women's empowerment: by giving more economic power to women, the latter should also gain in autonomy, responsibility and decision power, and possibly make their whole households and especially their children benefit from these gains. Thus, women's economic empowerment is one of the main objectives of microfinance also because it is supposed to be a main channel of development. Nonetheless, just as for the other objectives such as poverty reduction, the impact studies about microfinance show that the effects on women are mixed. Gu erin (2009) even quotes several studies ending up in negative results: after benefiting from microcredits, women's specialization in low-productivity sectors may be strengthened (Fernando, 2004); the additional activity may result in heavier responsibilities, workload and more fatigue for women (Ackerly, 1995); domestic violence and patriarchal domination by loan officers may be worsened (A. Rahman, 1999); women's enterprises may be misappropriated once they become profitable (Grasmuck & Espinal, 2000); inequalities between women may be worsened as well (Gu erin & Palier, 2005; Mayoux, 2001).

Because of these mixed results on women's empowerment, attention has also been paid in the literature to the mechanisms hampering the emergence of more positive effects: for instance, basing on the Indian case, Gu erin (2009) mentions the fact that financial products are not always adapted to the local demand, that the structural organization of markets is not favorable to small entrepreneurs, and that consequently financial services should be completed with non-financial services to strengthen clients' entrepreneurial capacities and provide them with the necessary resources. With regard to women's specific issues, Kabeer (1997) reminds that if microfinance may lead to more financial autonomy for women and therefore may give them more leeway, it does so within a social framework which does evolve very slowly. This social framework consists of social and gender norms regulating men's and women's actions and behaviors in a specific society, on which microfinance can have little impact only. This would account for the little impact of microfinance on women's empowerment and the possible negative externalities. In the same way, Mayoux (2000) claims that microfinance mainly focuses on the economic dimension of empowerment, as if it was supposed to drag the other aspects along with it, whereas neglecting the political dimension leads to forgetting that giving more economic power to women may shake other power relationships and result in conflicts, backlash and resistance. In other words, microfinance would miss the structural causes of gender inequalities, and consequently fails to fulfil its objectives.

III. RESEARCH QUESTIONS AND FIELD OF APPLICATION

This research work is in keeping with this part of literature: instead of critically analyzing microfinance impacts, it focuses on the mechanisms supposed to foster or possibly preventing MFIs from fulfilling their objectives in terms of women's economic empowerment. Whereas the examples of mechanisms previously mentioned rather concern the external context in which microfinance is implemented, this work focuses on MFIs' procedures and their possible contribution to the reduction of gender inequalities. More precisely, it analyses to what extent the way MFIs treat women in the microcredit allocation process helps reducing existing inequalities between male and female applicants and clients. To do so, while these pre-existing inequalities have to be examined, loan officers are at the core of the analysis.

Indeed, as already stated, the microfinance model today does not make women the exclusive target of MFIs: men represent an increasing share of MFIs' clients. Many poor men are also excluded from the traditional financial system, and it seems relevant to include them in microfinance programs as well. However, as acknowledged by the Gender and Development approach, women still face specific issues, especially in developing countries where they do not always have the same rights as men; consequently, the way MFIs deal with this complex reality deserves attention. Including men could result in positive externalities, by fostering exchanges between male and female clients within MFIs and thus contributing to make gender relationships and representations evolve; but if MFIs do not take into account the specific problematics faced by women, they could also miss their initial target.

Therefore, the first point of interest in this research work is the identification of the initial differences between male and female applicants and clients. This includes their socio-demographic profiles and economic resources as well as project characteristics when they request their first loans, whether they get them or not. These differences may represent existing inequalities between men and women in the society under study, as well as the targeting policies of MFIs, to the extent that MFIs may choose to target different profiles of potential male and female clients. This also includes the differences in terms of project evolutions, which can be revealed by the evolution of specific operational and financial indicators observed from a credit cycle to another, such as the value of assets, monthly benefit, number of employees, etc. Finally, a last determining difference to take into account, if existing, concerns clients' behavior towards MFIs, in terms of repayment, default and renewal. Indeed, if male and female clients do not behave the same way as clients, MFIs may treat them differently in return.

All these differences taken into account, the second point of interest is the way male and female clients are treated in the microcredit allocation process. This means focusing on the selection process when applicants request their first loans, which is supposed to give insight into how MFIs deal with the issue of access to credit. Indeed, one of the main aims of MFIs is to facilitate access to credit to those who are excluded from the traditional banking system. Since women are supposed to be particularly excluded from banks because of their lack of resources, MFIs are supposed to especially foster women's access to credit. One of the objectives of this research work is to analyze to what extent MFIs facilitate women's access to credit, and the possible differences of treatment between male and female applicants in the selection process.

However, access to credit is only a first step. It is also necessary to examine the loan conditions granted to male and female clients once their requests were accepted. A specificity of microfinance is that interest rates are fixed by by-product, which means that at equal by-product, MFIs cannot grant credits with different rates. For this reason, the conditions examined in this research work are loan amounts only. A third objective of this research work is therefore to examine the amounts granted to male and female clients, to check if at equal characteristics, male and female clients are treated at least equally. Indeed, equality of treatment between men and women appears as the minimum expected result from MFIs targeting both male and female clients. Because the asymmetry of information between loan officers and clients is not of the same nature and magnitude when applicants request their first loans and when they renew them, it seems necessary to distinguish between the amounts granted for first loans and those granted for renewals. Indeed, in the second case, loan officers know their clients better than in the first one, and project evolution has to be taken into account.

Finally, a last point of interest is gender representations; indeed, since other above-mentioned studies have already pointed out that representations of men's and women's roles in society could limit the positive effects of microfinance on women's empowerment, one of the hypotheses in this work is that representations of male and female clients are also likely to influence loan officers' behaviors. In particular, the idea that female clients face specific difficulties may have negative effects by confining them in such an image instead of fostering their empowerment. The objective is to examine to what extent MFIs and especially loan officers' work may be affected by gender representations, and how MFIs may deal with this issue. An attempt to make loan officers' gender representations evolve and to raise awareness on gender issues is analyzed in terms of impact on their work.

Obviously, these research questions are relevant only for a specific model of microfinance, all the more so as microfinance is today highly diverse in terms of providers, clients, products, funding models, etc. Therefore, these research questions particularly apply to MFIs which target both men and women; however, analyzing to what extent MFIs contribute to reduce gender inequalities and how gender representations may hamper the fulfillment of this objective requires focusing on MFIs which claim a policy in favor of women. Indeed, today some MFIs look more like traditional banks than organizations with specific development goals, and such MFIs do not necessarily aim at reducing gender inequalities in terms of access to financial services, possibly because such gender inequalities are not especially salient where they operate.

Moreover, microfinance has been particularly studied in some regions and countries, such as India, Bangladesh, Bolivia, Morocco, and so forth, and it seems more useful to focus on a new context, all the more so as the context is determining in the way MFIs work, whether in terms of law and regulation or of social, cultural and economic aspects. Consequently, this research work focuses on the MENA region: apart from Morocco, few countries have been subjected to studies on microfinance so far, probably because microfinance has not developed so much in the region as detailed in the next section; however, this is changing, with a growth rate of the region's portfolio of 9,6% in 2015 (Convergences, 2017).

Additionally, in order to ensure some coherence in the research work, it focuses on a unique microfinance institution for all the analyses, with a sufficient size in terms of clients, portfolio and market share. This institution is Enda inter-arabe, the main Tunisian microfinance institution. Enda inter-arabe fulfils the research requirements since it targets men and women and has always claimed acting in favor of women. Furthermore, Tunisia was a relevant context to study for several reasons: first, the microfinance sector has boomed since the Revolution thanks to a high potential of development and recent regulatory changes as detailed below, and has not been much studied so far; second, the country is peculiar in that women's rights and gender equalities are particularly well-protected by the law, especially concerning work. Yet, the labor force participation rate remains very low among women (25% in 2015) and has almost not increased for 20 years (23% in 1996)⁵. The origins of this paradox may lie at another level than public policies only, such as gender norms and representations, which is one of the points of interest in this research work.

As a result, this research work does not pretend to apply to microfinance in general: such an aim would be vain and doomed to failure given the complexity and diversity of microfinance today. Instead of aiming at drawing general conclusions on microfinance, it rather intends to

⁵ Data from the World Bank data portal.

identify some parameters and circumstances likely to facilitate or conversely hamper the fulfillment of microfinance objectives. This implies nonetheless that the results are supposed to be useful for other current and future professionals, regulators and researchers in their work, given their specific objectives and contexts. To that extent, it is rather in keeping with the practical and pragmatic perspective adopted in the recent literature than with the more ideological one of the previous decades.

IV. CONTEXT

1. The potential of microfinance in MENA and Tunisia

The MENA region is the one where microfinance is the least developed in the world, with only 1,8% of adults getting a loan from an MFI⁶, 30 microfinance institutions reporting to the MIX Market, and a total portfolio of 1,4 billion US dollars in 2016, against 8,7 for Sub-Saharan Africa or 9,3 for Eastern Europe and Central Asia (Convergences, 2017): the MENA region accounted for only 1,4% of the global portfolio and 1,8% of borrowers that year (Khamar, 2017). Yet, this region is characterized by high unemployment rates, especially among young people, and weak female labor force participation, hence the potential of development of microfinance should be significant, which may explain the very recent increase in the sector's growth rate for the year 2015. It is also the region where financial inclusion makes the slowest progress: according to The Global Findex Database 2014 (World Bank Group, 2014), if 62% of adults reported having an account worldwide (against 51% in 2011), this average rate hides huge disparities across geographical areas, including across developing regions. Thus, account penetration reaches 69% in East Asia in 2014, but the rate is only of 18% in the MENA region (13% for women).

Tunisia stands at a lower middle position in the MENA region in terms of account penetration, with a rate of 27%⁷ in 2014, against 50% in Algeria, 47% in Lebanon, 33% in Morocco (2011), 90% in Israel, and above 65% in all Gulf countries, but only 14% in Egypt, 24% in West Bank and Gaza, and 6% in Yemen (World Bank Group, 2014). These numbers show that even within the MENA region, there are high disparities across countries in terms of financial inclusion. It is also worth noticing that Tunisia is less advanced than its North African neighbors on this point. Regarding the gender gap in account penetration, it remained stable between 2011 and 2014

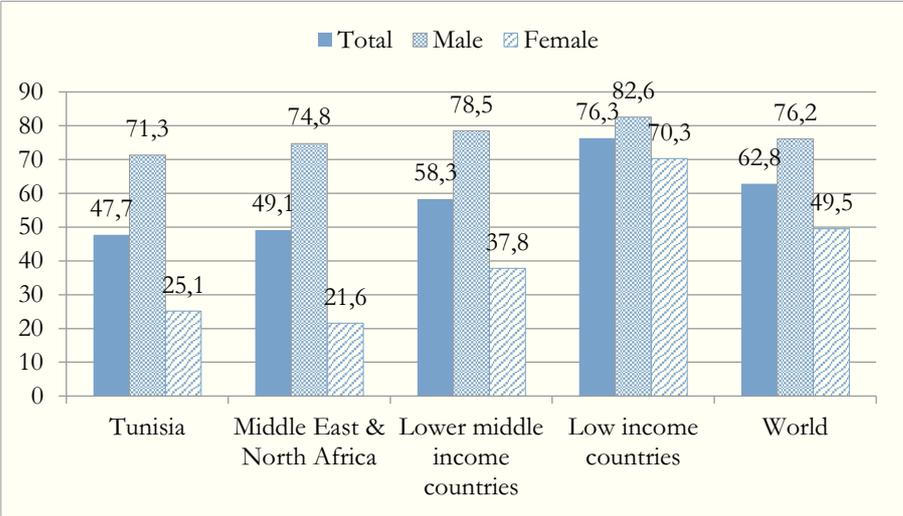
⁶ Data from Sanabel network, the microfinance network of the MENA region.

⁷ A study on financial inclusion achieved by ADA found slightly higher numbers for Tunisia, with 34% of adults having an account (ADA, 2014).

in developing countries, with a gap of 9 percentage points between men and women, but is even higher in Tunisia, with 20,7%⁸ of women having an account in 2014 against 34,2% of men. People living in rural areas are also less likely to hold an account (22,4%) than the average as well as young people under 25 (18,8%).

Currently, Tunisia is also facing economic difficulties especially in terms of employment. The labor force participation rate as defined by ILO (i.e. including the informal sector) was 47,7%⁹ in 2016, but hides a significant gender gap, with rates of 71,3% for men and 25,1% for women. This gender gap is higher in Tunisia than in lower middle income countries, which Tunisia belongs to, but slightly smaller than the average in the MENA region (figure 3). Besides, the total unemployment rate at the same period was 15,6% but higher for women (23,5% against 12,4% for men).

Figure 3. Labor force participation rate in 2016 (modeled ILO estimate)



Source: World Bank data portal

As a consequence, the development potential of the microfinance sector is huge in Tunisia, since microfinance targets vulnerable people excluded from the official banking sector but also from the formal job market, which is especially the case of women and young people in the country.

Therefore, after the Jasmine Revolution in 2011, Tunisian authorities have undergone deep regulatory changes, aiming to foster microfinance development. Indeed, before 2011, microfinance activities were led by two types of organizations: the NGO Enda inter-arabe on the one hand, and the “associations of microcredit” (AMC) on the other hand, funded by a public bank, the Tunisian Bank of Solidarity (BTS), which were offering subsidized microcredit at a very low cost. Some of

⁸ ADA found 25% of women having a bank account (ADA, 2014).

⁹ Numbers from National Institute of Statistics, Tunisia, and from the World Bank Data Portal for other countries or regions.

them interrupted their activity after the Revolution, in particular because of financial unsustainability and organizational issues. New regulations were designed in 2011 and implemented in 2013, the new law especially allowing private companies to operate and deliver microcredits. As a result, new actors have entered the sector since 2014 and several international organizations have started their activities. This has deeply transformed the microfinance landscape in the country, all the more so as the law has also enforced a specific credit ceiling for private companies, which is 20 000 Tunisian Dinars (TND), whereas the ceiling for NGOs was and still is 5 000 TND.

2. Women in Tunisia

The numbers concerning the position of Tunisian women in the economic sphere are all the more surprising as Tunisia has enforced a progressive legislation regarding women's rights: the Code of Personal Status established in 1956 abolished polygamy and repudiation, allowed women to ask for divorce, set a minimum age and imposed mutual consent for marriage. In 1957, women got the right to vote; after the Independence in 1962, they also got the right to work, move and open a bank account without their husbands' permission. In 1965, abortion was legalized, and in 1968, the country ratified ILO convention number 100, which instituted equality of treatment in employment of men and women for work of equal value.

Furthermore, over the last decades, huge progress has been made in girls' education, so that in 2013, the progression to secondary school was higher for girls (93,2%) than for boys (88,7%)¹⁰, and the share of women among students aged between 19 and 24 enrolled in higher education was of 55,6% in 2014¹¹.

However, Tunisian legislation has not immediately gone all the way with gender equality: in 1980, the Tunisian government signed the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW)¹² "with reservations". These reservations were officially withdrawn in April 2014 only. In the same way, the Code of Personal Status still makes discrimination against women legal at some levels, especially within family: first, inheritance law remains unequal, as Tunisian daughters are still denied an equal share of inheritance with brothers, and sometimes with other male family members; then, although a woman may be granted custody of her children, the father still remains the legal guardian. The recent controversy about gender in the Constitution has also highlighted the ambiguity around women's role the Tunisian society is

¹⁰ Source: World Bank data portal.

¹¹ Source: Tunisian National Institute of Statistics.

¹² The CEDAW is an international treaty adopted in 1979 by the United Nations General Assembly.

ready to acknowledge: in the draft Constitution dating from 2012, article 28 entitled “Women’s rights” asserted that women’s roles in the family were “complementary” to that of men. This sparked huge protests from the Tunisian civil society, and the final version of the Constitution dating from 2014 eventually guarantees gender equality with article 21:

“All citizens, male and female, have equal rights and duties, and are equal before the law without any discrimination”¹³.

Revising laws to ensure their complying with the Constitution still remains to be done.

Therefore, despite this progressive legislation, including concerning work, which makes Tunisia so special in the region, law does not guarantee perfect equality between men and women yet. Such ambiguity at the legal level might maintain or encourage equivalent ambiguity in other social strata, which may hamper deeper women’s economic empowerment in the country.

The question is whether this is also the case in microfinance.

3. Enda inter-arabe

Enda inter-arabe (hereinafter Enda) was created in 1990 in Tunis by its current executive director and general secretary¹⁴ as an NGO working in favor of environmental protection and socio-professional integration of vulnerable people from disadvantaged urban areas. Enda started offering microcredit services in 1995 and decided in 2000 to entirely commit to supporting micro-entrepreneurs, mainly through financial but also non-financial services (such as collective trainings, individual coaching, etc.). Whereas collecting deposits was and is still not legally authorized for non-banking institutions in Tunisia, Enda managed to become financially autonomous in 2003, as its operating revenues covered its expenses. Since then, it has kept growing steadily, until reaching cumulative numbers of 600 000 clients served between 1995 and 2015, which represents 2 008 300 credits granted for a total of 1 952 millions TND (~ USD 803 millions)¹⁵. Enda is thus active on the whole Tunisian territory, with 79 branches spread over the 24 governorates¹⁶ and in more than 200 delegations out of 264 in 2016.

¹³ Article retrieved from <http://www.legislation.tn/sites/default/files/news/constitution-b-a-t.pdf>, accessed on 24/05/2017.

¹⁴ Enda i-a’s general secretary became the president of Enda tamweel’s board of directors in 2016. Enda tamweel is Enda i-a’s private subsidiary created the same year.

¹⁵ Enda inter-arabe (2016), *Annual Report 2015*.

¹⁶ Tunisia is divided in various levels of administrative units, especially 24 governorates and 264 delegations.

If Enda started its activities in urban areas, today it covers rural areas as well, with 42% of its clients living in a rural area in late 2015. Enda serves clients working in all activity sectors: trade, handicraft, food production, breeding, agriculture, and so forth. There is no exact symmetry between rural areas and agriculture, since many clients lead projects in other sectors in rural areas while some others lead agricultural projects in urban areas, especially breeding. To meet the needs of this wide variety of clients, Enda offers different financial products: for instance, some of them were specifically conceived for agricultural projects, with irregular instalment schedules, grace periods, and prime rates, supposed to be adequate for seasonal activities. The interest rates do not vary by client but depend on by-product characteristics; as usually in the microfinance sector, they are higher for products corresponding to lower amounts and smaller for products enabling to grant greater amounts. Thus, Enda serves very diverse clients from the whole Tunisia, ensuring some representativeness of potential clients of microfinance.

According to the activity report of 2015, in December 2015, Enda was serving 271 000 active clients (+10% since 2014) and had disbursed 278 300 loans (+5%). Its portfolio-at-risk at 30 days was of 1,07% in 2015, which is very low compared to the global average in the sector (3,7% in 2014¹⁷), and the default rate was of 0,68%, which is also very low, even though default rates are usually inferior to 2% in microfinance. These good numbers are in keeping with the various awards and global recognitions the Tunisian MFI got over the last years, for both its financial and social performances: indeed, Enda received a Transparency Certificate with the highest mark by the MIX Market and Sanabel Network in 2009; it was recognized as the second best MFI in the world in terms of social performances in 2015 by Planet Rating, and was the first MFI in the MENA region to get the Smart Campaign Certification, which acknowledges commitment to client protection, in 2015 as well.

From 2000 until 2014, Enda was the main microfinance institution in Tunisia, as it held the greatest market share despite the existence of AMCs. Since 2014 though, thanks to the new regulation, four foreign private companies acting in the microfinance sector worldwide as well as one Tunisian Islamic microfinance institution have launched their activities in the country, and Enda has had to face actual competition for the first time in its history. Even though this competition remained marginal in 2015 as the other MFIs took time to organize, its effects could quickly emerge. As the law sets different credit limits for not-for-profit organizations and private companies, Enda decided to create a subsidiary under private status, in order to be able to meet its clients' needs. The processing was effective at the beginning of 2016, and the organization split

¹⁷ Convergences (2016).

into two distinct structures: Enda tamweel is now the private company delivering financial services whereas Enda inter-arabe still exists as an NGO and is responsible for non-financial services.

Since the very beginning, Enda has always made a point of supporting vulnerable people and especially women, and its targeting policy towards women has always been made clear. Nevertheless, in order to avoid some negative effects such as the use of women by male members of the household to get access to credit, Enda changed its policy in 2008 and chose to give priority only to women instead of exclusivity¹⁸. For at least this reason, the number of women among clients has regularly decreased over the last years, since 80,4% of clients were women in 2007 against only 65% in 2015. Given the transformation of Enda into a private company in 2016, which allows the MFI to grant higher amounts, the share of men could keep increasing until becoming the majority, since men usually request higher amounts.

Consequently, some questions started being raised about internal objectives: although there was still a quantified target of 65% of women among clients in 2015, the relevance of maintaining this objective has been discussed since then. In particular, given the currently increasing social and economic difficulties in Tunisia, Enda decided to extend its priority targets to youth and rural people in addition to women, in order to consider all kinds of vulnerable people. Nonetheless, so far, women have remained a priority target, and fostering women's empowerment is still one of the main official objectives. In order to feed thoughts on that question, Enda started to develop its research activities, some of them aiming at examining gender issues.

V. CARRYING OUT THIS RESEARCH WORK

In the meanwhile, in early 2014, I had decided to work on microfinance in Tunisia for my Master thesis, especially because I was interested in this development tool on the one hand and in the MENA region on the other hand, and because the development of microfinance in Tunisia at that time was making this country an exciting field research. I first got in touch with the international organizations with French headquarters which had started investing in Tunisia to launch their activity there, given the new regulation. I had decided to work with the professionals in the field to get original data, first to be as close as possible to actors, clients and context, and second because there was no other data anyway. I chose the French actors thinking it would be easier to convince them to cooperate. Despite interesting discussions on possible collaborations with two of them, our respective schedules were not matching, as in 2014, these organizations did

¹⁸ This information has been provided by the MFI managing staff.

not have their legal certification to start their activities yet. Therefore I decided to get in touch with Enda inter-arabe, the main microfinance institution in Tunisia which, at least, had been operating for two decades. Some other people I had previously contacted had indeed recommended contacting Enda, and in particular its Chief Executive Officer in person. With no real conviction, I used the most commonly used means of communication in Tunisia after the Revolution, and wrote directly to Enda's CEO on Facebook, explaining that I was really interested in doing research on microfinance in Tunisia and that an internship within Enda would be a great opportunity to do it. It took one month and two emails to get a positive answer. In May 2014, I started a two-month internship at Enda's headquarters in Tunis within the Marketing Department, which was also responsible for more in-depth studies. This is when and where I heard about their willingness to work on gender issues, and decided to make our interests coincide. After two months, they offered me to stay for one more year as a local employee in order to pursue the research work initiated, and take part in a broader project on gender, which especially included an experimental training on gender issues dedicated to loan officers. My contract ended in July 2015, however I came back four times in Tunisia between September 2015 and July 2017 for about three weeks each time, in order to finalize some quantitative analyses at Enda's headquarters, and to discuss with some staff members, informally or through interviews.

As a consequence, this research work results from the meeting between my initial personal interest in microfinance in Tunisia, and Enda's own specific needs and concerns at that time. Deeply convinced that it is in the best interest of both research and field work to better know each other and to work more together, chiefly with regard to development issues, I made my best to achieve a work in keeping with this vision. Ideally, I aimed at achieving rigorous research work which would directly answer specific needs in the field and enable stakeholders to improve their actions. Obviously, this was very ambitious, but an excellent learning opportunity at the same time.

During this year in the field, I had the opportunity to visit a few branches and follow some loan officers in their daily work, in office and at clients' homes, both in Tunis suburbs and in rural area. However, I spent most of my time at headquarters, working mainly with a researcher-statistician hired in October 2014, and with other members of various departments, such as Marketing, Training, Credit, Agriculture, Non-Financial Services, and IT. I participated in various studies which are not all included in this work, but which fed my thoughts for those which are. For instance, we carried out a qualitative survey on the constraints to micro-entrepreneurship in Tunisia, following the DELPHI method. It consisted in collecting the opinions of various specialists, including academicians, private consultants, civil servants working for national ministries or regional agencies, and professional actors of non-for-profit civil society, through three

rounds of questionnaires. The idea was to generate consensual hypotheses concerning the main obstacles faced by micro-entrepreneurs in Tunisia, distinguishing between men and women as well as young and older people. The main result is that the very risk-averse banking and financing system is the first obstacle for all kinds of micro-entrepreneurs, immediately followed by the social and cultural environment for women.

The exchanges I had with top and intermediate managers, some officers and trainers (of officers and of clients), as well as what I heard and observed during this year in the field or during my next short visits also helped build hypotheses and interpret results. Some relevant and telling quotations were included in corresponding chapters as illustrations. Even though some of these exchanges took the form of individual interviews, especially with some loan officers, the value of this qualitative material must be qualified and I would not claim it to be scientific. However, every quotation comes from written records, either by me at the time I heard it or by trainers just after each training session as far as training reports are concerned. Consequently, they are at least genuine, and I believe they are representative of what I heard, read and observed, even though subjectivity and selection biases are likely to come into play. For instance, one of my field visits into a rural branch in early November 2014 particularly left its mark: another newly recruited person and I were visiting the branch in Thala, a small town in rural Western Tunisia. Like in other rural branches, the share of agricultural projects was higher than in urban branches (60%). I had requested the figures corresponding to this branch from the IT service before coming, since no employee has access to the entire information system for security reasons, and printed them. During our visit, I interviewed one of the loan officers about his clients, and asked him to describe them, especially in terms of projects. Whereas I had the actual figures in front of me in my notebook showing that the share of agricultural projects was actually higher for women (62%) than for men (57,5%), he asserted that agricultural projects were mostly run by male clients, even when I asked a second time. In the same way, he affirmed that women's agricultural projects were very small ones compared to those of men, whereas my numbers were saying that if the share of agricultural income generating activities (smaller scale projects) was indeed higher for women (27%) than men (22%), while the share of agricultural micro-enterprises (higher scale projects) was higher for men (15%) than women (11%), the differences were not so substantial, and lower than what he was implying. This is one of the experiences which made me realize that loan officers may have inaccurate representations of men's and women's projects.

To carry out the quantitative analyses in this research work, I requested the data about requests, clients and loans from the internal information system. This required working in close cooperation with the IT service, which was in charge of meeting this kind of technical requests.

The gross data had then to be cleaned and understood. To do so, the IT service helped detail the meaning of each indicator while the Marketing department provided information on their reliability. Without such cooperation, it would have been much more complicated to use these data and avoid misinterpretations.

To complete the analyses on real data, I initiated an experiment with loan officers using fictitious requests. It would have been impossible to carry it out without the support of my statistician colleague. Indeed, Enda's managers were rather reluctant to this kind of experiment, refusing to use humans as guinea pigs for research purposes. They even had already declined such a proposition by the World Bank in the past. Once again, being an internal employee and being supported by a Tunisian and more experienced colleague was definitely an advantage, and enabled me to see this project through to completion. Indeed, one of the challenges was to gain the confidence of Enda's managers and to stand out from the image of the patronizing western researcher who came to play in the developing field before going back to the developed world. Giving this image may seriously hamper the achievement of the project, since it may especially lead to withholding of information. Of course, the price to pay for being an employee and working within a team which does not necessarily have the same purposes is a loss of freedom and leeway to carry out the research work as expected, let alone the time it takes to adapt to different working methods and habits. Research work in direct cooperation with field actors entails pros and cons; however, given the achievements, I undoubtedly consider that it was worth it.

VI. OUTLINE

This research work is structured in five chapters. Chapter 1 focuses on the allocation process of the first microcredit in clients' credit history. Using 61 353 observations corresponding to the requests made by new applicants between January 1, 2014 and September 23, 2014, the three steps of the process are examined: first the amount requested, second the selection process, and third the amount granted. The objective is to disclose the possible gender biases at each step. The analysis of the first step highlights the initial differences between male and female applicants in terms of profiles, resources and projects, and shows that women already start from further behind. These initial differences taken into account, the analysis of the amount requested reveals that they also tend to request lower amounts all other things being equal. From the supply side, the analysis proves that Enda effectively favors women in terms of access to credit, since women are more likely to see their application approved than men; however, once they are selected, women tend to receive lower amounts than men, especially those requesting high amounts, disclosing a kind of

glass ceiling effect. As a consequence, the starting inequalities are only partly compensated, with an access to credit facilitated but less favorable loan conditions.

Because chapter 1 uses real data coming from the information system filled by loan officers, there is a risk that the information observed by the researcher does not totally correspond to the one observed by loan officers: the latter may have collected additional information during their visits which has not been reported, even though the critical information to make a decision is supposed to be. Consequently, the gap observed between amounts granted to men and women in Chapter 1 might be explained by this unobservable observation. However, the main hypothesis is rather that women are effectively disadvantaged in terms of amounts due to statistical discrimination.

To check this hypothesis, chapter 2 consists in an experimental study involving loan officers. A sample of Enda's officers took part in an exercise consisting in allocating a loan amount to fictitious loan requests. These fictitious cases were built so that they contained information about the most determining risk factors according to official procedures, but were considerably shortened compared to a real application. This was done on purpose, in order to incite loan officers to recreate an imaginary story around the available information, using their experience and representations. The analysis shows that on the whole, officers assessed the various risk factors in accordance with procedures, which proves that these procedures are assimilated; however, at equal other risk factors, the fictitious cases involving a female applicant received lower amounts than those involving male applicants. Given the low number of observations, a robustness check analysis is carried out replacing all other risk factors by a risk score, and the results hold. The experimentation supports the explanatory hypothesis of the results found in chapter 1, which is that women probably face discrimination.

To know to what extent this discrimination may be statistical, chapter 3 consists in examining men's and women's behaviors as clients throughout their credit history. Indeed, if women appear as riskier clients in terms of repayment or default, discrimination against them would be effectively statistical, and this would constitute an objective explanation of the gap observed between amounts granted for first loans, even though this would not be justifiable. Dropping out, defaulting and late repayment are the three kinds of risky behaviors analyzed using a dataset of 183 109 observations which correspond to the credits granted between June 2012 and March 2016 to the 69 301 clients who got their first loan between June 2012 and December 2013. The results show that women are on the contrary less likely to default or repay late than men, all other things being equal; in other words, they show less risky behavior, and this is not due to specific project or

profile characteristics. Nonetheless, this may be not sufficient to assert that lending to women is more advantageous for MFIs: indeed, if women appear as less risky clients, they still borrow less money, making them potentially less profitable clients. Therefore, this chapter also attempts to contribute to the discussion about the financial advantage of lending to women, and concludes that if profits generated by women's loans are slightly lower than those generated by men's ones, the gap remains lower than between the costs generated by risky behaviors, which are higher for men.

Taking the information about clients' past behavior into account, as well as the evolution of their projects, and correcting for the selection bias over credit cycles since some clients drop out, chapter 4 examines the progressive lending policy applied by Enda, by using the same dataset as in chapter 3. The analysis of the evolution of loan amounts over credit cycles, in level and in growth rate, shows that both men and women benefit from a progressive lending policy all other things being equal: this means that the amounts granted grow more rapidly than the financial indicators reflecting the evolution of projects. Such a progressive lending policy implies that the MFI increasingly trusts its clients over credit cycles. However, the progressive lending policy is slightly less quick for women than for men, confirming the existence of a glass ceiling effect, which does not disappear as the relationship between the MFI and its clients lasts and strengthens. Given the fact that women are not riskier clients, this result questions the statistical nature of the discrimination they face in terms of amounts. Indeed, negative gender-based stereotypes seem to prevail over the positive information on women's repayment behavior in the microcredit allocation process.

Consequently, chapter 5 consists in an impact study of an initiative launched by Enda to raise awareness on gender issues among its staff. Indeed, Enda had already planned to train its whole staff on this question, and started with an experimental phase in 2014 and 2015 during which only a sample of the field staff was trained. The 2-day training consisted in giving factual information on existing gender inequalities in Tunisia in general and among Enda's clients in particular, and to make participants think about what they could do in their professional life to improve the situation. Using the information of the monthly portfolios of participating and non-participating loan officers, the objective of chapter 5 is to verify if such training may have an effect on various outcomes such as the average loan amount granted to women or the share of women among clients. A difference-in-differences approach is applied to a panel dataset consisting of 19 monthly periods, 82 trained officers and from 200 to 500 control officers according to the control group chosen, and five different outcomes are examined. The results show that the effects were heterogeneous according to officers' sex and experience, with more significant, direct and positive

effects on new female officers. On the whole, if the effects remain modest, they rather encourage for more regular and numerous initiatives of this kind.

CHAPTER 1

DEFEATING THE PURPOSE: TARGETING VERSUS FAVORING WOMEN IN MICROFINANCE

I. INTRODUCTION

Whereas microfinance was worshipped for a while as a miracle solution to fight against poverty and to empower women, its potential to achieve its initial goals has been recently questioned: not only have a certain number of impact assessments found mixed results regarding women's empowerment (Banerjee, Karlan, & Zinman, 2015; Garikipati, 2008; Goetz & Gupta, 1996; Guérin, Kumar, & Agier, 2013; Kabeer, 2005; Leach & Sitaram, 2002), but new doubts have also been cast on positive discriminatory practices towards most vulnerable people (Labie, Méon, Mersland, & Szafarz, 2015) and towards women in particular (Agier & Szafarz, 2013a, 2013b).

The core aim of microfinance is to promote financial inclusion by offering a set of products and services (e.g. credit, insurance, saving and money transfer) dedicated to people excluded from formal financial and banking system. For this reason, microfinance is sometimes considered as a financing system specifically conceived for women (Armendariz & Morduch, 2010), especially in developing countries. Indeed, this part of the population is the most disadvantaged in terms of access to credit, with 58% of women having a bank account in 2014 against 65% of men in the world (Demirgüç-Kunt, Klapper, Singer, & Van Oudheusden, 2015). Women are also more represented in informal employment (International Labour Office, 2013), which led microfinance institutions (MFIs) to make women a priority target. Furthermore, targeting women has been for a long time considered as a way to maximize performances by MFIs, from a social point of view on the one hand, since women dedicate a bigger part of their revenues to their household compared to men, resulting in higher welfare (Khandker, 2005), and from a financial point of view on the other hand, since women tend to show better recovery rates (D'Espallier, Guérin, & Mersland, 2011; Khandker, Khalily, & Khan, 1995). As a matter of fact, 84% of MFIs' clients were women in 2016 (Convergences, 2017)¹⁹.

However, if for a long time, most studies about microfinance kept on focusing on the impact issue, that is to say on what happens after the credit allocation process, more recent papers pay attention to what occurs ahead of loan granting. While some studies already show that microfinance does not necessarily always reach the poorest of the poor (Navajas, Schreiner, Meyer, Gonzalez-vega, & Rodriguez-meza, 2000; Rhyne, 1998) whereas the latter are supposed to be MFIs' priority target, in the same way some others have started to examine if women are effectively treated as a priority target in practice. In other words, discrimination towards women in the sector is not considered as necessarily positive any longer and has become a point of interest for researchers (Garikipati, Johnson, Guérin, & Szafarz, 2016). This paper adopts the same standpoint

¹⁹ The numbers are based on voluntary declarations to the MIX Market by MFIs.

and attempts to make its contribution to this new literature by examining potential gender bias before and during the granting process. The aim of the study is to check if female applicants to a microcredit could be rationed in a way or another, contrary to what is usually expected. More precisely, the potential rationing is analyzed not only regarding access to credit, which would be loan-quantity rationing, but also regarding loan conditions, which would be loan-size rationing in this case. So far, only two others studies have examined the same issue, in Brazil (Agier & Szafarz, 2013a) and more recently in Uganda (Corsi & De Angelis, 2016), showing that women are loan-size rationed in the first case but not in the second one.

Whereas both studies use the same methodology, this paper adopts a different one by choosing to focus on first loans only, since granting decisions are not made using the same criteria when a client is unknown from an MFI as when he/she already has a credit history. This allows a proper analysis of a possible selection bias. Additionally, whereas both studies focus on MFIs displaying a gender-neutral policy, this one focuses on a Tunisian MFI displaying a policy that officially favors women. The analysis shows that even in this case, gender-based credit rationing may exist, especially regarding loan amounts.

The structure of the chapter is as follows: section 2 presents existing works about gender bias in microfinance; section 3 introduces the case study and data; section 4 details the various models corresponding to each step of the granting process and main results regarding gender bias; section 5 concludes.

II. LITERATURE REVIEW ON THE GENDER PERSPECTIVE IN MICROFINANCE

Apart from the impact issue on women's empowerment, the gender perspective has been included in various ways in studies on microfinance. From the demand side on the one hand, the differences between female and male micro-entrepreneurs lie at several levels, and are similar to those observed between female and male entrepreneurs in developed countries (Brana, 2013): women's projects tend to be concentrated into specific activity sectors, generally considered as less productive (Buvinic' & Berger, 1990; Carter, Anderson, & Shaw, 2000; Hilhorst & Oppenorth, 1992), revealing that gender segregation in the job market also exists in the informal sector; women's projects also tend to be smaller in terms of assets and benefits (S. Coleman, 2000; Grasmuck & Espinal, 2000; Hilhorst & Oppenorth, 1992; Marlow & Carter, 2004), even though

results are mixed concerning the way of operating a business, as some studies proved that there was not always statistical difference between male and female entrepreneurs' ability to generate increases in business sales (Kevane & Wydick, 2001) or employment (Clark, 1991).

Male and female microcredit borrowers also tend to show different financial behaviors, which would be an additional reason for MFIs to target women in particular, as they display better repayment rates (D'Espallier, Guérin, & Mersland, 2011; Shahidur R. Khandker, Khalily, & Khan, 1995; Sharma & Zeller, 1997) and dedicate bigger parts of their revenues to their households (Downing, 1991; S. R. Khandker, 2005; McKee, 1989).

About the supply side on the other hand, especially concerning what occurs ahead of credit granting, there are few studies about discrimination in general in microfinance, as it is supposed to be a service dedicated to vulnerable people. However, Labie et al. (2015) proved that such a phenomenon remains possible even in this sector, both in theory, with an agency model applied to a non-for-profit MFI showing that MFIs may have an interest in letting their officers discriminating to some extent instead of fighting against such behaviors, and in practice, with a case study in Uganda revealing that loan officers tend to discriminate disabled people.

Regarding discrimination in the credit market and especially gender-based discrimination, it is referred to as credit rationing and can take two specific forms, loan-quantity and loan-size rationing (Baydas, Meyer, & Aguilera-Alfred, 1994). In other words, women could be discriminated in terms of access to credit, meaning they would be more likely to see their requests being rejected all other things being equal, or, in case of acceptance, could receive smaller loans than men. Existing studies about gender-based discrimination in the credit market show mixed results because of the multiplicity of entangled factors which could explain the gap between granted credits to men and women. While some studies show that at least a large part of the observed gap in terms of quantity and size could be explained by business characteristics (Buvinic' & Berger, 1990; Fabowale, Orser, & Riding, 1995; Haines, Orser, & Riding, 2009; Robb & Wolken, 2002) or women's self-censorship (Buvinic' & Berger, 1990; Fletschner, 2009; Treichel & Scott, 2006), some others prove that women are more credit-constrained either in terms of access (Bellucci, Borisov, & Zazzaro, 2010; Fletschner, 2009) or size (Baydas et al., 1994; Treichel & Scott, 2006). To go further with the form discrimination can take, the conditions or costs of credit can be analyzed with a gender perspective, and some results tend to show that women have to pay more for credit than men, either in terms of interest rates or collateral requirements (A. F. Alesina, Lotti, & Mistrulli, 2013; Brana, 2013; Wu & Chua, 2012).

Gender-based credit rationing has not been so much studied within MFIs, since so far only two very recent studies have tackled the issue: Corsi and De Angelis (2016) work on Uganda on the one hand, and Agier and Szafarz (2013a) use a database provided by a Brazilian MFI on the other hand. Whereas the former finds that there is no gender-based loan-size rationing, the latter shows that despite the absence of loan-quantity rationing, women still encounter a glass ceiling effect in terms of amounts granted. In particular, this gap increases with the project size, whatever the credit officer's gender. Thus, the paper concludes by drawing the attention to the fact that discrimination does not always lie in access but also in credit conditions, which are worth being examined. The authors also highlight that the MFI concerned by their analysis does not give priority to women but applies a fair targeting policy, as the Ugandan MFI analyzed by Corsi and De Angelis (2016) does; consequently, a similar study about an MFI giving prior access to women would complete this first analysis in a relevant way, by checking if women could encounter the same kind of loan-size rationing even when they are supposed to be favored in terms of access. This is what this paper aims to verify with a case study in Tunisia, a country belonging to a region which has not been investigated yet on this issue whereas the microfinance sector is currently booming.

III. DATA

1. Data source

The data used in this analysis comes from the information system of the main Tunisian MFI Enda. This information system enables the MFI to collect and centralize all the information concerning applicants, clients and loans. Before May 2012, Enda's information system was basic and did not include much information about denied applications. Only paper files contained such information, which was hence neither computer-recorded nor centralized. For May 2012, the information system has been considerably improved, in order to record much more detailed information about applicants, whether their requests were finally approved or not. As a consequence, as soon as a person has achieved the first step of the application process, which is detailed below, his or her information is recorded in the system and a client code is assigned to him or her, even if the application is eventually dismissed. It is then possible to retrieve the information concerning all applicants for a certain period of time from what the MFI calls "the applicant database".

The kind of information available in the applicant database concerns applicants' socio-demographic characteristics, amounts requested, projects the loans are supposed to support, credit

officers responsible for the request process as well as branches where requests were made. Such information is filled in the system in several steps, corresponding to the application process.

As a matter of fact, before getting a loan, future clients have to go through various steps. First of all, they have to show their interest in getting a loan from Enda. This could result from two kinds of situations: either they heard about Enda through word of mouth thanks to other clients and/or communication media, or they were directly approached by a loan officer. Indeed, each loan officer within Enda is assigned with a specific geographical area around the branch where he or she works. This geographical area usually consists of one up to three sub-areas, each sub-area being affected to strictly one loan officer. Loan officers are preferably assigned with areas where they originally come from, or at least they know, in order to take advantage of their existing relationships and to minimize the information asymmetry between themselves and their clients. In particular, in order to get new clients, loan officers are encouraged to refer to one or several “source clients” from their area, who are already active clients who got several loans and showed good repayment behavior. These source clients are supposed to recommend other reliable potential future clients to loan officers, who then attempt to sell microcredits from door to door on the basis of these recommendations.

Unfortunately, there is no reliable information in the system about the way an applicant heard about Enda. However, according to several experienced loan officers, there are as many applicants coming directly to the closest branch on their own initiative as applicants they approached through door-to-door selling. Only less experienced officers who had been recruited for less than one year said that they were only relying on direct applications, because they did not have source clients yet.

Whether they come on their own initiative or after being approached by a loan officer, the first step for potential future clients consists in coming to the closest branch to their home where the administrative assistant makes them fill an application form with basic information about their personal situations and projects, including amounts requested. In the case when applicants came spontaneously, a specific loan officer is assigned to them depending on their physical address.

The second step is carried out by the loan officers in charge of the areas where the applicants live and consists in visiting applicants’ homes and projects to assess their stability, as well as conducting an investigation into their reputation and ethics by surveying neighbors and relatives. The information collected up to that step is used to fill a risk assessment sheet to select clients. All the information contained in the paper sheets is then computer-recorded by the officer; usually, a credit officer’s typical working day is organized so that he or she visits applicants’ and

clients' houses and projects in the morning and does the administrative work at the branch in the afternoon.

The third step consists in an additional visit during which financial information about households and projects is filled in applicants' files. This financial information is used to set the amounts to grant, and computer-recorded in the system only if the applications are successful, that is to say only if clients have been selected to get a loan.

Indeed, such information is not part of the "applicant database" but of the "loan database". The loan database also belongs to the information system, and contains information about loans granted to successful applicants, regarding loan amounts granted, loan terms, interest rates, loan use, collateral offered by clients and financial information about households and projects.

For this chapter, the database used results from the merging of two data retrievals. The first one is retrieval from the applicant database and concerns all new requests for a first loan made between January 1st 2014 and September 23rd 2014²⁰. It was then merged with the loan database using the client code, in order to add relevant information about clients' financial situations and loan characteristics for successful applications. The final database contains 62 610 observations, one observation being one new request for a first loan, whether it was finally granted or dismissed. After data cleaning with outliers deleting²¹, 61 353 observations remain in the database.

It was decided to include only the new requests for a first loan and the characteristics of this first loan for several reasons: first of all, when potential clients apply for a loan for the first time, credit officers do not know them and face an asymmetric information issue; credit-rationing is a way to tackle this asymmetric information issue (Baydas et al., 1994; Stiglitz & Weiss, 1981) and this is the kind of behavior this paper aims at analyzing. On the contrary, for the next loans, a relationship has been built between the client and the MFI, and other interpersonal processes than asymmetric information are likely to come into play. Additionally, new aspects are likely to affect the granting decision, such as the evolution of the client's business since the previous loan, which reciprocally could depend on the size of the previous loan, let alone the fact that most MFIs apply progressive lending policies. Consequently, in order to properly analyze the possible gender bias in

²⁰ September 23, 2014 was the date when data were retrieved from the information system of Enda.

²¹ Outliers have been defined in collaboration with the marketing department of Enda inter-arabe, which provided ranges of numbers which can be considered as reliable for several variables, according to their knowledge of clients and projects (ex: fixed assets above 400 000 TND was considered as an outlier).

credit-rationing due to asymmetric information, only first loans are taken into account. However, chapter 4 focuses on the possible gender bias in loan renewal and progressive lending policy.

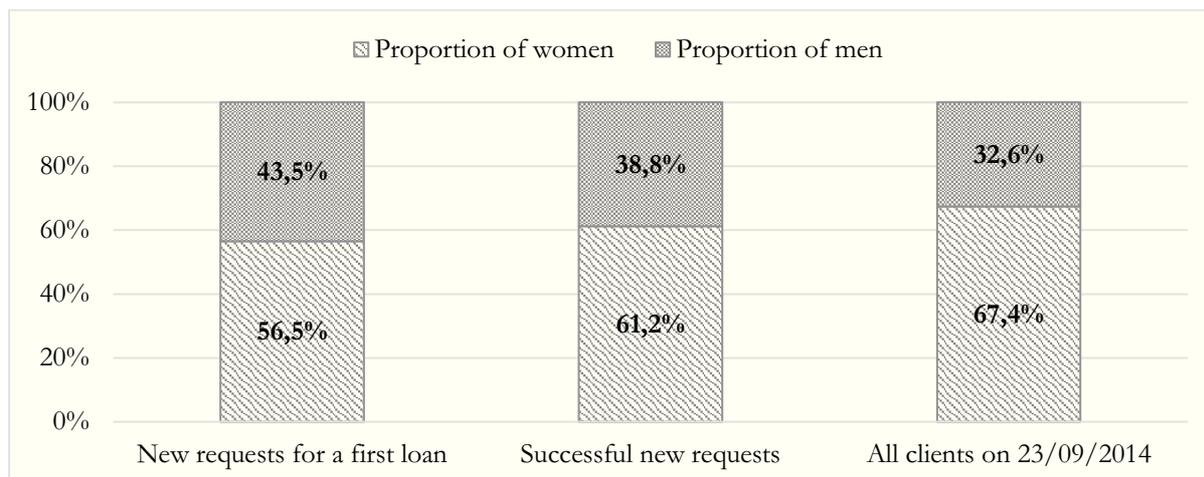
2. Data description

2.1 Loan-quantity and loan-size rationing

In order to check whether women are credit-constrained or not within this Tunisian MFI, the two possible forms of credit-rationing are considered, which implies to analyze access to credit and loan size. Whereas credit conditions do not include loan size only but also interest rates and collateral requirements, the analysis of potential gender bias in credit conditions within this MFI focuses on loan amounts only: indeed, first, as usual in microfinance, interest rates charged by Enda are fixed by financial by-product, or specific type of credit, and hence cannot be used to discriminate between individuals; second, potential clients are free to offer different kinds of collaterals, including non-financial or physical ones, consequently there is no specific minimum requirement in terms of collateral to get a credit. As reported by several officers, the kind of collateral or even the absence of collateral cannot be a ground of refusal: in the worst case, when a potential client does not have any collateral to offer, the officer always attempts to find a solution by suggesting mutual guarantee with another client, joint surety with a group of clients, or that another client with good credit background acts as a guarantor. Finally, neither collateral requirement nor interest rate can be source of discrimination, and loan size appears as the only credit condition which can be.

Among the 61 353 new requests for a first loan made between January 1, 2014 and September 23, 2014, 56,5% were made by women. However, the proportion of women among all active clients was 67,4% in 2014, which could imply that the official policy of Enda in favor of women is indeed applied in practice. This idea is corroborated by two other numbers: 61,2% of the successful new requests for a first loan were made by women, a proportion higher than the one referring to the requests themselves (56,5%), and the acceptance rate of requests made by women is 71,8% against 59,1% for men (66,3% on average). The priority given to women seems then real, even though this still has to be proved through econometric analysis. Nonetheless, this could not necessarily remain the case in the future, as the proportion of women among successful new requests is lower than the current proportion of women among clients (61,2% against 67,4%, see figure 4), which means that this proportion is likely to keep decreasing over the next few years.

Figure 4. Proportions of women among new requests, successful new requests and clients in 2014



Comparing these figures with access to credit for men and women in general in Tunisia still remains impossible today. Indeed, the available data on this issue is almost inexistent, let alone the fact that it is usually not disaggregated by sex, as many other statistical indicators in Tunisia. For this reason, United Nations Women has recently launched a project aiming at supporting the Tunisian National Institute of Statistics (INS) to integrate a gender perspective in the production of statistical indicators, including banking indicators. This project resulted in the publication of the first national report on gender issues in 2015 by INS, in which many gender indicators collected and/or calculated according to international standards can be found. According to this report (INS & UN Women, 2015), the indicators corresponding to the proportion of the population getting access to credit by sex and to the acceptance rate of credit requests by sex have not been made available yet, whether by the Tunisian Central Bank, the BTS (Tunisian Bank of Solidarity, which delivers microcredits) or the BFPME (a bank funding small and medium enterprises).

All that is known so far is that the total acceptance rate by the BFPME was 18,3% at the end of August 2015, which is very low compared to the average acceptance rate of 66,3% within Enda. This confirms one of the results found in the qualitative survey we carried out towards experts of micro-entrepreneurship in Tunisia, as well as one of the issues mentioned during several professional events on entrepreneurship in Tunisia I attended²²: Tunisian banks are highly risk averse and reluctant to grant credits to micro-entrepreneurs, and access to funding for very small, small and medium enterprises should be improved. Besides, the high acceptance rate within Enda may be explained by its specific strategy to target new clients: officers are encouraged to rely on

²² In particular: “Start-Up Expo” organized in February 2015 in Tunis by UTICA, the main employer organization in the country; “OECD Investment Days” organized by OECD in March 2015 in Tunis as well.

source clients' recommendations, and hence a preselection is already achieved for a considerable share of new applicants.

Among the successful requests made to the BFPME, only 17% were by women. According to a study carried out by ILO and the Tunisian National Chamber of Female Entrepreneurs²³, women represent 43% of BTS' clients, which delivers microcredits. For its part, the Central Bank gave information about real estate and consumer credits only: in 2015, 23,3% of new real estate credits and 26,4% of new consumer credits were granted to women. All these figures are also much lower than the share of female clients within Enda (61,2%). Because acceptance rates are not available by sex for these banks, it is impossible to know if the low shares of female clients are due to low shares of female applicants, which would reflect self-censorship by women themselves, or to lower acceptance rates for women, due whether to their worse access to resources resulting in lower assets and lack of collateral, or to even more reluctance from banks to grant credits to women. According to the above-mentioned qualitative survey and events²⁴, a combination of all these factors is likely to explain these figures.

Concerning loan size, a first loan granted by Enda during this period is 907 Tunisian dinars (TND) on average, with slightly higher amounts for non-agricultural credits (923 TND against 865 for agricultural ones), but the gender gap is significant, as men got 1183 TND on average against 733 TND for women. No information is available concerning the size of loans granted by other banks, hence there is no possible comparison.

At first glance, if women do not seem to face loan-quantity rationing with Enda, they could encounter loan-size rationing. However, this gap could be at least partly explained by other gender differences or inequalities in socio-demographic characteristics (McKee, 1989), business characteristics (Baydas et al., 1994), or preferences and risk aversion resulting in lower requests, which thus deserve to be examined.

2.2 Socio-demographic profile of new applicants

Applicants' main socio-demographic characteristics are presented in table 1. Female applicants are more likely to be married than men, who are relatively more likely to be single, and to have another active member within their household. For these reasons, women could be considered as more stable potential clients by the MFI, since these characteristics are considered as stability criteria in the MFI's official procedures. However, only 43,4% of women have reached

²³ The study has not been published yet but its main results were presented during a public event in June 2015.

²⁴ Such events always included a specific conference or workshop on female entrepreneurship.

secondary education or more, against 53% of men, and women are more represented among illiterate applicants (12,5% against only 3,1% of men), even though it is also the case among highly educated ones (8,4% against 6,9% of men). Looking at the whole Tunisian population (table 2), new applicants to microcredits from Enda seem to have a specific profile: they are more likely to be married, especially women, and their education level tends to be lower even though there are relatively fewer illiterate people among applicants than in the whole population.

About professional status of Enda's applicants, if most men and women are independent workers, women are more represented among inactive people (unemployed or at-home). Therefore, female applicants seem to be less advantaged in terms of education and professional status, which could have some consequences in terms of credit-rationing.

Table 1. Socio-demographic characteristics of male and female new applicants

	Men	Women	Diff.
Age (mean)	37,87	38,64	-0,761***
Marital status			
Married	61,9%	74,8%	-0,129***
Single	37,2%	20,3%	0,169***
Widowed	0,2%	2,7%	-0,0249***
Divorced	0,7%	2,2%	-0,0150***
Education			
Illiterate	3,1%	12,5%	-0,0938***
Primary	43,9%	44,2%	-0,00246
Secondary	46,1%	35,0%	0,111***
Higher	6,9%	8,4%	-0,0145***
Housing			
Owner (vs. renter or free lodging)	77,9%	78,1%	-0,00214
Professional status			
Inactive	2,5%	7,9%	-0,0542***
Salaried	5,9%	5,5%	0,00329
Independent	91,6%	86,5%	0,0510***
Other working member in household	75,2%	79,3%	-0,0411***
Rate of rural areas (branch)	36,5%	36,1%	0,00369
Observations	26696	34657	61353

* p<0.05, ** p<0.01, *** p<0.001

Table 2. Socio-demographic characteristics of men and women in Tunisia

	Men	Women
Marital status (aged 15 and over)		
Married	57,0%	56,7%
Single	41,2%	32,5%
Widowed	1,2%	9,0%
Divorced	0,7%	1,8%
Education (aged 10 and over)		
Illiterate	12,9%	25,7%
Primary	34,8%	29,2%
Secondary	40,3%	32,9%
Higher	12,0%	12,2%

Source: Author's calculation based on data from 2014 Tunisian census

Finally, there is no difference between male and female applicants in terms of kinds of areas served by the branch they go to. As previously explained, each branch serves a specific geographical area divided in several sub-areas, and each loan officer of the branch is assigned with one or several sub-areas. The sub-areas served by an officer and hence by a branch can be “communal” or “non-communal”, which is the Tunisian official designation of “urban” and “rural”. However, contrary to the denomination “urban”/ “rural” which is usually based on objective demographic criteria, the Tunisian one depends on a politico-administrative decision. Indeed, according to INS, the communal area is defined as “all the municipalities established as such by a decree from the Home Office and consequently subject to municipal law”. The non-communal area is defined as “all the areas out of communal perimeters” and concerns “the population living in towns not established as municipalities and the scattered population living isolated” (Masri, 2008). In other words, there is no official demographic threshold from which a town is established as a municipality and consequently as part of the communal area, and sometimes the issuing of a decree from Home Office was rather subjected to political issues. This has resulted in peculiar cases such as towns of 5000 inhabitants remaining non-communal and towns of 700 inhabitants set as municipalities according to INS. Several works attempted to statistically identify such a threshold but found different results (Belhedi, 1992; Masri, 2008), and especially Masri (2008) finds different thresholds according to governorate²⁵, going from 3500 to 5000 inhabitants, against a unique threshold of 2000 found by Belhedi (1992). This ambiguity of the official denomination explains why Enda has not used it for a long time, before eventually including it in the information system when competition arrived in the country.

²⁵ Tunisia is administratively divided in 6 regions, 24 governorates and 264 delegations.

However, because peculiar cases remain rare, and since INS and all organizations producing statistics about Tunisia are still using the official denomination communal/non-communal, which is the only one available, this is the one which was used to categorize the sub-areas served by a branch. In particular, a branch serves several delegations, for which INS provides the rate of population living in communal or non-communal area. The indicator “rate of rural areas” in table 1 applies to a branch and refers to the average rate of population living in non-communal areas in the delegations served by this branch. The similar rates of about 36% for female and male clients mean that on average, the branches serving male and female clients serve areas where 36% of the population lives in non-communal area. This indicator does not reveal if female applicants are as likely as male clients to live in non-communal areas or not, since applicants’ physical addresses were removed from the database for confidentiality reasons. However, it at least says that female applicants are not more likely to go to a branch serving more communal or non-communal areas than male applicants.

Looking at the repartition of Enda’s branches on the Tunisian territory (figure 5), it clearly appears that the most rural branches (serving areas where more than 55%²⁶ of the population lives in non-communal areas) are concentrated in North-West and Center-West regions. These two regions are also the poorest regions in Tunisia (INS & Ministère du Développement Régional et de la Planification, 2012), the ones with the lowest labor force participation rates, for both men and women, and with the highest unemployment rates for both men and women with South-West, and with South-East for women only²⁷; by contrast, the littoral regions (North-East including Great-Tunis and Center-East) are the richest regions, the ones where the most numerous enterprises can be found (INS, 2016), with the highest labor force participation rates, lowest unemployment rates, and lowest inequalities between men and women in terms of both unemployment and labor force participation.

Regarding communal and non-communal areas, interestingly, the labor force participation rates differ between the two kinds of areas only in North-West, Center-West and North-East, where in non-communal areas, women and only women are far less active than in communal areas.

²⁶ The four categories of branches correspond to quartiles of rates of rural areas.

²⁷ Data retrieved from INS online database of 2014 national census.

Figure 5. Repartition of branches by rate of rural areas



2.3 Project characteristics

In most cases, new applicants' projects consist in a professional activity, even though a tiny minority concerns personal projects such as housing improvement or children's education. Activity sectors are based on the official Tunisian classification: agriculture (breeding and culture), production (food, textile, handicraft, and so forth), services (transport, health and beauty, IT, and so forth) and trade.

Activity sectors significantly differ between men and women (table 3), the former being relatively more likely to run an activity in agriculture or services, the latter being more represented in production or trade, even though agriculture is the first activity sector for both men and women. Regarding agriculture, men are also relatively more likely to do culture than breeding, even though

breeding remains the major agricultural activity. There seems to be gender-based occupational segregation among the MFI's applicants.

Table 3. Project characteristics of new applicants

	Men	Women	Diff.
Activity sector			
Agriculture	42,0%	37,5%	0,0451***
<i>Culture</i>	14,0%	5,7%	0,0836***
<i>Breeding</i>	86,0%	94,3%	-0,836***
Production	7,6%	21,5%	-0,139***
Trade	28,9%	32,0%	-0,0310***
Services	20,3%	7,9%	0,124***
NA (consumption)	1,2%	1,1%	0,00134
Credit use			
Working capital	68,4%	73,1%	-0,0469***
Education, Health, Housing, Consumption	1,5%	1,5%	0,000101
Co-financing	6,3%	5,9%	0,00433*
Creation	4,4%	3,1%	0,0133***
Loss	0,0%	0,0%	0,0000547
Investment	10,1%	9,0%	0,0111***
Recovery	0,4%	0,6%	-0,00197***
Other loan (yes or no)	2,0%	1,1%	0,00829***
Personal contribution (yes or no)	17,2%	17,5%	-0,00306
Observations	26696	34657	61353

* p<0.05, ** p<0.01, *** p<0.001

Looking at the whole employed population in Tunisia in 2014 (table 4), the repartition by activity sector seems specific among new applicants as well: agriculture and trade represent smaller parts in the whole population, whereas the service sector is under-represented among new applicants. In terms of gender differences, women are also more represented than men in the production sector in the whole population, and men are slightly more represented in services but the difference is less significant in the whole population than among new applicants. Finally, trade is slightly more masculine in the whole population whereas it is more feminine among new applicants. With regard to agricultural activity, there is no available information disaggregated by sex in the last study by the Ministry of Agriculture.

Concerning the geographical repartition of economic activity in Tunisia, according to 2014 national census, 71,9%²⁸ of the employed labor force is located in communal areas, with high

²⁸ Data retrieved from the INS online database of 2014 national census.

regional disparities: 68% of the employed labor force is indeed concentrated in North-East (43,2%) and Center-East (24,6%), especially in services, production and trade. The employed labor force in agriculture is mainly situated in non-communal areas (74,3%), and if 29,3% is concentrated in North-East, Center-West and North-West are relatively more agricultural than the other regions, with respectively 23,6% and 22,5% of the employed labor force working in agriculture in these regions, against a national average of 10,5%.

Table 4. Repartition of employed population aged 15 and over by activity sector in 2014

	Men	Women
Agriculture	11,4%	8,0%
Production	15,8%	30,9%
Trade	14,8%	9,0%
Services	57,9%	51,9%

Source: author’s calculation based on data from 2014 Tunisian census.

Note: Original data include more activity sectors. Sectors have been merged to compare with the classification used by Enda.

Production includes manufacturing industry and mining and energy industry; Services include transport, education, health, administration, construction and other services.

Since Enda has a clear targeting policy towards rural regions and disadvantaged population, it is particularly well established in Center-West and North-West with a high number of branches in these regions, and logically funds a high share of agricultural projects. Compared to other banks specialized in the funding of small enterprises, Enda is also particularly well positioned in the agricultural market: only 6,2 % of men’s projects and 4,3% of women’s projects funded by the BFPME were agricultural in 2015 (INS & UN Women, 2015).

2.4 Denied versus successful applications

Denied and successful applications differ on some specific characteristics (table 5): women, owners and married applicants in particular are more represented among successful applications, whereas younger or single applicants, as well as those creating an activity or requesting higher amounts are more often unsuccessful.

Table 5. Differences between denied and successful applications

	Denied	Successful	Diff.
Women	47,3%	61,2%	-0.139***
Age (mean)	36,9	39,0	-2.139***
Owner	76,4%	78,8%	-0.0243***
Single	35,2%	23,9%	0.114***
Married	61,8%	73,0%	-0.112***
Divorced	1,7%	1,4%	0.00270**
Widowed	1,3%	1,7%	-0.00415***
Household size (mean)	4,40	4,37	0.0333*
Creation of an activity	6,6%	2,2%	0.0436***
Requested amount (mean)	1819	1410	409.4***
Observations	20652	40701	61353

* p<0.05, ** p<0.01, *** p<0.001

Comparing with Tunisian entrepreneurs in general, Enda's policy consisting in targeting women in priority clearly appears. Indeed, according to several studies, the share of women among entrepreneurs in Tunisia is low: women would manage 19% of enterprises registered as legal entities, 23% of those registered as natural persons²⁹, and 17% of non-agricultural microenterprises (INS, 2012)³⁰. In the same way, only 6,4% of farm owners are women (Ministère de l'Agriculture, 2006) whatever the farm size, 4,2% of farm owners who had requested a credit for the on-going year were women, and 3,7% of those who effectively got a credit were women. In other words, not only are there very few female farm owners in Tunisia, but they are also less likely to request a credit and even less likely to get one. As a consequence, the high proportion of women among Enda's clients, including among those running an agricultural project, reflects Enda's policy in favor of female micro-entrepreneurs.

2.5 Additional characteristics of successful applicants' projects

Once an application is accepted, additional information about the project is included in the MFI's information system, which provides relevant insight on other differences between men's and women's businesses and economic conditions (table 6). In particular, men tend to offer physical guarantee (salary or pledging of equipment) more often than women, who rather offer social

²⁹ Data from a study on female entrepreneurship carried out by ILO and the Tunisian National Chamber of Female Entrepreneurs, which has not been published yet but whose main results were presented during a public event in Tunis in June 2015.

³⁰ Microenterprises are defined by INS as enterprises of 6 employees or less, officially registered but not necessarily keeping accounts.

guarantees implying the network of clients (either joint surety, involving a group of clients, or mutual guarantee, involving only two clients)³¹. In the same way, men's non-agricultural projects are significantly bigger in terms of fixed and current assets, monthly benefits, and more likely to be officially registered³². Regarding agricultural projects, useful areas of women's projects are smaller than men's. All these differences illustrate the existing gender inequalities in terms of access to economic resources: women cannot afford to offer the same kind of guarantees than men, as Buvinic and Berger (1990) observed in Peru, and they run smaller businesses, as found in other previously mentioned studies. Finally, male applicants' households would be richer than female ones, as expenses are higher; this could reveal that the MFI especially targets more vulnerable women.

Table 6. Additional characteristics of successful applicants' projects

	Men	Women	Diff.
All projects			
Guarantee			
Loyal client	25,4%	25,0%	0,00476
Joint surety	3,3%	5,7%	-0,0246***
Salary	43,2%	32,3%	0,110***
Parental engagement	0,9%	0,5%	0,00354***
Mutual guarantee	21,1%	31,3%	-0,102***
Own background	4,2%	4,0%	0,00198
Equipment pledging	1,9%	1,2%	0,00701***
Financial characteristics			
Fixed assets (TND)	12916	4945	7971,2***
Current assets (TND)	3452	2029	1422,4***
Household monthly expenses (TND)	528	489	39,03***
<i>Observations</i>	<i>16134</i>	<i>25248</i>	<i>41382</i>
Non-agricultural projects			
Official registration (yes or no)	37,2%	12,4%	0,249***
Monthly benefit (TND)	923	452	470,9***
<i>Observations</i>	<i>10227</i>	<i>17233</i>	<i>27460</i>
Agricultural projects			
Useful farming area (ha)	2,4	1,5	1,9***
<i>Observations</i>	<i>4453</i>	<i>6490</i>	<i>10941</i>

* p<0.05, ** p<0.01, *** p<0.001

³¹ In the following analyses, the various types of guarantees are gathered in three categories: reciprocal guarantee (joint surety or mutual guarantee), unique guarantor (loyal client, parental engagement or own background) and physical collateral (salary or pledging of equipment).

³² Monthly benefits and official registration are information which is only available for non-agricultural projects, whereas the useful area concerns only agricultural projects in the information system.

Comparing with Tunisian micro-entrepreneurs in general is delicate, since the last INS study on microenterprises is biased by the presence of an untypical and very profitable microenterprise managed by a woman in financial services in the sample (INS, 2012). Nonetheless, considering only microenterprises in industry (or production), the study reveals that microenterprises managed by women secure gross surpluses representing on average 62% of those secured by male micro-entrepreneurs. The projects managed by Enda's female clients are relatively a bit less profitable, since their monthly profits represent on average 48% of those of men's projects. Concerning agricultural projects, gender inequalities among Enda's clients tend to correspond to what may be observed for Tunisian farm owners in general: female farm owners, who represent only 6,4% of all owners, are relatively more represented in small farms than men, since they represent 10% of farm owners with no land and only 1,5% of those with lands of 100 ha or more (Ministère de l'Agriculture, 2006). If female farm workers are actually far more likely to be family helpers than owners, since they represent 57% of all family helpers, they are still relatively more represented in small farms even with this status, since they represent 60% of family helpers in farms with no land and 40% of helpers in farms of 100 ha or more.

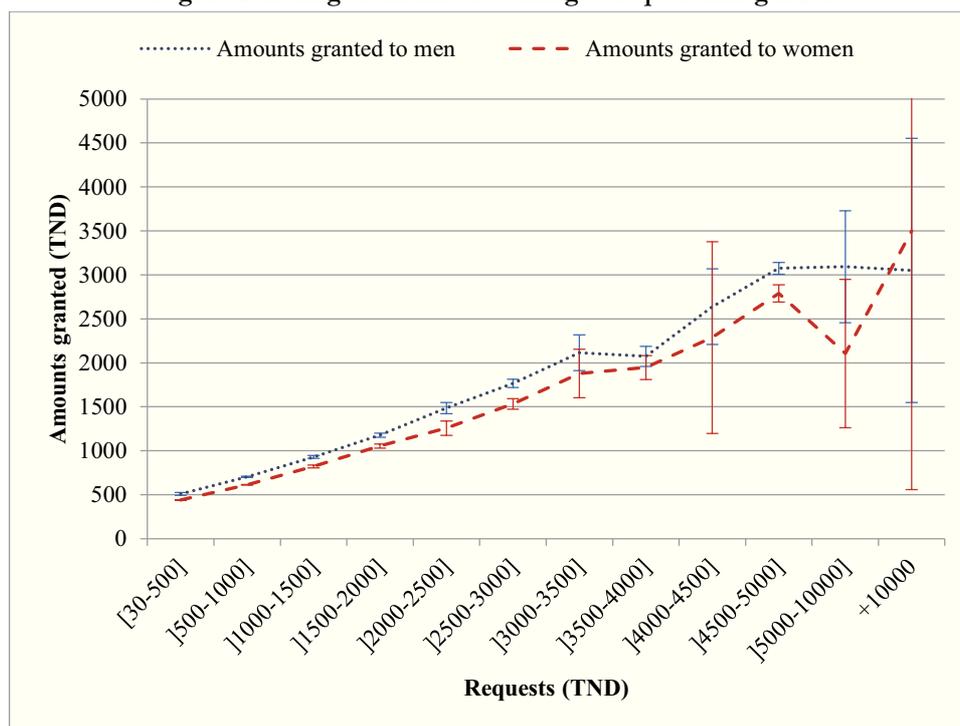
2.6 Risk aversion

Finally, men's and women's requests are significantly different: men requested 1978 TND on average against 1216 TND for women, with more variability for men; looking at successful applicants only, men requested 1832 TND on average against 1142 for women. As women's businesses tend to be smaller, it is impossible to know at that point if this gap may be entirely explained by differences in projects or if women have different preferences and are more risk averse. This gap between amounts requested could at least partly explain the gap between amounts granted to men and women (table 7), but the fact that the gap increases with the amount requested (figure 6) implies that other factors may play a part. Concerning these amounts granted, in 2014, Enda was still constrained by its NGO status to respect a ceiling of 5000 TND (about 2550 USD), the minimum amount to be granted being 200 TND.

Table 7. Requests and loan size by gender

	Requests (TND - all applications)		Requests (TND - successful applications)		Loan size (TND)	
	Mean	Std. Dev.	Mean	Std. Dev	Mean	Std. Dev
Male applicants	1978	1628	1832	1484	1182	1032
Female applicants	1216	1134	1142	1030	733	652
All	1548	1422	1410	1272	907	849

Figure 6. Average loan size according to request and gender



2.7 Credit officers

Among all applications, 65,4% have been processed by male credit officers, which is representative of the overall staff distribution within Enda, as 64% of credit officers are men in total. With regard to portfolio specialization, there is a gender effect at some levels only (table 8). If female officers tend to deal slightly more often with female applicants, the difference is not economically significant though, as 56% of applications processed by men were made by women against 57,7% for female officers. Then, the difference is not statistically significant between the proportions of applications accepted by male and female credit officers. There is no statistically significant difference either between average amounts requested from or granted by male and female credit officers. This tends to show that female credit officers do not deal with smaller scale applications. However, there is a gender specialization in terms of activity sector, as men are more likely to deal with agricultural projects compared to women, who conversely deal more often with projects in production, trade or services sector. In the same way, women deal relatively more often with requests dedicated to working capital whereas men are more likely to deal with requests for investments or activity creations. As previously explained, credit officers are responsible for specific geographical areas, hence they are at least partly constrained by the local demand; in particular, branches are usually located in the center of an urban area, and the trend within Enda is to assign female officers with the closest sub-areas to the branch, whereas male officers tend to be

assigned with remoter sub-areas. Consequently, male officers are more likely to be assigned with more rural sub-areas, which are usually further away from branches, even though this is not systematic. When officers are asked about this assignment pattern, some account for it saying that it is more tiring for female officers to walk a greater distance. Some others more convincingly explain that women are more constrained in terms of mobility, since it may be considered more dangerous and/or less socially acceptable for women to take a taxi or collective transport alone in remote rural areas. Some also mention that in these areas, it is more complicated for a woman to knock at a male client's door to claim credit repayment. Nonetheless, this is only a trend, and some female officers are effectively assigned with rural sub-areas and do serve clients with agricultural projects, either male or female. The econometric analysis should help analyze the officer gender effect more accurately.

Table 8. Specialization of officers by gender

	Male officer	Female officer	Diff.
Women	56,0%	57,6%	-0,0168***
Application accepted	66,3%	66,2%	0,000644
Amount requested	1541	1550	-9,353
Amount granted	907	908	-0,537
Activity sector			
Agriculture	46,1%	25,8%	0,203***
Production	13,8%	19,3%	-0,0551***
Trade	26,9%	38,2%	-0,113***
Services	12,1%	15,4%	-0,0327***
Consumption	1,1%	1,3%	-0,00210*
Loan use			
Working capital	67,7%	77,4%	-0,0974***
Investment	10,4%	7,8%	0,0264***
Creation	4,1%	2,9%	0,0121***
Observations	39570	20915	60485

* p<0.05, ** p<0.01, *** p<0.001

IV. MODELS AND RESULTS

The aim of the study is to check if gender-based loan-quantity or loan-size rationing is observed when applicants request their first microcredit, which means focusing first on the probability to see one's application accepted, and second on the amount granted if the application was successful. These two phenomena correspond to the two steps of the microcredit granting process. However, they both depend on the amount requested by the applicant, which is the prior step.

1. Requests: do women have different risk preferences?

This question is all the more important as a huge segment of economic literature aims at analyzing gender differences in preferences, especially concerning risk aversion, whether in the financial field or not. As stated by Croson & Gneezy (2009) in their review of experimental studies on this question, most lab and field experiments indicate that women are more risk averse than men, with some exceptions though. The most important exception mentioned by the authors concerns the professional and managerial population, among which financial risk preferences are often nonexistent (see for instance Atkinson, Baird, & Frye (2003) on fund managers, and Masters & Meier (1988) or Birley (1989) on managers of small businesses and entrepreneurs). Additionally, Finucane, Slovic, Mertz, Flynn, & Satterfield (2000) find a gender difference in risk-taking among white people but not among other ethnic groups, which leads them to talk about the "white male effect". This implies that culture is also likely to bias risk preferences, and maybe gender differences in these preferences.

As a consequence, examining the amounts requested by new applicants seems relevant since the existence of a gender gap all other things being equal may reveal gender differences in risk preferences.

The first issue arising to carry out such an analysis is selectivity. The first selection bias concerning the individual decision to request a loan cannot be corrected. It could be an issue though, especially because as already explained, this individual decision may be spontaneous or may result from a preselection undertaken by officers on the basis of information provided by other source clients. If such a selection bias exists for both men and women, there is no guarantee that spontaneous requests are driven by the same factors for men and women, or that officers refer to the same kind of information before attempting to sell microcredits door-to-door to male and female potential clients. This issue should be kept in mind to interpret next results.

The second issue is that some crucial information is not available for all applicants in the database. Indeed, as previously explained, the various steps of the application process imply that financial information is not available in the dataset for applicants rejected. However, such information reflects project size, and is very likely to be linked to amounts requested. Consequently, amounts requested are examined for all applicants first in order to have an overview, and then for successful applicants only with additional available information, to get a more accurate understanding of factors determining requests. Moreover, this additional information differs according to the type or credit granted (agricultural or not), therefore agricultural and non-agricultural loans are analyzed separately.

Amounts requested are estimated using equation (1) defined as follows:

$$RA_i = \gamma + a_w W_i + a'_X X_i + a_F F_i + a_B B_i + \mu_i \quad (1)$$

Where:

- RA is the amount requested in Tunisian dinars³³ by the applicant i ;
- $W=1$ if the application i was made by a woman and $W=0$ if it was by a man;
- X is the vector of control variables concerning the applicant i ;
- $F=1$ if the loan officer responsible for the application i is female;
- B is a dummy for the branch where the application i was made;
- μ_i is the error term;
- a_w, a'_X, a_F, a_B are the corresponding coefficients or vector of coefficients.

The control variables X_i include applicants' socio-demographic characteristics (age, marital status, education level, household size, number of children going to school, housing ownership or not, professional status), the characteristics of applicants' projects and economic situations (activity sector, type of use of the loan, personal contribution or not, another active person in the household or not, another client of the MFI in the household or not, or of another loan).

For successful applicants, X_i also includes current assets, fixed assets, monthly expenses and revenues, number of employees, and type of guarantee. Moreover, additional information such as monthly benefits, activity location (at home or in independent premises) and official registration (yes or no) is available for the projects funded with non-agricultural credits only (some of them may concern activities linked to agriculture though, but without necessitating specific agricultural

³³ All the analyses were also carried out by log-transforming monetary variables and results remain stable. Since residuals look normally distributed with variables in TND, this unit is preferred since coefficients are easier to interpret and since interaction terms with monetary variables are added in the following models.

credits, which especially differ in terms of repayment schedules), as well as the useful farming area for agricultural products only. This information is included to control for the project size.

The model is estimated using the Ordinary Least Squares (OLS) estimator, for all requests first (model 1a), and with an interaction term between applicant gender and officer gender (model 1b). In a third version of this model (model 1c), the dummy variable “branch” is replaced by a dummy variable “governorate” and an interaction term between “women” and the categorical variable indicating the rate of rural areas by branch, in order to identify a potential effect of more rural branches, possibly different for men and women. The model is then estimated for successful requests for non-agricultural credits (models 2a and 2b) and agricultural credits (models 3a and 3b), without (models 2a and 3a) and with (models 2b and 3b) additional information available for successful applications. The results are presented in tables 9 and 10.

The main striking result is that female applicants do request lower amounts all things being equal. About all requests first (model 1a), the gap between amounts requested by men and women appears as huge, since women request 600 TND less than men on average. Being served by a female officer does not seem to have any effect on this phenomenon (model 1b). Looking at the specific effect of rural branches (model 1c), interestingly the gap between amounts requested by men and women is reduced in more rural branches, but still remains significant though (figure 7). The examination of descriptive statistics concerning amounts requested by gender and by region reveals that indeed, the gap between requested amounts by men and women is particularly significant in Center-East, which is more urban, while more reduced in Center-West, where most rural branches can be found. The size of the gap is pulled by men’s requests, which are much higher in the first case and much lower in the second one. This result tends to imply that regional economic disparities in Tunisia seem to affect male applicants more than female ones, since there is more variability in men’s requests than in women’s. Whereas it could have been expected that women’s projects would be even smaller in more rural and disadvantaged areas such as Center-West where women are less active, these results show that it is not necessarily the case.

Table 9. Estimation of amounts requested for all requests (OLS)

	Base model (model 1a)		Interaction with officer gender (model 1b)		Interaction with rural areas (model 1c)	
<i>Socio-demographic characteristics</i>						
Women	-	(29.89)	-	(33.69)	-	(52.65)
Women# female officer	601.5***		572.3***	(51.47)	734.8***	
Rate of rural areas served by the branch (vs. <7%)					-	
7-35%					-54.31	(90.44)
35-55%					-224.9**	(93.30)
>55%					-113.9	(126.1)
Women#7-35%					45.45	(75.21)
Women#35-55%					141.4	(87.24)
Women#>55%					294.7***	(79.79)
Client's age	5.642***	(0.865)	5.677***	(0.866)	5.837***	(0.880)
Education (vs. Primary)	-		-		-	
Illiterate	-	(23.76)	-	(23.39)	-	(24.23)
Secondary	85.22***		88.78***		84.82***	
Higher	246.4***	(19.56)	247.1***	(19.44)	256.4***	(20.59)
Household size	692.0***	(44.95)	693.4***	(44.71)	703.4***	(45.93)
Marital status (vs. Married)	12.65**	(6.181)	12.66**	(6.174)	11.42*	(6.412)
Single	-		-		-	
Divorced	-11.84	(13.78)	-11.70	(13.74)	-15.13	(14.67)
Widowed	-40.58	(42.02)	-39.53	(41.90)	-26.89	(42.50)
Number of schoolchildren	-77.76**	(30.39)	-77.41**	(30.52)	-67.89**	(30.09)
Inactive	7.683	(6.139)	7.717	(6.143)	13.03**	(6.395)
Owner	-8.609	(26.64)	-7.044	(26.30)	-101.9**	(44.05)
Other client in household	92.26***	(18.58)	91.87***	(18.53)	63.37***	(22.62)
Other working member in household	-52.94*	(28.53)	-53.34*	(28.51)	-53.47	(33.36)
Other loan(yes/no)	-37.84	(28.34)	-37.58	(28.32)	4.448	(36.30)
	326.5***	(60.17)	326.9***	(60.18)	317.7***	(65.01)
<i>Project characteristics</i>						
Activity sector (vs. Agriculture)	-		-		-	
Production	-38.77	(60.30)	-36.53	(59.42)	-7.907	(62.03)
Trade	121.8***	(39.60)	122.2***	(39.53)	134.8***	(40.16)
Services	565.1***	(51.11)	564.2***	(51.22)	591.1***	(52.88)
Consumption	-	(65.51)	-	(65.32)	-	(72.02)
Not documented (ND)	460.4***		459.8***		454.6***	
Credit use (vs. Working capital)	254.4***	(69.52)	254.6***	(69.28)	275.2***	(72.66)
Agricultural campaign	-		-		-	
Investment	180.9*	(94.44)	181.6*	(94.40)	132.2	(89.36)
Creation	206.1***	(32.12)	205.6***	(32.14)	149.8***	(48.34)
Other	1245***	(87.93)	1,246***	(88.06)	1256***	(93.68)
Personal contribution	-39.08	(40.18)	-39.30	(40.05)	-89.75*	(50.16)
	3.821	(43.89)	4.083	(43.84)	-22.77	(47.80)
<i>Environment</i>						
Female officer	-59.13	(43.92)	-10.58	(67.57)	317.7***	(65.01)
Branch dummies included	yes		yes		no	
Governorate dummies included	no		no		yes	
Constant	1860***	(64.34)	1844***	(65.89)	1907***	(93.29)
Observations	60485		60485		60485	
Adjusted R-squared	0.213		0.214		0.198	

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 7. Predicted request by gender and type of branch (95% CI)

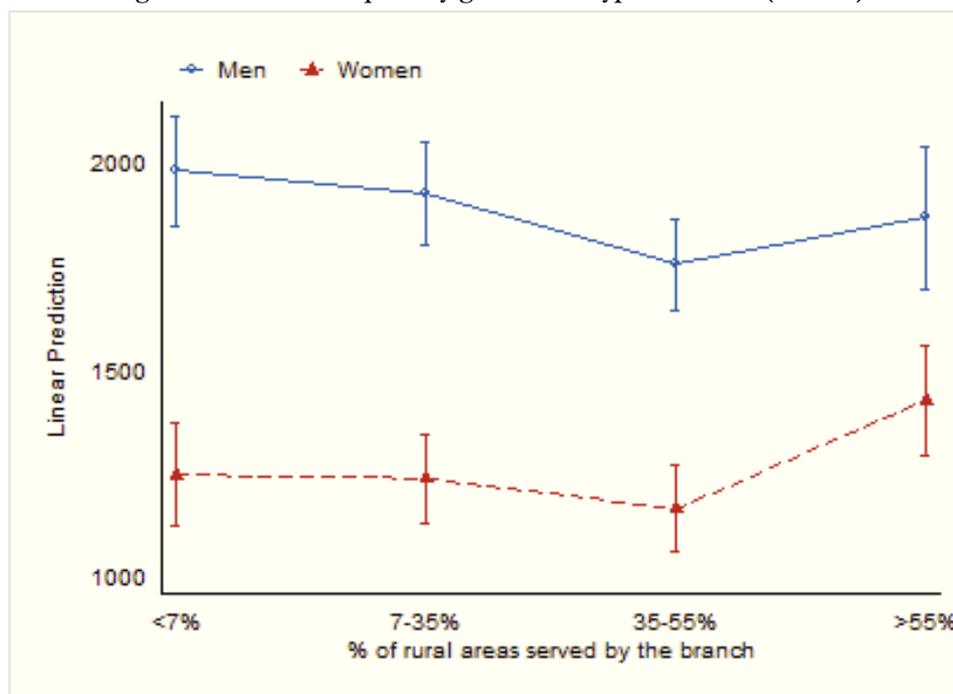
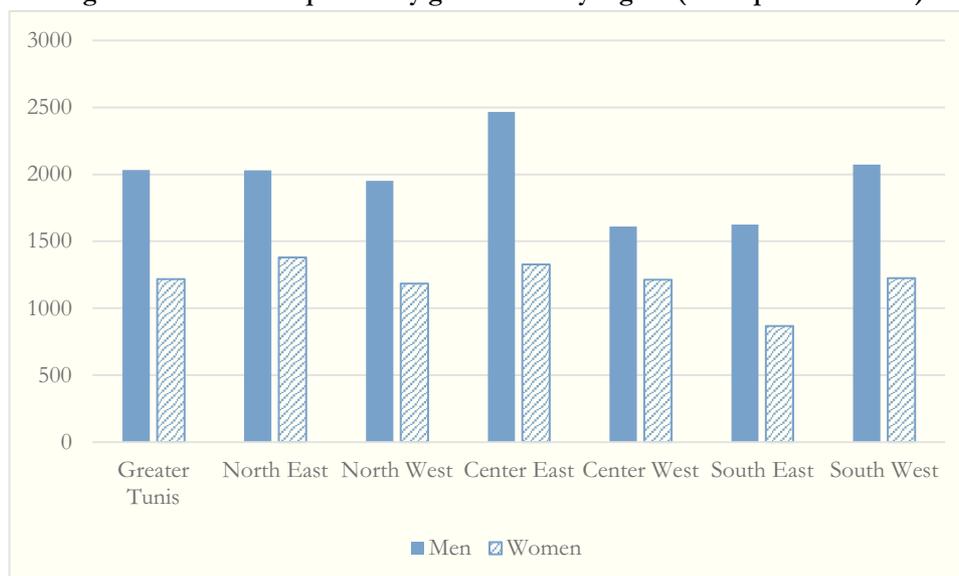


Figure 8. Amounts requested by gender and by region (descriptive statistics)



Considering successful requests only (table 10), controlling for financial information about households and projects makes the gender gap significantly decrease, especially for non-agricultural projects. The gaps still remain substantial though, with -195 TND on average for non-agricultural loans and -169 TND for agricultural ones. This shows first that financial information is indeed determining to estimate amounts requested, and second that female applicants do seem to have

different risk preferences from male ones, which is consistent with what Agier & Szafarz (2013b) find, but not with what studies quoted by Croson & Gneezy (2009) reveal on managers. However, it is not possible to know at that point if such a gap reflects women's higher risk aversion, or better needs assessment. Indeed, as Croson & Gneezy (2009) summarize in their review of experiments, if both men and women are often found overconfident, men generally appear more overconfident in their success in uncertain situations than women, and tend to view risky situations relatively more as challenges rather than threats compared to women. In the case of new applicants to microcredit, loan officers in this MFI often mention the tendency of male clients to overestimate and/or inflate their financial needs for their projects while underestimating domestic expenses³⁴. Some officers also mention that men are more likely to anticipate that a negotiation will be necessary to get a certain amount, and then deliberately inflate their requests in order to get at least a part of it. On the contrary, female applicants would be more aware of their households' expenses and would be less likely to engage in negotiation games. As a consequence, if the gap observed between amounts requested by men and women is likely to reveal some gender difference in preferences, it remains impossible to conclude that it is due to women's higher risk aversion, men's higher overconfidence, different requesting strategies, or a combination of all these. This question would deserve to be deepened in future works.

Finally, it should not be forgotten that this gap could be also due to a selection bias: first, male and female potential clients who censor themselves by not even requesting a loan may have different kinds of profiles. Enda is particularly identified as an MFI serving women in priority, consequently women may have less hesitation in requesting a loan, even if they have less ambition for their projects, whereas men may think that they definitely need to prove high entrepreneurial skills and motivation to get a loan. With regard to door-to-door selling, it is also possible that officers deliberately preselect more vulnerable female potential clients, with less entrepreneurial culture and/or higher risk aversion, either because it is Enda's policy to serve vulnerable women, or because female potential clients with the same entrepreneurial culture and/or risk preferences as men are not so numerous: as a reminder, only 17% of microenterprises (INS, 2012) are managed by women. However, it should be emphasized that the number or share of female clients in officers' portfolios are not included in the calculation of their bonuses (more information about officers' incentives and bonuses is provided in chapter 2): indeed, so far Enda has always been reluctant to include such an indicator into bonus calculation, to prevent officers from registering women's names as clients while their husbands would be the real loan recipients. Officers explain that they

³⁴ Discussion with former loan officers working at Enda headquarters in 2014, and with employees from the marketing department.

know that serving women is one of Enda's primary objectives and that it is part of their mission. If there is no financial incentive to do it, they are supposed to be aware of this mission from the time of their recruitment: the head of Credit Department told the story of a newly recruited officer who was fired after a few weeks because his managers realized that he deeply thought that loans were not for women. She referred to this story as an exceptional error of judgement during the recruitment process, which is not supposed to happen. Therefore, officers are expected to serve a high share of female clients, even without financial incentive, which may lead them to preselect women with smaller projects and less ambition.

Moreover, the reduction of the gaps when financial information is included for successful applicants would imply that the huge gap in model 1a is likely to be due to the absence of such crucial information more than to a selection bias whereby denied female applicants would tend to request even lower amounts. However, the selectivity issue is examined in the next section.

Concerning the other determining factors of amounts requested, the effects are those expected in most cases: for all requests whether agricultural or not, being highly educated and owning one's house increases the amount, as well as planning an investment instead of using the credit for working capital and showing higher financial indicators. On the contrary, offering reciprocal guarantee with one or several other clients instead of having a unique guarantor is correlated with lower requests, which would imply that applicants who do not act themselves as a guarantor are more ambitious or more confident. Finally, dealing with a male or a female officer does not have any effect on requests, including when distinguishing between agricultural and non-agricultural ones. With regard to non-agricultural loans specifically, running a project in the services sector, offering physical collateral instead of a unique guarantor, planning the creation of an activity, being registered, having independent premises and higher monthly profits are correlated with higher requests, which is logical since most of these characteristics reflect greater project size. Concerning agricultural loans, amounts requested are significantly higher for culture projects than breeding, which is also logical since culture projects are usually greater than breeding ones; they are also higher for projects with greater useful areas, and for applicants who have another loan.

Table 10. Estimation of amounts requested for successful applications (OLS)

	Non-agricultural requests (model 2a)		Non-agricultural requests (model 2b)		Agricultural requests (model 3a)		Agricultural requests (model 3b)	
<i>Socio-demographic characteristics</i>								
Women	-596.4***	(28.51)	-195.2***	(15.61)	-275.8***	(37.71)	-163.8***	(29.42)
Client's age	4.440***	(0.957)	-0.140	(0.718)	4.513***	(1.022)	0.412	(0.870)
Education (vs. Primary)								
Illiterate	-68.96**	(29.66)	-4.974	(25.26)	-99.31***	(26.00)	-55.11**	(23.65)
Secondary	231.0***	(20.31)	59.00***	(16.75)	165.0***	(26.94)	98.59***	(22.26)
Higher	522.4***	(46.65)	136.9***	(30.86)	351.7***	(68.65)	162.9***	(55.50)
Household size	7.593	(6.075)	-5.682	(5.239)	34.04***	(9.113)	13.56	(8.551)
Marital status (vs. Married)								
Single	-69.13***	(19.45)	-42.08**	(16.96)	19.52	(28.47)	-52.96**	(24.14)
Divorced	-34.82	(54.85)	50.73	(44.32)	-131.0**	(60.06)	-93.75	(57.84)
Widowed	-64.64*	(34.95)	6.159	(27.09)	-119.3	(73.68)	-97.45	(65.05)
Number of schoolchildren	6.908	(7.587)	-8.269	(6.468)	-8.327	(11.59)	-5.171	(10.83)
Inactive	-72.07**	(29.89)	-1.917	(30.00)	-45.46	(67.53)	-67.83	(50.95)
Owner	77.42***	(20.15)	57.73***	(16.79)	94.84***	(24.33)	49.14**	(23.61)
Household monthly expenses (100 TND)			26.74***	(4.323)			10.91	(11.30)
Household monthly revenues (100 TND)			13.53***	(1.743)			14.64***	(4.307)
Other client in hh.	-29.73	(24.91)	-22.46	(22.48)	56.41	(61.25)	30.81	(54.39)
Other working member in hh.	-27.65	(24.81)	-43.03**	(20.25)	105.9*	(61.16)	98.64*	(53.33)
Other loan(yes/no)	437.9***	(82.73)	69.28	(74.01)	58.33	(36.12)	45.34	(34.57)
<i>Project characteristics</i>								
Sector (vs. Agriculture)								
Production	81.25**	(36.01)	34.23	(28.76)	na	na	na	na
Trade	260.1***	(26.79)	23.72	(24.66)	na	na	na	na
Services	547.1***	(38.94)	207.6***	(34.48)	na	na	na	na
Not documented (ND)	209.0***	(54.35)	49.15	(42.53)	na	na	na	na
Culture (vs. Breeding)	na	na	na	na	481.7***	(98.84)	195.0***	(61.21)
Credit use (vs. Working capital)								
Agri. campaign	39.90	(62.86)	41.85	(39.89)	111.8	(79.49)	79.23	(69.36)
Investment	184.7***	(34.91)	123.2***	(30.03)	99.29*	(59.37)	112.4**	(51.16)
Creation	127.8*	(64.26)	238.5***	(55.82)	135.8	(183.8)	-18.49	(158.7)
Other	-35.87	(36.70)	-18.94	(27.93)	10.06	(69.52)	62.28	(63.49)
Personal contribution	-71.30*	(36.64)	-99.36***	(30.42)	56.41	(61.25)	30.81	(54.39)
Collateral (vs. Unique guarantor)								
Reciprocal guarantee			-69.88***	(19.30)			-212.8***	(50.75)
Physical collateral			303.5***	(25.29)			75.47	(52.11)
Fixed assets (100 TND)			0.772***	(0.105)			0.683***	(0.0730)
Current (100 TND)			6.043***	(0.294)			5.910***	(0.707)
Monthly benefit (100 TND)			28.21***	(2.143)			na	na
Official registration			481.6***	(24.99)			na	na
Independent premises			204.2***	(21.45)			na	na
Farming area (ha)			na	na			13.25***	(4.477)
<i>Branch and officer</i>								
Female officer	-46.00	(31.30)	-37.35	(24.03)	-4.756	(60.76)	-11.41	(61.85)
Branch dummies	yes		yes		yes		yes	
Constant	1611***	(58.43)	810.2***	(53.35)	704.0***	(69.67)	813.0***	(95.99)
Observations	27140		27139		10062		10062	
Adjusted R-squared	0.179		0.421		0.243		0.377	

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

2. Access to credit: is there a gender bias in selection?

The MFI displays an official policy in favor of women, which implies that women should be favored in the selection process. The choice of considering only first loans is determining to check if it is indeed the case. The probability of being selected to receive a credit is estimated using the same full database as previously and expressed with equation (2) defined as follows:

$$P(S_i=1) = \Phi (\alpha + b_w W_i + b_A RA_i + b'_X X_i + b'_O O_i + b_B B_i) \quad (2)$$

Where:

- $S=1$ if the application i was successful and $S=0$ otherwise;
- Φ the cumulative distribution function of the standard normal distribution;
- α the intercept term;
- $W=1$ if the application i was made by a woman and $W=0$ if it was by a man;
- RA the amount requested by the applicant i ;
- X the vector of control variables concerning the applicant who made the application i ;
- O the vector of control variables concerning the credit officer responsible for the application i ;
- B the branch dummy where the application was made;
- And b_w, b_A, b_B the coefficients and b'_X, b'_O and the vectors of corresponding coefficients.

The vector X_i includes the same control variables as the first model estimated with equation (1), and O_i includes officer's gender and level of experience in years.

A probit model is used to estimate the probability for an application to be successful. Table 11 presents the marginal effects of a base model (model 4a) and of a model where the dummy variable "branch" is replaced by a dummy variable "governorate" and an interaction term between "women" and the categorical variable indicating the rate of rural areas by branch (model 4b). Table 12 presents marginal effects of a model with an interaction term between officer and applicant genders (model 5) and between female applicant and the amount requested (model 6).

Looking at model 4a, the main result is that women indeed seem to be favored all other things being equal in the selection process: their chance to see their application approved is 8 percentage points higher than men's, with an average probability of success of 69,8% for women and 61,8% for men. The probability of success is also higher for married applicants, with no

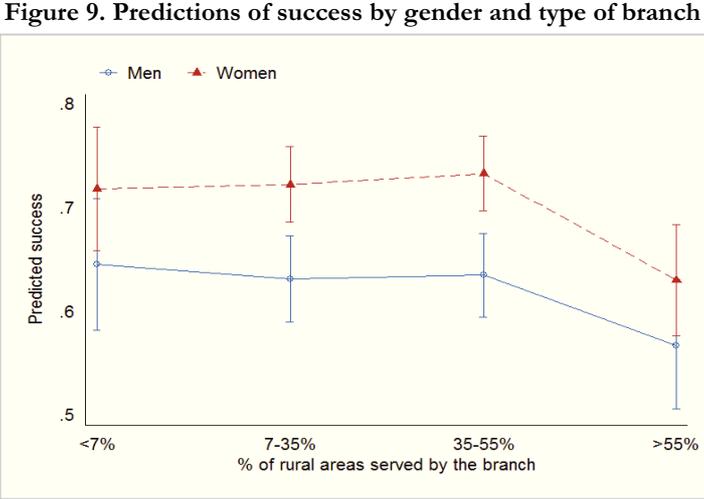
significant difference between men and women³⁵, for owners, and for applicants with more children going to school. All these characteristics correspond to the “stability criteria” which are supposed to be taken into account in the official procedure of selection in the MFI. Indeed, as previously mentioned, during the application process loan officers have to fill in various sheets with crucial information to make a decision. One of these sheets is a risk assessment sheet and consists in a summary grid where the criteria quoted above are gathered, with stability levels going from 1 to 5 to tick. This grid is then conveyed to the Risk Department at headquarters, which uses a confidential econometric model to predict risk, and then sends results presented as a color code (red, orange or green) back to officers, who are supposed to follow this code to make their decision to grant a credit or not. Financial information about households and projects are not included in the grid and hence in the prediction of risk, therefore they are not supposed to be considered in the decision to grant a credit or not. The results indicate that stability criteria are indeed respected by loan officers. Additionally, we know that “female” is correlated with less risk in the calculation of the risk score resulting in the color code; consequently the advantage of women to get a credit may come from officers’ compliance with this procedure.

Furthermore, applicants with another active member or another client in their household and those bringing a personal contribution are also more likely to see their application accepted. These characteristics also appear as securing aspects for the creditor. On the contrary, the younger applicants, the ones who want to use the loan to create their own activity, or those requesting higher amounts are more likely to be rejected. Indeed, the two latter characteristics are riskier for the MFI, especially when applicants are not known yet: there is still a high risk of moral hazard with new potential clients, this risk declining with loan renewals. However, the fact that younger applicants are considered as riskier is less easy to explain, and seems more linked to cultural aspects, as the lack of confidence in youth is often mentioned as an obstacle to entrepreneurship in Tunisia, young people having more difficulty in accessing credit (Belkacem & Mansouri, 2013). Some experts surveyed in the frame of our own qualitative study on the constraints to micro-entrepreneurship in Tunisia highlighted that young people aiming at launching a project were usually not supported, either financially or morally, by their relatives, who tend to discourage risk-taking and foster more secure options such as jobs in the public sector. According to these experts, the Tunisian society would also underestimate young people, who hence have to face low esteem and low trust, especially from banks or other professional organizations supposed to support entrepreneurial initiatives. These factors may have an impact on the quality of projects managed

³⁵ Other interaction terms between « women » have been tested and remain non-significant (with marital status and activity sector).

by young applicants to a credit from Enda, or loan officers may also distrust young people themselves.

Another interesting result is that the activity sector does not seem to have any effect on the selection process: agricultural projects are especially not more likely to be rejected whereas agriculture is often considered as riskier. This is explained by the fact that the MFI prevents such risks by offering specific financial products adapted to agricultural projects. The results of model 4b also show that branches serving more rural areas are less likely to grant credits, especially compared to branches with more balanced proportions of urban and rural areas; if women keep their advantage in all cases, it is less strong in more urban and more rural branches (figure 9).



About officer characteristics, more experienced officers seem more cautious and less likely to accept applications, whereas female officers do not seem to behave differently than their male counterparts in the selection process. Looking at model 5 gives more insight into this point: female applicants appear as equally favored by male and female officers, whereas male applicants are not more favored by male or female officers: the average probability of success remains around 69% for women and around 61% for men, whether they are received by male or female officers. This interestingly complete the previous results on gender differences in risk preferences from the analysis of amounts requested: indeed, expecting female loan officers to be more cautious and strict in the selection process would have been consistent with the existing literature showing that women are more risk averse in the financial field. However, this is not what is observed here: female loan officers are as likely as men to grant an application. Consequently, this result is more in keeping with the studies showing that there is no gender difference in risk preferences as far as professionals and managers are concerned, especially as there was no effect of officer gender on amounts requested, implying that female officers do not tend to deal with smaller or less risky applications either.

Table 11. Probability of being selected (marginal effects from a probit model)

	Base model (model 4a)		Interaction with rural areas (model 4b)	
<i>Variables of interest</i>				
Requested amount	-0.025***	(0.003)	-0.026***	(0.003)
Women	0.080***	(0.007)		
Rate of rural areas served by the branch (vs. <7%)			-	-
7-35%			-0.014	(0.032)
35-55%			-0.010	(0.043)
>55%			-0.074	(0.051)
Women#<7%			0.074***	(0.012)
Women#7-35%			0.092***	(0.012)
Women#35-55%			0.100***	(0.011)
Women#>55%			0.059***	(0.015)
<i>Socio-demographic characteristics</i>				
Client's age	0.002***	(0.000)	0.002***	(0.000)
Education (vs. Primary)	-		-	
Illiterate	-0.012	(0.011)	-0.011	(0.011)
Secondary	0.024***	(0.007)	0.023***	(0.007)
Higher	0.013	(0.010)	0.009	(0.010)
Household size	-0.006***	(0.002)	-0.006**	(0.002)
Marital status (vs. Married)	-		-	
Single	-0.058***	(0.006)	-0.060***	(0.006)
Divorced	-0.090***	(0.016)	-0.096***	(0.016)
Widowed	-0.033*	(0.016)	-0.040*	(0.016)
Number of schoolchildren	0.014***	(0.002)	0.013***	(0.003)
Inactive	0.032	(0.017)	0.004	(0.024)
Owner	0.026**	(0.008)	0.024*	(0.010)
Other client in household	0.064***	(0.013)	0.062***	(0.015)
Other working member in household	0.064***	(0.013)	0.047***	(0.012)
Other loan	0.032	(0.022)	0.036	(0.024)
<i>Project characteristics</i>				
Activity sector (vs. Agriculture)	-		-	
Production	0.015	(0.011)	0.013	(0.013)
Trade	0.008	(0.010)	0.002	(0.011)
Services	0.030*	(0.012)	0.024	(0.013)
Consumption	-0.024	(0.051)	-0.061	(0.051)
ND	-0.237***	(0.041)	-0.225***	(0.046)
Credit use (vs. Working capital)	-		-	
Agricultural campaign	-0.022	(0.016)	-0.043*	(0.020)
Investment	0.048**	(0.018)	0.055***	(0.016)
Creation	-0.171***	(0.019)	-0.176***	(0.020)
Other	0.015	(0.029)	0.032	(0.024)
Personal contribution	0.187***	(0.022)	0.187***	(0.023)
<i>Officer characteristics</i>				
Female officer	-0.009	(0.009)	0.003	(0.011)
Number of years of experience	-0.004**	(0.002)	-0.003	(0.002)
Branch dummies included	yes		no	
Governorate dummies included	no		yes	
Constant (coef)	0.179***	(0.049)	0.137	(0.121)
Observations	60485		60485	

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 12. Probability of being selected with interactions (marginal effects from a probit model)

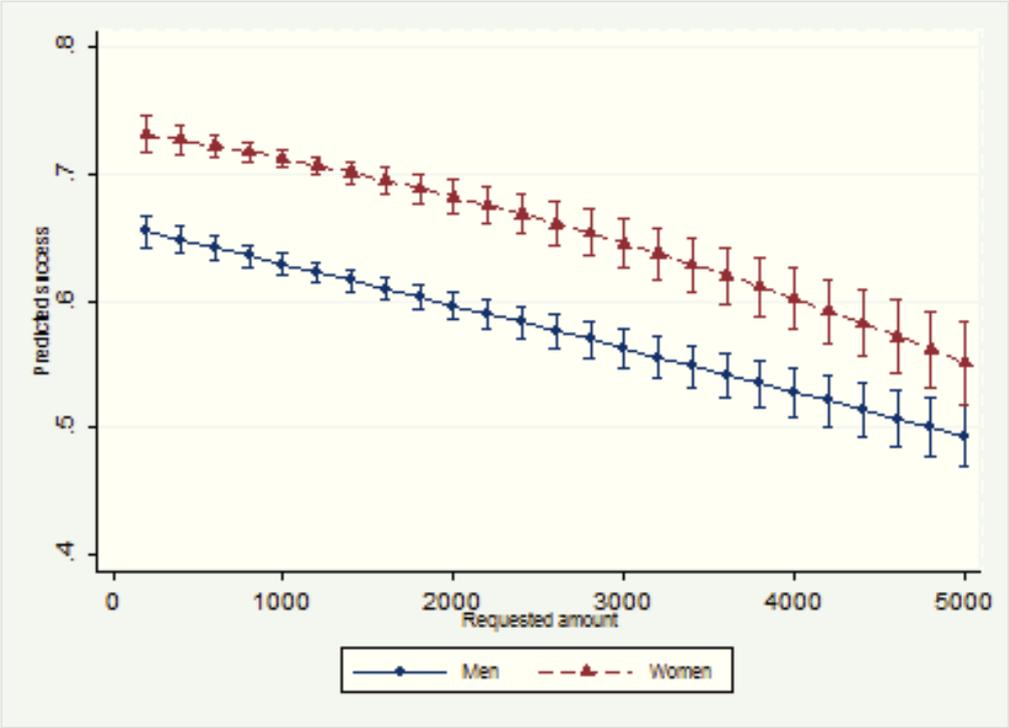
<i>Variables of interest</i>	Interaction with officer's sex (model 5)		Interaction with request (model 6)	
Requested amount (1000 TND)	-0.025***	(0.003)	-0.025***	(0.003)
Male applicant# Male officer	-			
Male applicant# Female officer	-0.015	(0.01)		
Female applicant# Male officer	0.075***	(0.008)		
Female applicant# Female officer	0.072***	(0.011)		
Women	-		0.090***	(0.01)
Women# requested amount			-0.007	(0.006)
Squared requested amount			0.000	(0)
Women# squared requested amount			0.000	(0.001)
<i>Socio-demographic characteristics</i>				
Client's age	0.002***	(0)	0.002***	(0)
Education (vs. Primary)	-		-	
Illiterate	-0.011	(0.011)	-0.013	(0.011)
Secondary	0.024***	(0.007)	0.025***	(0.007)
Higher	0.013	(0.01)	0.014	(0.01)
Household size	-0.006***	(0.002)	-0.006***	(0.002)
Marital status (vs. Married)	-		-	
Single	-0.058***	(0.006)	-0.058***	(0.006)
Divorced	-0.090***	(0.016)	-0.090***	(0.016)
Widowed	-0.033*	(0.016)	-0.034*	(0.016)
Number of schoolchildren	0.014***	(0.002)	0.014***	(0.002)
Inactive	0.031	(0.017)	0.032	(0.017)
Owner	0.026**	(0.008)	0.026**	(0.008)
Other client in household	0.064***	(0.013)	0.064***	(0.013)
Other working member in household	0.064***	(0.013)	0.064***	(0.013)
Other loan	0.032	(0.022)	0.031	(0.022)
<i>Project characteristics</i>				
Activity sector (vs. Agriculture)				
Production	0.015	(0.012)	0.014	(0.011)
Trade	0.008	(0.01)	0.009	(0.01)
Services	0.030*	(0.012)	0.030*	(0.012)
Consumption	-0.024	(0.051)	-0.025	(0.051)
ND	-0.237***	(0.041)	-0.237***	(0.041)
Credit use (vs. Working capital)				
Agricultural campaign	-0.022	(0.017)	-0.022	(0.017)
Investment	0.048**	(0.018)	0.048**	(0.018)
Creation	-0.171***	(0.019)	-0.170***	(0.019)
Other	0.015	(0.029)	0.015	(0.029)
Personal contribution	0.187***	(0.022)	0.187***	(0.022)
<i>Officer characteristics</i>				
Female officer			-0.009	(0.009)
Number of years of experience	-0.004**	(0.002)	-0.004**	(0.002)
Branch dummies included	yes		yes	
Constant (coef.)	0.180***	(0.05)	0.164***	(0.047)
Observations	60485		60485	

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Finally, model 6 specifies the negative effect of the amount requested, which appears as linear (the coefficient of the squared amount is not significant, including in interaction with “women”, giving null marginal effects) and not different for female and male applicants (figure 10). This means that requesting higher amounts decreases the probability to see their applications accepted for both men and women.

Figure 10. Predictions of success for all requests by gender and amount requested (95% CI)



As a result, men seem to face loan-quantity rationing within this MFI, which is in keeping with its official policy claiming to act in favor of women’s economic empowerment, as women usually face more constraints to access credit.

3. Loan size: do men and women receive fair credit amounts?

3.1 Base model

The last step to analyze concerns loan conditions, in particular loan size in this case. As previously explained, the decision to grant a specific amount is supposed to be mainly based on financial characteristics of the application, which are observed during the officer’s second visit. According to official procedures and to all the officers asked about this process, their decision to grant a certain amount depends on two crucial criteria: the client’s financial need on the one hand, which is assessed by officers on the basis of how the client plans to use the loan and on the project

financial characteristics, especially current assets, and monthly repayment capacity on the other hand, which is calculated using monthly expenses, monthly revenues and monthly benefit. This implies that in most cases, only a part of the amount requested is finally granted: 75% on average, with a minimum of 16% and a maximum of 166% (28% of the successful applications get the exact request and 3,3% get a superior amount); indeed, according to officers, applicants frequently overestimate their financial needs, especially when they anticipate a negotiation with officers. As a consequence, officers often grant only a part of the request. Usually, the monthly repayment capacity is used to set the number of installments, but it may also influence the total amount to grant.

All the financial characteristics which are crucial for officers to set the amounts to grant are included in the database. However, given that applicants whose loan requests were accepted were not selected at random, as the previous analysis of selection shows, it is also possible that applicants' unobserved characteristics such as ambition, self-confidence or entrepreneurial skills influence the selection as well as amounts granted. Such a selection bias, if existing, should be corrected. To do so, an exclusion restriction is identified using the selection criteria applied by the MFI, the most important criterion being stability³⁶ as previously mentioned. A high number of children going to school is particularly considered as an indicator of high stability, as it is supposed to prevent clients from running away with the money and disappearing. On the other hand, it is not supposed to influence the amount to be granted, all the more so as the household size is already taken into account in the estimation of this amount, and hence supposed to catch additional expenses inferred by a larger family. Additionally, if children going to school may infer specific expenses, these ones are also supposed to be included in the variable "household monthly expenses", included in the estimation of amounts granted. Therefore, the number of children going to school appears as an appropriate exclusion restriction, correlated with the probability of being selected but not with amounts granted another way than through household size and monthly expenses. A model including Heckman correction for the selection bias is run (appendix I.A) and reveals that the error terms of the selection equation and of the main equation are actually not correlated (ρ not significantly different from 0). This implies that there is no selection bias based on unobserved characteristics in the analysis of granted amounts. This is an interesting result in itself: it probably indicates that unsuccessful clients are very heterogeneous in terms of socioeconomic profiles and projects, some of them being likely to run small projects (the denied applications have been made by younger people, more likely to be single, who may have less support from family or relatives)

³⁶ The grid containing the list of criteria to be assessed has been made available by the MFI for this research work.

and some others running large-scale projects probably necessitating other funding than microcredit (the amounts requested in denied applications being higher and more often supposed to be used to create an activity). Besides, the main reason for rejection is what officers refer to as “bad morality”, which they assess during their visits to applicants’ homes and their investigation in the neighborhood: applicants having problems with alcohol, who are violent, who are known to be indebted to several persons without repaying, or who show bad repayment behavior with invoices are considered as of “bad morality”. Such applicants have all chances to see their requests rejected, however bad morality is not necessarily related to applicants’ project size. As a consequence, specific characteristics of denied applications may have had contradictory effects on amounts granted if they had been successful, which could explain the non-significant effect of selectivity.

As a consequence, amounts granted may be predicted with the following linear regression model estimated by OLS:

$$GA_i^* = \beta + c_w W_i + c_A R A_i + c'_Z Z_i + c'_O O_i + c_B B_i + \varepsilon_i \quad (3)$$

With:

- GA_i^* the amount granted observed only for successful applicants;
- Z the vector of control variables concerning the client i ;
- c_w, c_A, c_B the coefficients and $c'_Z; c'_O$ the vectors of coefficients;
- ε_i the error term.

The vector Z_i includes the same elements as X_i in equation (2) as well as additional information which is available only for successful applicants. These additional elements are current assets, fixed assets, monthly expenses and revenues, number of employees and type of guarantee. Moreover, additional information such as monthly benefits, activity location (at home or in independent premises) and official registration (yes or no) is available for the projects financed with non-agricultural credits only, as well as the useful farming area for agricultural products only. Consequently, the amounts of non-agricultural and agricultural credits are estimated separately.

The model is estimated on all credits first (models 7 and 11), and then on three subsamples depending on amounts (models 8, 9, 10, 12, 13 and 14). The results are presented in table 13 (non-agricultural credits) and 14 (agricultural credits).

Concerning non-agricultural loans, the main striking result is that if women do not seem to face loan-size rationing on average (model 7), they do encounter a glass ceiling: the higher the amount requested, the larger the gap between amounts granted to men and women, all other things

being equal. Yet, as previously showed, all applicants requesting higher amounts are less likely to get a credit, either male or female. Additionally, applicants requesting higher amounts are indeed a bit different from the others, since they are more likely to run a project in services sector, to offer salary as collateral, and to plan an investment or a creation instead of using the credit as working capital, but these differences apply to both men and women (table 25 in appendix 1.C) and are taken into account in the analysis. Looking at agricultural loans, this time women face loan-size rationing even on average (model 11), and the gap also keeps increasing with the amount requested. Consequently, it seems that more ambitious women are more rationed than the others. This result is in keeping with the one found by Agier and Szafarz (2013a) in Brazil, but not with the one by Corsi and De Angelis (2016) in Uganda, which implies that the context is likely to have a great influence, as discussed below.

Besides, including an interaction term between “women” and activity sector, marital status, number of children or branch rate of rural areas does not shed more light on this phenomenon, since no significant result emerges; however, including an interaction term with the region does (table 15 and figure 11): women getting non-agricultural credits especially face loan size rationing in South-West and North-East. Interestingly, these regions are not the most disadvantaged ones in Tunisia, even though they are not the richest ones either when Great Tunis is distinguished from the rest of North-East. However, North-East and especially Cap-Bon, the peninsula in far northeastern Tunisia, is considered as a conservative region in terms of traditions and culture; as a matter of fact, the officer who was fired because of his misunderstanding of Enda’s core mission towards women came from this region. In the same way, southern Tunisia in general is considered as socially and culturally conservative. On the other hand, women getting agricultural loans are more disadvantaged in Center-East than elsewhere; in this region, most active women work in industry or services, and only 3,3% of the feminine active population work in agriculture. As a consequence, it is probably much more unusual to see women with agricultural projects in Center-East than in Center-West or North-West, which are traditionally more agricultural regions, where women often work in this sector. Therefore, there may be more doubts on women’s capacity to run agricultural projects in Center-East than elsewhere.

What should also be highlighted about this gender bias is that the negative bias from the supply side is less substantial than the one from the demand side, meaning that female applicants are their main own censor; however, the results reveal that the MFI tends to emphasize this phenomenon, whereas it is expected to reduce it, as Brana (2013) highlights when finding the same results with French MFIs.

About the other determining factors, requesting a higher amount, being more educated or being married compared to being single is associated with a greater loan size, as well as showing a comfortable financial situation. Furthermore, offering physical collateral (salary or pledging of equipment) rather than a unique guarantor tends to increase the loan size for non-agricultural loans, whereas a unique guarantor is considered as an advantage compared to the reciprocal guarantee for agricultural loans. This is in keeping with what loan officers say about the various types of guarantees and associated risks: indeed, most officers asked about this point answered that a loyal client acting as a guarantor (which is the most common type of unique guarantor) is the safest guarantee, the second one being salary. None officer said that reciprocal guarantee (either with one other client or with a group) was the safest. Indeed, according to officers, a loyal client (who is defined as an active client who has already had at least 3 loans, has shown good repayment behavior, and can act as a guarantor for two other clients maximum) is supposed to know how things work at Enda and to be more convincing to make a client repay.

With regard to project characteristics, larger-scale projects logically tend to increase the amount granted, as loan size increases with fixed assets, current assets and the number of employees in all cases, and with the useful farming area for agricultural credits (model 11) as well as with monthly benefits, formal registration and location in independent premises for non-agricultural ones (model 7).

Concerning officers, the more experienced ones tend to grant higher amounts in all cases. Conversely, female officers do not seem to behave differently than their male counterparts, except those granting agricultural credits to applicants who requested high amounts: in this case, female officers tend to grant higher amounts (models 13 and 14). This again goes against the general consideration that women would be more risk averse: as far as loan officers are concerned, this is not the case here, contrary to what Bellucci et al. (2010) find in Italy. Female loan officers are comparable to female fund managers observed in previously mentioned studies.

Table 13. Estimation of loan size for non-agricultural credits (OLS)

	All (model 7)		Requests<1000 TND (model 8)		Requests>1000 TND (model 9)		Requests>2000 TND (model 10)	
<i>Variables of interest</i>								
Women	-12.12	(8.875)	-7.901	(6.663)	-58.28***	(18.21)	-101.8***	(36.10)
Requested amount	0.316***	(0.0164)	0.256***	(0.0222)	0.319***	(0.0208)	0.307***	(0.0317)
<i>Sociodemographic characteristics</i>								
Client's age	1.307***	(0.321)	0.151	(0.218)	3.287***	(0.887)	5.887***	(1.975)
Education (vs. Primary)								
Illiterate	-0.841	(10.90)	-8.728	(6.147)	-21.38	(48.76)	-120.3	(95.89)
Secondary	17.54**	(7.685)	9.278*	(4.788)	56.11***	(15.78)	100.1***	(31.63)
Higher	110.1***	(17.15)	24.23***	(8.645)	221.3***	(36.32)	343.9***	(65.85)
Marital status (vs. Married)								
Single	-19.31**	(7.403)	-3.862	(4.475)	-34.40*	(20.54)	-72.69	(44.34)
Divorced	-27.37*	(15.87)	-3.095	(8.085)	-74.44	(46.06)	-129.2	(110.0)
Widowed	3.625	(12.82)	-3.692	(7.548)	35.26	(57.52)	75.36	(166.6)
Household size	-11.39***	(1.967)	-4.028***	(1.168)	-14.36**	(5.689)	-17.26	(11.22)
Inactive	-14.39	(13.63)	-5.990	(6.520)	-26.62	(46.14)	-30.74	(107.0)
Owner	20.08***	(7.161)	7.855*	(4.347)	32.48*	(18.68)	35.15	(37.56)
Hh monthly exp. (100 TND)	14.13***	(2.642)	3.991**	(1.757)	20.36***	(4.250)	24.79***	(6.690)
Hh monthly rev. (100 TND)	5.921***	(1.248)	1.844***	(0.699)	7.968***	(2.047)	8.880***	(3.168)
Other client in household	24.75**	(10.96)	2.759	(7.502)	64.15**	(26.97)	65.77	(56.33)
Other active member	7.663	(10.12)	4.697	(5.201)	19.84	(25.66)	42.21	(50.25)
Other loan	-22.25	(37.77)	-10.86	(28.44)	-24.99	(56.38)	12.28	(93.00)
<i>Project characteristics</i>								
Activity sector (vs. Agriculture)								
Production	12.50	(12.96)	10.79	(9.633)	2.103	(35.19)	-1.231	(80.28)
Trade	-23.11*	(12.33)	0.445	(7.679)	-17.32	(31.16)	-19.55	(73.43)
Services	74.22***	(16.34)	26.99**	(11.72)	139.2***	(32.92)	218.3***	(74.74)
ND	17.12	(27.51)	25.97	(26.06)	73.02	(55.34)	128.4	(118.2)
Credit use (vs. Working capital)								
Agricultural campaign	-22.00	(23.46)	39.28	(24.89)	-159.7**	(63.76)	-295.4*	(151.5)
Investment	39.41***	(13.09)	2.476	(7.936)	89.52***	(28.61)	104.3*	(52.35)
Creation	30.25	(43.96)	21.40	(22.88)	63.58	(123.4)	-65.01	(235.8)
Other	28.67**	(12.45)	1.511	(5.611)	99.53***	(36.65)	200.2**	(85.63)
Personal contribution	54.00***	(13.78)	15.72**	(7.340)	114.5***	(31.24)	210.3***	(53.07)
Collateral (vs. Unique guarantor)								
Reciprocal guarantee	-20.73**	(8.941)	-17.34***	(4.475)	-61.10**	(23.97)	-104.0*	(54.20)
Physical collateral	49.76***	(9.726)	32.47***	(7.180)	82.18***	(20.25)	166.6***	(38.91)
Fixed assets (100 TND)	0.527***	(0.053)	0.430**	(0.198)	0.538***	(0.0597)	0.583***	(0.0726)
Current assets (100 TND)	2.392***	(0.186)	1.670***	(0.380)	2.639***	(0.218)	2.925***	(0.297)
Number of employees	12.68**	(5.799)	0.916	(1.279)	22.01*	(12.92)	17.04	(11.32)
Number of seasonal employees	0.180	(9.581)	8.417	(9.409)	30.12**	(13.21)	33.99**	(14.77)
Monthly benefit (100 TND)	11.91***	(1.087)	7.832***	(1.208)	13.98***	(1.444)	16.04***	(1.984)
Independent premises	40.40***	(10.74)	15.05**	(6.154)	88.35***	(22.32)	125.9***	(41.06)
Official registration	123.5***	(11.76)	58.46***	(12.14)	170.3***	(18.49)	261.4***	(35.84)
<i>Officer characteristics</i>								
Experience (years)	12.17**	(6.082)	1.737**	(0.674)	23.75*	(13.77)	43.56**	(19.60)
Female officer	-18.21	(11.51)	-3.140	(4.380)	-11.01	(26.54)	40.02	(47.99)
Constant	-109.0**	(44.28)	208.5***	(16.47)	-544.6***	(97.83)	-962.3***	(176.1)
Branch dummies included	yes		yes		yes		yes	
Observations	27139		10860		8871		3795	
R-squared	0.667		0.303		0.581		0.502	

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 14. Estimation of loan size for agricultural credits (OLS)

	All (model 11)		Requests<1000 TND (model 12)		Requests>1000 TND (model 13)		Requests>2000 TND (model 14)	
<i>Variables of interest</i>								
Women	-38.95***	(10.27)	-25.48***	(7.442)	-83.76***	(28.53)	-163.9**	(63.24)
Requested amount	0.332***	(0.0270)	0.330***	(0.0354)	0.310***	(0.0301)	0.242***	(0.0342)
<i>Sociodemographic characteristics</i>								
Client's age	0.508	(0.407)	0.0437	(0.483)	1.001	(1.469)	-1.600	(2.654)
Education (vs. Primary)								
Illiterate	-9.080	(11.20)	6.156	(8.981)	-55.22	(41.36)	-37.19	(70.81)
Secondary	15.92	(9.654)	9.632	(6.328)	10.35	(24.21)	-11.44	(51.50)
Higher	98.27***	(28.45)	5.392	(14.29)	167.9***	(57.35)	188.4	(113.4)
Marital status (vs. Married)								
Single	-29.70**	(12.57)	-3.507	(8.683)	-88.26**	(37.06)	-175.8**	(69.00)
Divorced	-29.30	(20.15)	-3.221	(13.73)	-116.4	(81.23)	-405.8	(254.3)
Widowed	-56.84**	(23.66)	-31.13**	(15.43)	-83.94	(85.96)	-328.7	(200.7)
Household size	-1.667	(2.040)	0.0260	(1.844)	-6.539	(5.347)	-9.740	(11.16)
Inactive	-6.999	(23.82)	-1.693	(9.161)	-28.39	(79.98)	-124.7	(218.1)
Owner	-23.19	(14.73)	-0.266	(7.316)	-48.24	(49.88)	-200.8	(136.0)
Household monthly expenses (100 TND)	0.0130	(0.0630)	0.0581	(0.0370)	-0.00138	(0.121)	0.0877	(0.176)
Household monthly revenues (100 TND)	0.0533***	(0.0200)	0.0207	(0.0148)	0.112**	(0.0473)	0.146	(0.0906)
Other client in household	36.39**	(16.96)	19.40	(16.81)	125.5***	(37.06)	266.2***	(75.09)
Other working member in household	-22.13*	(12.08)	4.546	(5.666)	-41.51	(44.37)	-169.8	(116.9)
Other loan	-18.90	(52.82)	-36.00*	(18.40)	7.588	(84.40)	35.97	(131.3)
<i>Project characteristics</i>								
Culture (vs. Breeding)	112.9***	(39.65)	23.11	(26.35)	222.0***	(53.97)	344.1***	(92.39)
Credit use (vs. Working capital)								
Agricultural campaign	43.71*	(23.27)	10.54	(7.434)	89.95*	(52.32)	82.39	(85.74)
Investment	32.29**	(15.67)	2.391	(7.669)	82.65**	(35.85)	156.5	(95.73)
Creation	13.49	(52.82)	-50.25	(45.65)	26.20	(159.5)	-79.63	(261.1)
Other	-3.289	(18.35)	4.284	(8.647)	-32.91	(73.39)	138.8	(157.4)
Personal contribution	33.79**	(12.90)	12.06*	(6.685)	53.78	(41.02)	19.43	(74.02)
Collateral (vs. Unique guarantor)								
Reciprocal guarantee	-96.06***	(23.63)	-29.21***	(8.849)	-180.5***	(40.88)	-267.4***	(92.64)
Physical collateral	-41.76	(26.56)	5.757	(11.31)	-63.95	(45.68)	-58.83	(79.89)
Fixed assets (100 TND)	0.350***	(0.0421)	0.210*	(0.125)	0.340***	(0.0460)	0.392***	(0.0574)
Current assets (100 TND)	2.66***	(0.328)	0.854***	(0.213)	4.01***	(0.489)	5.17***	(0.800)
Number of employees	50.86*	(28.74)	-6.957	(7.010)	143.1***	(53.79)	188.5*	(102.2)
Number of seasonal employees	14.20	(10.43)	1.184	(4.908)	14.70	(15.02)	7.609	(20.75)
Useful farming area (ha)	4.206	(2.850)	4.888**	(2.037)	6.614	(4.016)	8.016**	(3.791)
<i>Officer characteristics</i>								
Experience (years)	7.135**	(2.873)	0.972	(1.505)	18.70**	(7.387)	64.19***	(21.00)
Female officer	38.63*	(22.19)	-4.733	(10.82)	99.84**	(43.86)	145.2*	(82.90)
Constant	197.1***	(57.08)	315.5***	(28.92)	25.23	(114.3)	-259.2	(262.9)
Branch dummies included	Yes		Yes		Yes		Yes	
Observations	10061		3954		2935		1200	
R-squared	0.683		0.239		0.623		0.553	

Clustered standard errors in parentheses

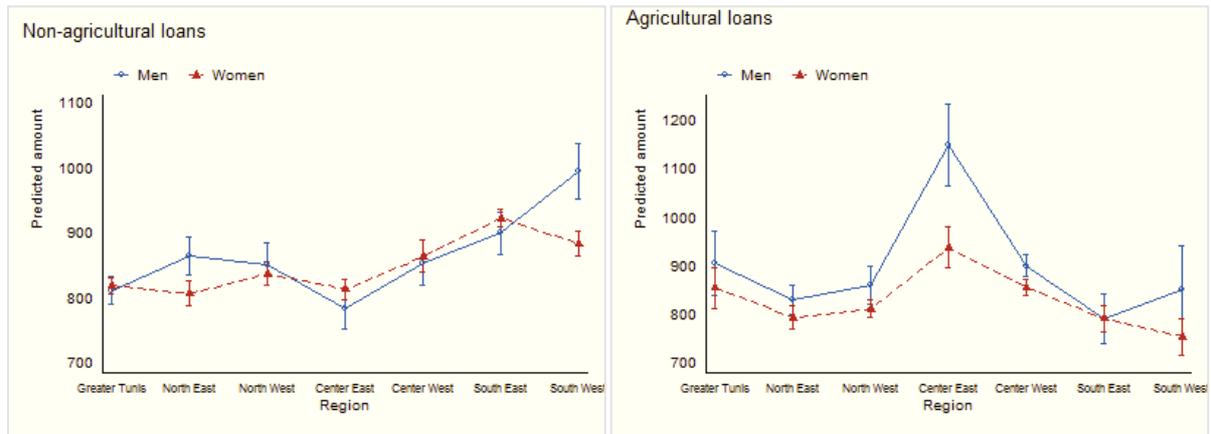
*** p<0.01, ** p<0.05, * p<0.1

Table 15. Gender bias in loan size according to region

	Non-agricultural loans		Agricultural loans	
Women	8.198	(11.87)	-53.77	(39.92)
North-East	67.73***	(18.58)	-76.78**	(36.91)
North-West	64.19***	(19.74)	-43.76	(39.82)
Center-East	-25.88	(19.65)	227.3***	(54.58)
Center-West	68.88***	(20.76)	-1.623	(36.62)
South-East	90.57***	(19.89)	-98.69**	(44.22)
South-West	193.3***	(24.72)	-42.97	(59.73)
Women#North-East	-64.72***	(20.64)	15.08	(43.44)
Women#North-West	-23.44	(21.05)	2.731	(45.05)
Women#Center-East	24.13	(20.85)	-153.8**	(60.73)
Women#Center-West	0.988	(22.75)	6.406	(42.10)
Women#South-East	17.97	(20.37)	38.64	(49.32)
Women#South-West	-119.7***	(25.96)	-58.24	(64.78)
Constant	-56.70**	(22.40)	218.0***	(45.23)
All other controls included	yes		yes	
Observations	27134		10737	
R-squared	0.651		0.638	

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Figure 11. Predictions of loan size by gender and region (95% CI)



3.2 A glass ceiling effect?

Since previous results show that the gender bias differs according to amounts requested, the phenomenon is analyzed more deeply by estimating the same models again, this time including the quadratic function of the amount requested and interaction terms with applicant gender (models 15 and 16). Moreover, since higher requested amounts are likely to reflect larger projects, the models are also estimated including an interaction term between applicant gender and the financial product granted (model 17 and 18). Indeed, the financial product granted is supposed to be adapted to the project size; in particular, a specific product is dedicated to income generating activities, which are smaller-scale projects, and another one to micro or very small enterprises, which are larger-scale projects; therefore, the financial product granted appears as a proxy of the project size. Only the main results are presented in tables 16 and 17, even though all control variables were included as in previous models.

Table 16. Gender bias in loan size according to amounts requested

	Non-agricultural loans (model 15)		Agricultural loans (model 16)	
Requested amount	0.415***	(0.0363)	0.479***	(0.0335)
Women	222.4***	(34.77)	100.4***	(24.88)
Women# requested amount	-0.247***	(0.0428)	-0.131***	(0.0325)
Squared requested amount	-1.19e-05*	(6.51e-06)	-1.88e-05***	(4.08e-06)
Women # Squared requested amount	3.51e-05***	(8.85e-06)	7.59e-06	(6.79e-06)
Constant	-243.3***	(53.06)	-22.84	(54.73)
All other controls included	yes		yes	
Branch dummies included	yes		yes	
Observations	27139		10739	
R-squared	0.672		0.684	

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 17. Gender bias in loan size according to project size

	Non-agricultural loans (model 17)		Agricultural loans (model 18)	
Requested amount	0.263***	(0.0145)	0.201***	(0.0198)
Income generating activities	-		-	
Women# Income generating activities	28.22***	(7.886)	-22.23***	(7.557)
Micro and Very Small enterprises	540.9***	(29.64)	1111***	(59.54)
Women# Micro and Very Small enterprises	-108.2***	(27.07)	-128.6***	(46.26)
Constant	-87.05**	(41.01)	167.6***	(42.50)
All other controls included	yes		yes	
Branch dummies included	yes		yes	
Observations	27128		10736	
R-squared	0.706		0.779	

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Looking at the effect of gender according to project size, interestingly, women who received a financial product for non-agricultural income generating activities, that is to say for smaller projects, seem slightly favored in terms of amounts granted (model 17) whereas those who received a product dedicated to non-agricultural micro or very small enterprises, that is to say larger projects, receive lower amounts than men all other things being equal. This confirms that concerning non-agricultural credits, women with larger projects face loan-size rationing. Concerning agricultural loans (model 18), women face loan-size rationing whether they run income generating activities or micro or very small enterprises, but the gap is also more substantial for larger projects. This confirms the previous results of models 13 and 14.

The analysis of the possible non-linear effect of amounts requested corroborates these results as well: if higher requests tend to increase loan size on average, this increase is less significant for women whether credits are agricultural or not (models 15 and 16). However, this positive effect of requested amounts decreases from a certain point, as the coefficient of the quadratic term is negative in both cases. There is no difference between men and women for agricultural loans concerning this effect, which means that the relationship between amounts requested and granted looks concave for men in all cases and for women’s agricultural credits, whereas it is convex for women who got non-agricultural loans, who see the size of their loans finally increase with higher amounts requested. However, this late increase does not enable them to catch up with men in terms of amounts granted, as graphic representations show (figures 12 and 13).

Figure 12. Predictions of loan size for non-agricultural credits by gender and amount requested (95% CI)

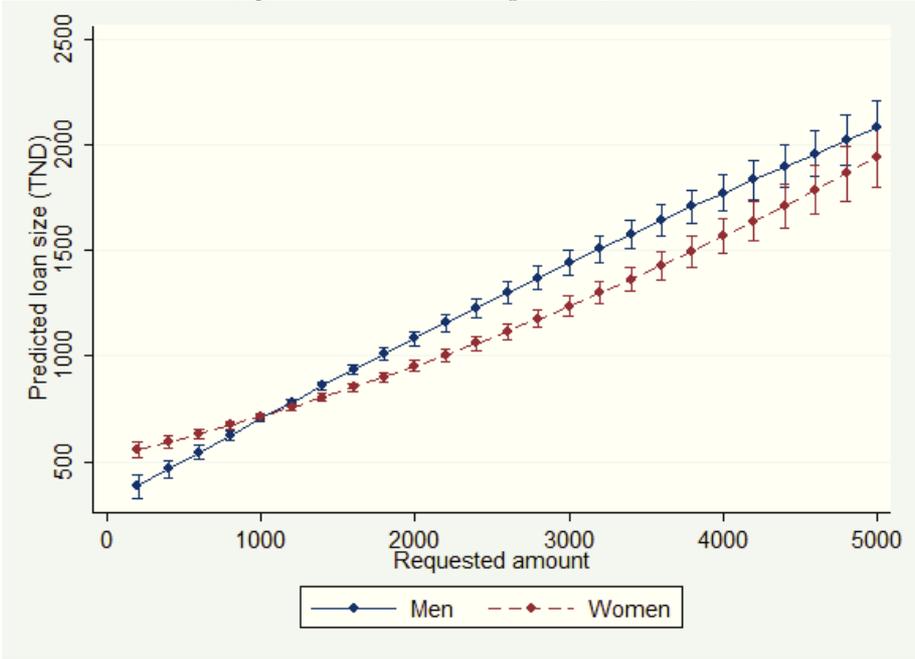
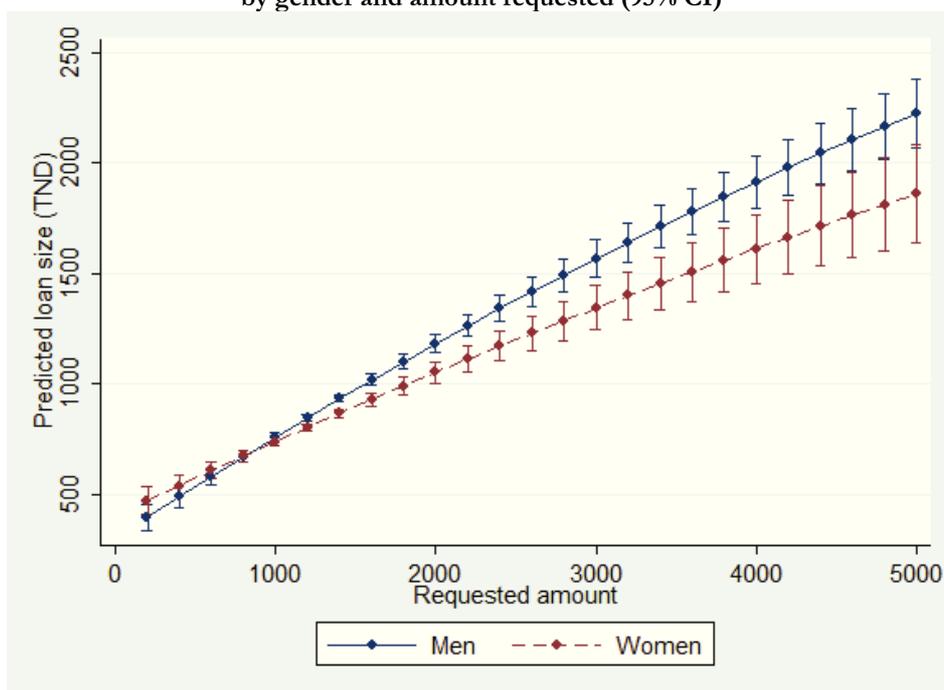


Figure 13. Predictions of loan size for agricultural credits by gender and amount requested (95% CI)



Considering the predicted coefficients in these models, amounts granted to men become higher than those granted to women from amounts requested equaling or above 767 TND for agricultural credits, which represents 67 % of agricultural credits, and from amounts requested equaling or above 1059 TND for non-agricultural credits, which represents 33% of non-agricultural credits.

As a consequence, it seems that if the MFI effectively applies a policy in favor of women regarding access to credit, women who got access to credit are not necessarily advantaged in terms of loan size, as those who request higher amounts are increasingly rationed. This result is in keeping with the one found by Agier & Szafarz (2013a) on Brazil, as in both cases, women face loan-size rationing and the ones requesting higher amounts tend to be even more rationed. This goes against the findings of Corsi & De Angelis (2016) on Uganda though.

3.3 A gender bias among officers?

Finally, the effect of officer gender is analyzed by including new interaction terms between applicant and officer genders. The results of interest are reproduced in table 18.

Table 18. The effect of officer gender

	Non-agricultural credits				Agricultural credits			
	All	Requested amounts >1000 TND		All	Requested amounts >1000 TND			
Requested amount	0.316***	(0.0164)	0.319***	(0.0208)	0.329***	(0.0270)	0.303***	(0.0333)
Male applicant # Male officer	-		-		-		-	
Female applicant # Male officer	-7.033	(11.32)	-50.48**	(22.52)	-56.32***	(11.21)	-131.5***	(29.01)
Male applicant # Female officer	-9.800	(20.81)	-3.201	(32.82)	40.03	(34.98)	84.10	(58.37)
Female applicant # Female officer	-30.01**	(11.92)	-72.04***	(26.60)	-18.24	(20.98)	-15.74	(51.49)
Constant	-112.3**	(43.93)	-548.3***	(97.12)	146.5**	(62.66)	-48.16	(117.8)
All other controls included	yes		yes		yes		yes	
Branch dummies included	yes		yes		yes		yes	
Observations	27139		8871		10739		3198	
R-squared	0.667		0.5811		0.674		0.605	

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The most striking fact is that the effect is heterogeneous according to the type of credit. For non-agricultural credits, the negative bias towards women comes from female officers, who tend to grant lower amounts to female applicants compared to the baseline, which is male applicants received by male officers, whereas they do not grant lower amounts to men, and male officers do not seem to treat differently male and female applicants, at least on average. Looking at applicants who requested more than 1000 TND, the negative bias against women still mainly comes from female officers but male officers also tend to grant lower amounts to women. Conversely, the negative bias against women for agricultural credits comes from male officers who grant lower amounts to women than men, both on average and for high amounts requested, whereas female officers neither seem to disadvantage women, nor to grant lower amounts to male applicants compared to their male counterparts.

This is again in keeping with the idea that female loan officers are not more risk averse than male officers: indeed, men's projects are considered as riskier in this MFI, as men tend to show worse repayment behaviors and more likely to default (see chapter 3). As a consequence, if female officers were more risk averse than their male counterparts, they would grant lower amounts to men compared to male officers, which is not the case here. On the contrary, although female clients are considered as less risky, female officers dealing with non-agricultural credits grant them lower

amounts. In the same way, whereas agricultural projects are usually considered as riskier than projects in other sectors, female officers do not tend to grant lower amounts than their male counterparts in this field either.

To sum up the gender bias among officers, whereas there was no gender effect in the selection process as female applicants were equally favored by male and female officers, there is a heterogeneous effect on amounts granted: female applicants are particularly disadvantaged by female officers for non-agricultural credits, and by male officers for agricultural ones. In short, if they are not disadvantaged in all cases, they are never advantaged either, whereas a kind of female solidarity could have been expected. As a consequence, this result seems to confirm another outcome of the literature on gender differences in risk preferences: as stated by Eckel & Grossman (2008), whether or not there is a significant gender difference in risk preferences, it is possible that there is in any case a perception of greater risk aversion among women. In their experimental study, the authors find that women are perceived as more risk averse than men, by both men and women. Moreover, both men and women overestimate others' risk aversion, and the error is greater when predicting for women than for men. As a consequence, both men and women use stereotypes to predict others' preferences and attitudes, which were not necessarily false but exaggerated in this case, leading to errors of predictions.

In the case of loan officers, it is possible that both male and female officers do the same kind of predictions about female applicants, and use stereotypes to predict applicants' attitudes and preferences, leading to grant lower amounts to women. This is discussed at greater length in the next section.

3.4 Robustness checks

A potential issue in our model concerns the possible endogeneity of amounts requested, which could result from an omitted variable bias: indeed, some specific individual characteristics, such as self-confidence or ambition, are not observed but could have an influence on both amounts requested and granted, if not on selection. To test and deal with this possible issue, a model consisting of three equations is defined following Wooldridge's method (Wooldridge, 2010): it is based on the instrumentation of requests by average requests in 2013 at the branch level, in the selection equation and the estimation of loan size, while correcting the possible selection bias and allowing all error terms to be correlated. The model, the tests of the instrument and the results are presented in appendix I.B.

Using Two-Stage Least Squares estimator (2SLS) first to test the instrument in the estimation of loan size, without taking into account a possible selection bias, shows that the instrument seems correctly chosen, since the null hypotheses of under-identification and weak identification tests are rejected. The negative bias against women in terms of amounts granted still appears using this method and is even stronger for non-agricultural credits. The endogeneity issue is also confirmed by the endogeneity test. As a consequence, this first robustness check confirms the results found with OLS, which could be even underestimated for non-agricultural credits.

Using the final model with three equations to include the selection equation, the non-significance of the correlation coefficients of the error terms for agricultural credits tends to imply that such a model might be inappropriate in this case, and that simple OLS or 2SLS are more reliable. For non-agricultural credits, the significance of the three correlation coefficients implies that such a model seems relevant in that case, and the negative bias against women in terms of amounts is stronger and significant. Consequently, our results seem robust, if not underestimated for non-agricultural credits.

V. DISCUSSION

1. Loan-size rationing and statistical discrimination

The results of the estimation of loan size reveal that female applicants tend to be disadvantaged and face a glass ceiling in terms of amounts granted all other things being equal, especially the financial characteristics which are supposed to influence loan size. However, female clients in this MFI are similar to female clients observed in other studies on microfinance in the sense that they show better repayment rates and are less likely to default (see chapter 3). As a consequence, objective characteristics fail to fully explain the gap observed, and women seem to encounter discrimination through loan-size rationing.

The question arising concerns the nature of this discrimination. Indeed, discrimination has been economically theorized in two main ways, the two main models of discrimination referring to “taste-based” discrimination and “statistical discrimination”. Originally, the need for theorizing this concept came from what was observed in the labor market, with Gustav Cassel being the first economist raising the question in 1918 why women receive lower wages than men while doing similar work (Cain, 1986). Later, other demographic characteristics such as race, ethnicity or age were used to identify groups potentially receiving inequitable treatment in terms of wages, and hence being discriminated. The concept of “taste-based” discrimination was first developed by

Becker (1957): employers feeling disutility in hiring a worker belonging to a specific demographic group, and hence unequally treating this worker in terms of wage only because of this worker's demographic characteristic and not because of his/her lower productivity, are responsible for taste-based discrimination. In the taste-based discrimination model, tastes are considered as given, and market outcomes are indirect measures of these tastes. This model provides a rational explanation to the unequal wages received by equally productive groups, in a context of perfect information.

By contrast, the concept of “statistical” discrimination, originally developed by Arrow (1972, 1973) and Phelps (1972), applies to a context of imperfect information: employers do not know workers' productivity with certainty. As a consequence, they refer to an imperfect indicator of this productivity; in earlier models, this indicator is individual, such as diploma supposed to convey a signal about the worker's potential productivity (Spence, 1973). In later versions, the indicator is group-specific, and becomes the average level of productivity (known or supposed) of the group the worker belongs to. In the case of women, employers statistically discriminate them if they think that women are on average less qualified, or more likely to quit their job and/or the labor market than men, or if they consider that acquiring additional information on women is too costly, and consequently pay women less or provide them with lower-quality jobs (Havet & Sofer, 2002). In this model, employers refer to stereotypes on a specific group to make decisions concerning individuals; if these stereotypes appear to be false, this model actually corresponds to taste-based discrimination, since stereotypes become a way to explain tastes. If these stereotypes are true (or have become true especially because of discrimination itself, as conceptualized by Coate & Loury, (1993) and Farmer & Terrell (1996)), that is to say if women are indeed less productive on average, discrimination becomes economically rational, but still deserves to be referred to as “discrimination”, because stereotypes based on average characteristics will disadvantage all woman, including those who are more qualified and who plan a long professional career (Havet & Sofer, 2002).

With regard to applicants to microcredit, given that the applicants under study are new applicants, the information asymmetry is substantial for loan officers and is likely to affect the loan contracts they offer. Acquiring all the necessary information to predict the way applicants will run their projects and their success would be too costly for officers, if not impossible given the uncertainty of future. Hence, officers are in a situation of imperfect information, and the discrimination female applicants face is most probably due to officers referring to clients' average characteristics to make their granting decisions. As a consequence, such discrimination is at least statistical. Indeed, loan officers know from their experience that on average, female clients are less educated, tend to run smaller projects, and usually run projects which remain complementary

resources for their households, whereas men's projects are more often the main source of revenues. They probably also know that women still take care of a large part of domestic labor and child care, and they may even anticipate that women are more risk averse with regard to finances, leading them to estimate that it may be preferable to grant lower amounts to women. In other words, officers' referring to gender-based stereotypes is a likely explanation for the gap observed. The applicant gender appears as a signal in the sense of Spence (1973), indicating fewer needs and/or fewer resources and abilities and/or lesser ambition in the case of women. This would especially explain that the most ambitious women are the most rationed ones, that is to say the "glass-ceiling" effect: indeed, women with small projects correspond to the stereotype whereby women run projects only to complement their household's revenues; by contrast, women with greater projects or greater ambition for their projects do not correspond to this image, and are more likely to suffer from it. In the same way, women running agricultural projects are particularly rationed in a region where very few women work in the agricultural sector compared to elsewhere; as a consequence, these women probably distinguish themselves from the typical female client or active woman in the region, and are also more likely to suffer the consequences of the doubts officers may have about their abilities or simply about the difficulties and obstacles they will have to face to run their projects.

If these stereotypes prove to be true, the discrimination encountered by women is indeed statistical, and officers' behavior could be considered as rational; however, just as in the labor market, even in this case this would still remain discrimination, as women's average characteristics would be used to anticipate the way individual women would run their project, including the most ambitious ones planning to invest more time and resources in their project. As stated by Phelps (1972, page 661), "discrimination is no less damaging to its victims for being statistical. And it is no less important for social policy to counter."

However, concluding about the truthfulness of stereotypes may sometimes be tricky: the general observation may be true but its magnitude may be exaggerated, as found by Eckel and Grossman (2008) on women's risk aversion. In the case of female applicants or clients, they may have less ambition, or less time to invest in the project or less access to resources, but the difference with men may be not as substantial as officers imagine it. Additionally, contradictory average characteristics of female clients are available for officers: female clients do run smaller projects and request lower amounts, but they also show better repayment rates and lesser propensity to default (see chapter 3), which most probably explain that women are actually favored in terms of access to credit. Officers' referring to negative average characteristics only and not considering positive average characteristics to make their decision on the amounts to grant questions the statistical

nature of discrimination. In practice, distinguishing statistical from taste-based discrimination may prove difficult, especially when the rationality of agents' behavior is only limited. This subject is more deeply broached in chapter 2.

2. Heterogeneity of results across countries

The fact that our results are similar to those found by Agier and Szafarz (2013a) in Brazil but not to those of Corsi and De Angelis (2016) in Uganda implies that such women's loan-size rationing strongly depends on the context; more precisely, Corsi and De Angelis specify in their paper that Uganda is especially highly ranked regarding the Gender Gap Index (World Economic Forum, 2015): in 2015, Uganda was ranked 58th whereas Brazil was 85th and Tunisia 127th, this order being unchanged for several years. If women's socio-economic rights and position are more favorable in Uganda than in Brazil and chiefly Tunisia, the representations of gender roles are also likely to be different and to have different consequences on the perceptions of female microcredit applicants' needs and capacities. Gender norms are likely to be transmitted and reproduced in the microfinance sector as well, as Johnson shows in Kenya (Johnson, 2004), and to explain the gaps observed not only in supply but also in demand.

Another study by Mueller & Conway Dato-on (2013) corroborates this idea: the authors explore the links between socialized gender-roles, culture and entrepreneurial self-efficacy and find that the traditional pattern of gender stereotypes is not consistent across cultures, whereas they work on Spain and the United States, two developed Western countries which can be considered as culturally close. The authors claim for more research on how culture and related gender stereotypes may influence the development of nascent entrepreneurs; indeed, their results imply that such heterogeneity of gender stereotypes on entrepreneurship across cultures may explain the heterogeneity of consideration and treatment of female entrepreneurs across countries.

VI. CONCLUSION

In conclusion, this study reveals that gender biases exist at all steps of the microcredit allocation process. The most significant one remains at the demand side and is in keeping with the existing literature: in the Tunisian case as well, women tend to have smaller projects they run at home rather than in independent premises, projects which are less likely to be registered compared to men's. This could reflect existing socio-economic inequalities, especially in terms of access to resources, as gender differences in types of collateral seem to illustrate. On top of that, female applicants tend to request lower amounts compared to men all other things being equal, possibly revealing gender differences in risk preferences. The second series of biases concern the supply side: female applicants are indeed favored to get access to credit in comparison with men, which is in keeping with the official policy of the MFI claiming to promote women's economic empowerment. However, as far as loan size is concerned, women tend to be disadvantaged, especially when they run agricultural activities and are more ambitious: the gap between amounts granted to men and women increase with amounts requested and is more substantial in credits granted to very small enterprises compared to those dedicated to income generating activities, revealing a glass ceiling effect.

This means that if there are indeed some differences in nature and size of projects led by men and women from the beginning, as well as gender differences in risk preferences resulting in lower requests from women, these differences do not account for the entire gaps we may observe between granted amounts to men and women, even though this bias is relatively small compared to the one from the demand side. Female clients apparently suffer from discrimination by loan officers; because they are new clients, officers make their decisions in a context of imperfect information, on the basis of stereotypes. Moreover, the analysis of officer gender implies that these stereotypes are integrated by both male and female officers: all officers favor women in access to credit, but both male and female officers may grant lower amounts to women, depending on the type of credit.

Therefore, instead of correcting or compensating unequal starting points, the MFI tends to reproduce them, even slightly emphasizing them, even though it may not be done intentionally. This raises all the more questions as women represent less risky clients compared to men for the MFI in terms of late repayment or default, which could give the MFI some leeway to favor them, including with regard to loan size.

Finally, these questions are all the more important to raise as the proportion of female clients within the MFI has been decreasing for several years, and as new regulations raised the

microcredit ceiling from 5 000 TND to 20 000 TND for private companies, leading the MFI to turn into a private company. Knowing that men lead larger-scale projects, and that granting greater amounts is more profitable for any financial institution, this could lead to a double penalty for women: they could appear as less profitable clients (D'espallier, Guerin, & Mersland, 2013), and the decrease of their proportion among clients could even worsen; second, the gap between amounts granted to men and women could dramatically increase, reproducing even more unequal starting points. Then, instead of correcting inequalities as it intends to do, the MFI could be led to reproduce and worsen them. Such a growth pattern from a non-for-profit status to a commercial one is common for MFIs, which means that Enda is not the only MFI which could know such an evolution, and that many female clients are likely to be concerned.

More generally speaking, these results may also have implications for microfinance rating agencies and academic researchers: indeed, loan amounts are often used by these actors as proxies of client's level of poverty, in order to assess social performances of MFIs. If loan amounts are lower than what objective criteria would make expect, using average loan amounts as a proxy could lead to overestimating client's level of poverty and as a consequence, social performances of MFIs, let alone the fact that unequal treatments towards men and women should also depreciate the social performances' assessment.

APPENDIX I.A: THE HECKMAN SELECTION MODEL

Before estimating loan size, the existence of a selection bias was tested by defining the following model:

$$P(S_i=1) = \Phi(\alpha + b_W W_i + b_{SC} SC_i + b_A RA_i + b'_X X_i + b'_O O_i + b_B B_i) \quad (A0)$$

$$GA_i^* = \beta + c_W W_i + c_A RA_i + c'_Z Z_i + c'_O O_i + c'_B B_i + \varepsilon_i \quad (A1)$$

With equation (A0) being the selection equation, where:

- $S=1$ if the application i was successful and $S=0$ otherwise;
- Φ the normal distribution;
- α the intercept term;
- $W=1$ if the application i was made by a woman and $W=0$ if it was by a man;
- SC the number of children going to school;
- RA the amount requested in the application i ;
- X the vector of control variables concerning the applicant who made the application i ;
- O the vector of control variables concerning the credit officer responsible for the application i ;
- B a dummy variable indicating the branch where the application was made;
- And b_W, b_{SC}, b_A and b_B the coefficients and $b'_X; b'_O$ and the vectors of corresponding coefficients.

And equation (A1) being the equation of interest, a linear regression of loan size, where:

- GA_i is the amount granted to the successful application i , observed only if $S=1$ in the previous equation;
- β the intercept term ;
- Z the vector of control variables concerning the applicant who made the application i ;
- And c_W, c_A, c_G and c_B the coefficients and $c'_Z; c'_O$ the vectors of corresponding coefficients.

The control variables X_i include applicants' sociodemographic characteristics (age, marital status, education level, household size, housing's ownership or not, professional status), the characteristics of applicants' projects and financial situations (activity sector, type of use of the loan, personal contribution or not, another active person in the household or not, another client

of the MFI in the household or not, or of another loan); the control variables O_i include credit officer characteristics (gender, years of experience).

The control variables Z_i in equation (2) is equal to X_i in model A1 and differ from X_i in model A2. Indeed, as there is more information about the applicant's project in the dataset for successful applications, Z_i contains more variables in model A2. This is not the usual application of the Heckman selection correction model, however, in rare cases it can make sense to exclude elements from the selection equation (Wooldridge, 2014, Chapter 17); in the case of equation A1, these elements are not supposed to be considered at the selection step in the microcredit granting process, as they should only influence the amount to grant. Consequently, their exclusion (which is necessary as they are not observed for unsuccessful applications) should not bias the results. Both models are still presented.

The additional elements of Z_i are current assets, fixed assets, monthly expenses and revenues, number of employees and type of guarantee. Moreover, additional information such as monthly benefits, activity location (at home or in independent premises) and official registration (yes or no) is available for the projects financed with non-agricultural credits only (model A2a), as well as the useful farming area for agricultural products only (A2b).

The results of models A1, A2a and A2b are presented in tables 19, 20 and 21. In all three models, rho and lambda are not significant, meaning that the error terms of the equations are not correlated, which is confirmed by the result of the Wald test. This means that selectivity does not seem to bias the results of the estimation of amounts granted, which can be therefore carried out using OLS estimator.

Table 19. Model A1 : Estimation of loan size with Heckman selection correction (All credits)

	Loan size		Selection	
Women	-86.86***	(9.275)	0.240***	(0.0213)
Requested amount	0.467***	(0.0157)	-7.61e-05***	(8.14e-06)
Client's age	1.901***	(0.333)	0.00687***	(0.000685)
Education (vs. Primary)				
Illiterate	-6.574	(10.60)	-0.0358	(0.0318)
Secondary	48.34***	(7.797)	0.0747***	(0.0208)
Higher	229.1***	(19.89)	0.0405	(0.0294)
Marital status (vs. Married)				
Single	-6.336	(8.364)	-0.171***	(0.0188)
Divorced	-46.49***	(16.77)	-0.264***	(0.0456)
Widowed	-14.73	(14.01)	-0.101**	(0.0479)
Household size	-2.556	(1.811)	-0.0187***	(0.00555)
Number of schoolchildren			0.0417***	(0.00718)
Inactive	13.57	(16.36)	0.0960*	(0.0506)
Owner	19.06**	(9.612)	0.0782***	(0.0242)
Activity sector (vs. Agriculture)				
Production	3.272	(14.16)	0.0467	(0.0350)
Trade	9.744	(14.28)	0.0257	(0.0314)
Services	152.7***	(18.42)	0.0913**	(0.0370)
Consumption	-55.50**	(26.09)	-0.0730	(0.151)
ND	41.09	(31.86)	-0.672***	(0.117)
Credit use (vs. Working capital)				
Agricultural campaign	74.82***	(28.00)	-0.0646	(0.0487)
Investment	39.66***	(11.82)	0.150***	(0.0566)
Creation	639.2***	(69.65)	-0.484***	(0.0528)
Other	22.10	(13.74)	0.0445	(0.0881)
Personal contribution	80.91***	(14.94)	0.568***	(0.0675)
Other client in household	25.06*	(13.52)	0.194***	(0.0405)
Other working member in household	-3.967	(10.97)	0.193***	(0.0389)
Other loan	80.99*	(46.98)	0.0961	(0.0671)
Female officer	-17.55	(15.99)	-0.0260	(0.0270)
Officer's years of experience	18.42*	(10.22)	-0.0132***	(0.00504)
Branch dummies included	yes		yes	
Constant	39.20	(51.33)	0.173***	(0.0487)
	Coef.	S.e.	95% Confidence interval	
rho	0053432	.0066198	-0.0183162	.0076316
lambda	-2.764811	3.432951	-9.493271	3.96365
Observations	60485			
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Wald test of indep. eqns. (rho = 0): chi2(1) = 0.65 Prob > chi2 = 0.4196				

Table 20. Model A2a : Estimation of loan size with Heckman selection correction (non-agri)

	Loan size		Selection	
Women	-12.15	(8.889)	0.210***	(0.0226)
Requested amount	0.316***	(0.0164)	-0.000117***	(1.03e-05)
Client's age	1.306***	(0.321)	0.00692***	(0.000794)
Education (vs. Primary)				
Illiterate	-0.825	(10.98)	-0.118***	(0.0416)
Secondary	17.53**	(7.642)	0.0902***	(0.0239)
Higher	110.1***	(17.13)	0.0350	(0.0336)
Marital status (vs. Married)				
Single	-19.28***	(7.275)	-0.179***	(0.0217)
Divorced	-27.34*	(15.84)	-0.231***	(0.0478)
Widowed	3.636	(12.77)	-0.0927*	(0.0506)
Household size	-11.39***	(1.962)	-0.0182***	(0.00665)
Number of schoolchildren			0.0372***	(0.00774)
Inactive	-14.41	(13.57)	0.119**	(0.0558)
Owner	20.07***	(7.181)	0.0859***	(0.0279)
Activity sector (vs. Agriculture)				
Production	12.41	(12.57)	0.729***	(0.0820)
Trade	-23.21*	(12.04)	0.712***	(0.0801)
Services	74.12***	(15.77)	0.757***	(0.0817)
Consumption			-6.420***	(0.186)
ND	17.11	(27.45)	-0.0279	(0.145)
Credit use (vs. Working capital)				
Agricultural campaign	-21.92	(23.65)	-0.460***	(0.101)
Investment	39.39***	(13.05)	0.144***	(0.0559)
Creation	30.40	(43.76)	-0.989***	(0.0647)
Other	28.67**	(12.42)	0.00741	(0.112)
Personal contribution	53.93***	(13.39)	0.569***	(0.0769)
Other client in household	24.72**	(11.01)	0.204***	(0.0400)
Other working member in household	7.638	(10.06)	0.192***	(0.0499)
Other loan	-22.26	(37.72)	0.0541	(0.0662)
Collateral (vs. Personal network)				
Clients network	-20.73**	(8.922)		
Physical collateral	49.76***	(9.706)		
Household monthly expenses	0.144***	(0.0267)		
Household monthly revenues	0.0612***	(0.0121)		
Fixed assets	0.00545***	(0.000518)		
Current assets	0.0239***	(0.00187)		
Number of employees	12.68**	(5.787)		
Number of seasonal employees	0.180	(9.561)		
Monthly benefit	0.127***	(0.0111)		
Official registration	123.5***	(11.73)		
Independent premises	40.40***	(10.72)		
<i>Officer's characteristics</i>				
Female officer	-18.21	(11.49)	0.0150	(0.0345)
Officer's years of experience	12.18**	(6.072)	-0.0174***	(0.00624)
Branch dummies included	yes		yes	
Constant	-108.8**	(43.10)	-0.418***	(0.0930)
	Coef.	S.e.	95% Confidence interval	
rho	-0.005566	.0101087	-0.0203664	.0192537
lambda	-2.412168	4.381969	-8.829718	8.347284
Observations	47548			
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Wald test of indep. eqns. (rho = 0): chi2(1) = 0.00 Prob > chi2 = 0.9561				

Table 21. Model A2b : Estimation of loan size with Heckman selection correction (agri)

	Loan size		Selection	
Women	-58.07***	(10.49)	0.285***	(0.0380)
Requested amount	0.329***	(0.0269)	-4.09e-05***	(1.49e-05)
Client's age	0.663	(0.426)	0.00724***	(0.00110)
Education (vs. Primary)				
Illiterate	-11.41	(11.77)	-0.0111	(0.0409)
Secondary	19.46*	(10.95)	0.0165	(0.0311)
Higher	113.5***	(27.08)	-0.0825	(0.0587)
Marital status (vs. Married)				
Single	-35.90***	(12.88)	-0.191***	(0.0249)
Divorced	-31.22*	(18.63)	-0.317***	(0.0964)
Widowed	-47.99**	(21.62)	-0.112	(0.0799)
Household size	-1.413	(2.120)	-0.0154***	(0.00587)
Number of schoolchildren			0.0243**	(0.0108)
Inactive	1.894	(23.87)	0.0944	(0.0664)
Owner	-15.10	(14.28)	0.0619	(0.0423)
Activity sector (vs. Agriculture)				
Production	-26.13	(50.38)	-2.088***	(0.0836)
Trade	-11.99	(36.05)	-2.057***	(0.0703)
Services	-193.3**	(79.52)	-2.135***	(0.0984)
Consumption			-7.867***	(0.112)
ND			-7.819***	(0.151)
Credit use (vs. Working capital)				
Agricultural campaign	58.82***	(21.51)	0.0219	(0.0759)
Investment	27.85*	(15.56)	0.156	(0.0991)
Creation	-212.4	(168.1)	-0.667***	(0.108)
Other	12.29	(20.31)	0.167**	(0.0713)
Personal contribution	35.01***	(13.00)	0.485***	(0.0611)
Other client in household	27.03	(18.18)	0.0537	(0.0526)
Other working member in household	-23.45*	(12.18)	0.181***	(0.0295)
Other loan	-34.51	(52.81)	0.0306	(0.105)
Collateral (vs. Personal network)				
Clients network	-99.87***	(24.11)		
Physical collateral	-35.77	(27.16)		
Household monthly expenses	0.0736	(0.0649)		
Household monthly revenues	0.0329	(0.0226)		
Fixed assets	0.00403***	(0.000444)		
Current assets	0.0261***	(0.00310)		
Number of employees	62.41**	(27.58)		
Number of seasonal employees	15.63**	(6.949)		
Useful farming area	0.00979**	(0.00422)		
<i>Officer's characteristics</i>				
Female officer	39.18	(24.15)	-0.0521	(0.0468)
Officer's years of experience	6.544**	(3.118)	-0.0151	(0.0129)
Branch dummies included	yes		yes	
Constant	151.5**	(63.03)	-0.501***	(0.0870)
	Coef.	S.e.	95% Confidence interval	
rho	-0.0140155	.008783	-0.031224	.0032014
lambda	-5.519886	3.426013	-12.23475	1.194975
Observations	31148			
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Wald test of indep. eqns. (rho = 0): chi2(1) = 2.55 Prob > chi2 = 0.1106				

APPENDIX I.B: DEALING WITH THE ENDOGENEITY ISSUE

To test and deal with the possible endogeneity of amounts requested which could affect both selection and loan size, a model consisting of three equations following Wooldridge's method (Wooldridge, 2010) is defined.

Such a model requires instrumenting the amount requested. The instrument chosen is the average amount requested in the branch in 2013. Indeed, there are high disparities between branches regarding average amounts requested, with a range going from 677 TND to 2782 TND. Such disparities could be due to specific local socio-economic characteristics of the area, which are controlled for by including a dummy variable at the governorate level, but also to local trends in terms of ambition or project size; indeed, the MFI's clients resorting to one specific branch are likely to share information and resources, all the more so as some clients act as guarantors for some others. As a consequence, they are likely to imitate the requesting behaviors of their counterparts. Conversely, there is no reason to think that average amounts requested by branch in 2013 are correlated with the probability for the individual requests made in 2014 to be accepted or with individual amounts granted, since these outcomes depend on individual characteristics. This leads us to suppose that average amounts requested within a branch in 2013 should be correlated with individual requests made in 2014, but not to the outcomes of interest in another way than through individual requests.

To test this instrument, a first step consists in estimating loan size by 2SLS, using equations 1 and 3 from part V. In these equations, the dummy variable "branch" is dropped to avoid a collinearity issue with the instrument, and replaced by a dummy variable "governorate" and some branch characteristics (age, female supervisor or not, proportion of female officers, portfolio at risk in December 2013). The results of the model and of the tests of the instrument are presented in table 22.

Table 22. Estimation of loan size by 2SLS and tests of the instrument

	Non-agricultural credits				Agricultural credits			
	Request		Loan size		Request		Loan size	
Requested amount			-0.0232	(0.167)			0.422***	(0.123)
Branch av. requested amount 2013 (Ins)	0.268***	(0.0507)			0.755***	(0.0637)		
Women	-192.2***	(15.90)	-76.85**	(35.11)	-212.8***	(29.26)	-44.28*	(24.88)
Client's age	-0.242	(0.727)	1.208***	(0.421)	0.540	(0.954)	0.450	(0.473)
Education (vs. Primary)								
Illiterate	2.949	(25.97)	3.793	(13.33)	-55.84**	(23.16)	-3.831	(13.24)
Secondary	48.82***	(16.40)	28.15**	(12.16)	114.5***	(22.75)	1.582	(17.59)
Higher	132.0***	(31.18)	147.8***	(32.34)	147.3***	(53.78)	101.4***	(29.66)
Marital status (vs. Married)								
Single	-41.43**	(17.52)	-30.73**	(12.63)	-29.44	(29.89)	-32.19**	(13.61)
Divorced	47.56	(44.12)	-10.82	(20.88)	-89.65	(59.89)	-19.98	(22.82)
Widowed	-0.0452	(28.49)	8.165	(17.84)	-83.00	(64.81)	-24.37	(25.76)
Household size	-4.005	(5.449)	-12.89***	(3.004)	12.30	(8.281)	-3.218	(3.053)
Number of schoolchildren	-8.654	(6.515)	-4.766	(3.810)	0.668	(10.97)	1.965	(3.732)
Inactive	16.22	(32.32)	27.17	(27.00)	-41.16	(66.60)	30.49	(29.06)
Owner	41.93**	(17.01)	37.58***	(11.57)	76.53***	(29.05)	9.454	(18.72)
Sector (vs. Agriculture)								
Production	13.08	(29.48)	-3.452	(20.55)	-80.84	(113.4)	-25.31	(53.18)
Trade	4.639	(25.97)	-32.91*	(18.91)	176.8	(119.6)	-51.68	(50.26)
Services	188.7***	(35.38)	127.3***	(38.67)	47.71	(183.8)	-210.3**	(87.90)
ND	14.02	(44.74)	11.27	(38.53)				
Credit use (vs. Working capital)								
Agricultural campaign	-35.22	(44.68)	-36.59	(31.40)	54.70	(56.08)	59.37***	(20.56)
Investment	104.6***	(32.40)	67.20**	(29.47)	55.21	(44.65)	5.207	(22.47)
Creation	253.8***	(53.43)	133.8*	(69.98)	741.4	(577.3)	-268.7	(238.5)
Other	-4.846	(30.42)	31.43*	(17.32)	7.016	(54.23)	18.81	(30.49)
Personal contribution	-98.26***	(29.64)	10.53	(20.74)	35.56	(58.10)	22.65	(17.46)
Other client in household	-10.74	(21.96)	31.78**	(13.97)	95.71*	(56.91)	27.04	(27.32)
Other working member in household	-36.05*	(21.75)	-9.166	(16.19)	70.05**	(32.65)	10.20	(20.46)
Other loan	107.8	(71.39)	20.12	(44.59)	246.8**	(121.0)	-58.04	(64.20)
Collateral (vs. Personal network)								
Clients network	-64.69***	(19.61)	-64.59***	(15.98)	-221.6***	(47.08)	-88.19***	(27.30)
Physical collateral	299.6***	(25.05)	144.5***	(50.17)	111.0**	(49.99)	-46.13	(30.30)
Household monthly expenses	0.263***	(0.0422)	0.241***	(0.0581)	0.140	(0.111)	0.0498	(0.0699)
Household monthly revenues	0.126***	(0.0173)	0.103***	(0.0231)	0.138***	(0.0414)	0.0162	(0.0253)
Fixed assets (100 TND)	0.742***	(0.103)	0.790***	(0.149)	0.736***	(0.0724)	0.348***	(0.106)
Current assets	0.0598***	(0.00294)	0.0438***	(0.0103)	0.0594***	(0.00653)	0.0195**	(0.00762)
Number of employees	25.52**	(12.78)	21.34*	(11.04)	76.16	(49.21)	60.34**	(28.63)
Monthly benefit	0.280***	(0.0217)	0.218***	(0.0503)	na		na	
Independent premises	201.3***	(20.61)	104.9***	(38.70)	na		na	
Official registration	484.1***	(25.73)	292.5***	(81.05)	na		na	
Useful farming area	na		na		0.00719	(0.00543)	0.00891**	(0.00402)
Female officer	-21.80	(23.21)	-1.524	(16.96)	-35.85	(59.22)	29.73	(22.81)
Officer's years of experience	9.767	(7.066)	14.45*	(8.123)	0.579	(6.076)	3.801	(3.181)
Branch PAR in december 2013	-2,610**	(1,034)	-845.8	(944.2)	2,286**	(894.9)	-931.7	(843.5)
Female supervisor	41.40	(26.35)	28.47	(38.93)	-16.97	(38.06)	17.41	(34.24)
Branch age	-2.165	(3.001)	-10.87**	(4.358)	-39.05***	(8.252)	-4.731	(8.219)
Proportion of women among officers in the branch	26.96	(69.99)	-20.98	(102.1)	184.6	(138.7)	-63.88	(107.9)
Governorate dummies included	Yes		Yes		Yes		Yes	
Constant	551.6***	(99.15)	254.3	(158.1)	711.3***	(164.6)	350.4*	(206.8)
Observations	26953		26953		10726		10726	
R-squared	0.4182		0.477		0.3555		0.644	
Sargan statistic			0				0	
LM test statistic for underidentification (Anderson)			75.89				289.6	
p-value of LM statistic			0				0	
F statistic for weak identification (Cragg-Donald)			75.93				295.9	
Endogeneity test of endogenous regressors			38.83				10.69	
p-value of endogeneity test			4.63e-10				0.00108	

Clustered standard errors in parentheses (branch level)

*** p<0.01, ** p<0.05, * p<0.1

The results of the tests show that requested amounts seem endogenous (p-value of the endogeneity test close to 0), even though it seems to be more the case for non-agricultural credits than agricultural ones. The null hypotheses of under-identification and weak identification tests are also rejected. Given these results, the instrument is kept for the final model consisting of three equations which deal with both endogeneity issue and possible selection bias, since endogeneity could also affect selection. It is also worth noting that the main effect of interest is confirmed using 2SLS: the negative bias against women in terms of loan size is similar to the one found with OLS for agricultural credits, and stronger for non-agricultural ones.

In the final model, the three equations correspond to the three observable steps of the microcredit allocation process:

$$RA_i = \gamma + a_w W_i + a_{ins} Ins + a'_X X_i + a_F F_i + a_B B_i + \mu_i \quad (B1)$$

$$P(S_i=1) = \Phi(\alpha + b_W W_i + b_{SC} SC_i + b_A RA_i + b'_X X_i + b'_O O_i + b_B B_i) \quad (B2)$$

$$GA_i^* = \beta + c_w W_i + c_A RA_i + c'_Z Z_i + c'_O O_i + c'_B B_i + c_G G_i + \epsilon_i \quad (B3)$$

With:

- equation (B1) being the estimation of the amount requested using a linear regression (OLS), instrumented by the average amount requested by branch in 2013 (*Ins*);
- equation (B2) the selection equation using a probit model in which the variable *number of children going to school (SC)* is the exclusion restriction;
- equation (B3) the estimation of loan size, which is observed only if the selection variable *S* (successful application) equals 1.

The model is estimated by full information maximum likelihood (FIML) estimator and allows correlations between error terms of the equations. The results are presented in table 23 for non-agricultural credits and 24 for agricultural ones.

Looking at the correlation coefficients between error terms (*atanhrho_12*, *atanhrho_13* and *atanhrho_23*), the significance of these coefficients for non-agricultural credits implies that dealing with the endogeneity issue and correcting the selection bias indeed makes sense. However, the non-significance of two out of three coefficients for agricultural cases questions the relevance of such a model in this case.

Table 23. Estimation of loan size, selection and request for non-agricultural credits

	Loan size		Selection		Request	
Women	-83.85**	(34.88)	-0.0425	(0.0666)	-597.9***	(30.23)
Requested amount	0.199***	(0.0551)	-0.000475***	(7.55e-05)		
Branch av. requested amount 2013 (Ins)					0.752***	(0.0583)
Client's age	1.930***	(0.431)	0.00806***	(0.000682)	5.428***	(0.885)
Education (vs. Primary)						
Illiterate	5.864	(11.60)	0.0570*	(0.0304)	73.11***	(23.36)
Secondary	45.31**	(21.42)	0.216***	(0.0383)	305.4***	(30.22)
Higher	190.6***	(48.67)	0.367***	(0.0664)	751.6***	(54.14)
Marital status (vs. Married)						
Single	-17.45**	(8.412)	-0.158***	(0.0165)	-13.67	(14.14)
Divorced	-32.92*	(17.24)	-0.244***	(0.0407)	-52.83	(41.04)
Widowed	-1.280	(15.38)	-0.124***	(0.0394)	-81.31***	(29.51)
Household size	-10.21***	(2.291)	-0.0108*	(0.00572)	12.03*	(6.349)
Number of schoolchildren			0.0390***	(0.00697)	10.86*	(6.472)
Inactive	19.27	(21.81)	-0.0463	(0.0728)	-20.26	(27.45)
Owner	32.43***	(10.27)	0.0909***	(0.0259)	77.33***	(21.05)
Number of employees	11.62**	(5.696)				
Number of seasonal employees	3.647	(11.07)				
Sector (vs. Agriculture)						
Production	-13.44	(17.71)	0.0331	(0.0376)	-43.93	(59.18)
Trade	-21.73	(14.69)	0.0641**	(0.0306)	105.7***	(39.17)
Services	130.7***	(34.51)	0.310***	(0.0508)	563.6***	(51.70)
Consumption			-0.350***	(0.121)	-508.2***	(70.65)
ND	38.55	(30.45)	-0.400***	(0.110)	254.1***	(75.48)
Credit use (vs. Working capital)						
Agricultural campaign	-12.73	(27.97)	-0.0319	(0.0620)	96.58	(81.61)
Investment	48.28**	(19.82)	0.204***	(0.0474)	142.5***	(37.71)
Creation	193.8**	(86.34)	0.0665	(0.149)	1,204***	(89.11)
Other	29.21*	(15.63)	0.0813	(0.0638)	-30.28	(41.28)
Personal contribution	43.38***	(13.60)	0.523***	(0.0648)	1.091	(43.34)
Other client in household	29.58**	(12.22)	0.121***	(0.0398)	-45.56	(28.98)
Other working member in household	2.966	(13.08)	0.134***	(0.0311)	0.942	(32.58)
Other loan	25.03	(43.60)	0.215***	(0.0670)	349.6***	(59.27)
Collateral (vs. Personal network)						
Clients network	-42.41***	(9.298)				
Physical collateral	41.68***	(11.52)				
Household monthly expenses	0.151***	(0.0282)				
Household monthly revenues	0.0594***	(0.0131)				
Fixed assets (100 TND)	0.536***	(0.0531)				
Current assets	0.0232***	(0.00193)				
Independent premises	35.83***	(11.17)				
Monthly benefit	0.122***	(0.0112)				
Official registration	126.2***	(11.67)				
Female officer	-0.222	(15.37)	-0.0292	(0.0260)	-51.80	(43.41)
Officer's years of experience	14.27*	(8.048)	-0.000198	(0.00795)	25.99	(19.33)
Branch PAR in december 2013	72.86	(766.0)	-1.077	(1.666)	200.8	(1,212)
Female supervisor	17.17	(32.35)	0.0882*	(0.0497)	25.64	(32.05)
Proportion of women among officers in the branch	-13.08	(94.01)	0.203	(0.149)	142.7	(108.3)
Branch age	-11.39***	(3.922)	-0.00516	(0.00731)	-10.47**	(4.072)
Governorate dummies included	Yes		Yes		Yes	
Constant	157.4	(104.3)	0.597***	(0.206)	720.2***	(165.8)
Insig_1	6.149***	(0.0573)				
Insig_3	7.140***	(0.0278)				
atanhrho_12	0.164**	(0.0734)				
atanhrho_13	0.340**	(0.149)				
atanhrho_23	0.575***	(0.139)				
Observations	26953		60103		60103	

Clustered standard errors in parentheses (branch level)

*** p<0.01, ** p<0.05, * p<0.1

Table 24. Estimation of loan size, selection and request for agricultural credits

	Loan size		Selection		Request	
Women	-21.90	(64.00)	-0.0419	(0.0665)	-597.8***	(30.23)
Requested amount	0.401***	(0.118)	-0.000474***	(7.55e-05)		
Branch av. requested amount 2013 (Ins)					0.753***	(0.0591)
Client's age	0.154	(0.795)	0.00806***	(0.000683)	5.431***	(0.884)
Education (vs. Primary)						
Illiterate	3.744	(14.85)	0.0570*	(0.0303)	73.24***	(23.38)
Secondary	-0.584	(38.44)	0.216***	(0.0383)	305.7***	(30.18)
Higher	72.38	(80.81)	0.366***	(0.0664)	751.8***	(54.15)
Marital status (vs. Married)						
Single	-35.22***	(12.96)	-0.158***	(0.0166)	-13.70	(14.10)
Divorced	-28.44	(20.19)	-0.245***	(0.0408)	-52.84	(41.12)
Widowed	-27.38	(24.80)	-0.124***	(0.0394)	-81.31***	(29.51)
Household size	-2.499	(2.465)	-0.0108*	(0.00573)	12.05*	(6.358)
Number of schoolchildren			0.0390***	(0.00702)	10.78*	(6.296)
Inactive	27.41	(28.16)	-0.0463	(0.0729)	-20.24	(27.47)
Owner	12.03	(19.24)	0.0908***	(0.0259)	77.29***	(21.07)
Number of employees	65.38**	(27.77)				
Number of seasonal employees	13.82**	(6.728)				
Sector (vs. Agriculture)						
Production			0.0328	(0.0375)	-44.77	(58.76)
Trade			0.0637**	(0.0307)	104.8***	(38.83)
Services			0.309***	(0.0509)	562.1***	(50.94)
Consumption			-0.350***	(0.121)	-508.9***	(70.52)
ND			-0.401***	(0.110)	253.3***	(75.34)
Credit use (vs. Working capital)						
Agricultural campaign	57.95***	(18.84)	-0.0322	(0.0621)	96.16	(81.57)
Investment	0.309	(23.33)	0.204***	(0.0474)	142.6***	(37.68)
Creation	-288.0	(229.8)	0.0654	(0.149)	1,204***	(89.11)
Other	19.54	(30.08)	0.0814	(0.0638)	-30.17	(41.29)
Personal contribution	25.06*	(14.13)	0.523***	(0.0648)	1.105	(43.34)
Other client in household	38.42	(23.90)	0.122***	(0.0398)	-45.51	(28.99)
Other working member in household	17.13	(20.28)	0.134***	(0.0311)	0.944	(32.57)
Other loan	-58.25	(72.72)	0.215***	(0.0670)	349.7***	(59.28)
Collateral (vs. Personal network)						
Clients network	-108.3***	(25.17)				
Physical collateral	-37.81	(26.12)				
Household monthly expenses	0.0581	(0.0646)				
Household monthly revenues	0.0285	(0.0222)				
Fixed assets (100 TND)	0.404***	(0.0473)				
Current assets	0.0245***	(0.00325)				
Useful farming area	0.00959**	(0.00422)				
Female officer	30.79	(23.10)	-0.0292	(0.0260)	-51.72	(43.38)
Officer's years of experience	1.814	(3.762)	-0.000223	(0.00794)	26.01	(19.33)
Branch PAR in december 2013	-835.4	(916.9)	-1.077	(1.667)	204.1	(1,211)
Female supervisor	13.47	(34.76)	0.0882*	(0.0497)	25.54	(32.02)
Proportion of women among officers in the branch	-61.94	(108.4)	0.203	(0.149)	142.8	(108.3)
Branch age	-7.480	(7.022)	-0.00513	(0.00731)	-10.45**	(4.072)
Governorate dummies included	Yes		Yes		Yes	
Constant	379.2*	(196.3)	0.596***	(0.206)	718.1***	(166.2)
Insig_1	6.022***	(0.0746)				
Insig_3	7.140***	(0.0278)				
atanhrho_12	-0.102	(0.167)				
atanhrho_13	-0.201	(0.336)				
atanhrho_23	0.574***	(0.139)				
Observations	10726		60103		60103	

Clustered standard errors in parentheses (branch level)

*** p<0.01, ** p<0.05, * p<0.1

Considering the results of interest in this model, the negative bias against women in terms of loan size appears stronger for non-agricultural credits, and weaker in agricultural ones. However, the relevance of such a model is more questionable in the latter case, and simple OLS or 2SLS are likely to be more reliable for agricultural credits. As a consequence, this tends to confirm our main results found using OLS and 2SLS, which could be even underestimated for non-agricultural credits.

APPENDIX I.C: DIFFERENCES BETWEEN APPLICANTS WITH LOW AND HIGH REQUESTS

Table 25. Differences between applicants with low and high requests

	Male clients			Female clients		
	Request<= 1000 TND	Request> 1000 TND	Diff.	Request<= 1000 TND	Request> 1000 TND	Diff.
Sector						
Agriculture	49,2%	31,7%	0,175***	39,0%	33,8%	0,0517***
Production	6,4%	9,0%	-0,0254***	24,3%	15,4%	0,0888***
Trade	26,4%	31,7%	-0,0526***	30,6%	34,5%	-0,0387***
Services	15,7%	27,2%	-0,115***	4,9%	15,7%	-0,108***
Consumption	2,3%	0,4%	0,0186***	1,2%	0,6%	0,00645***
Credit use						
Working capital	68,7%	68,3%	0,004	74,1%	71,0%	0,0316***
Education, Health, Housing, Consumption	2,8%	0,7%	0,0204***	1,7%	1,0%	0,00695***
Co-funding	8,0%	5,7%	0,0229***	6,6%	4,5%	0,0205***
Creation	0,9%	4,8%	-0,0383***	1,0%	4,4%	-0,0340***
Loss	0,0%	0,0%	0,000	0,0%	0,0%	0,000
Investment	10,1%	12,9%	-0,0274***	8,9%	12,4%	-0,0351***
Recovery	0,5%	0,4%	0,001	0,7%	0,5%	0,00267*
Other working member in household	76,0%	78,8%	-0,0279***	80,1%	83,1%	-0,0301***
Other loan	1,6%	3,0%	-0,0132***	0,8%	2,5%	-0,0171***
Personal contribution	21,8%	22,0%	-0,002	20,6%	20,9%	-0,003
Collateral						
Former client	27,4%	23,6%	0,0385***	25,8%	22,2%	0,0353***
Joint surety	3,8%	2,7%	0,0111***	6,4%	3,8%	0,0265***
Salary	32,8%	53,8%	-0,210***	26,3%	51,7%	-0,254***
Parental engagement	1,0%	0,8%	0,001	0,4%	0,9%	0,00413***
Mutual guarantee	28,4%	13,5%	0,149***	35,7%	17,0%	0,187***
Own background	4,5%	3,9%	0,00654*	4,2%	3,2%	0,00979***
Equipment pledging	2,1%	1,7%	0,004	1,2%	1,2%	-0,001
Observations	8086	7717	15803	19089	5809	24898

* p<0.05, ** p<0.01, *** p<0.001

CHAPTER 2

GENDER REPRESENTATIONS IN MICROFINANCE: AN EXPERIMENTAL STUDY

This chapter is based on an article co-written with Walid Jbili, statistician and researcher at Enda inter-arabe, who especially conceived the experimental design.

I. INTRODUCTION

Since the creation of the Grameen Bank in Bangladesh by Mohammad Yunus in 1976, microfinance has appeared as one relevant lever to contribute to poverty reduction and women's empowerment. However, after being raised as a miracle solution, several scandals about huge interest rates and profits within various institutions led to question the capacity of microfinance to achieve its initial goals. This fostered the research work on the impact issue, in terms of both poverty reduction and women's empowerment. To answer this question, experimental studies have been implemented, most of them being natural experiments (Banerjee, Duflo, Glennerster, & Kinnan, 2015; de Mel, McKenzie, & Woodruff, 2008; Roodman & Morduch, 2014, etc.).

However, this growing interest for natural experiments or lab experiments in the field in development economics in general, and microfinance in particular, seems to focus on the impact issue only, forgetting one determining step, which is the microcredit allocation process. Indeed, as already detailed in chapter 1, microfinance institutions tend to target mainly or even sometimes only women for various objective reasons, either social (S. R. Khandker, 2005) or financial (D'Espallier et al., 2011; Shahidur R. Khandker et al., 1995). Yet, our previous results in chapter 1 as well as those found by Agier & Szafarz (2013a) show that the widespread preference for women in the targeting policies of MFIs does not necessarily mean that women are favored in the whole allocation process, even though MFIs effectively favor women in terms of access to credit.

Whereas many studies, including experimental studies, have been implemented to detect a possible discrimination according to gender or race in the labor market (Bertrand & Mullainathan, 2004; Carlsson & Rooth, 2007; Pager, Bonikowski, & Western, 2009) as well as in the standard credit market (Fay & Williams, 1993), nothing similar has been done in the microfinance sector. So far, only a few studies have recently showed that discrimination was possible in microfinance, in theory and in practice in Uganda towards disabled people (Lapie et al., 2015), and in Brazil towards women (Agier and Szafarz, 2013), but they remain non-experimental.

Nevertheless, when using real data, there is still a risk for the researcher of having missed some relevant information contained in unobserved variables, as he or she is not able to have exactly the same information as loan officers who received and dealt with the request. Indeed, if the dataset used in chapter 1 contained all the financial information which is supposed to be used to set the amount to grant according to Enda's official procedure, loan officers directly meet clients several times in their own house and business premises, and their discussions or feelings resulting from these direct interpersonal relationships could influence their judgement, even though all

officers asked about this issue asserted that all the necessary information to make a decision about the amount to grant was included in the information system.

As a consequence, to complete the analysis in chapter 1 and give more weight to its results, I suggested to Enda that we implemented an experimental study with loan officers to analyze their behavior in the microcredit allocation process. In particular, the idea was to highlight the gender bias in the allocation of the microcredit amount, if existing. Indeed, the advantage of an experiment is that exactly the same information is available for participants and researchers. As a consequence, the results cannot be biased by some information which would be unobservable by the researcher but available for agents under study. Therefore, the existence of a gender bias in the results of the experimental study would corroborate the idea stated in chapter 1 that the gap between amounts granted to men and women is due to gender-based stereotypical representations of clients.

The experience consisted in a kind of lab-in-the-field experiment involving loan officers as the subjects of the experiment. To the best of our knowledge, this is the only experiment of this kind in microfinance. By comparing the results of the experiment with those of the previous analysis on real data in the same MFI, some implications in terms of procedures arouse to enable the MFI to achieve its objectives.

The chapter is structured as follows: section 2 introduces literature on discrimination and experimental economics, section 3 details the experimental design, section 4 describes the data, section 5 presents the empirical method of analysis and summarizes main results, section 6 discusses and compares these results with those of chapter 1, and section 7 concludes.

II. LITERATURE REVIEW ON DISCRIMINATION AND EXPERIMENTAL ECONOMICS

As previously mentioned, literature about discrimination in the microfinance sector remains very scarce, mainly because it is a very recent topic, and because researchers face a lack of data, given that such data has to remain confidential most of the time. Some evidence has started to emerge with Agier and Szafarz (2013a) who analyze loan amounts, but future research works could also focus on other loan conditions such as guarantees requested for instance.

Nonetheless, a part of the literature on microfinance focuses on the sources of its “mission drift”, that is to say on what could lead MFIs to eventually miss or not to serve properly their initial target, the poorest of the poor. Jeon & Menicucci (2005) consider for instance that loan officers

may be tempted to be dishonest and to embezzle borrowers' repayments, leading to solvability problems for the MFI, and hence to difficulty in fulfilling objectives; in such a case, according to these authors, some solutions for the organization would be to implement audits and chiefly incentive pays. However, Aubert, de Janvry, & Sadoulet (2009) show that the way financial incentives are designed is more determining for the fulfillment of the MFI's objectives than just the fact of giving incentives to officers: they show that in the case of pro-poor MFIs, giving incentives based on repayment only may lead officers to select the richest of the poor, because repayment and wealth are likely to be correlated. Finally, other studies consider that financial incentives are not the key to success for not-for-profit organizations: Francois (2003) and Rowat & Seabright (2006) even consider that hiring altruistic and motivated workers and paying them below-market wages is what enables such organizations to fulfil their objectives. This implies that on the contrary, hiring not motivated workers may lead to a drift from the organization's initial objectives.

Even though these papers do not directly deal with our issue of interest, their analyses of what kind of workers' incentives are the most efficient to ensure the fulfillment of a not-for-profit organization's objectives may be inspiring to understand the causes of a potential gender bias in the granting process of loan amounts. In particular, these papers insist on financial incentives on the one hand, and motivation on the other hand, which we refer to in the following analyses.

If few studies proved the existence of discrimination against women in microfinance, other works did it in other markets. With regard to the traditional credit market, the main difference between microfinance and the traditional credit market concerns the interest rate, which is fixed most of the time in microfinance, contrary to the banking sector where it may vary from a client to another. As a consequence, some studies show that in the traditional credit market, women may be discriminated against through interest rates. For instance, Alesina et al. (2013) find that women leading micro-firms or self-employed women are credit-rationed by banks in Italy compared to their male counterparts, as the same bank charges different rates to male and female borrowers, whereas the authors did not find any evidence of women being riskier. In the same way, Calcagnini, Giombini, & Lenti (2015) show, after taking the structural differences between businesses managed by men and women into account, that the conditions to get access to credit differ between male and female entrepreneurs in Italy: guarantees are less powerful instruments to get access to credit for women and women are more likely to have to pledge collateral compared to men. Once again, there is no discrimination in terms of access, as gender does not affect the likelihood of obtaining a credit, but discrimination lies in the credit conditions. Finally, Fletschner (2009) also shows that

women are more credit-constrained and that women's rationing status responds to a different set of factors than men's in rural Paraguay.

All these works rely on empirical data and not on field experiments. Karlan & Zinman (2008) and Karlan & Zinman (2010) use randomized experiments to study the elasticity of microcredit demand to interest rates and the effects of microcredit rationing in South Africa and Mexico; therefore they focus on the access issue, but do not include any gender or discrimination perspective.

In contrast, many experiments were implemented to analyze discrimination in the labor market. Indeed, experiments were made possible in this field as sending fake CVs to real job offers to compare response rates according to race or gender is more easily feasible than simulating businesses to apply for a loan. The most famous study which uses this method is the one of Bertrand & Mullainathan (2004) which proves racial discrimination against African-American job seekers in two American states; a similar study was conducted in Australia (Booth, Leigh, & Varganova, 2012) and finds discrimination against minority candidates. Another one concludes with similar results in Sweden (Carlsson & Rooth, 2007), and several studies in France use the same kind of experiments to show the existence of discrimination in the labor market according to gender (Duguet & Petit, 2005; Petit, 2007), residency (Bunel, L'Horty, & Petit, 2016), apparent ethnic origin (Berson, 2016) or a combination of several factors (Duguet, Leandri, L'Horty, & Petit, 2010; Petit, Duguet, L'Horty, du Parquet, & Sari, 2013; Petit, Sari, L'Horty, Duguet, & du Parquet, 2011).

All these experiments may be described as natural field experiments according to Harrison & List (2004), since the environment of the experiment is the one where the subjects (here the employers) naturally undertake these tasks (the job offers are real) and where the subjects do not know that they are in an experiment (the employers do not know the CVs are fictitious).

This kind of experiments appeared in the 1990s, in other words rather recently in the history of experimental economics, which emerged in the 1950s with lab experiments to get empirical results about theories on behavior, decision making process or market negotiations. Experimental economics has become a relevant and complementary element of the economists' toolbox over the two last decades, and is most likely to keep evolving by including innovative methods. The experiment designed in this research work could represent one of these innovations by not only involving participants from the population under study, but also by taking place directly on site.

III. EXPERIMENTAL DESIGN

The experimentation was made possible thanks to Enda's managers who accepted to provide the necessary information and leeway to implement it. Such experimentation was in keeping with their will to carry out various studies adopting a gender perspective, and part of a broader approach including specific trainings dedicated to loan officers on gender problematics in microfinance (see chapter 5).

1. Definition

The experimental design implemented does not correspond to standard experimentation, but could be compared to a lab-in-the field experience, even though it did not imply games to be played on a computer or physical objects disconnected from real situations, as it is often the case in behavioral economics; it was not a field experiment either, whether natural or randomized, with a treatment group and a control group to analyze the effect of a phenomenon or a measure in real situation.

In our case, the idea was to submit a set of fictitious loan applications to a sample of loan officers, just as Bertrand and Mullainathan (2004) did with fictitious CVs sent as applications to real job offers, but the difference lies in the fact that loan officers knew that the loan applications were fictitious. Indeed, simulating real applications would have been impossible, as loan officers directly meet clients several times at home and in business premises before making a decision, and as officers know very well their working area and the population living there. There was no means to simulate such cases and pretend they were real. In that respect, the experiment gets closer to a lab experience, but the difference is that the experiment remains strongly connected with real situations loan officers are used to facing. To this extent, it would best fit in the category of "framed field experiment" from Harrison's and List's terminology (2004), which refers to an experiment with nonstandard subject pool (i.e. non students), an imposed set of rules (an exercise and not a real situation) and field context (the subjects are supposed to use their experience in their daily work to take the exercise).

Indeed, the loan officers of this MFI are used to attending trainings. Most of these trainings take place just after their recruitment. At that moment, officers learn the procedures to follow and respect all along the credit granting process, and especially the criteria which should be taken into account to make the decision of granting or not, and of the amount to grant. During these trainings, they sometimes have to take exercises which put them in fictitious situations, to test their

understanding of the procedure. Over their career, loan officers are sometimes requested to take other exercises of the same kind to detect possible needs for further training. For instance, just a few weeks before we carried out the experiment, the training department had launched a survey towards loan officers using an online platform to ask them about their needs for training. Our experiment, which was implemented not so long after this survey, was presented to loan officers as an exercise to detect possible needs for training. As a consequence, it may have been considered as complementary to the previous survey and not surprising for loan officers. Moreover, because it was presented as an exercise, officers knew that the applications they had to study were fictitious, without knowing the exact purpose of the experiment.

2. Objective

The aim of the experiment was to check if gender of the potential new client is determining in the amount granted by the loan officer.

It should be highlighted that checking if gender of the potential new client is determining in the decision to grant a credit or not was *not* the objective. Indeed, the results of chapter 1 already clearly show that women are indeed favored in terms of access to credit. As previously explained, this is probably due to the official procedure that officers are supposed to follow to decide to grant a credit or not, since this procedure effectively includes gender as a determining factor by integrating it in the calculation of the risk score resulting in the color code. Additionally, officers are also expected to serve a high share of women because it is part of their mission. As theorized by Besley & Ghatak (2005), in such mission-oriented organizations, workers are supposed to need less financial incentive to fulfill the organization's mission, because they are expected to be themselves motivated by this mission. This implies of course that both organization's and workers' goals match. In the case of Enda, as soon as they are recruited, officers are supposed to be aware of and themselves motivated by the organization's objectives, which are serving the poor and especially women. Consequently, so far, Enda has only relied on such motivation and on procedures to ensure that a high proportion of women is served, and not on financial incentives.

In contrast, the procedure that officers are supposed to follow to grant a certain amount does not include gender as a determining factor, since the two crucial criteria are financial need and monthly repayment capacity. In the same way, there is no explicit detail in the phrasing of Enda's mission either about how much to grant to men and women. This implies that neither procedures nor the definition of Enda's mission are expected to have the same impact on the decision to grant

a certain amount as on the decision to grant a credit or not to a female applicant. Therefore, testing if applicant gender has an effect on the amount granted in practice or not, and what kind of effect, seems relevant. More generally, the aim of the experiment is to analyze how the various criteria included in the risk assessment grid may influence the officers' decision concerning the amount to grant, since officers seem to have more leeway to make this kind of decision.

Moreover, in order to understand such a decision, it may be useful to examine officers' incentives in more detail. Indeed, not only are officers supposed to follow official procedures to grant a certain amount, but they are also encouraged to fulfill Enda's objectives through financial incentives which take the form of bonuses. The way these bonuses are designed may help understand how officers make their decisions. Officers get their first bonus at the end of their first 6 or 9 months, depending on the duration of their training period, and then, bonus is recalculated every three months. The way bonus is calculated is very complex, and if the number or share of women in portfolio is not part of it as already mentioned, many other monthly portfolio indicators intervene in this calculation. These indicators may be classified in two categories: the indicators of portfolio quality on the one hand, with the rate of timely repayment, the share of portfolio-at-risk (PAR), the rate of dropouts; and the indicators of portfolio productivity³⁷ on the other hand, with the number of new clients, the number of credits granted, the total outstanding. Additionally, bonus calculation may vary according to Enda's punctual priorities; for instance, during our period of study, the priority was given to micro and small enterprises rather than to income generating activities. This means that officers who granted more financial products dedicated to higher-scale projects got higher bonuses than those who granted more financial products dedicated to low-scale projects. In this case, this also means that officers who granted higher amounts got higher bonuses, since financial products dedicated to higher-scale projects are characterized by higher ceilings and higher average size. Nevertheless, granting too high amounts may have negative effects on other indicators used to calculate bonuses: in particular, if officers grant high amounts to clients who do not have the necessary repayment capacity, these clients will be more likely to repay late, and the share of portfolio-at-risk could increase, which would make bonus decrease. In the same way, selecting numerous new clients is expected to make bonus increase, but if these clients are selected too rapidly and eventually cannot repay, this will make bonus decrease. As a consequence, such a bonus system conceived to incite officers to maximize the number of clients and loan size while minimizing risk makes the effects of incentives difficult to foresee.

³⁷ This designation was used by the marketing and research department.

As a matter of fact, when officers were asked about their strategy to maximize their bonus, their answers were very heterogeneous. For instance, an officer said that it is easier to maximize the rate of timely repayment and to minimize the PAR, whereas dealing with dropouts is trickier, since clients cannot be forced to renew their loans. Nonetheless, she added that she always tries to find incentives for clients to renew, such as offering smaller loan size or credits for housing improvement instead of credits dedicated to projects if clients do not need such credits. Another officer explained that her strategy depends on the state of her portfolio: if she has already a lot of clients, she will try to keep them and minimize the rate of dropouts; if her portfolio is characterized by a high rate of late repayment, she will decrease loan amounts and make sure to minimize the PAR. For his part, another officer even explained that he does not try to maximize his bonus, because a high bonus is rarely stable, whereas financial stability is more important for him and for his family's welfare than a high bonus once in a while. Finally, a newly recruited officer who was about to receive his first bonus confessed that he has absolutely no strategy yet: all that he knew at that moment was that bonus depends on loan amounts, but it was too early for him to think about how to maximize it. He was just trying to get new clients.

According to an internal study within Enda, these various strategies are actually correlated with officers' level of experience. Indeed, this study aimed at highlighting different types of officers according to their productivity and shows that three types of officers may be identified: the newly recruited on the one hand, who only try to develop their portfolio and then to get new clients without thinking about bonus, the "intermediates" on the other hand, who tend to maximize their productivity and hence to grant higher amounts and/or to follow Enda's punctual priorities; and finally the "expert portfolio managers", who have a comprehensive view of all the determining factors of their bonus and try to act on all of them at the same time. Nevertheless, there is still high heterogeneity within each category, since the three first above-mentioned examples correspond to highly experienced officers.

Going back to female clients, it appears that there is no clear financial incentive for officers to grant them low or high amounts. Nonetheless, if applicant gender had to influence the decision, it should do it in favor of women: indeed, the data about real and current clients in the MFI show that women are less likely to repay late or to default compared to men (see chapter 3), which is conform to what is observed in most MFIs in the world (D'Espallier et al., 2011). This information is known within the MFI, including loan officers. As a consequence, it should be less risky for officers to grant high amounts to women than to men, all other things being equal, and hence more rewarding in terms of bonus.

To sum up the expected effects of procedures and financial incentives on amounts granted to women, in the case of strict compliance with procedures, being a woman is expected to have no effect on the decision of the amount to grant; financial incentives are supposed to have no direct effect either, since there is no bonus for granting high or low amounts to women. However, these financial incentives could have indirect effects in favor of women, if officers consider average repayment behaviors of men and women. If the gender effect appears as negative, other mechanisms such as those described in chapter 1 come into play.

3. Conception

In practice, to analyze officers' behaviors and see which risk factors influence the amounts granted, the idea was to submit fictitious applications for a first loan to loan officers in which we controlled all criteria included, and to present the experiment as an exercise. Since the official procedure includes many criteria, we had to choose some of them only, to reduce the experiment duration. The choice of criteria was made in collaboration with the credit department and the agricultural department. Indeed, as the procedures and criteria differ for agricultural and non-agricultural loans, two sets of fictitious cases had to be defined. The choice ended up in 9 criteria for each set of cases, with each criterion possibly taking 2 or 3 values, or levels (table 26):

Table 26. Criteria used to create fictitious cases

Factors	# Levels	Non-agricultural cases	Agricultural cases
1	2	Gender (Male/Female)	
2	3	Education (None/Primary/Secondary)	
3	2	Household stability (marital status, housing tenure) (Stable/unstable)	
4	2	Additional revenue in the household (Yes/No)	
5	3	Activity Sector (3 levels of risky activity)	
6	2	Experience in the activity (Medium/High)	
7	2	Paying behavior (of invoices) ³⁸ (Late/On time)	
8	2	Financial risk in the activity (Yes/No)	Agricultural risk (Yes/no)
9	2	Number of suppliers (One/Several)	Mixed farming (Yes/No)

However, the total number of possible combinations of all these factors was 1152 for each set: it was therefore impossible to request officers to examine all the possible cases each. To deal with this issue and reduce the number of cases to be examined, we resorted to an optimal design of experiment.

Designs of experiments were first implemented in the scientific field, especially in agronomy by Ronald A. Fisher at the early XXth century. Fisher's book *The Design of Experiments* (Fisher, 1935) is considered as the founder work in experimental design, followed by Fedorov's *Theory of Optimal Experiments* (Fedorov, 1972). Such designs of experiments were then replicated in other disciplines such as psychology and industry.

As mentioned by Muller & de Leon (1996), experimental design is still not commonly used in economics, in spite of a close relationship between statistical techniques and economics, especially through econometrics. According to these authors, this would be due to the consideration of economics as a traditionally "non-experimental" discipline. However, experimental techniques have been increasingly used in economics over the two last decades, and experimental designs may deserve more attention.

The theory of experimental designs relies on the idea that such designs ensure the conditions in which the best possible accuracy is achieved with as few runs as possible. Indeed, if the best and most accurate possible design to study a phenomenon is a full factorial design, which consists in carrying out each possible experiment and then testing each possible combination of factors (1152 in our case), this is often too costly. Consequently, the objective of experimental

³⁸ This criterion is one of those normally observed by officers during the « moral enquiry »: officers are supposed to check that the applicant does not have a "bad morality", i.e. that he/she pays his/her invoices (water, electricity, etc.)

designs is to get the maximum information by realizing the minimum number of experiments, which means at a minimum cost in terms of money and time. To achieve such efficiency, the idea consists in making the several factors vary simultaneously, instead of one by one, and then to choose the best set of combinations of factors among all possible combinations to get this maximum information despite the reduced number of experimental runs.

In our case, the factors are the nine criteria, which can take two or three values, or levels. Each experimental run, that is to say each combination of factors, is supposed to give an outcome y . At the end of an experimental design with n runs, we get a system of n equations which can be written:

$$y = \beta X + \varepsilon$$

with:

- y the vector of outcomes including n elements;
- X the matrix of each combination of factors considering all their possible levels, which are coded -1 and 1 for two-level factors, and -1; 0 and 1 for three-level factors;
- β the vector of coefficients;
- ε the vector of error terms;

The vector of coefficients β can be estimated using the ordinary least squares estimator. In such a case, the covariance matrix of the estimator $\hat{\beta}$ is given by:

$$V(\hat{\beta}) = \sigma^2 (X'X)^{-1}$$

With:

- σ^2 the variance of the error term, which is supposed to be constant;
- $(X'X)^{-1}$ the dispersion matrix.

Getting the maximum of information with an optimal design of experiments comes down to getting the most accurate estimators, or the ones with the weakest variance. This means that the optimal design is the one which minimizes the dispersion matrix $(X'X)^{-1}$, since the variance of the error term is supposed to be constant, which is equivalent to maximize the inverse of the dispersion matrix, which is usually referred to as the information matrix $(X'X)$.

An optimal design refers to a kind of experimental design which is optimal according to a statistical criterion. In the case of a D-optimal design, which is the most commonly used in practice, the statistical criterion used is the determinant of the information matrix (the “D” of D-optimal referring to “determinant”): the highest this determinant, the lowest the determinant of the

dispersion matrix, and the most accurate the estimators. Thus, in the comparison of all possible combinations of factors, the D-optimal design will be the one which maximizes the determinant of the matrix $(X'X)$ (Goupy & Creighton, 2009).

In practice, a D-optimal design is generated by an iterative search algorithm on a computer, according to the number of parameters, their levels, and the number of runs to be carried out. The algorithm compares the determinants of all possible matrices, which are all possible combinations of factors, and chooses the design which maximizes this determinant.

In our case, a fixed effects model was chosen with only main effects to be estimated (i.e. no interaction effects), and the Modified Fedorov (simultaneous switching) algorithm was used to construct the D-optimal design for the factors considered in this study. It resulted in a set of 12 combinations (the output of the SAS procedure can be referred to in appendix II.A), which was used to build the two sets of 12 cases to be examined by the loan officers (12 agricultural and 12 non-agricultural cases which can be read in appendix II.B).

In order to add credibility to the cases, an amount requested was added to each case, knowing that the law was imposing a ceiling of 5000 TND at that time. Given the differences of procedures for agricultural and non-agricultural loans, a monthly benefit was also added to non-agricultural cases. Indeed, for agricultural loans, officers are free to fit a flexible repayment schedule to take seasonality into account: they grant a total amount and then fit the schedule. For non-agricultural loans, the key criterion to be taken into account by officers is clients' monthly repayment capacities; in our summarized cases, which contain less financial information than a real application, a signal about this monthly repayment capacity had to be added. This was profit, either monthly or annual, which was supposed to guide officers. Amounts of profits were set with one of the managers from the credit department to ensure their credibility, and so that average monthly profits in male and female cases were not significantly different. Since it was the only financial information in the case, officers were expected to think in terms of monthly amount granted.

As far as credibility is concerned, all criteria included in the case are supposed to be gender-neutral, which means that the various levels of each factor are indeed represented in the actual population of new male and female applicants as well as in the actual population of male and female clients in 2014 (table 27).

Table 27: Socio-economic information about male and female new applicants and clients in 2014

	Female applicants	Male applicants	Female clients	Male clients
Education level	35% secondary 44.2% primary	46.1% secondary 43.9% primary	27.9% secondary 51.7% primary	40.1% secondary 51% primary

	12.5% illiterate	3.1 illiterate	16.3% illiterate	4.1% illiterate
Marital status	74.8% married	61.9% married	81.4% married	71.4% married
	4.9% divorced or widowed	1% divorced or widowed	5.2% divorced or widowed	0.7% divorced or widowed
Housing tenure	78% owner	77.8% owner	78.4% owner	79.3% owner
	10.2% renter	9.9% renter	9.4% renter	9.1% renter
Additional revenue	79.3% yes	75.1% yes	80.8% yes	77.4% yes
	20.7% no	20.7% no	19.2% no	22.6% no
Activity sector	37,4% agriculture	41.9% agriculture	32.7% agriculture (1/3 large scale- 2/3 small scale)	37% agriculture (1/2 large scale – 1/2 small scale)
	32.1% trade	29% trade	33.8% trade	24.8% trade
	21.6% production	7.6% production	16.2% production	10.3% production

Additionally, all combinations of criteria are also realistic: the activity sectors chosen are the most represented among the population of applicants and/or clients, including among men and women, which makes sure that other socio-economic characteristics could be realistically combined with those activities. Even though some risk criteria may represent different things whether they apply to men or women (for instance, women with no additional revenue in their household may be perceived as more vulnerable than men in the same situation, since there are more active husbands with inactive wives in Tunisia than active wives with inactive husbands), these combinations exist in the population of clients any way: 19,2% of female clients in 2014 did not have any other revenue in their household. This means that it is neither a ground of refusal, nor an exceptional situation.

In the same way, amounts requested were chosen to be in the upper fringe of actual amounts requested while remaining realistic, to let a leeway for rationing, since higher amounts requested are more likely to be rationed and since loan-size rationing is the phenomenon under study.

Obviously, the repartition of criteria in our fictitious cases does not represent the actual repartition in actual applications or clients' files. However, since the number of fictitious cases had to be limited, diversity was preferred to proportionality. Moreover, even though it would have been easier to analyze, creating exactly similar cases with applicant gender varying only would have been too suspect in a set of 12 cases, and officers could have guessed the purpose of the exercise, that is why making the various factors vary across cases was a necessity.

4. Implementation

The experiment was implemented online, as other exercises of detection of needs for further training in the MFI. The officers had to complete the exercise before going to a physical training, and had no idea of the exact aim of the exercise.

The officers who took part in the experiment were those who were appointed by their regional manager to participate in the physical training, and allowed by their branch supervisor to go according to their workload. Managers were requested to appoint the same number of male and female officers, from the maximum of different branches under their supervision, and a half of officers specialized in agricultural loans, which finally let them little leeway. In some regions, it was more difficult to find female officers specialized in agriculture, which resulted in a sample with slightly more male officers. If the officers were not randomly selected, there is no reason to believe that they shared some common unobservable characteristics correlated to our variable of interest. Moreover, the sample was representative of the whole population of officers in the MFI, as shown in the next section.

IV. DATA

1. Loan officers

The sample consists in 76 officers out of about 600 in the MFI, 39 having participated in the agricultural exercise and 37 in the non-agricultural one. The officers came from the whole territory (table 28), and the proportion of women in the sample is similar to the one in the MFI, even though slightly superior: 42% of the officers in the sample were women (32 over 76) against 36% in the MFI. The proportion is slightly lower among officers participating in the agricultural exercise (38,5% against 45,9% among the others), which is also in keeping with what is observed in the MFI (male officers are more likely to grant more agricultural loans).

Since all officers or almost are able to grant agricultural loans (as long as they followed the appropriate training), there is no official threshold above which an officer is considered as officially specialized in agricultural loans. Therefore, the choice to allocate the set of agricultural cases to officers depended on the proportion of agricultural loans in their portfolios compared to the proportion of agricultural loans in the portfolios of their colleagues in the branch.

The two sets of officers were representative of the overall population of officers in the MFI in terms of age, education and experience (table 29).

Table 28. Repartition of sampled loan officers by region and gender

Region	Agricultural cases			Non-agricultural cases			TOTAL
	Men	Women	Total	Men	Women	Total	By region
Cap Bon	2	1	3	1	2	3	6
Center West	8	3	11	3	2	5	16
Great Tunis	4	3	7	6	3	9	16
North West	3	1	4	4	2	6	10
Sahel	1	1	2	1	2	3	5
South East	4	3	7	3	5	8	15
South West	2	3	5	2	1	3	8
Total	24	15	39	20	17	37	76
Proportions	61,5%	38,5%		54,1%	45,9%		

Table 29. Experience, post-bac studies and age among loan officers in the MFI and in the sample

	Experience			Post-Bac studies			Age		
	MFI	Sample		MFI	Sample		MFI	Sample	
	All	Agri.	Non-agri.	All	Agri.	Non-agri.	All	Agri.	Non-agri.
Q1	2,2	2,1	2,1	2,5	2,5	2,5	29,4	29,2	29,7
Q2	4	3,7	3,9	3	2,5	3	31,8	32,1	32,5
Q3	5,5	5,1	4,8	4	3	4	34,5	34,4	34,9
Mean	4,1	3,7	3,7	3	2,9	3,2	32,1	31,8	32,3

Overall, these officers did not behave differently than their colleagues towards male and female clients in terms of amounts granted for first loans before the experiment³⁹ (table 30). The only difference which may be observed concerns the amounts granted to male clients for agricultural loans, since officers in the sample seem to grant higher amounts on average than their colleagues; however, there is no difference when considering these amounts in terms of ratio over amounts requested. As a consequence, the difference rather concerns the type of clients served than officers' behaviors.

³⁹ The data used to check such potential differences concerns the first loans granted between January 1, 2014 and September 23, 2014, i.e. the database used in chapter 1.

Table 30. Differences between amounts granted for first loans by officers in the sample and the others

			Other officers	Sample	Diff.	Obs.
Non-agricultural loans	Male clients	Loan size (TND)	1126	1079	47.02	10361
		Ratio loan size/request	72,0%	72,5%	-0.00566	
	Female clients	Loan size (TND)	681	662	19.01	17524
		Ratio loan size/request	75,3%	74,0%	0.0138	
Agricultural loans	Male clients	Loan size (TND)	1021	1220	-199.7***	4560
		Ratio loan size/request	76,3%	75,9%	0.00440	
	Female clients	Loan size (TND)	738	734	4.269	6616
		Ratio loan size/request	76,7%	75,3%	0.0142	

* p<0.05, ** p<0.01, *** p<0.001

2. Requests and amounts granted

For credibility reasons, an amount requested was added to each case, ranging from 1700 TND to 4500 TND. Usually, loan officers grant a proportion of this amount requested. The real data concerning the requests for a first loan in September 2014 revealed that the ratio between average requests and average loan amounts was 64,2% for women, against 64,4% for men, when the application was accepted.

In the experiment, the amounts granted by officers were extremely variable for one single case (tables 31 and 32). This extreme variability may be explained by the fact that the fictitious cases are considerably summarized compared to real applications for a first loan, and a lot of necessary information to apply the real procedure was not provided. This was done on purpose in order to allow the officers to rebuild the case according to their experience and representations; as a consequence, officers rebuilt very different stories, which resulted in high variability in the amounts granted to each case.

Table 31. Amounts granted to non-agricultural cases

Case #	Gender	Request	Amount granted	S.d.	Minimum	Maximum	N
1	Female	2000	1670	463	1000	2000	37
2	Male	4000	2829	931	700	4000	37
3	Male	4500	3283	1382	1000	4500	37
4	Female	2200	1256	497	500	2200	37
5	Male	2500	2054	695	500	2500	37
6	Female	2500	1364	616	500	2500	37
7	Female	1800	1618	293	1000	1800	37
8	Male	2000	1208	456	500	2000	37
9	Female	1800	1413	422	500	1800	37
10	Male	3000	2618	620	1000	3000	37
11	Male	1700	1086	370	500	1700	37
12	Female	4500	3229	1031	1000	4500	37
Total		2708	1969	1051	500	4500	444

Table 32. Amounts granted to agricultural cases

Case #	Gender	Request	Amount granted	S.d.	Minimum	Maximum	N
1	Female	3500	2564	998	500	3500	39
2	Male	5000	3376	1548	500	5000	38
3	Female	2500	1562	680	500	2500	37
4	Male	4800	4113	1020	1500	5000	37
5	Male	3000	1862	884	500	3000	37
6	Female	2500	1297	678	500	2500	37
7	Male	3000	2462	794	800	3000	37
8	Female	4500	2340	1235	500	4500	37
9	Female	3000	2040	828	500	3000	37
10	Male	2000	1413	585	500	2000	37
11	Female	5000	3155	1472	500	5000	34
12	Male	2500	1635	642	700	2500	34
Total		3441	2321	1288	500	5000	441

The ratios between requests and amounts granted are higher in the experiment than in the real data of September 2014, and different between agricultural and non-agricultural cases: they vary between 0,1 and 1 for agricultural cases, and between 0,175 and 1 for non-agricultural cases, with a high proportion of ratios equaling 1. This proportion is higher for male cases in the two sets (figure 14), but the difference in proportions is statistically significant only for agricultural cases (table 33).

Figure 14. Ratios between amounts requested and granted by gender and type of case.

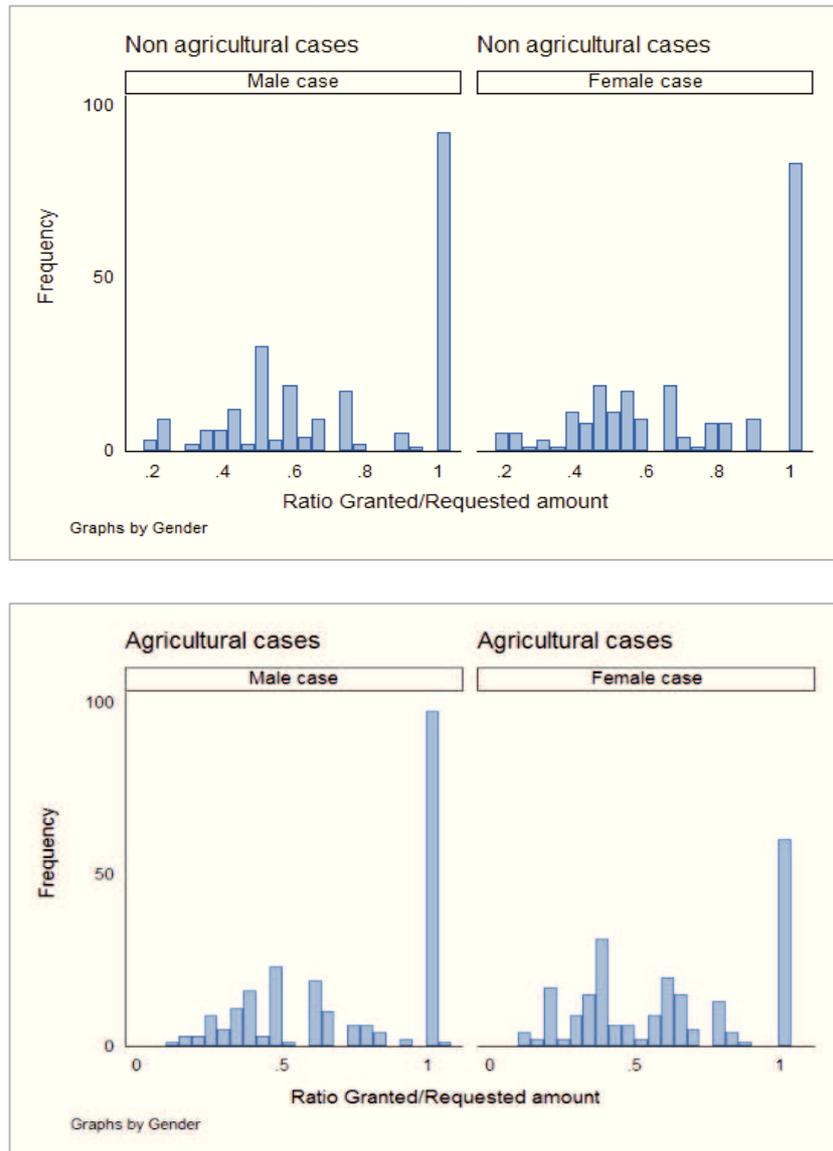


Table 33. Proportions of ratios of 100%

	Non-agricultural	Agricultural
Male cases	41,4%	44,1%
Female cases	37,4%	27,1%
Difference	0,041	0,169***

In the same way, the difference between average ratios for male and female cases is not significant for non-agricultural cases even though the ratio is inferior for female cases, but it is strongly significant for agricultural cases, the ratio still being inferior for female cases. Besides, the ratios between average amounts granted and average amounts requested are inferior for both

agricultural and non-agricultural cases, and the difference is much higher in agricultural cases (table 34).

Table 34. Ratios between amounts requested and granted by case

Case #	Non-agricultural cases		Agricultural cases	
	Male	Female	Male	Female
1		83,5%		73,3%
2	70,7%		67,5%	
3	73,0%			62,5%
4		57,1%	85,7%	
5	82,2%		62,1%	
6		54,6%		51,9%
7		89,9%	82,1%	
8	60,4%			52,0%
9		78,5%		68,0%
10	87,3%		70,7%	
11	63,9%			63,1%
12		71,8%	65,4%	
Average	72,9%	72,6%	73,3%	61,8%
Difference	0,003		0,104***	
Ratio average granted/average requested amount				
	73,9%	71,3%	73,3%	61,8%

Concerning duration, the average number of instalments by case varies from 10 to 16 months for non-agricultural cases and from 10 to 12 months for agricultural cases, with respective means of 11,6 and 11,1 months. The difference in means is not significant between genders neither for non-agricultural cases nor agricultural cases. This is consistent with the procedures associated with each financial product (or type of credit): indeed, the instalments are framed by the kind of financial product, and loan officers are not totally free to choose any duration, even though they have a leeway. As a consequence, the number of instalments assigned is not analyzed in itself, but it will be taken into account, especially for non-agricultural cases for which monthly repayment capacities are determining.

V. EMPIRICAL METHOD AND MAIN RESULTS

1. All cases considering all risk factors

The two experiments contain respectively 441 and 444 observations treated as panel data, which makes 885 observations in total, with the officer being the individual observation and the case being the repetition variable. A fixed effects model with clustered standard errors at the individual level is defined as follows:

$$Y_{it} = \alpha + \beta X_t + \gamma_i + \varepsilon_{it}$$

With:

- Y_{it} the amount granted by the loan officer i for the case t ;
- α the constant term;
- X_t the characteristics of the case t ;
- β the vector of associated coefficients;
- γ_i the individual fixed effects for the loan officer i ;
- ε_{it} the error term;

In order to analyze loan officer's characteristics, which are constant for each case, we estimate a random effects model as well, defined as follows:

$$Y_{it} = \mu + \beta X_t + \delta_i + \lambda Z_i + \varepsilon_{it}$$

With:

- Y_{it} the amount granted by the loan officer i for the case t ;
- μ the constant term;
- X_t the characteristics of the case t ;
- β the vector of associated coefficients;
- δ_i the individual random effects for the loan officer i ;
- Z_i gender of officer i ;
- λ the associated coefficient;
- ε_{it} the error term;

Indeed, the random-effects model assumes that the individual term δ_i and the explicative variables included in the model are independent; if such hypothesis is often considered too strong, this should not be the case here, as the explicative variables concern the fictitious case we built ourselves, whereas the individual term δ_i refers to loan officers. As a consequence, they should not be correlated.

The first set of analyses is run over all the observations gathered together, i.e. mixing agricultural and non-agricultural cases. Results are presented in table 35. The base model including all risk factors as well as request is estimated with the fixed-effects estimator in model 1. In model 2a, an interaction term between the type of case (agricultural or not) with profit is added; profit varies with each non-agricultural case, and equals 0 for agricultural cases so that it remains fixed and is omitted in the estimation. This enables us to keep all cases while estimating the effect of profit for non-agricultural loans only. The same model is estimated with random effects in model 4. A Hausman test was performed to check if the hypothesis of independence between the individual term and the explicative variables holds, and the p-value associated with Chi square (p-value = 0.73) confirms that the random-effects estimator is unbiased and efficient. Therefore, the coefficients estimated in models 4, 5, 6 and 7 can be trusted. In any case, the coefficients of interest found using the fixed-effects estimator and the random-effects estimator are similar, which may constitute a robustness check of our results.

An interaction term between female case and request is included in the fixed-effects model in model 3, while we add officer gender in model 5, an interaction term between officer gender and case gender in model 6, and an interaction term between case gender and the rate of rural areas in the branch where the officer usually works in model 7, which are all random effects models. Finally, model 2b is the same fixed-effects model as model 2a, with the ratio between amounts requested and granted as the dependent variable instead of the amount granted.

The main result which is observed in models 1, 2a, 2b and 4 is the significant and negative coefficient associated with female case: on average, a female case received around 280 TND less than a male case, at equal risk factors, request, as well as profit for non-agricultural cases in models 2a and 4. When amounts granted are considered in terms of ratios (model 2b), they are also inferior by 7 percentage points on average for female cases.

Table 35. Estimation of amounts granted to all cases

	Model 1	Model 2a	Model 3	Model 4	Model 5	Model 6	Model 7	Model 2b
	FE	FE + Profit	FE + interact Request	RE	RE + Officer	RE + interact Officer	RE + interact Rural	FE Ratio
Female case	-277.6*** (59.71)	-299.2*** (61.22)	258.4 (224.6)	-277.9*** (54.38)	-278.1*** (54.38)	-285.7*** (71.10)	-208.7 (127.1)	-0.0724*** (0.0179)
Female case# Request			-0.177** (0.0761)					
Female officer					-56.35 (106.2)	-65.31 (119.1)		
Female case# Female officer						17.91 (107.6)		
Rate of rural areas (vs. <7%)							-	
7-35%							162.5 (184.3)	
35-55%							71.58 (194.3)	
>55%							-28.23 (172.8)	
Female case# rural areas							-	
Female case# 7-35%							-184.0 (164.5)	
Female case# 35-55%							-38.11 (173.2)	
Female case# >55%							-40.21 (154.6)	
Stability level	197.3*** (51.51)	208.8*** (51.71)	199.5*** (52.00)	203.6*** (59.46)	203.6*** (59.46)	203.7*** (59.50)	203.9*** (59.50)	0.0893*** (0.0184)
Education level	127.4*** (36.77)	217.5*** (48.40)	109.2* (62.68)	136.9*** (36.52)	137.5*** (36.54)	137.4*** (36.56)	139.2*** (36.70)	0.0479*** (0.0115)
Experience level	-93.39 (64.95)	-121.0* (65.51)	-116.7* (65.75)	-109.9* (62.98)	-110.0* (62.98)	-110.0* (63.02)	-109.5* (63.03)	-0.0446** (0.0182)
Additional revenue	33.56 (79.52)	28.89 (81.12)	65.83 (81.79)	13.97 (63.23)	13.92 (63.22)	13.92 (63.26)	14.45 (63.28)	-0.0279 (0.0212)
Activity (vs. less risky)	-	-	-	-	-	-	-	-
Moderately risky	-321.3*** (112.9)	-542.1*** (130.5)	-376.6*** (127.8)	-306.8*** (117.1)	-308.5*** (117.2)	-308.2*** (117.3)	-313.5*** (117.6)	-0.180*** (0.0394)
Riskier	-594.3*** (124.0)	-838.9*** (144.6)	-642.2*** (147.4)	-562.9*** (143.4)	-565.0*** (143.5)	-564.6*** (143.6)	-571.6*** (144.1)	-0.284*** (0.0445)
Multiple suppliers (non-agri)/ mixed farming (agri)	-166.8*** (46.21)	-202.6*** (45.12)	-203.3*** (45.13)	-170.4*** (58.52)	-170.4*** (58.52)	-170.4*** (58.55)	-171.1*** (58.57)	-0.0808*** (0.0171)
Repayment risk	-208.7*** (61.04)	-152.6** (62.24)	-136.9** (59.64)	-179.3*** (66.31)	-179.1*** (66.31)	-179.2*** (66.35)	-180.0*** (66.37)	-0.0622*** (0.0214)
Activity risk	-370.9*** (67.44)	-314.6*** (68.64)	-331.1*** (69.89)	-344.3*** (62.65)	-344.1*** (62.65)	-344.2*** (62.69)	-343.8*** (62.71)	-0.0908*** (0.0166)
Profit#Non-agri. Case (100 TND)		62.8*** (0.200)	53.7*** (0.203)	13.3 (0.0874)	13.6 (0.0878)	13.6 (0.0878)	0.142 (0.0893)	0.0147*** (4.66e-05)
Request (100 TND)	45.7*** (0.0658)	30.2*** (0.0852)	47.9*** (0.0969)	46.7*** (0.0628)	46.6*** (0.0628)	46.6*** (0.0629)	0.462*** (0.0632)	-0.0121*** (2.28e-05)
Constant	1361*** (277.8)	1570*** (291.6)	1030*** (295.0)	1228*** (296.1)	1255*** (300.2)	1258*** (301.0)	1195*** (324.0)	1.249*** (0.0913)
Observations	885	885	885	885	885	885	885	885
R-squared	0.520	0.527	0.529	0.453	0.454	0.454	0.455	0.147
Number of ID	76	76	76	76	76	76	76	76
Clustered standard errors	yes	yes	yes	no	no	no	no	yes

*** p<0.01, ** p<0.05, * p<0.1

This effect is consistent with what was observed in chapter 1 using real data, but much more substantial though. The experiment, which was designed so that fictitious cases contain less information than real cases, requested loan officers to reproduce the complementary information necessary to grant an amount on the basis of their experience and representations; the results tend to show that this imaginary complement to the story defined female cases as necessitating lower amounts all other things being equal. It seems obvious here that gender representations come into play in the assessment of individual requests, and that these representations lead to disadvantage women in terms of amounts: this time, objective information unobserved by researchers but observed by officers cannot account for the gap observed.

The role of gender representations tended to be confirmed during a session of presentation of these results to managers. Indeed, after the experiment and after the analysis on real data presented in chapter 1, the results of both studies were summarized during a meeting with most regional managers, in order to confront our explanatory hypotheses. The first answer given by managers always mentioned the size of women's projects, which tend to be smaller, and which would account for the gap between amounts granted to men and women. It was explained to managers that the size of projects was taken into account in the analysis on real data, and that results should be understood *ceteris paribus*, especially in the experiment, however their reaction seems to reflect the general representation widely spread among officers and managers (who are former officers). The next section expounds in-depth discussion on the role of representations.

The results in model 3 corroborate another result of the analysis on real data: the significant and negative coefficient of the interaction term between female case and request indicates that the higher the request, the more disadvantaged women are in terms of amounts granted. This implies that the most ambitious women are even more rationed than the others.

Looking at the effect of officer gender, the results of model 5 show that female officers do not grant different amounts than their male counterparts; they especially do not grant lower amounts, just as the analysis on real data demonstrated. The results of model 6 reveal that this similar behavior holds when cases are distinguished by gender: female cases are granted lower amounts by both female and male officers, without significant difference according to officer gender. We distinguish by type of case (agricultural or not) below.

Adding the interaction term between female case and branch rate of rural areas confirms the results found in chapter 1 as well (model 7): the type of branch does not have any impact on officers' behaviors towards female cases, and officers working in more rural branches especially do not ration women more than their colleagues in other branches.

With regard to the other risk factors, they all seem to have been correctly taken into account by officers: amounts granted decrease with the riskier level of each factor. The only exception concerns diversification (multiplicity of suppliers for non-agricultural cases or mixed farming for agricultural cases): whereas such diversification is supposed to be considered as less risky according to training contents, lower amounts were granted in such cases. The discussion with managers shed some light on this result: some officers may sometimes interpret such diversification as a multiplication of risk sources, and therefore consider this factor as riskier. Looking at activity sectors, they can be ordered according to their risk level as well: for agricultural cases, small-scale breeding is considered as riskier than large-scale breeding, which is also riskier than large-scale farming, usually considered as the least risky activity. For non-agricultural cases, perishable production is considered as riskier than trade which is riskier than non-perishable production. This order of risk levels was predefined in the analysis and is confirmed by the results: officers seem to consider the risk level of activity sectors in the same way as we defined them. Overall, this means that loan officers mainly considered the various risk criteria as expected, showing on the one hand that these official risk criteria were correctly identified, and on the other hand that a riskier project according to these official criteria (and still not too risky to be rejected) is rationed in terms of amount, which is in accordance with general procedures. Finally, higher monthly profits are associated with higher amounts for non-agricultural cases, which is also consistent with procedures.

2. Distinguishing between agricultural and non-agricultural cases using a risk score

A remaining question concerns the existence of a possible difference between agricultural and non-agricultural cases. Given the number of observations to analyze, including all risk factors in the econometric analysis is not supposed to bring multicollinearity problems because of the experimental design: indeed, a D-optimal design is built in such a way so that factors are orthogonal or almost. However, since additional information was added (amounts requested for all cases and profits for non-agricultural cases), the limited number of degrees of freedom may be an issue. Consequently, the analysis distinguishing between agricultural and non-agricultural cases (which decreases the number of observations) is carried out by replacing all the risk factors (gender excluded) by a unique variable representing a risk score.

As the various factors were initially chosen to be the most determining ones according to actual procedures, we decide to allocate the same weight to each factor. For all the binary variables (6 out of 8), the allocated score is 1 if the level is risky and 0 otherwise. For the variables with 3

ordered levels (education level), the allocated score is 2 for illiteracy, 1 for primary education and 0 for secondary education. The remaining variable is activity sector, which takes 3 different values also ordered according to our predefined classification, which is consistent with previous results: for agricultural cases, a small-scale breeding activity is considered as the most risky and then gets a score of 2, the large-scale breeding activity is moderately risky, and gets a score of 1, while large-scale farming activity is less risky, and gets a score of 0. Regarding non-agricultural cases, an activity of non-perishable production gets a score of 0, trade gets a score of 1, and an activity of perishable production gets a score of 2.

The allocation of scores by case is presented in table 36. In accordance with the design of cases, the average scores of male and female cases are equal, with a mean of 5.

A first set of analyses is run on all cases first, and then on agricultural and non-agricultural cases separately, to define the variables to include properly. The results are presented in table 37.

Table 36. Risk score by case

Case #	Non-agricultural cases		Agricultural cases	
	Male	Female	Male	Female
1		5		4
2	2		4	
3	4			6
4		5	2	
5	7		4	
6		5		6
7		6	6	
8	5			6
9		5		4
10	4		5	
11	8			4
12		4	9	
Average score	5	5	5	5

Table 37. Estimation of amounts using risk scores (FE model)

	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Dependent variable	Total amount	Total amount	Total amount	Monthly amount	Total amount	Total amount
Cases	All	Non-agri.	Non-agri.	Non-agri.	Agri.	Agri.
Female case	-249.6*** (56.25)	-100.4* (53.93)	-148.4*** (52.57)	-23.38*** (7.766)	-372.9*** (89.96)	-378.8*** (90.03)
Risk score	-89.67*** (20.79)	-15.22 (42.64)	-98.70** (38.65)	-22.86*** (5.407)	-126.1*** (22.26)	-122.1*** (21.81)
Request	0.597*** (0.0516)	0.649*** (0.0969)	0.452*** (0.0839)	0.0163** (0.00731)	0.606*** (0.0626)	0.612*** (0.0626)
Profit# non-agri case	0.249* (0.126)	0.249* (0.146)	0.527*** (0.136)	0.0671*** (0.0189)		
Number of installments			85.76*** (12.45)			27.18 (23.70)
Constant	757.3*** (226.8)	90.18 (392.5)	-218.8 (354.7)	193.8*** (43.55)	1051*** (285.9)	710.6* (355.9)
Observations	885	444	444	444	441	441
R-squared	0.485	0.539	0.617	0.334	0.458	0.462
Number of ID	76	37	37	37	39	39
Clustered standard errors in parentheses	yes	yes	yes	yes	yes	yes

*** p<0.01, ** p<0.05, * p<0.1

Model 8 is run on all cases including gender, risk score, request, and profit for non-agricultural cases. The results show that the score seems correctly defined, as one more point in risk score decreases the total amount granted by 90 TND on average. A female case is still associated with a lower total amount, while request and profit still increase amounts. Considering non-agricultural cases only, as suspected, loan officers tend to think in terms of monthly repayment: model 9 is the same model as model 8 run on non-agricultural cases only, whereas in model 10, the number of installments set by loan officers is added as a control, and the specification in model 10 seems better. Indeed, the R-squared is higher, and the coefficient of risk score is more consistent as it is negative and significant only in this case. In model 11, we estimate the monthly amount (total amount divided by the number of installments) instead of the total amount, but the specification does not appear as better. As a consequence, model 10 is kept as the base model for further analysis in non-agricultural cases. Concerning agricultural cases, since repayment schedules are flexible, loan officers were not expected to think in terms of monthly repayment; this is confirmed by comparing models 12 and 13: the former does not include the number of installments whereas the latter does, but results remain similar, and the number of installments is not significant

in the latter. For consistency reasons with non-agricultural cases, model 13 is kept as the base model for agricultural cases though.

In any case, whatever the specification chosen, a female case still receives lower amounts, in both agricultural and non-agricultural cases. This result therefore seems robust. Deeper analyses are carried out considering agricultural and non-agricultural cases separately and presented in tables 38 and 39.

With regard to non-agricultural cases first (table 38), fixed-effects (model 14) and random effects (model 15) models show similar results⁴⁰: female cases receive lower amounts and the higher the risk score, the lower the amounts. Adding officer gender in the random-effects model (model 16) shows that female officers who assessed the non-agricultural cases do not grant different amounts compared to their male counterparts, and this result holds when distinguishing between female and male cases (model 17), which means that again, female cases receive lower amounts from both female and male officers. In order to test the hypothesis that women would be more risk averse, an interaction term between female officer and risk score is added in model 18, and the result confirms the conclusion found in chapter 1 on this question: female officers are not more risk averse than male officers, since they do not tend to grant lower amounts to riskier projects. Finally, adding an interaction term with the rate of rural areas served by the officer's branch does not have any effect (model 19), confirming that the negative bias against women is not pulled by either more rural or more urban branches.

The same conclusions can be drawn from the analyses carried out on agricultural cases (table 39)⁴¹: in these cases as well, female officers do not grant different amounts than their male counterparts (model 22), female cases receive lower amounts from both male and female officers (model 23), and female officers do not appear as more risk averse (model 24). Officers from more rural branches do not seem to behave differently towards women when granting agricultural credits either, even if the non-significant coefficients may be due to the low number of officers by category. Indeed, the negative coefficients associated with the interaction term between female case and more urban branches, even if statistically non-significant, are significant in magnitude, and might indicate that women with agricultural projects are more rationed in areas where agriculture is less developed, which would also confirm the results found in chapter 1: it is possible that in the regions where officers are less used to seeing women working in the agricultural sector, they tend to

⁴⁰ A Hausman test was performed between both models and the p-value of 0.93 confirms that the random-effects estimator is unbiased.

⁴¹ A Hausman test was performed between models 19 and 20 and the p-value of 0.97 confirms that the random-effects estimator is unbiased.

particularly disadvantage women with agricultural projects. However, given the statistical non-significance of the result in the experiment, we cannot be too affirmative about it.

Finally, the main difference between agricultural and non-agricultural cases, apart from the role of repayment schedule, seems to be the magnitude of the gap between amounts granted to male and female cases: the disadvantage appears more substantial in agricultural cases, which is also in keeping with the results found with real data.

Table 38. Estimation of amounts granted to non-agricultural cases

	Model 14	Model 15	Model 16	Model 17	Model 18	Model 19
	FE	RE	RE + Officer	RE + interact Officer	RE + interact score officer	RE + interact Rural
Female case	-148.4*** (52.57)	-146.4** (66.91)	-146.6** (66.90)	-176.1** (87.88)	-146.7** (66.89)	-143.6 (156.1)
Female officer			80.09 (102.7)	47.77 (120.1)		
Female officer# Female case				64.52 (124.2)		
Female officer# risk score					44.98 (42.15)	
Rate of rural areas (vs. <7%)						-
7-35%						-14.81 (187.9)
35-55%						337.5 (219.1)
>55%						19.36 (173.5)
Female case# rural areas						-
Female case# 7-35%						32.80 (194.8)
Female case# 35-55%						-85.10 (228.3)
Female case# >55%						-2.487 (180.5)
Risk score	-98.70** (38.65)	-95.20*** (31.91)	-95.50*** (31.91)	-95.35*** (31.94)	-116.5*** (37.46)	-96.72*** (32.01)
Request	0.452*** (0.0839)	0.460*** (0.0595)	0.459*** (0.0595)	0.460*** (0.0595)	0.459*** (0.0595)	0.456*** (0.0597)
Monthly profit	0.527*** (0.136)	0.515*** (0.123)	0.516*** (0.123)	0.516*** (0.123)	0.517*** (0.122)	0.520*** (0.123)
Number of installments	85.76*** (12.45)	82.16*** (8.963)	82.47*** (8.976)	82.32*** (8.987)	82.76*** (8.978)	83.72*** (9.073)
Constant	-218.8 (354.7)	-205.9 (265.9)	-243.8 (270.3)	-228.4 (272.2)	-141.6 (286.7)	-261.5 (298.1)
Observations	444	444	444	444	444	444
R-squared	0.617	0.567	0.569	0.569	0.570	0.576
Number of ID	37	37	37	37	37	37
Clustered standard errors	yes	no	no	no	no	no

*** p<0.01, ** p<0.05, * p<0.1

Table 39. Estimation of amounts granted to agricultural cases

	Model 20	Model 21	Model 22	Model 23	Model 24	Model 25
	FE	RE	Re + Officer	RE + interact Officer	RE + interact score officer	RE + interact Rural
Female case	-378.8*** (90.03)	-383.8*** (85.66)	-384.2*** (85.63)	-353.7*** (110.3)	-385.6*** (85.75)	-269.3 (196.0)
Female officer			-165.0 (185.6)	-125.9 (205.9)	-309.5 (324.6)	
Female case# Female officer				-77.04 (175.5)		
Female officer# score					29.03 (53.53)	
Rate of rural areas (vs. <7%)						-
7-35%						173.7 (317.5)
35-55%						-119.8 (308.9)
>55%						-88.90 (301.1)
Female case# rural areas						-
Female case# 7-35%						-365.7 (261.4)
Female case# 35-55%						3.958 (255.2)
Female case# >55%						-85.98 (251.9)
Risk score	-122.1*** (21.81)	-122.1*** (30.69)	-122.2*** (30.68)	-122.0*** (30.72)	-133.0*** (36.62)	-122.8*** (30.71)
Request	0.612*** (0.0626)	0.614*** (0.0488)	0.614*** (0.0488)	0.614*** (0.0488)	0.615*** (0.0488)	0.614*** (0.0488)
Number of installments	27.18 (23.70)	20.79 (14.73)	21.83 (14.77)	21.35 (14.83)	22.59 (14.85)	18.29 (14.97)
Constant	710.6* (355.9)	778.5** (347.4)	833.5** (353.1)	822.7** (354.3)	878.7** (363.0)	829.0** (407.9)
Observations	441	441	441	441	441	441
R-squared	0.462	0.373	0.377	0.377	0.377	0.379
Number of ID	39	39	39	39	39	39
Clustered standard errors	yes	no	no	no	no	no

*** p<0.01, ** p<0.05, * p<0.1

VI. DISCUSSION

The main result of this experiment is that loan officers, either male or female, tend to grant lower amounts to female applicants. This is consistent with the results of the analysis on real data from chapter 1, with a significant difference though: the gap appears as far more substantial in the experiment than in reality. As a consequence, several lessons may be drawn: first of all, the experiment was designed so that officers had to face a lack of information, and the complements to the story they had to imagine in order to assess the fictitious cases are revealing about their representations of male and female applicants. Officers seem to consider that female applicants need or deserve less money for a similar project. Many reasons may be behind such consideration, as exposed in chapter 1: officers may think that women are less capable, have less access to resources to run their projects in the same conditions as men, have less time to invest in their projects, or have smaller projects in any case, whatever the available objective and quantitative indicators officers may observe. However, whatever these reasons, the negative coefficient associated with female case in the experiment is necessarily explained by general and average representations of female applicants; moreover, loan officers seem to refer only to general representations with a negative connotation, whereas we know that they also have some positive information about female clients in general. According to neoclassical economic theory, economic agents are supposed to be rational, and rational agents are supposed to make important decisions using all the information that is provided to them (Kahneman, 2011). In our case, loan officers do not seem to behave as rational agents; conversely, the arbitrary choice between positive and negative information about female applicants to assess requests rather implies that their rationality is bounded within the meaning of Simon (March, Simon, & Guetzkow, 1958; Simon, 1957, 1982). To that extent, officers do not seem to behave as “Econs” but rather as “Humans” as Thaler & Sunstein (2009) described them.

Since female cases received lower amounts because they were female, female applicants seem to have been considered as belonging to a category; according to Kahneman (2011), such a social category is represented by norms and prototypes, and these representations are actually stereotypes. Whether these stereotypes are true or false does not have any impact on the fact that they constitute how categories are thought. We could also add that whether officers themselves truly believe in these stereotypes, or only think that such stereotypes are widespread in the population does not matter much: indeed, in the second case, even though they do not think that women are less able or have projects of worse quality, officers could anticipate that women are anyway more likely to face difficulties in the management of their projects because of existing gender inequalities in terms of access to resources and mobility, or because of existing

representations of what women should or should not do, and decide to grant them lower amounts because of these anticipated difficulties.

According to the statements made by some loan officers during a training on gender inequalities organized by the MFI⁴², it seems that both situations coexist. Some officers anticipate the difficulties women could face and disagree with resulting inequalities, since some of them, both male and female, said during the training that “[they are] aware of the difficulties faced by women”, that “conditions for men and women are not fair, with more mobility constraints for women, and impossibility of working during pregnancy”, and that “the world should be more egalitarian”. However, some other officers seem to truly share some gender representations. Indeed, during this training, gender inequalities existing in Tunisia were exposed through a formal presentation, followed by a collective discussion with officers, which highlighted very diverse reactions and ways of looking at these inequalities, and constituted some illustrations of prescriptions associated with the social category “women”. For instance, a male officer asserted that since “there is no woman occupying important positions in the world, apart from Angela Merkel and the president of Brazil”, it should be for a reason, and existing gender inequalities are therefore not so surprising. Another one explained that “if [he] ha[s] a boy and a girl at home, [he] trust[s] and rel[ies] more on the boy for responsibilities”. A female officer also accounted for some gender inequalities at work by saying that “there are men’s jobs and women’s jobs”. Finally, some male officers expressed nostalgic feelings for the past when “relationships between men and women were better: there was more respect”, while “today, women want too many things, they are too demanding. There are a lot of divorces, and this is often because of women”.

Therefore, the norms likely to have been associated with the category “female applicants” by some officers seem consistent with the ones associated with the social category “women” described by Akerlof & Kranton (2000). In their paper, the authors analyze how identity, and the social categories it is associated with, may affect economic outcomes. According to these authors, gender discrimination in the job market may be explained by the fact that women would be “assigned” to the social category “homemakers” whose “prescribed behavior” is to invest time at home, whereas “prescriptions dictate that “men” should not do “women's work” in the home” (Akerlof & Kranton, 2000, p. 747). The authors explain that people internalize these categories and prescribed behaviors, and if this affects how people see themselves, it is likely to affect how they

⁴² This training is described in details in chapter 5. Quoted statements were made during the first training session in December 2014 in Tunis.

see others as well. Consequently, it is likely that at least some officers, both male and female, consider that female applicants do have less time to invest in their project because their identity of women prescribe them to invest more time at home than men, and doing otherwise would represent a social cost for these women. It is also likely that some officers imagine that these women's husbands would not let them spend too much time in their project because of these social prescriptions as well. What corroborates this idea is that although official procedures do not require female applicants to get their husbands' agreement to request a loan, in practice, loan officers check that they do get it, to prevent these women as well as themselves to get into trouble if husbands find out. This implies that getting a loan and running a project for a woman is not self-evident, and that social resistances still exist.

Consequently, such stereotypes may bias people's judgements, this is what Tversky & Kahneman (1974) call the "representativeness heuristic": people use categories to make a judgment and, if applicable, the decision depending on this judgement. To these authors, two different processes, or "systems", intervene in human thinking, the first one being fast and intuitive, the second one being slow and capable of a more systematic and careful approach to evidence, and of complex computation following a list of boxes to check before making a decision. However, intuitive thinking is likely to influence even the most careful decisions: mental shortcuts are more comfortable and it is easy to jump on conclusions on the basis of limited evidence. Stereotypes are part of such limited evidence, and even though a concrete list of boxes to check is available and easily observable in the case of loan officers, who could refer to the individual information available for each case, it seems that intuitive thinking gets the upper hand, including over other base-rate information that points in another direction – in this case, the positive information about repayment behavior of female clients.

If stereotypes contribute to such biases of judgement, they are not the only source of bias; these authors also point out that a salient event which attracts attention is easily retrieved from memory, and the frequency of such an event is likely to be exaggerated. In the case of loan officers, a story about one female client who used her loan for consumption only and lied about her project was mentioned several times, either by some officers or by managers from the headquarters, to attempt to justify the lower amounts granted to women when the results of these analyses were presented. The striking fact is that this justification was not introduced as a general fact about female clients who would tend to use loans for consumption instead of projects, but rather as a specific story which apparently left its mark on people's minds. Surprising individual cases may have a powerful impact and contribute to the overestimation of unlikely events, leading to

judgement bias according to Kahneman (2011), and this indeed seems to be the case for some loan officers.

This leads to an additional important aspect to take into account, which is the fact that these loan officers belong to a single institution. Following the evolutionary theory of the firm (Nelson & Winter, 1982), such an institution is a learning environment; instead of computing complex calculations to make a careful decision based on individual objective evidence, officers may be tempted to rely on “routines” and pre-established thinking and behavior schemes widely shared in the institution, which enables them to make quick decisions. As a consequence, the kind of well-known story above-mentioned is likely to contribute to such routines and schemes consisting in considering and treating female applicants as representative elements of a category.

Finally, given that the gap observed between granted amounts to men and women is more substantial in the experiment than in the analysis on real data enables us to draw another lesson: when more relevant information is available to assess a request, such information thwarts stereotypes. In other words, when judgement is less guided by objective criteria to take into account in a specific procedure, more leeway is let to subjectivity and intuitive thinking, and stereotypes are more likely to lead to – at least - statistical discrimination. What emerges from the comparison of analyses is that the existing procedures enable the officers to refer to more numerous objective criteria to assess a request, leading to fairer assessments than when less information is available. The difference between the procedures to accept a request and to grant a credit amount seems to support this idea as well: indeed, as previously explained, after the first visit to applicants’ homes, loan officers fill the system with the information concerning the investigation into applicants’ reputation and ethics, or what the MFI calls the “moral enquiry”. After this, they receive a color code (red, orange or green) directly from the risk department which is supposed to reflect the risk associated with this request, based on an econometric analysis of similar clients’ former loans and repayments. The scoring system is strictly confidential and unknown from officers, who are just supposed to use the color code to help them make the decision whether to grant a loan or not to a client. All that we know as researchers is that gender is included in this scoring system and female is correlated with less risk. This is likely to at least partly explain that women are favored in terms of access to credit. However, the procedure to decide the amount to grant is less detailed: it is supposed to be based on monthly repayment capacities, calculated using monthly revenues, expenses and profits, but the result of the calculation constitutes only an upper bound of the monthly repayment the potential client would have to honor. As a consequence, more leeway is let to officers to make a decision with regard to amounts to grant. This could explain that women are disadvantaged in terms of amounts while being favored in terms of access.

Furthermore, we could have expected the calculation of bonuses to influence the amounts to be granted; given how bonuses were calculated at the time of our study, we could have especially expected an indirect positive effect in favor of women, who show better repayment rates. However, the contrary is observed in the experiment; yet, officers assessed the other risk factors as expected given the official procedures and the calculation of bonuses, which discourages the granting of risky projects.

The fact that financial products dedicated to larger-scale projects were more rewarding in terms of bonuses than those dedicated to income generating activities at that time might partly explain the observed gap though: indeed, in reality, men are more represented in the first category of projects while women are more represented in the second one; as a consequence, officers might have been encouraged to inflate the amounts of the first type of credit, which would have mechanically benefited to men. However, again, because male clients show worse repayment rates and are more represented in portfolio-at-risk, granting them higher amounts is not completely economically rational. Additionally, amounts requested are supposed to be an indicator of project size, and were included and controlled for in the experimental analysis; as a result, the unexplained gap rather tends to reflect officers' representations, whereby men's projects are necessarily of larger-scale than women's ones, whatever the available information officers may refer to. Finally, the fact that the gap between amounts granted to men and women is even higher in the frame of the experiment than on real data does not support the idea that the way financial incentives are designed would be the source of this gap.

VII. CONCLUSION

To complete the study based on empirical data in chapter 1, we run an experiment with loan officers to analyze their risk assessment criteria. This experiment could be considered as what Harrison and List name a "framed field experiment". In our case, loan officers of the main Tunisian microfinance institution were the subjects of an exercise about the microcredit granting process: they were requested to grant an amount to twelve fictitious cases of loan requests, which were built on the basis of nine risk factors including gender, the factors varying across the twelve cases according to a D-optimal design. Two sets of cases were built, to distinguish between agricultural and non-agricultural loans.

The results of the experiment confirm the results of the previous study on empirical data: female cases are granted lower amounts, all things being equal, in both agricultural and non-

agricultural cases, the gap being still higher for agricultural cases. However, the gap between the amounts granted to men and women is more sizeable in the experiment than in the analysis on real data. We assume that this gap reveals that loan officers refer to their subjectivity and intuitive thinking to assess requests, and the experiment unveiled and heightened their gender representations. Unfair treatment towards women would thus result from –at least– statistical discrimination, based on stereotypes of possibly several kinds, concerning female applicants' project size, capacities, access to resources, time to invest in their projects, etc., and salient episodes of some loan officers' experience which are well-known in the institution and left their mark in officers' minds.

Therefore, the smaller gap in real cases could be explained by the role of procedures: in reality, officers have more relevant information to make their decisions, which let them less leeway to draw on their representations.

This result has substantial implications for the microfinance sector: indeed, it seems that the existing inequalities between men and women in the Tunisian society, in terms of education, professional experience and access to resources for instance, tend to be reflected in the microbusinesses run by potential clients of microfinance institutions, which are smaller on average when they are run by women. These starting inequalities are well-known by officers, which generates overall representations about men's and women's projects, possibly resulting in statistical discrimination. However, detailed procedures based on specific and objective criteria are likely to reduce the space for subjectivity and representations in the granting decision process. As a consequence, in order to minimize the risk for gender discrimination, reviewing the procedures to grant a certain amount by including a gender perspective could be relevant, all the more so as empirical data also show that women tend to be less likely to repay late or to default. These changes in procedures may be implemented at the MFI level, but also at the national regulation level: as in many other countries where the microfinance sector has developed, a national authority exists in Tunisia, whose role consists in regulating the sector and making recommendations. A gender perspective should be included in these regulations and recommendations, in order to not only facilitate the access to credit for women, which has already been achieved so far, but also to ensure at least equal treatment between men and women in terms of loan conditions, if not positive discrimination at that level as well, to compensate starting inequalities.

APPENDIX II.A: OUTPUT OF THE SAS PROCEDURE TO CONCEIVE THE D-OPTIMAL DESIGN

ADX Report for Untitled Experiment

DESIGN DETAILS

Design type: Optimal
 Design description:
 Number of factors: 9
 Number of runs: 12

FACTORS

Factors and Levels:

Factor	Low	Center	High
GENDER	-1	0	1
EDUC	-1	0	1
STAB	-1	0	1
MULTIACT	-1	0	1
EXP	-1	0	1
SECTOR	-1	0	1
ADDR	-1	0	1
FINRIS	-1	0	1
AGRRIIS	-1	0	1

RESPONSE

Response

- Y1
- Y2
- Y3
- Y4
- Y5
- Y6
- Y7
- Y8
- Y9
- Y10
- Y11
- Y12

DESIGN POINTS (Coded)

GENDER	EDUC	STAB	MULTIACT	EXP	SECTOR	ADDR	FINRIS	AGRRIIS
1	1	1	-1	-1	0	-1	1	1
1	1	-1	1	1	-1	1	1	-1
1	0	1	-1	1	1	1	-1	-1
1	0	-1	1	-1	1	-1	-1	1
1	-1	1	1	1	0	-1	-1	-1
1	-1	-1	-1	-1	-1	1	-1	1
-1	1	1	-1	1	-1	-1	-1	1
-1	1	-1	1	-1	0	1	-1	-1
-1	0	1	1	-1	-1	-1	1	-1
-1	0	-1	-1	1	0	1	1	1
-1	-1	1	1	1	1	1	1	1
-1	-1	-1	-1	-1	1	-1	1	-1

APPENDIX II.B: FICTITIOUS CASES (TRANSLATION FROM FRENCH)

Non-agricultural cases

Case #1:

A woman managing a grocery for more than 5 years requests a first loan to invest. She aims to use the loan to buy a refrigerator costing 2000 TND.

The moral enquiry was positive, and the applicant has all necessary guarantees. All her invoices were paid on time.

She is married, has two children going to school and living at her house, and has been owning her house for 5 years. She has primary education.

The household enquiry revealed that there is no other source of revenue within the household.

The project enquiry showed that her claims represent more than 55% of her assets, and that she has only few cash assets and stock. She stocks up from one supplier.

The financial enquiry showed that she clears a net monthly profit of 700 TND.

Case #2:

A craftsman who has been making ornaments goods for three years requests a first loan of 4000 TND to use as working capital in order to get ready for the tourist season.

The moral enquiry was positive and he has all necessary guarantees. His invoices were paid on time. He has been owning his housing for 5 years, he is married and lives with two children going to school. He has a secondary level of education.

The household enquiry showed that his household earns an additional revenue.

The project enquiry revealed that he stocks up from several suppliers. His activity is more significant during the summer with the tourist season.

The financial enquiry showed that he clears an annual profit of 10 000 TND.

Case #3:

A man working for more than 5 years in the making of handbags, and who is also a subcontractor for a plant, requests a first loan of 4500 TND to buy a new machine in order to develop a new product.

The moral enquiry was positive and he has collateral. Some of his invoices were paid with a short delay. Widowed and renter for 15 years, he lives with his three children who go to school. He has a secondary level of education.

The household enquiry showed that there is no additional revenue in his household.

The project enquiry revealed that he stocks up from one unique supplier.

According to the financial enquiry, he clears a net monthly profit of 1000 TND.

Case #4:

A woman working as a pastry chef requested a first loan to use it as working capital. She aims to spend the money to buy raw materials worth 2200 TND. She has more than 5 years' experience in pastry.

The moral enquiry was positive and she has the necessary collateral. Her water and electricity invoices were paid on time. She has been renting her house for 15 years, her husband died and she lives with her three children going to school. She left school when she was in secondary level.

The household enquiry showed that her household does not earn any other revenue.

During the project enquiry, the officer saw that she has a significant stock of raw materials, and that she stocks up from several suppliers.

The financial enquiry revealed that she clears a net monthly profit of 1000 TND.

Case #5:

A man producing natural juices for weddings and fests, with a three years' experience, requests a first loan to invest in order to buy a refrigerator costing 2500 TND.

The moral enquiry was positive and he has the necessary guarantee. His invoices were paid on time. He is divorced and lives with his three kids in the house he has been renting for 15 years. He has a primary education level.

The household enquiry proved that he has no additional revenue.

The project enquiry revealed that he stocks up from a unique supplier, who lends him money from time to time.

The financial enquiry showed that he clears a net monthly profit of 1000 TND.

Case #6:

A woman managing a clothes shop for three years requests a first loan of 2500 TND to use as working capital.

The moral enquiry was positive and she has the necessary collateral. Her invoices were paid with a short delay of a few days. She has been renting her housing for 15 years, she is divorced and lives with her three children who go to school. She has a primary education level.

The household enquiry showed that her former husband pays a pension every month.

According to the project enquiry, she stocks up from several suppliers.

The financial enquiry proved that she clears a net monthly profit of 900 TND.

Case #7:

A woman working for three years in a sewing shop which produces curtains and drapery requests a first loan for an investment. She aims to buy a new machine costing 1800 TND.

The moral enquiry was positive. Her invoices were paid a few days late. She is married and lives with her two kids who go to school in the house she is been owning for 5 years. She is illiterate.

The household enquiry showed that her household does not have any additional revenue.

The project enquiry revealed that she stocks up from several suppliers. Her activity is more important during the summer, with the orders for weddings, and is much shortened during the rest of the year.

According to the financial enquiry, last year she cleared a net profit of 8000 TND.

Case #8:

A pastry chef requests a first loan to use as working capital, in order to increase his stock of raw materials by 2000 TND. He has 5 years' experience in this activity sector.

The moral enquiry was positive and he has the necessary guarantee. Some of his invoices were paid a few days late. He is married, has two kids going to school and has been owning the house for five years. He has primary education.

According to the household survey, his household has an additional revenue thanks to his wife' embroidery.

The project enquiry showed that he has got a significant stock, and that he stocks up from several suppliers.

He clears a net monthly profit of 700 TND.

Case #9:

A female caterer requested a first loan to use as working capital. She aims to buy raw materials for 1899 TND in order to face the increase of orders as Eid is getting close.

The moral enquiry was positive and she has all the necessary guarantee. The officer saw that she paid some invoices a few days late. She has been owning her house for five years and lives with her husband and two children going to school. She interrupted her studies when she was in secondary level.

The household enquiry showed that her household earns another revenue as her husband is a keeper at the neighbourhood's school.

During the project enquiry, the officer saw that she is always dealing with the same supplier who offers some overdraft facility from time to time.

She clears a net monthly profit of 800 TND.

Case #10:

A man running a grocery for 6 year requests a first loan of 3000 TND to use as working capital.

The moral enquiry was positive and he has collateral. All his invoices were paid on time. He is married, has two kids going to school and he has been owning his house for 5 years. He is illiterate.

His household does not earn any additional revenue according to the household enquiry.

The project enquiry showed that he knows several suppliers.

The financial enquiry revealed that he clears a net monthly profit of 1600 TND.

Case #11:

A chicken seller who has been working for three years requests a first loan of 1700 TND to use as working capital in order to feed his stock.

The moral enquiry was positive, and he has the necessary collateral. His water and electricity invoices were paid a few days late. Divorced, he lives with his three kids who go to school in a housing he has been renting for 15 years. He is illiterate.

His household gets another revenue as his son is working in a car repair shop.

The project enquiry showed that he stocks up from a unique supplier. He has few cash liquidity and a small stock, while his debts represent 60% of his assets.

According to the financial enquiry, he clears a net monthly profit of 900 TND.

Case #12:

A female designer who has been selling wedding dresses for more than 5 years requests a first loan of 4500 TND to use as working capital.

The moral enquiry was positive and she has no guarantee issue. Her invoices were paid on time. Divorced, she lives with her three kids in the same house she has been renting for 15 years. She is illiterate.

The household enquiry showed that her household does not earn any additional revenue.

The project enquiry revealed that she stocks up from the only supplier she knows.

According to the financial enquiry, she clears a net monthly profit of 1800 TND.

Agricultural cases**Case #1:**

A woman with two years' experience requested a first loan for an activity of dairy cattle rearing. She aims at using the loan to buy an in-calf heifer costing 3500 TND.

The moral enquiry was positive and she has the necessary collateral. She has been owning her house for 5 years, she is married and has two kids going to school. She left school when she was at secondary level.

Her household does not get any additional revenue.

During the project enquiry, the officer saw that she is working full-time for her breeding activity. It is semi-integrated farming: a part of food is bought on the market and the other part is fodder produced at the farm. On top of that, the new-born calves are fattened and then sold on the market.

This potential client does not manage to do regular follow-up of her herd as her farm is hardly reachable for the veterinarian.

Case #2:

A farmer with 7 years' experience requested a first loan for his activity of field crops. He aims at using the loan to buy wheat seeds for 5000 TND.

The moral enquiry was positive and he has a guarantee. The man has been living for free in the same house for 15 years with this three kids who go to school. His wife died. He left secondary school before the end.

His household does not get any additional revenue.

During the project enquiry, the officer saw that this farmer does monoculture, which exposes him to risk if a disease appears in his plot. However, he has savings in a bank account which constitutes a kind of insurance in case of need.

Case #3:

A woman with 6 years' experience in her sector requested a loan for an activity of sheep breeding. She will use the loan to buy food and increase the size of her livestock for 2500 TND.

The moral enquiry was positive and she has no guarantee problem. The woman has been owning her housing for 5 years, she is married and has two kids going to school who live with her. She left school when she was at primary level.

Her household does not get any additional revenue.

During the project enquiry, the officer noticed that she does not have any other activity. She masters very well the techniques of what she is doing. During the summer, she stores straw to face her cattle's needs for food. However, because of the sheep price drop last year, she has been having difficulty in building a new stock.

Case #4:

A farmer with 2 years' experience requested a first loan for his activity of tomato cultivation. He wants to use the loan to buy seeds for 4800 TND.

The moral enquiry was positive and he has the necessary guarantee. He has been owning his house for 5 years, he is married and has two kids going to school and living with him. He left school when we was at secondary level.

His household earns an additional revenue thanks to his older son who has a car repair shop.

During the project enquiry, the officer noticed that the farmer also has olive and apricot trees crops. His agricultural products are of good quality and sold on the wholesale sector, and sometimes directly at the farm. The farmer does all phytosanitary treatments, which avoids him facing yield losses. Sometimes, he has difficulty in funding his farm charges.

Case #5:

A breeder with 5 years' experience requested a first loan for his activity of sheep breeding. He aims at using the loan to buy a ewe for 3000 TND.

The moral enquiry was positive and he has no problem of guarantee. He has been owning his housing for 7 years, he is married with two kids going to school. He left school at primary level.

His household earns an additional revenue, as the man also works as a coach driver.

During the project enquiry, the officer saw that he is also selling free-range chickens. Over the last three years, the area where his activity is located has been hit by several diseases which killed some of his sheep. Because of the lack of appropriate vaccines, the breeders of this area are starting converting to other activities.

Case #6:

A woman with 2 years' experience requested a first loan for her activity of quail breeding. She wants to use the loan to buy an incubator-hatcher costing 2500 TND.

The moral enquiry was positive and she does not have any problem of guarantee. She has been living for free in the same house for 15 years, she is divorced with three kids going to school and living with her. She left school when she was at primary level.

Her household gets an additional revenue each month, as her former husband pays a pension of 150 TND.

During the project enquiry, the officer saw that she also has a sewing machine at home, which enables her to get a seasonal revenue.

Although she has experience, she does not manage to master the mortality rate of her quails.

Case #7:

A breeder with 2 years' experience requested a first loan for his activity of calf fattening. He aims at using the loan to buy young calves for 3000 TND.

The moral enquiry was positive and he has collateral. He has been living for free in the same house for 20 years, he is divorced and has three kids going to school. He left school when he was at primary level.

His household does not get any additional revenue.

During the project enquiry, the officer remarked that this breeder is specialized only in calf fattening. He made a deal with the veterinarian of the area so that the latter ensures a regular follow-up of his cattle. His livestock is fully insured, which avoids him losing his assets.

Case #8:

A woman with 2 years' experience requested a first loan for her activity of potato cultivation. She wants to use the loan to buy seeds for 4500 TND.

The moral enquiry was positive and she has collateral. The woman is illiterate, has been owning her house for 5 years, is married and has two kids going to school.

Her household does not have any additional revenue.

During the project enquiry, the officer saw that she also has an activity of sheep breeding.

If potato cultivation provides revenues during the summer and at the early winter, these revenues are fluctuating, given prices changes in the market. On top of that, she has difficulty in finding high-quality seeds, although she imports them.

Case #9:

A woman with 5 years' experience requested a first loan for an activity of sheep fattening. She wants to use the loan to buy 20 lambs for 3000 TND.

The moral enquiry was positive and she has collateral. She has been living for free in the same house for 15 years, she is widowed and she has three kids going to school and living with her.

Her household does not get any additional revenue.

During the project enquiry, the officer saw that apart from fattening, she also does traditional carpet weaving, which provides her with additional revenue. She manages a cattle of 100 ewes. Over this year, she has had difficulty in selling her carpets because of competition from industrial carpet. Moreover, the sheep price drop had a great impact on her revenues provided by sheep selling, which usually occurred three times a year.

Case #10:

A breeder with 7 years' experience requested a first loan for his sheep breeding. He aims at using the loan to buy food for his cattle for 2000 TND.

The moral enquiry was positive and he has collateral. The man is illiterate, has been owning his house for 5 years, is married and has two kids going to school.

His household does not get any additional revenue.

During the project enquiry, the officer found that the breeder is also a seasonal farm worker for the big neighboring farm. The food ration he gives to his cattle is properly chosen. In case of need for liquidity, he sells a couple of sheep at the weekly market.

Case #11:

A woman with more than 5 years' experience requested a first loan for an activity of greenhouse vegetable cultivation. She wants to use the loan to fund a campaign of peppers produced in greenhouses, to buy seeds and to pay the workforce, for a total sum of 5000 TND.

The moral enquiry was positive and she has collateral. She is illiterate, has been living for free for 15 years in the same house, she is divorced and has three kids going to school and living with her.

Her household gets an additional revenue thanks to the pension of 100 TND paid by her former husband each month.

During the project enquiry the officer saw that she masters her activity. The yields of her greenhouses are among the best in this area. When she needs financial support to cover her project's charges, she can rely on her neighbors' help, who are also farmers.

Case #12:

An apiarist with 2 years' experience requested a first loan to buy new beehives for 1500 TND.

The moral enquiry was positive and he does not have any guarantee problem. He is illiterate, has been living for free in the same house for 15 years, he is divorced with three kids going to school and living with him.

He earns an additional revenue thanks to his retirement pension.

The project enquiry showed that the apiarist is working full-time for his activity. The selling revenues are seasonal as they come twice a year. Over the previous year, he lost a part of his bee swarms because of a virus which had not been treated on time.

CHAPTER 3

GOOD PAYERS, SMALL BORROWERS: ARE WOMEN BETTER CLIENTS FOR A MICROFINANCE INSTITUTION?

This chapter is partly based on the working paper published by UNU-Wider under the reference WIDER Working Paper 2017/101.

I. INTRODUCTION

The main aim of microfinance is to provide financial products and services, and especially credits, to vulnerable people excluded from the traditional banking system in order to enable them to generate their own income and hopefully get out of poverty. Targeting the poor is hence at the core of the social mission of microfinance. However, to meet these people's needs, MFIs offer very low loan amounts; as a result, they face higher transaction costs than traditional banks, since granting low loan amounts costs as much as granting higher amounts but is not as profitable. Consequently, microfinance may appear as essentially based on a dichotomy: in order to serve as many poor people as possible, MFIs have to be at least financially viable to survive and at best profitable to develop, but lending to the poor is hardly profitable. This intrinsic contradiction may have been one of the sources of microfinance "mission drift": some MFIs have tended to focus mainly on their financial performance at the expense of their social mission. As a result, the salient cases of mission drifts have led to a debate about the conciliation of MFIs' financial and social performances: attempting to achieve this double bottom line would necessarily imply a trade-off, and MFIs would have to find the proper balance between both objectives.

Given that women are highly represented among the most vulnerable part of the population, targeting women in particular may even worsen the dilemma. Although many studies demonstrated the social and financial advantages of lending to women, since this tends to increase the whole household's welfare (Khandker, 2005) and is associated with better repayment rates (D'Espallier, Guérin, & Mersland, 2011; Khandker, Khalily, & Khan, 1995), some others have recently questioned the reality of these advantages: Roodman & Morduch (2014) found no proof of causal links between credit access and impacts, and Morduch & Bauchet (2010) highlighted a negative correlation between profitability and the proportion of female clients. Finally, it is also recognized that women tend to seek smaller loans, which also holds in our case as demonstrated in chapter 1; this automatically increases MFIs' transaction costs (Armendariz & Morduch, 2010), and goes against the idea that lending to women is necessarily more profitable for MFIs. This might explain that contrary to common belief, women are not the exclusive target of MFIs: although women make up 81% of MFIs' clients on average in 2014, there is a wide diversity of rates according to geographical area. For example, women represent 92% of clients in Southern Asia but only 60% in the Middle East and North Africa (MENA) region and even a minority in Eastern Europe and Central Asia with a rate of 44% (Convergences 2016).

Eventually, drawing conclusions on whether lending to women is advantageous or not for MFIs is a knotty issue: it especially depends on the indicators considered, both in social and financial terms, and on the importance attached to each indicator.

In this chapter, the social dimension is set aside and the objective is to determine whether women appear as better clients or not in terms of risk for the MFI under study. Again, there are several aspects in clients' behavior which may represent a risk for an MFI: first, there is considerable information asymmetry between a new potential client and the MFI, which is likely to decrease with time and loan renewals; as a consequence, it is in MFIs' interest to keep clients, and losing clients represents a risk. Therefore, the profile of dropouts is analyzed in order to identify a potential gender effect on the probability to leave the MFI. The second kind of risk concerns clients' repayment behavior, especially their propensity to repay late or to default. Indeed, a defaulting client directly makes an MFI lose money, while a client repaying late threatens the MFI's financial viability, as it contributes to downgrade the financial indicators that investors refer to, and compel the MFI to immobilize funds to anticipate potential credit losses. Consequently, the analysis also aims at identifying a possible gender effect in clients' repayment behavior, and the results show that female clients appear as less risky than men. Finally, considering these various types of risk that clients' behavior might represent, we attempt to estimate the costs incurred by these risks and compare them with revenues generated by repaid loans for male and female clients separately, in order to contribute to the discussion on the potential advantage of lending to women.

The chapter is structured as follows: section 2 justifies the choice to focus on client retention and repayment behavior to assess the risk a client may represent and takes stock of the literature on these points, section 3 introduces the data used for the analysis, section 4 presents the empirical method and results, section 5 puts the results in perspective by comparing costs and revenues incurred by the clients in the dataset, and section 6 concludes.

II. CLIENT RETENTION, REPAYMENT BEHAVIOR AND GENDER IN PRACTICE AND IN LITERATURE

1. Gender and financial performance

Determining if lending to women is advantageous or not for a single MFI, at least in financial terms, is complicated: indeed, all the indicators of financial performance used by rating agencies and investors are calculated at the MFI level, in order to facilitate the comparison between MFIs, even though this remains arduous given the differences in terms of status, country

regulations, policies, funding models, etc. For instance, efficiency indicators such as cost per borrower or loan officer productivity ratio are calculated using all loans and all clients. Since loan officers serve both male and female clients, it is not possible to calculate the part of administrative and salary expenses that are dedicated to male clients on the one hand and to female clients on the other hand: if an MFI does not have an equal share of male and female clients, the cost per borrower will be mechanically lower for the most represented gender. Actually, most costs supported by an MFI are expected to be the same for male and female clients. A type of cost which could differ would be one depending on clients' behavior and/or profile, such as the time spent with a client to grant a credit or to collect repayments with some days overdue; Aleem (1990) attempts to estimate the cost of such time spent to pursue delinquent loans, however, this cost is very likely to depend on the internal organization of an MFI and then to be very heterogeneous between MFIs.

In order to assess the consequences of lending to women for an MFI, a recent study rather uses data and information on 398 MFIs in 73 countries for 10 years (D'Espallier et al., 2013): the results show that MFIs focusing on women benefit from better repayment rates, but not from better financial performance because of higher relative costs. However, these higher relative costs do not come directly from serving women but from the fact that loans granted to women are smaller, and because MFIs focusing on women use group-lending methodologies, which tend to be more costly. When controlling for the average loan size and lending methodology, focusing on women is not associated with higher operational costs any more.

Another study by Morduch & Bauchet (2010) demonstrates that whether lending to women is financially advantageous for MFIs or not strongly depends on the kind of MFI: indeed, they show that for the MFIs reporting to the MIX Market, there is a negative correlation between profitability and the proportion of women among clients, but the contrary is observed for MFIs reporting to the Microcredit Summit Campaign (MSC). Actually, the MFIs reporting to the MIX Market are less socially oriented, medium-size, and relatively more likely to be located in Eastern Europe or Central Asia, while the MFIs reporting to MSC have more poor borrowers and women among their clients, tend to be smaller, and relatively more likely to be located in Southern Asia. Therefore, this study shows that there is no general answer to the question whether lending to women is financially advantageous for MFIs or not, and that it depends on other MFI features.

Consequently, attempting to answer this question in the case of a single MFI would be particularly interesting, but this remains complicated though: in the case of Enda, considering some drivers of costs and profit identified by D'espallier et al. (2013), there is no group-lending, and the

lending methodology is the same for male and female clients. As a consequence, there could not be different costs for male and female clients due to the lending methodology. With regard to time spent to collect repayments with days overdue, the internal organization of Enda is also specific: loan officers are requested to spend the last week of each month collecting these late repayments. In other words, this time is formally included in loan officers' schedule, and is not supposed to vary from a month to another according to portfolio quality: officers are supposed to dedicate the last week of each month to this task, whatever the number of repayments to collect. When officers were asked about this point, they confirmed that they respect this schedule: they make their best to make sure that this task does not encroach on the rest of their time. As a consequence, they cannot say that they spend a certain amount of time on each late repayment; they rather adapt the duration spent on each case to make sure this task fits the schedule. It still may be expected that officers with a high number of late repayments to collect spend more time to do it than the others, and that this time cannot be used to grant new credits, however, because of this organizational feature, it is not possible to consider a fixed amount of time spent on each late repayment, and consequently, a fixed cost.

Therefore, this chapter does not attempt to estimate a precise cost of granting a credit to a man or a woman for Enda, but rather to determine if a female client appears as riskier on average than a male client, by focusing on two specific drivers of costs for an MFI, client retention and repayment behavior. Then, the costs incurred by these risky behaviors are estimated and compared to the revenues generated by repaid loans, for male and female clients.

2. Client retention

The first kind of risk a client may represent for an MFI is to drop out. Indeed, it is of higher interest for an MFI to lend to a client who already proved that he/she was willing and able to repay a first loan: it appears as less risky and it even enables the MFI to lend more to this client, which implies relatively lower transaction costs. As a consequence, one of the development strategies implemented by MFIs is to make their best to keep clients, or in other words, to foster client retention. It has been effectively proved that improving client retention improves MFIs' financial performance, since it is associated with higher efficiency (lower cost per borrower) and higher officers' productivity (Gonzales, 2010).

Client retention is also considered as an indicator of clients' level of satisfaction and is used by rating organizations to assess MFIs: the Universal Standards for Social Performance

Management were launched in 2012 by the Social Performance Task Force and recognized as the standards which should be followed by all actors of the sector worldwide. One of these standards is the “understand[ing] of the needs and preferences of different types of clients” (Social Performance Task Force, 2014, p. 22), which is supposed to be achieved through various essential practices, one of them being expressed as follows: “The institution monitors the client retention rate by client characteristic and understands the reasons clients exit the institution”. This principle is also included in the SPI4, the universal tool developed by the French NGO Cerise to enable MFIs to assess their social performance by themselves. As a consequence, client retention is supposed to be an indicator of both social and financial performance, as stated by the SEEP Network, which highlights that “retention has a major impact on cost, income, and thus, overall financial performance” and that “retention is a useful (though not perfect) proxy for client satisfaction” (The SEEP Network, 2006, p. 11).

However, as noticed by practitioners and scholars, assessing and measuring client retention is not an easy task. The SEEP Network, which was a pioneer in microfinance development and still provides resources and services to professionals today, dedicated a technical paper on the challenges of measuring client retention (The SEEP Network, 2006). Indeed, there is still no consensual indicator to measure it⁴³, and hence there is no way to compare MFIs on this aspect. This could be due to the fact that the interest for client retention is rather recent: as pointed out by Cohen (2002), microfinance clients had been considered as a given for a long time, with the idea that the demand for microfinance services was unlimited. The awareness that making MFIs more customer-centered would be beneficial to both institutions themselves and clients was raised at the end of the 1990s, after several scandals disclosed microfinance mission drift. Whereas before that, high repayment rates were considered as sufficient evidence of client satisfaction, it then became increasingly obvious that attention should be paid to dropouts, and that high dropout rates could reveal dissatisfaction and mismatch between supply and demand.

This growing awareness is reflected in literature, as the few studies on this phenomenon are also recent: Ibok & Udofot (2012), Pearlman (2014) and M. K. Rahman, Rahman, & Jalil (2014) focus on the determining factors of dropouts. Ibok & Udofot (2012) find that the main factors leading clients to leave an MFI in Nigeria are organizational features, such as transaction bureaucracy and waiting time; M. K. Rahman, Rahman, & Jalil (2014) also identify such organizational factors in Bangladesh, such as officers’ rude behavior when collecting payments or

⁴³ One of the difficulties concerns the case when a client stops using a specific product (a credit) but keeps using another one (a saving account) for instance: should client retention be calculated at the organization level or product level? Another difficulty concerns the threshold to take into account to count a client as a dropout.

delay on loan disbursement, but also product characteristics, such as too low loan amounts and too high interest rates, and external factors, such as personal event in client's life or external shock (natural disaster, etc.). In the same way, Pearlman (2014), who distinguishes between continuing borrowers, defaulters (that is to say clients who do not repay their loan and exit the program), and dropouts (who are the clients who repay their loans but do not renew them), finds that negative shocks are a significant predictor of dropouts whereas not of default, while clients with a higher income and owning their house are more likely to be part of continuing borrowers' category. Beyond the results, she regrets the lack of interest in this phenomenon as dropouts are definitely costly for MFIs, and claims for more research to better understand this phenomenon. The same claim is made by Epstein & Yuthas (2013): the authors explain that client retention is indeed a factor of financial sustainability as well as a key measure of social impact, and they assert that MFIs could increase both their financial and social performances by developing in rural regions, where client retention is higher as showed by their analysis in Malawi. The authors deplore the lack of attention paid to client retention by MFIs, rating organizations, and researchers as they also notice that no standard indicator of client retention actually exists—at least three different indicators used by various organizations are identified by the authors.

Finally, these few studies on client retention do not distinguish between the determining factors of dropout by gender, consequently they do not shed any light on a possibly existing gender effect on this phenomenon. Nonetheless, a study on the traditional banking system in Malaysia tends to confirm the common belief on this issue, which is that women would be more loyal customers than men: in this study, the author finds that when clients highly trust a bank, women are more loyal than men as customers; however, the contrary may be observed when the level of trust in the bank is low (Oly Ndubisi, 2006).

Additionally, it should be highlighted that the very recent attention paid to client retention also implies that client retention is considered without the benefit of hindsight. In practice, it now serves as an indicator of client satisfaction; this is probably better than using high repayment rates only to assess the match between supply and demand, but considering it only as an indicator of social performance is nonetheless arguable. Indeed, given that microfinance clients are vulnerable people, client retention may not only reflect client satisfaction and client loyalty but also client dependency or questionable practices from MFIs such as high-pressure sales tactics. This question has been raised in 2011 in a blog post of the Center for Financial Inclusion (CFI) by Elizabeth Rhyne, the managing director of CFI and co-creator of the Smart Campaign for client protection in microfinance. More studies on this issue would probably be necessary to identify the best way to measure client retention and to identify the extent to which it reflects client benefit.

3. Repayment behavior

As previously mentioned, clients' repayment behavior has generated more interest for much longer: indeed, one of the most crucial indicators of MFIs' financial viability is the portfolio at risk over 30 days (PAR30), which refers to the proportion of the outstanding balance of all loans with arrears over 30 days. This is the most commonly used indicator of portfolio quality by rating agencies and investors. Furthermore, MFIs also have to make provisions for credit losses, in case these loans with arrears would not be repaid eventually. A general guideline for MFIs is to make provisions equaling 100% of PAR30 (MicroRate, 2014). As a consequence, the highest the PAR30, the greatest these provisions should be, and these provisions represent as much money which cannot represent profit for MFIs. This implies that even though clients repaying late eventually repay their loans, they are costly for MFIs in any case. Therefore, MFIs have to do their best to make sure their clients repay timely, or at least with as few days overdue as possible.

With regard to gender, a common belief in microfinance is that women show better repayment rates than men, which has been confirmed by several practical experiences and studies: for instance, the Grameen Bank would have targeted men as well in its initial phase, but next decided to focus almost only on women because of repayment problems with men (Armendariz & Morduch, 2010). Studies on Bangladesh then confirmed that women indeed show better repayment rates (Shahidur R. Khandker et al., 1995; Sharma & Zeller, 1997), while the same result was found in other parts of the world such as in Malawi (Hulme, 1991) or Guatemala (Kevane & Wydick, 2001). Apart from these studies on specific cases or countries, a more recent and global one used data from 350 MFIs in 70 countries to show that indeed, a higher percentage of women among MFIs' clients is associated with lower portfolio risk, fewer defaults, and fewer provisions for losses, all else being equal (D'Espallier et al., 2011).

This gender difference might have several causes: women would be more cautious with loan repayment because they have fewer credit opportunities and want to secure future loans (Armendariz & Morduch, 2010); they would be more sensitive to peer or officer pressure (Goetz & Gupta, 1996; A. Rahman, 2002); they would manage specific activities more adapted to regular repayments (Johnson, 2004) whereas men would be more represented in riskier sectors such as agriculture, for which regular repayments are more complicated (Morvant-Roux, 2011). There may be also other explanations for the fact that female clients show better repayment rates, but a lot of studies effectively agree on this result. As showed by D'Espallier et al. (2013), if better repayment rates are not sufficient to ensure higher financial performance for MFIs, they are still one driver of

this financial performance; it is hence crucial to determine whether Enda's female clients effectively show better repayment rates than men or not in order to assess the risk they may represent.

III. DATA

1. Data preparation and management

The information systems of microfinance institutions are not often conceived to easily manage and analyze client panel data. Enda's information system was significantly enhanced in 2012 and is able to provide detailed information about clients, their households, projects, and loans for each credit cycle. Enda provided us with a complete panel dataset containing information about all new clients from June 2012 to December 2013 and about all the loans they received from June 2012 to March 2016. We decided to limit the dataset to new clients up to the end of December 2013 as the situation in the country changed in 2014, with the entry of new actors in the microfinance sector leading to the possibility that new clients in 2014 may have been selected in a different way.

The whole dataset consists of 69301 clients (63,5% of whom are women) who received a total of 183109 loans. One client can hold two loans concurrently but not two project loans. Indeed, Enda also offers other types of loans to fund personal projects, such as children's education or housing improvement. These loans can be taken in parallel of a project loan, but are not part of our panel dataset. Indeed, the objective of the research work is to analyze clients' behavior and to attempt to identify a gender effect everything else being equal, which means taking into account project characteristics and their evolution. Such information is missing for a personal loan as it is inapplicable. In the same way, Enda also very occasionally offers a specific financial product to enable some clients to grasp a market opportunity, such as raw materials at a temporary exceptionally cheap price for instance. This type of loan can be taken in parallel of another one, and does not require new information about the project, which would add missing information in the dataset if they were included. For this reason, all these loans dedicated to personal projects or market opportunity (a tiny minority though, as they represent only 2 636 loans, i.e. 1,42% of all the loans granted over the period) were removed from the dataset. However, as holding two credits at the same time could influence repayment capacity, a dummy variable was created to take this information into account, as well as a variable representing the additional monthly amount to reimburse for this loan.

2. Descriptive statistics

2.1 Clients' socio-demographic profiles

Among these 69301 clients, 63,5% are women, who got 64,2% of the 183109 loans. The average client age at the first loan's disbursement is 38,6 years, with no significant difference between men and women. Women tend to be less educated than men as 14% of female clients are illiterate compared to only 4% of men. By contrast, 43% of male clients have a secondary level of education against 32% of women. Women are also relatively more likely to be married (77% against 65% respectively), whereas men are more likely to be single than women (34% against 19% respectively). Most clients own their own house (79%), and have at least one other active member in the household—this proportion being slightly higher among women (82,4%) than men (77,7%). This can be explained by men having the highest labor force participation rate, meaning that female clients are more likely to have an active husband than male clients are to have an active wife. These characteristics will be included as controls in the analysis of clients' behavior.

2.2 Activity sector

The main activity sector is agriculture among both male and female clients, followed by trade (table 40). However, women are more likely to lead projects in the production sector (which covers mainly textile production, food production, or handicrafts) whereas men are more likely to work in services (especially transport or mechanics). The fact that agriculture is also the first activity sector for Enda's female clients shows that in the case of Enda, women are also highly represented in sectors where regular repayments may be constraining.

Table 40. Activity sector by gender (in%)

	Men	Women	Total
Agriculture	41.96	36.79	38.67
Trade	25.81	31.35	29.33
Production	13.11	22.78	19.25
Services	15.38	5.83	9.32
Not documented	3.75	3.25	3.43
Total	100.00	100.00	100.0

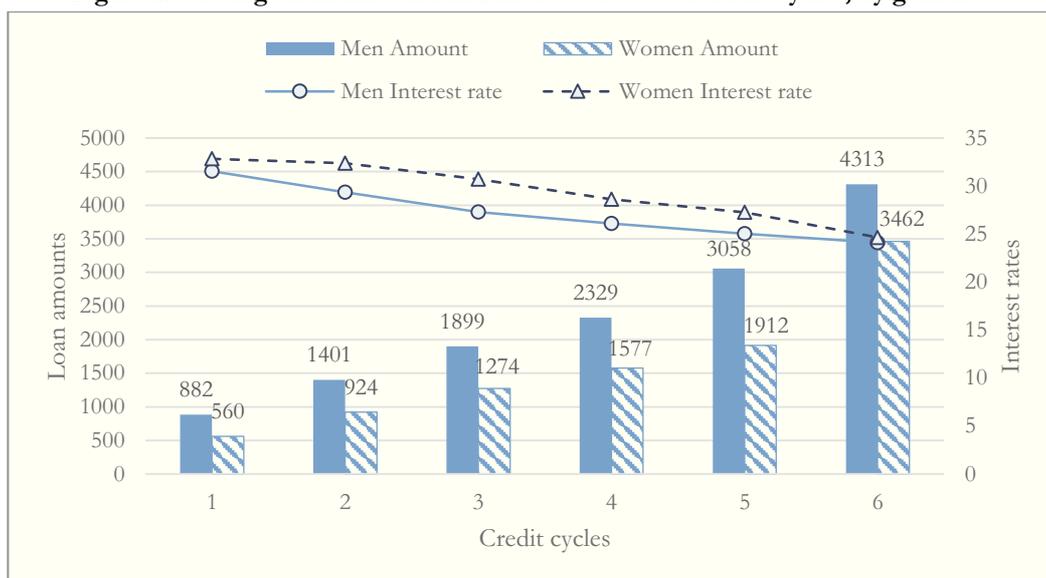
2.3 Loan amounts

The first element enabling an MFI to at least cover its costs and at best make profit is loan amounts, and especially the interests charged on these amounts. Enda, as most MFIs, charges fixed interest rates by by-product. Some financial products are dedicated to income generating activities, which are the smallest-scale projects, and some others are dedicated to micro- and small enterprises, which are larger-scale projects. The first category of financial products are characterized by lower amounts and higher interest rates, while the second category corresponds to higher amounts and lower interest rates. Indeed, to make up for the costs incurred by granting low amounts, higher interest rates are necessary than for higher amounts, which are more gainful.

The clients in our dataset got an average loan amount of 1123 TND, with a great gap between men and women, who got respectively average amounts of 1437 TND and 948 TND. However, because Enda applies a progressive-lending policy (analyzed in detail in next chapter), amounts are not constant over credit cycles but increase. Consequently, if the average annual interest rate charged on the loans in our dataset is 30%, this rate also varies over credit cycles and mechanically decreases (figure 15).

The fact that women receive lower amounts may make them more costly clients for the MFI, even though they also mechanically pay higher interest rates given these lower amounts: 31,7% on average against 29,3% for men. This question is discussed in more details in the discussion section, after examining the other potential sources of costs by gender.

Figure 15. Average loan amounts and interest rates over credit cycles, by gender



Another obvious conclusion which may be drawn from the previous figure is that clients who renew their loans become increasingly gainful, as their loan amounts increase over credit cycles. Consequently, client retention clearly appears as a source of financial performance, and dropouts as a source of loss.

2.4 First risk factor for MFIs: dropouts

With regard to credit cycles first, the average loan period is 11 months, and if 44% of loans should be reimbursed in 12 months (76% from 8 to 12 months), the loan period can run from 3 to 33 months. Therefore, the number of loans received by clients, or “credit cycles”, does not necessarily correspond to the number of years since they became clients. However, the most recent clients logically got fewer loans, on average. Overall, 23,8% of clients received one loan only over the period, while 19,4% received two, 30,2% received three, and 22,4% received four (table 41). Men seem slightly more represented among clients who got only one loan compared to women, who are more represented among clients who got 4 loans.

Table 41. Repartition of clients by the number of credit cycles over the period

	Credit cycles	1	2	3	4	5	6	7	8	9	10	11
All clients	Freq.	16505	13441	20938	15573	2561	199	55	24	3	1	1
	%	23.82	19.40	30.21	22.47	3.70	0.29	0.08	0.03	0.00	0.00	0.00
Men	Freq.	6549	4919	7428	5270	932	126	40	19	2	1	1
	%	25.90	19.45	29.37	20.84	3.69	0.50	0.16	0.08	0.01	0.00	0.00
Women	Freq.	9956	8522	13510	10303	1629	73	15	5	1	0	0
	%	22.62	19.36	30.69	23.41	3.70	0.17	0.03	0.01	0.00	0.00	0.00

This implies that women tend to receive slightly more loans than men, with a mean of 2,67 against 2,59 respectively. This could be due to shorter loan periods, on average, for women (10,6 months against 10,9 for men), however the statistically significant difference remains very tiny in magnitude, and this could also be due to more loyalty from women. Such an explanation would be in keeping with a widespread representation of female clients within Enda: many officers and managers often tell that female clients are more loyal than men and are more likely to renew their loans, whereas men are more likely to leave the MFI. This remains to be verified through econometric analysis, all the more so as descriptive statistics show that the average difference in number of loans is very tiny.

Concerning attrition, from the MFI's point of view, if a client does not renew a non-agricultural loan during the month following the closing date of the previous loan, it is considered as a dropout. Given the dependency on seasonality for clients managing agricultural projects, the period is three months for those who had an agricultural loan. It should be noticed that just as there is no consensual indicator of client retention, there is no standard threshold from which a client may be considered as a dropout for MFIs in general (The SEEP Network, 2006). Indeed, clients' loyalty may depend on the products and services MFIs are able to offer: for instance, a client may not renew a loan but still remain an active client by using other services such as a saving account. In the case of Enda, the Tunisian law does not allow MFIs to collect savings; as a consequence, Enda offers only microcredits, and if a client does not renew a loan, he/she cannot remain an active client. The choice of setting the threshold to one month for non-agricultural loans and to three months for agricultural loans to define dropouts is necessarily arbitrary, but corresponds to a reality observed by Enda. Besides, in our dataset, 50% of clients renew their loan less than 4 days after the closing date of their previous loan, and 75% did it after 18 days or less.

Dropouts represent 46% of our dataset, and just as the number of credit cycles, the difference between men and women is statistically significant but economically very tiny, as 45% of female clients leave the MFI before the end of our period of study against 47% of male clients. As a consequence, average numbers only slightly supports the idea that female clients are more loyal.

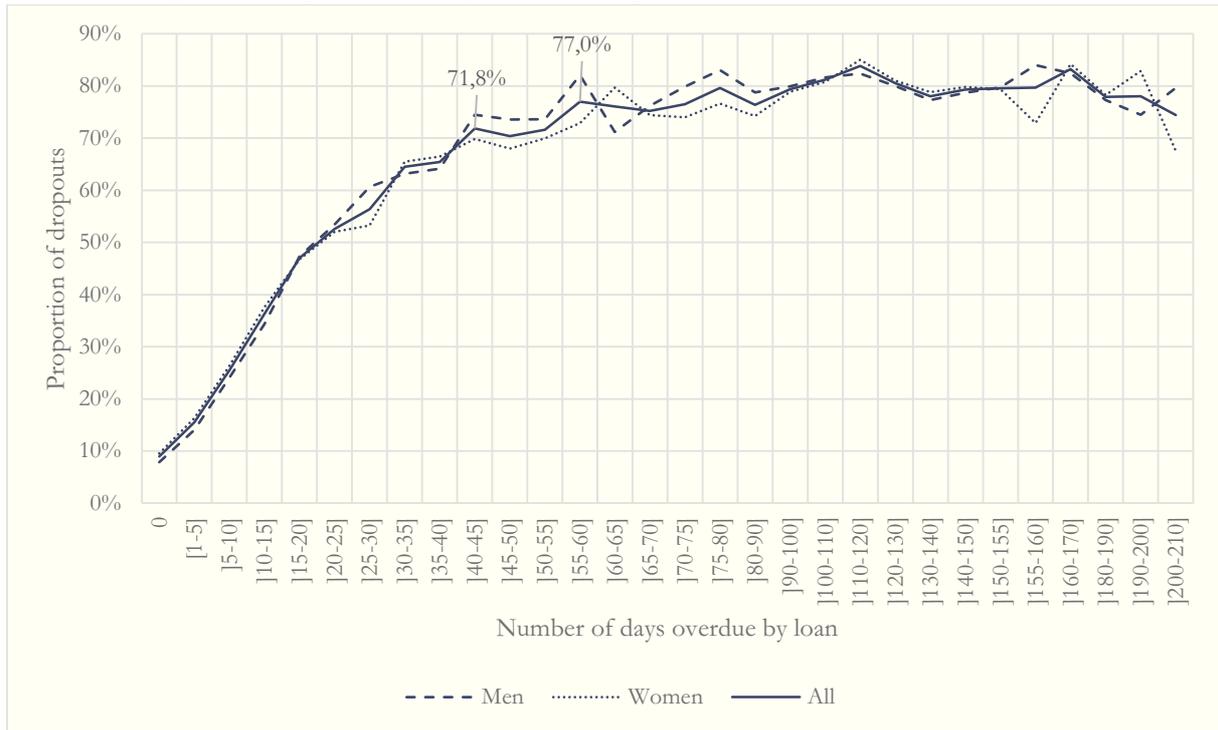
Clients who left the MFI were more likely to do so early in their credit history with Enda, as 52% of dropouts left after the first credit cycle, 33% after the second, and 13% after the third, resulting in a cumulative proportion of 98% of dropouts who left at the end of the third cycle or before.

Attrition covers different kinds of dropouts though: there are indeed different ways of leaving the MFI. The riskiest one for the MFI is defaulting, which was the case of only 1,43% of clients in our dataset, or 3,1% of dropouts. Among those who left the MFI without defaulting, some clients had ever repaid one or several loans late, but some others left without any day overdue. When clients have repaid their former loan(s) late, the MFI may choose not to renew their loans. However, there is no indication in the dataset whether the absence of renewal was due to the MFI's decision or the client's. Additionally, after discussing with several loan officers, all of them confirmed that there is no official threshold above which a client is automatically excluded from Enda; indeed, officers explain that the decision to exclude a client (or not to renew a loan) depends on the reasons for the delay, and on the client's morality, good faith and willingness to repay. A delay due to an external shock beyond the client's control does not necessarily prevent the client from getting another loan, even if the number of days overdue was high. Indeed, given the way bonuses are calculated, losing a client is costly for officers, and they may prefer to keep clients who have ever been late but are reliable, even though days overdue are also costly. What is certain is that a client who left without any day overdue chose to leave, whereas a client who ever repaid late is less likely to have chosen to do so.

Nonetheless, in order to approximately distinguish between the dropouts who intentionally left the MFI and those who were excluded because of their bad repayment behavior, the percentage of dropouts is examined according to the number of days overdue⁴⁴ by loan (figure 16). What clearly appears is that the proportion of dropouts strongly increases as the number of days overdue goes from 0 to 41-45, to reach 71,8% of all loans with between 41-45 days overdue (820 loans in total): this means that among the 820 loans in the dataset with 41 to 45 days overdue, 71,8% were clients' last loans, in other words these clients dropped out after this credit cycle. Then, the proportion of dropouts increases less quickly, to reach another pick at 56-60 days overdue, with 77% of the 496 loans concerned being clients' last loans. After this second pick, the proportion of dropouts remains relatively stable, and the number of loans with more than 60 days overdue falls below 420, which seems too few to draw other conclusions.

⁴⁴ The numbers of days overdue are calculated in a specific way, since they concern each instalment: for instance, if a client was late for two consecutive instalments, the number of days overdue of the first month is counted twice; as a result, instead of 60 days, the client accumulates 90 days overdue after two months. Consequently, the total number of days overdue may exceed the credit duration, and increases very quickly.

Figure 16: Proportion of dropouts according to the number of days overdue by loan

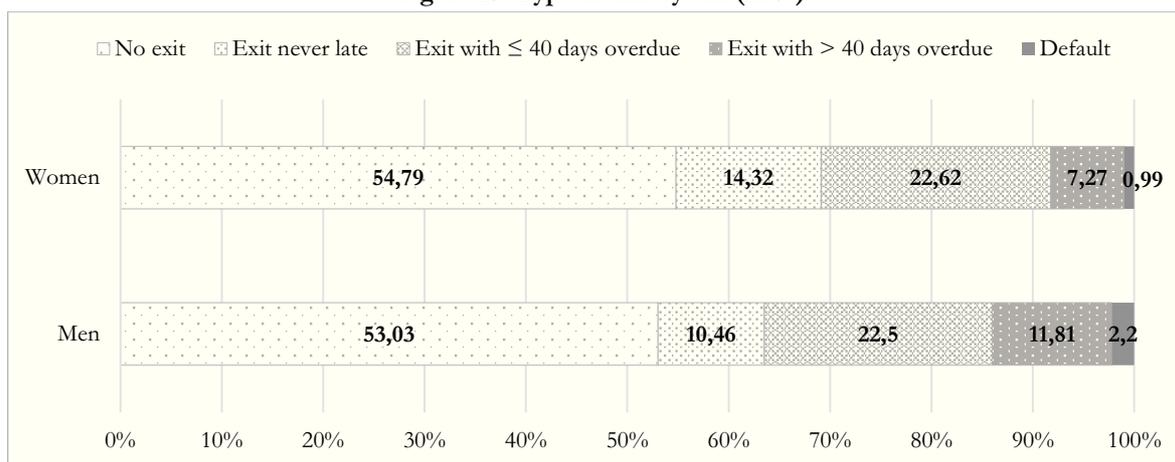


Given this trend, 40 days overdue⁴⁵ is considered as a threshold above which dropouts are more probably clients who were excluded by the MFI, whereas those with fewer days overdue may be clients who intentionally decided to leave. A distinction is hence made between these two kinds of dropouts: leaving the MFI with less than 40 days overdue is considered as a different type of exit than leaving the MFI with more than 40 days.

The repartition of clients by type of exit differs between men and women, all differences being statistically significant (figure 17). What stands out from the comparison is that men seem more likely to both default and leave the MFI having ever repaid their loans with more days overdue, whereas women are more likely to leave without any day overdue, or to stay. As a consequence, female clients clearly appear as less risky clients in terms of money loss; however, the fact that they are, on average, more likely to leave without any day overdue implies that leaving the MFI is more likely to be a deliberate choice for women than for men. This kind of exit represents also a loss for the MFI as already explained, even though it is a different type of loss, and this result even goes against the idea that women would be more loyal clients. Nevertheless, the econometric analysis should clarify if it is a pure gender effect or if the difference is due to other differences between men and women in terms of projects or profiles.

⁴⁵ The less conservative threshold, 55 days, will also be considered in next analyses, but the results always remain stable, whatever the threshold chosen.

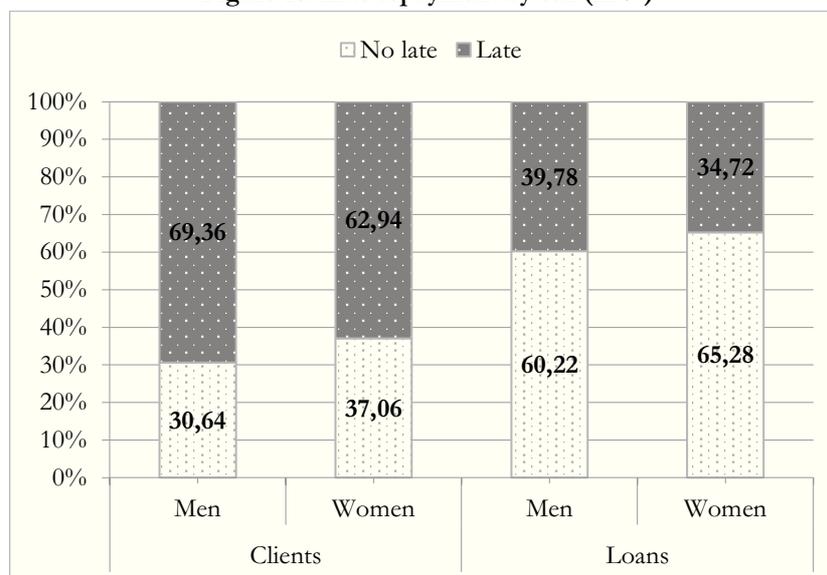
Figure 17. Type of exit by sex (in %)



2.5 Second risk factor for MFIs: clients' repayment behavior

With regard to repayment behavior, late repayments represent a risk for MFIs. Among clients, 65% have ever repaid a loan late, but only 37% of the disbursed loans in our dataset were repaid late. This means that a client who repays one loan late does not necessarily repay the others late as well. Overall, women are less likely to repay late, since the share of women who ever repaid late is lower, as well as the share of loans repaid late by women, all differences being statistically significant (figure 18).

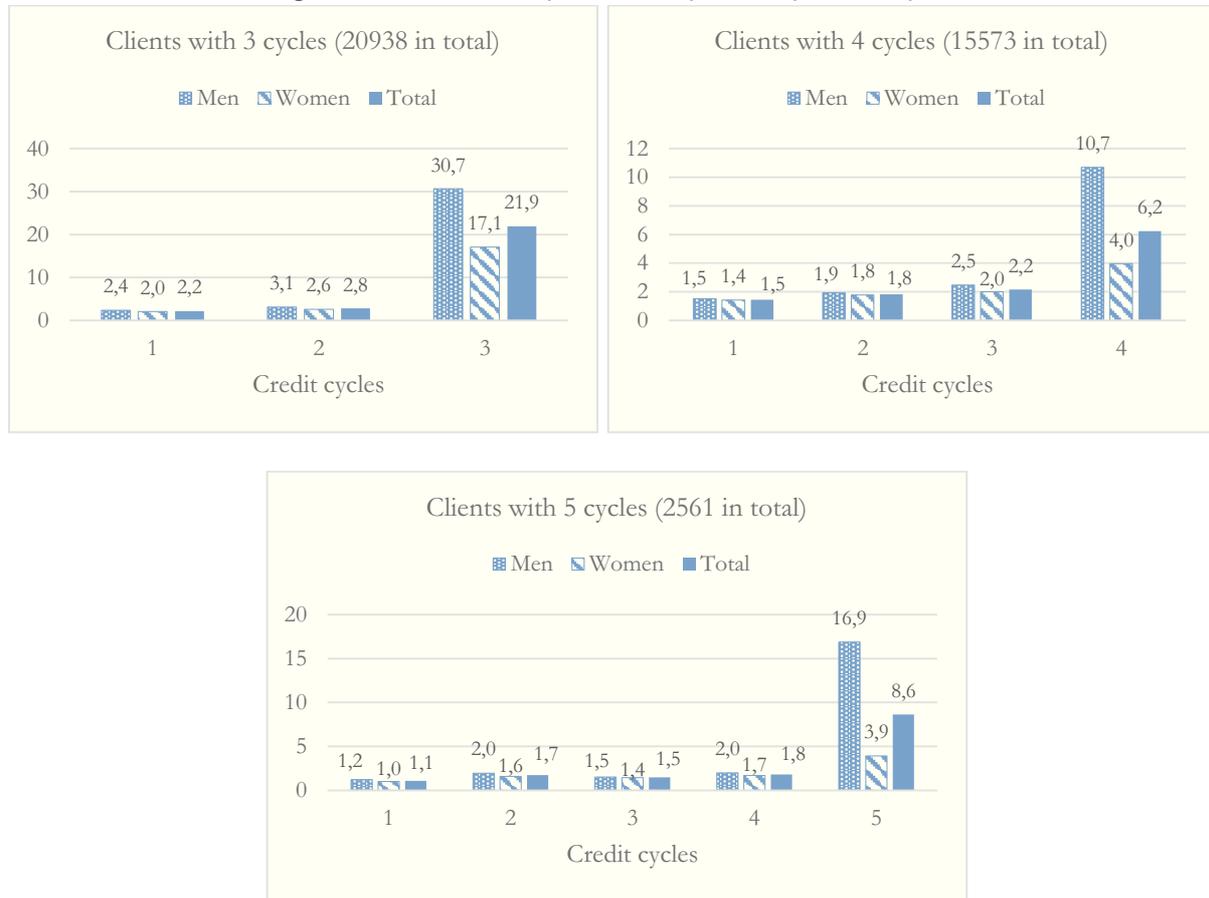
Figure 18. Late repayment by sex (in %)



Looking at the number of days overdue by credit cycle, keeping only the clients who got the same number of cycles, the difference between men and women appears to be mainly due to

the client's last cycle (figure 19), even though the number is also slightly higher for men's previous cycles.

Figure 19. Number of days overdue by credit cycle and by sex



Additionally, it appears that the number of days overdue by credit cycle remains stable and low all along the client's credit history, and strongly increases during the last cycle, the increase being particularly substantial for men. This would imply that clients show good repayment behavior all along their credit history, and that they do not ease the pressure to repay timely as their relationship with the MFI lasts. The last cycle appears as exceptional, and the high number of days overdue is most likely to be correlated with dropping out.

Repayment behavior indeed differs between dropouts and continuing borrowers. If 37% of all the disbursed loans in our dataset have been repaid late, this share goes up to 55,9% if we consider only the loans disbursed to dropouts, and down to 28,7% if we consider only the loans disbursed to continuing borrowers.

The number of days overdue also differs according to client status (dropout or continuing borrower), as well as to account status (table 42). Considering all loans including those with no day

overdue, dropouts repaid their loans with 56 days overdue on average against 7 only for continuing borrowers. Excluding written-off credits and on-going credits in bad condition ⁴⁶ which considerably pull up the means, the average numbers are 21,5 for dropouts and around 3 for continuing borrowers. However, the average number for dropouts is still pulled up by their last loans, and comparing only repaid credits except the last one for dropouts, the numbers are 3,4 for dropouts and 2,5 for continuing-borrowers.

Table 42. Average number of days overdue by client status and account status

	Continuing Borrowers			Dropouts		
	Repaid loans	On-going (good condition)	On-going (bad condition)	Repaid loans (except last one)	Repaid last loans	Written-off credits
Average number of days overdue <i>(% of loans among each client status)</i>	2,5 <i>(79%)</i>	4,2 <i>(20,7%)</i>	1195 <i>(0,3%)</i>	3,4 <i>(39,5%)</i>	33,7 <i>(58,6%)</i>	1842 <i>(1,9%)</i>
Mean <i>(repaid or good conditions only)</i>	2,9			21,5		
Mean (all) <i>(% of all loans)</i>	6,9 <i>(82,7%)</i>			55,9 <i>(17,3%)</i>		

These numbers show that dropouts tend to repay with more days overdue than continuing borrowers, even when their last loans are excluded, however, the difference is tiny in this case and considerably increases when last loans are included. As a consequence, dropouts may be slightly different than continuing borrowers, but this remains unsure at this stage; they rather seem to have faced a specific shock during their last loan period, which would explain the fact that they had to leave the MFI (either intentionally or through exclusion). The econometric analysis may shed light on the possible differences between dropouts and continuing borrowers.

⁴⁶ An on-going credit in bad condition is a credit of a still active client with a high number of days overdue. There is no exact threshold to be declared written-off as the status depends on whether the client has shown goodwill to repay.

IV. METHOD AND RESULTS

The aim of the econometric analysis is to identify a possible gender effect on two kinds of clients' behavior which may represent a risk for an MFI: leaving the MFI, that is to say not renewing a loan on the one hand, and repaying late on the other hand. Additionally, since a dropout covers different types of behavior (voluntary departure, exclusion or default), the existence of a possible gender effect on these different kinds of exits is also examined.

1. To stay or not to stay: the probability of renewing a loan

As previously mentioned, most dropouts leave the MFI after the first loan, but not all of them do. As a consequence, the credit characteristics are included in the analysis of the probability of renewing a loan, as well as clients' socio-demographic and financial characteristics and their project details. Indeed, we suspect that starting inequalities in terms of education and/or socioeconomic background could be correlated with entrepreneurial skills and then have an effect on a client's capacity to start and run an activity in the long term. In the same way, the composition and financial situation of the household could be determining (as having other sources of revenues may help keep the project running in the case of difficulty), as well as the type of collateral (which may reflect the client's social network). With regard to loan characteristics, the amount could be determining, as a high amount could enable the activity to maintain or develop and could provide an incentive for the client to stay. However, too high an amount could also represent too high a financial burden and put the client and/or his or her project at risk.

To take all these parameters into account, we estimate a sequential probit model, i.e. a structural equation model where one equation corresponds to the estimation of the probability of renewing a loan at the end of a specific credit cycle, including Heckman selection correction at each step. This allows taking into account the fact that the clients renewing their loans at the end of the third cycle are not the same ones as those renewing their loans at the end of the first cycle: the former have been selected, either by themselves or the MFI. Five equations are included, meaning that the probability of renewing a loan is estimated at the end of the first five credit cycles. Indeed, the sixth cycle concerns only 199 clients, which is too few to include a sixth equation. Such a model allows correlation between the errors of each equation, since unobserved individual effects could indeed be correlated over time.

In latent form, this model may be written as follows:

$$s_{it+1}^* = Z_{it+1}\delta_{t+1} + \varepsilon_{it+1} \quad (1)$$

$$\text{And } \begin{cases} s_{it+1} = 1 \text{ if } Z_{it+1}\delta_{t+1} + \varepsilon_{it+1} > 0 \\ s_{it+1} = 0 \text{ otherwise} \end{cases}$$

The selection equation being:

$$s_{it} = Z_{it}\delta_t + \varepsilon_{it} > 0$$

With:

- $s_{it}=1$ if the client renews a loan at the end of the credit cycle t , with $1 \leq t \leq 5$;
- Z_{it} representing the client's characteristics (some being time-varying, i.e. changing from one credit cycle to another, and others being time-invariant) as well as the characteristics of the project and the loan (being time-varying);
- δ a vector of parameters;
- ε_{it} following a normal distribution;
- $\text{Corr}(\varepsilon_{it}, \varepsilon_{it+1}) = \rho_{tt+1}$

Each equation of the system is estimated with a probit model for each t , allowing correlation between the errors of each equation, and including Heckman correction from $t=2$. The full model is estimated by maximum likelihood.

The vector Z_{it} include socio-demographic characteristics (gender, age, education level, marital status, household size, type of housing occupation, the presence of another active member in the household or not, household monthly expenses), project characteristics (activity sector, project age, presence of regular or seasonal employees, fixed assets in log value), closing loan characteristics (amount, interest rate, period, collateral offered, type of use of the credit, number of days overdue) and branch and officer characteristics (branch age, branch average granted amount that month, officer gender, new officer compared to the previous loan or not, and a dummy variable indicating whether the last repayment for the closing loan was made during the last week of the month or not). For the fifth cycle, some categorical variables have been turned into dummy variables to enable the probit model to converge (education: illiterate or not; housing: owner or not; activity sector: agriculture or other; employees: some or not; collateral: personal network or other; use: working capital or other).

The marginal effects of the estimated model are presented in table 43.

Table 43. Probability of renewing a loan at the end of a cycle (marginal effects)

	Cycle 1		Cycle 2		Cycle 3		Cycle 4		Cycle 5	
Client's profile										
Female	-0.0228	(0.0139)	-0.0329*	(0.0161)	-0.0249	(0.0219)	-0.0309	(0.0491)	0.155	(0.160)
Age	-0.000932	(0.000674)	0.00177*	(0.000768)	0.00301**	(0.00103)	0.00525*	(0.00233)	0.00839	(0.00816)
Education (vs. Illiterate)	-	-	-	-	-	-	-	-	-	-
Primary	-0.00232	(0.0216)	0.0437	(0.0244)	-0.0355	(0.0351)	0.0513	(0.0800)		
Secondary	-0.0104	(0.0242)	0.0530	(0.0272)	-0.0966*	(0.0383)	0.0697	(0.0870)	-0.104	(0.153)
Higher	-0.130***	(0.0328)	-0.0660	(0.0376)	-0.0913	(0.0530)	0.0818	(0.121)		
Single	-0.177***	(0.0162)	-0.127***	(0.0189)	-0.0912***	(0.0254)	-0.112*	(0.0551)	0.334	(0.208)
Household size	-0.00603	(0.00366)	-0.00288	(0.00425)	-0.0171**	(0.00579)	-0.0111	(0.0128)	-0.0256	(0.0451)
Housing (vs. Tenant)	-	-	-	-	-	-	-	-	-	-
Free lodging	0.0126	(0.0279)	-0.0170	(0.0308)	0.0373	(0.0388)	0.103	(0.0772)		
Owner	0.00431	(0.0226)	0.0249	(0.0251)	0.0548	(0.0314)	0.130*	(0.0621)	0.207	(0.159)
Other active member in household	0.0839***	(0.0152)	0.0980***	(0.0178)	0.0213	(0.0252)	0.0938	(0.0578)	0.312	(0.174)
Household's monthly expenses (1000 TND)	0.0177	(0.0229)	0.0230	(0.0239)	-0.0249	(0.0297)	-0.0390	(0.0593)	0.0236	(0.176)
Project										
Activity sector (vs. Agriculture)	-	-	-	-	-	-	-	-	-	-
Commerce	0.0306	(0.0174)	0.0148	(0.0199)	-0.163***	(0.0272)	-0.265***	(0.0684)		
Production	-0.0138	(0.0183)	-0.00527	(0.0208)	-0.131***	(0.0282)	-0.175*	(0.0708)	0.508	(0.299)
Services	0.118***	(0.0255)	0.0310	(0.0281)	-0.100**	(0.0377)	-0.360***	(0.0846)		
Not documented	-0.0329	(0.0341)	-0.120*	(0.0484)	-0.252***	(0.0694)	-0.462**	(0.144)		
Project age	0.00190*	(0.000922)	0.00229*	(0.00103)	0.00459**	(0.00141)	0.00176	(0.00324)	0.0172	(0.0123)
Fixed assets (log)	0.00662***	(0.00201)	-0.00270	(0.00235)	-0.00148	(0.00313)	-0.00207	(0.00716)	-0.0237	(0.0303)
Employees (vs. None)	-	-	-	-	-	-	-	-	-	-
Seasonals only	0.0790	(0.0507)	-0.0461	(0.0508)	0.0658	(0.0718)	-0.0528	(0.146)		
Regular workers only	0.0275	(0.0245)	0.0247	(0.0290)	-0.107**	(0.0386)	-0.110	(0.0814)	-0.0955	(0.173)
Both	0.0190	(0.0378)	-0.00360	(0.0450)	-0.186**	(0.0633)	0.0469	(0.177)		
Loan										
Loan amount (1000 TND)	0.200***	(0.0245)	0.0514***	(0.0155)	0.113***	(0.0160)	0.0935**	(0.0285)	-0.134	(0.0786)
Loan term (months)	-0.0202***	(0.00335)	-0.0148***	(0.00401)	0.0790***	(0.00535)	0.100***	(0.0116)	0.0723*	(0.0334)
Interest rate	0.00637	(0.00360)	-0.0254***	(0.00201)	-0.0162***	(0.00216)	-0.0117*	(0.00467)	-0.00778	(0.0225)
Collateral (vs. Unique guarantor)	-	-	-	-	-	-	-	-	-0.0199	(0.168)
Reciprocal guarantee	-0.129***	(0.0175)	-0.0479**	(0.0185)	-0.00403	(0.0235)	0.0696	(0.0568)	-	-

Physical collateral	-0.105***	(0.0174)	-0.0532**	(0.0182)	-0.0105	(0.0238)	0.0379	(0.0587)		
Credit use (vs. Working capital)	-	-	-	-	-	-	-	-	-0.0834	(0.160)
Investment	0.0766***	(0.0196)	0.0437*	(0.0220)	0.0345	(0.0302)	-0.0162	(0.0694)		
Creation	-0.246***	(0.0643)	-0.0259	(0.0651)	-0.156	(0.0863)	0.0238	(0.239)	-	-
Other	0.0127	(0.0167)	0.00995	(0.0194)	0.0139	(0.0269)	0.00191	(0.0622)		
Days overdue (log)	-0.449***	(0.00451)	-0.376***	(0.00499)	-0.304***	(0.00614)	-0.268***	(0.0145)	-0.146**	(0.0448)
<i>Officer and branch</i>										
New officer	na	na	-0.0732***	(0.0153)	-0.0353	(0.0208)	-0.0820	(0.0456)	-0.184	(0.154)
Female officer	-0.0279*	(0.0130)	-0.0431**	(0.0148)	-0.0442*	(0.0195)	-0.0869*	(0.0425)	-0.0137	(0.163)
Repaid the last week of the month	-0.260***	(0.0140)	-0.339***	(0.0158)	-0.612***	(0.0232)	-1.044***	(0.0623)	-0.760**	(0.239)
Branch mean amount (1000 TND)	-0.0258	(0.0147)	-0.121***	(0.0160)	-0.0142	(0.0199)	-0.0415	(0.0424)	-0.0254	(0.144)
Branch age	-0.0200***	(0.00173)	-0.0135***	(0.00191)	-0.000996	(0.00245)	-0.0111*	(0.00502)	0.0149	(0.0206)
Constant	1.320***	(0.141)	2.363***	(0.106)	0.967***	(0.141)	1.012**	(0.311)	1.100	(1.002)
Observations	66086		51511		38853		18204		2807	
<i>Correlation between equations</i>										
rho	Coef.	S.e.	95% Confidence interval							
rho_12	0.307	(0.326)	-0.370	0.771						
rho_13	-0.331	(0.591)	-0.928	0.743						
rho_14	0.670	(0.290)	-0.216	0.951						
rho_15	-0.228	(0.510)	-0.858	0.677						
rho_23	-0.122	(0.156)	-0.408	0.186						
rho_24	0.431***	(0.098)	0.222	0.602						
rho_25	0.273***	(0.109)	0.049	0.470						
rho_34	0.311*	(0.049)	0.213	0.403						
rho_35	0.214***	(0.047)	0.121	0.304						
rho_45	0.038	(0.034)	-0.028	0.104						
*** p<0.01, ** p<0.05, * p<0.1										

First, almost no variable is significant at the end of the fifth cycle, which concerns only 2807 observations. As a consequence, the discussion of results mainly concerns the first four cycles. It is interesting that clients' socio-demographic characteristics do not appear as determining in the probability of renewing their loans at the end of a cycle. The results of the sequential probit model confirms what descriptive statistics suggested and show that, all other things being equal, gender has no statistically significant effect on the probability of renewing a loan. The only significant household characteristics are matrimonial status, as single clients are less likely to renew their loans, and the economic composition of the household, as being a client from a household where at least one other member is active increases the probability of renewing a loan by 8 or 9 percentage points, at least after the first two cycles.

The characteristics of the project and especially the loan seem to be much more determining. Leading an agricultural activity increases the probability of renewing the loan from the third cycle compared to other activity sectors. This could be due to the fact that the agricultural credits offered by Enda are properly tailored to agricultural activity as they take seasonality into account. As a consequence, the clients leading such projects may be more dependent on Enda than the others. Furthermore, running a larger-scale project, with higher fixed assets, also increases the probability of renewing the loan after the first credit cycle. As most dropouts leave the MFI after the first cycle, it is possible that clients running smaller projects are less able to manage their credit and do not renew their loan after the first one. However, clients who receive a first loan to create their activity are less likely to renew it. This could indicate either failure of their project, as creations are riskier, or success, which would have enabled them to turn to traditional banks.

Second, having a higher loan amount for the on-going credit increases the probability of renewal, unlike higher interest rates. This result tends to corroborate what was revealed by a study carried out in 2013 by Enda's marketing department: this study aimed at better understanding the reasons for dropping out by contacting 8174 clients from the whole territory who left the MFI and questioning them about their departure. Among these surveyed clients, 42% had left voluntarily, the first reason being the too low amounts, the following ones being the inadequate repayment schedule, the absence of grace period, and the high interest rates in fourth position. Consequently, the fact that clients who received lower amounts are less likely to renew their loans probably reflects their dissatisfaction with regard to loan amounts. Another explanation may be that these clients are less able to make their project survive, however, this last hypothesis is less likely: indeed, according to the above-mentioned survey, only 2% of dropouts left because of economic problems, and 72% of surveyed clients who left affirmed that their activity was still

existing. Additionally, if 42% left voluntarily, 14% left temporarily, mainly because they did not need to invest at that moment. Most dropouts explained they were using their own funds to finance their activity, and 17% were resorting to informal borrowings from family and friends.

Coming back to our results, interestingly, having a unique guarantor increases the probability of a client renewing the loan compared to offering reciprocal guarantee or physical collateral—at least after the first two loans. This corroborates loan officers' perception that loyal clients acting as guarantors (the most common unique guarantors) represent a safe guarantee for the MFI: loyal clients, who got several loans themselves, may encourage clients they are responsible for to renew their loan as well. This is hence doubly advantageous for the MFI, as loyal clients contribute to foster client retention. Conversely, other clients, especially those offering reciprocal or physical guarantees, are less likely to renew their loans. The above-mentioned survey about dropouts is again enlightening on this point: apart from the 42% of voluntary departures and 14% of temporal departures, 44% of surveyed clients had actually been excluded by the MFI, the first reason being the lack of guarantee. Mutual guarantee (the most common reciprocal guarantee) had been especially mentioned as problematic, because in the case where the mutual guarantor does not renew or repays late, he/she cannot act as a guarantor anymore; as a consequence, the client loses his/her guarantee and it becomes more difficult for him/her to renew.

This result reminds us that the base model of microfinance is risky: the original principle of microfinance is that MFIs are not supposed to require any guarantee from their clients but rather count on clients' mutual commitment, either through group lending or group guarantee. In the case of Enda, there has been no group lending any longer since 2008, but clients are still allowed to choose to ask another (mutual guarantee) or several other clients (joint surety) to act as guarantors while acting as guarantors themselves at the same time, even though this is not the only possible guarantee to offer. The results of the analysis show that such reciprocal guarantee model is one of the riskiest for the MFI. It also shows that physical guarantee is not safer. Mixing different types of guarantees⁴⁷ is certainly a way of minimizing risk for the MFI, while keeping serving vulnerable clients who have no other choice than taking one or several other clients as guarantors and acting as guarantors themselves in return. Nonetheless, by relying on loyal clients as guarantors, Enda seems to have found an interesting compromise: this system enables clients who do not have any collateral to offer to use a person from their social network instead to act as a guarantor, without acting as a guarantor him/herself. Indeed, because this person is not

⁴⁷ The repartition of types of guarantees by gender is described in table 55.

unknown from the MFI and is supposed to be reliable, clients resorting to loyal clients as guarantors do not have to commit themselves as guarantors. This system seems less risky for the MFI in terms of moral hazard than mutual guarantee between two new clients still unknown from the MFI, who could agree on both taking the credit money and disappearing. It also seems more efficient in terms of client retention. This system hence appears as an improvement of the base model of microfinance.

Coming back to results, the probability of renewing a loan decreases with the number of days overdue. In this case, the MFI itself may become reluctant to grant another loan to a client who displays risky repayment behavior: the number of days overdue was indeed the second reason for exclusion from the MFI according to the above-mentioned survey. However, this reason was the one of only 11% of all dropouts. Some clients may have decided themselves not to renew their loans as they have realized they would not be able to repay another one, but again, dropouts for economic problems represented only 2% of all dropouts.

Third, we also notice that some organizational features have a significant effect on the probability of leaving the MFI. Thus, if the final repayment of the loan occurred during the last week of the month, this decreases the probability of the client renewing their loan. The internal administration of the MFI results in a far heavier workload for credit officers during the last week of the month: indeed, as previously mentioned, officers are supposed to dedicate the last week of the month to recalling and/or visiting all clients who are a few days overdue in their repayments in order to make sure these clients will eventually repay. Indeed, the objective for officers is to minimize the default and late repayment rates of their portfolios at the end of the month in order to maximize bonuses, since the PAR30 and default rates have a negative effect on their bonus, while the timely repayment rate has a positive effect. As a consequence, credit officers tend to spend less time during the last week of each month renewing the loans of clients who just fulfilled their last payment obligation as other actions become a priority. Usually, the renewal of a loan is anticipated and officers make sure to start the procedure just before the last instalment. If the loan has not been renewed at that point, and if the client was not particularly interested in renewing for any reason, then renewal is less likely to occur. It is then understandable that loans repaid in total at the end of a month are less likely to be renewed, even though this tends to reveal a failure in the MFI's inner workings.

Coming back to the gender perspective, as we do not find any clear gender effect on client retention, these results contradict the commonly held view in microfinance and in this specific MFI that women are more loyal customers than men. What could already be observed with

simple descriptive statistics also holds in the econometric analysis. As a consequence, women do not appear as more loyal, neither on average, nor because their projects, profiles or households would have specific characteristics. This is all the more surprising as in this MFI, the clients benefiting from non-financial services, such as training on entrepreneurship, money management, women's rights, support for marketing of products, etc., are female clients for the vast majority. Yet, it has been proved in the literature that offering non-financial services improves client retention (Karlan & Valdivia, 2011). Nonetheless, the different types of exits were not distinguished at this stage, and if there is no difference between men and women in terms of renewal, there may be some in terms of type of exit, which is examined below.

Finally, the significance of many rho coefficients shows that there is indeed a selection bias in the probability of renewing a loan over credit cycles, which is therefore affected by both observable and unobservable characteristics.

2. Dropping out, but not any way: the various types of exit

As descriptive statistics have already sketched, there are different types of dropouts: some clients did not renew their loans because they defaulted, which is the worst way of dropping out in terms of risk for MFIs, but some others left without being ever late in their repayments, which most probably corresponds to voluntary departures. Some others left after having repaid their loans with few days overdue, which may also correspond to voluntary departures but maybe for different reasons, such as financial difficulties, while others left with more than 40 days overdue, and were more probably excluded by the MFI. The profiles of dropouts are therefore likely to differ according to the type of exit.

In order to know more about these heterogeneous dropouts, a multinomial probit model is defined and first written in latent form as follows:

$$y_{ij}^* = X_i \beta_j + \varepsilon_{ij}$$

And

$$\begin{cases} y_i = j & \text{if } y_{ij}^* = \max(y_{i1}^*, y_{i2}^*, \dots, y_{ij}^*) \\ y_i = 0 & \text{otherwise} \end{cases}$$

Where:

- y_{ij}^* is the unobserved utility of client i to leave the MFI the way j ;
- y_i the observed type of exit of client i ;
- X_i the vector of characteristics of client i ;

- β_j the coefficient associated with these characteristics varying with the type of exit j ;
- ε_{ij} the error term following a multivariate normal distribution with covariance matrix Σ which is not necessarily the identity matrix.

The probability that a client i exits the MFI the way $q \neq j$ can then be written as follows:

$$P(y_i = q | X_i) = P[\varepsilon_{i1} - \varepsilon_{iq} > X_i(\beta_1 - \beta_q), \dots, \varepsilon_{ij} - \varepsilon_{iq} > X_i(\beta_j - \beta_q), \dots, \varepsilon_{ij} - \varepsilon_{iq} > X_i(\beta_j - \beta_q), \\ j = 1, \dots, J, j \neq q] \quad (2)$$

The hypothesis made on the distribution of the error term implies that the independence of irrelevant alternatives is relaxed, which means that error terms may be correlated across the various types of exit⁴⁸.

The various types of exit j defined are (1) exit with never any day overdue in credit history, (2) exit with 40 days overdue or less, (3) exit with more than 40 days overdue, (4) default, the reference (0) being no exit, or renewal.

The vector X_i includes socio-demographic characteristics (gender, age, education level, marital status, the presence of another active member in the household or not, household monthly expenses), project characteristics (activity sector, project age, presence of regular or seasonal employees, fixed assets in log value, current assets in log value), closing loan characteristics (amount, interest rate, period, collateral offered, type of use of the credit, credit cycle) and branch and officer characteristics (branch age, branch average granted amount that month, officer gender, officer experience, new officer compared to the previous loan or not).

The model is estimated via maximum likelihood using all observations pooled over credit cycles, in order to see the effect of the credit history on the probabilities associated with the type of exit, hence standard errors are clustered at individual level. The results in relative risk ratios compared to the reference category “no exit” are presented in table 44.

⁴⁸ An alternative possibility is to use the multinomial logit. However this model is based on the assumption of independence of irrelevant alternatives, meaning that error terms attached to each alternative are supposed to be uncorrelated. The multinomial probit allows such correlation between error terms and is thus less restrictive.

Table 44. Relative probabilities of the different types of exits, compared to renewal

	Exit (never late)		Exit with 1-40 days overdue		Exit with +40 days overdue		Default	
<i>Variables of interest</i>								
Credit cycle	0.622***	(0.00897)	0.760***	(0.00848)	0.722***	(0.0123)	0.808***	(0.0278)
Female	1.125***	(0.0184)	0.921***	(0.0126)	0.724***	(0.0129)	0.678***	(0.0230)
Loan amount (1000 TND)	0.998	(0.0191)	0.850***	(0.0145)	0.855***	(0.0197)	1.148***	(0.0418)
Interest rate	1.031***	(0.00255)	1.027***	(0.00204)	1.015***	(0.00271)	1.016**	(0.00533)
Loan term (months)	1.022***	(0.00401)	1.048***	(0.00356)	1.093***	(0.00503)	0.988	(0.00833)
<i>Sociodemographic profile</i>								
Age	1.001	(0.000777)	0.993***	(0.000668)	0.983***	(0.000943)	0.981***	(0.00184)
Single	1.246***	(0.0233)	1.204***	(0.0189)	1.107***	(0.0229)	1.031	(0.0404)
Education (vs. Illiterate)								
Primary	1.004	(0.0249)	0.950*	(0.0210)	0.889***	(0.0272)	1.024	(0.0646)
Secondary	0.999	(0.0279)	0.977	(0.0238)	0.905**	(0.0301)	1.005	(0.0688)
Higher	1.150***	(0.0443)	1.091**	(0.0360)	0.981	(0.0431)	0.951	(0.0874)
Other active member in household	0.947**	(0.0172)	0.898***	(0.0138)	0.889***	(0.0180)	0.927	(0.0361)
Household monthly expenses (1000 TND)	0.938*	(0.0268)	1.022	(0.0229)	1.022	(0.0292)	0.816**	(0.0558)
<i>Project</i>								
Agricultural project (vs. Non-agricultural)	0.993	(0.0175)	1.012	(0.0152)	0.984	(0.0192)	0.913*	(0.0322)
Age of project	0.999	(0.00103)	0.991***	(0.000941)	0.991***	(0.00130)	0.998	(0.00241)
Has regular and/or seasonal employees	0.944*	(0.0229)	1.052*	(0.0209)	1.078**	(0.0276)	1.119*	(0.0537)
Fixed assets (1000 TND)	1.000	(0.000430)	1.001***	(0.000328)	1.001	(0.000411)	0.998*	(0.000872)
Current assets (1000 TND)	0.990***	(0.00229)	1.004*	(0.00176)	1.004	(0.00219)	0.998	(0.00385)
Collateral (vs. Unique guarantor)								
Reciprocal guarantee	1.076***	(0.0197)	1.074***	(0.0169)	1.238***	(0.0277)	1.533***	(0.0700)
Physical guarantee	1.070***	(0.0201)	1.190***	(0.0190)	1.413***	(0.0311)	1.503***	(0.0708)
Use (vs. Working capital)								
Investment	0.935**	(0.0213)	0.911***	(0.0179)	0.904***	(0.0238)	0.872**	(0.0448)
Creation	1.212**	(0.0852)	1.207**	(0.0710)	1.102	(0.0898)	1.065	(0.183)
Other	1.026	(0.0202)	1.016	(0.0173)	1.089***	(0.0241)	1.151***	(0.0454)
<i>Branch and officer</i>								
Other officer than previous loan	0.914***	(0.0189)	0.911***	(0.0151)	0.936**	(0.0221)	1.148**	(0.0562)
Female officer	1.041**	(0.0157)	1.053***	(0.0136)	0.977	(0.0170)	1.011	(0.0339)
Officer experience (years)	1.000	(0.00332)	0.992**	(0.00280)	0.982***	(0.00452)	0.883***	(0.0108)
Branch age	0.968	(0.0198)	0.957*	(0.0163)	0.961	(0.0225)	1.063	(0.0511)
Branch mean amount (1000 TND)	0.924***	(0.0206)	0.863***	(0.0164)	0.874***	(0.0228)	0.847**	(0.0473)
Observations	176790							

Exponentiated coefficients

Clustered standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

First, what could not be seen in the analysis of the probability of renewing a loan was the effect of credit cycle; indeed, since the analysis was carried out at the end of each cycle, the cumulative effect of these cycles could not appear. However, the relationship between a client and the MFI is different after one credit cycle only or after 3 or 4: both parties are more likely to trust each other after several credit cycles, and the probability of leaving the MFI for a client could be affected by the duration and/or strength of the relationship, since more credit cycles means more time spent within a microfinance program and more numerous meetings with loan officers. In this analysis, the coefficient of “credit cycle” reflects the effect of such duration and/or strength of the relationship between clients and the MFI, and what clearly appears is that the longer/stronger the relationship, the less likely to leave the MFI clients are, whatever the type of exit considered. In other words, the longer clients stay, the longer they are likely to stay again. Clients become increasingly loyal over credit cycles.

With regard to our variable of interest, it also clearly appears that the relative probability of leaving the MFI without any day overdue rather than renewing a loan is 12,5% higher for female clients than for male clients. Conversely, the relative probabilities of leaving with 40 days overdue or less, of leaving with more than 40 days overdue, and of defaulting are respectively 7,9%, 27,6% and 32,2% lower for female clients than for male ones. Looking at computed marginal effects, the probability of leaving with no day overdue is on average 1,2 percentage point higher for women than for men, whereas the probability of defaulting is 0,4 percentage point lower, all other things being equal. Consequently, female clients clearly appear as less risky for the MFI than male clients, at least in terms of default and exit with days overdue. The same model was run adding an interaction term between women and several loan characteristics (loan amount, interest rate, cycle, collateral) and none coefficient of the interaction terms was significant: as a consequence, women are less risky whatever the amounts received, and in particular women receiving higher amounts are not riskier than the others.

Concerning the other determinants of the various types of exit, another striking result is that the higher the interest rate, the higher the probability to leave rather than renewing, whatever the type of exit. This is in keeping with the results of the 2013 survey which revealed that dropouts complain about high interest rates.

About sociodemographic characteristics, the relative probability of leaving with or without any day overdue is higher for single clients than for the others, whereas it is lower for clients with another active member in the household than for those without. This seems to indicate that clients who have relatives to support them are more likely to keep resorting to the

MFI, and that this is not the MFI's decision only, since the probability of leaving with no day overdue (which is necessarily the clients' decision) is also lower for those clients.

Concerning projects, collaterals appear as strong determinants of the type of exit. The results confirm that the relative probability of leaving the MFI, whatever the type of exit, is lower for clients with a loyal client acting as a guarantor. Those clients appear themselves as less risky and more loyal. Conversely, the relative probability of leaving with no day overdue rather than renewing is 7,6% higher for clients offering reciprocal guarantee and 7% higher for clients offering physical collateral, the relative probability of leaving with 40 days overdue or less is respectively 7,4% and 19% higher for those clients, the relative probability of leaving with more than 40 days overdue is respectively 23,8% and 41,3% higher, and the probability of defaulting is respectively 53% and 50% higher. Consequently, it seems that clients with a loyal client as a guarantor feel more committed to repaying their loans and renewing than the others. Conversely, reciprocal guarantee is the riskiest kind of guarantee with regard to default, even though the default rate at Enda remains very low.

The type of credit use also seems to influence the type of exit: the relative probability of leaving the MFI, whatever the way including default, rather than renewing is higher for clients using their loan for working capital than for those using it for investment. The contrary may be observed for clients who create their activity compared to those using the loan for working capital: the creation of an activity is indeed riskier than an already existing activity needing working capital. However, the relative probability of defaulting rather than renewing is not higher for creations than for clients using loans for working capital. The relative probability of defaulting and of leaving with more than 40 days overdue is higher for clients using their loans for agricultural campaign or as co-financing than for clients using them for working capital.

Finally, looking at officer characteristics, the relative probability of leaving with some days overdue or defaulting rather than renewing is lower for more experienced officers than for the others. More experienced officers seem more able to make their clients stay and repay timely. Conversely, the relative probability of leaving with 40 days overdue or less or without any rather than renewing is higher for clients received by female officers than for those received by male officers. Clients seem slightly less committed to the MFI when they are received by female officers. Lastly, the relative probability of leaving with or without some days overdue rather than renewing is lower when clients were received by a new officer for the on-going credit compared to the previous one, than for those who were followed by the same officer: this shows that new officers make their best to keep clients previously followed by other colleagues. However, these

clients are also relatively more likely to default than to renew when they are followed by a new officer, which shows that such clients may feel less committed to repay their loan in such a case.

Overall, such an analysis shows that dropouts may be very heterogeneous, and that dropping out while never being late is a different phenomenon than dropping out with some days overdue, which is not determined by the same factors as defaulting either. However, no real difference may be observed between dropouts with less or more than 40 days overdue; there may be two reasons for this absence of difference: either the threshold was not properly chosen, or clients who encountered some difficulty in repaying their loans, whether they chose to leave the MFI (those with less than 40 days overdue) or not (those with more than 40 days), were maybe not as much different from each other. Conversely, it seems that there would be more difference between clients who left without any day overdue and those who left with a few only, even though they intentionally left in both cases: indeed, it is possible that the first category of clients chose to leave because they did not need another loan, or preferred to wait before taking another one. According to the results, clients with fewer current assets and without any employee are relatively less likely to renew than to leave without any day overdue. As a consequence, these clients seem to manage smaller-scale projects: they might be more risk averse and prefer not to continually invest, as noticed in the 2013 survey. On the contrary, the second category of clients, those who left with a few days overdue only, apparently tend to have larger-scale projects than the first category, and they may chose to leave the MFI because they were dissatisfied by low amounts and high rates. The actual reasons for not renewing for the various categories of clients remain unknown, and it would be necessary to carry out a new survey similar to the one carried out in 2013 but distinguishing the dropouts by category before asking them the reasons why they left. It would help better understand this phenomenon. More generally, dropouts should be studied more carefully in order to enable MFIs to understand the various reasons behind such behavior, to manage risk in a better way, and to adapt their offer accordingly if necessary.

3. Who are the bad payers? The determinants of late repayment

The previous analysis only distinguishes between leaving the MFI ever being late and leaving the MFI with more or less than 40 days overdue. However, as descriptive statistics show, there is high heterogeneity among clients repaying late, and a few days overdue do not represent the same risk as numerous days overdue for MFIs. Identifying the determinants of a higher number of days overdue, which could be a warning sign of potential future default, seems necessary.

To do so, we follow Wooldridge's procedure (Wooldridge 1995; Semykina and Wooldridge 2010) to correct selection bias in panel data models. Indeed, as the analysis of the probability of renewing a loan shows, unobservable characteristics are likely to influence this probability, and consequently clients who renew their loan are not randomly selected; therefore they are likely to be different from the population of clients who got their first loan, including with regard to their repayment behavior.

The procedure is composed of three steps: the first consists in estimating the probability of being selected for each t , which means in our case the probability of renewing a loan at each credit cycle taken separately. Therefore, the first step corresponds to equation (1) described previously.

After estimating equation (1) with T standard probit models, the second step consists in computing T inverse Mills ratios for $s_{it}=1$. We afterwards include these ratios in subsequent equations to correct the selection bias. Moreover, this implies that an exclusion variable, highly correlated with the probability of renewing a loan but not to the number of days overdue, is included in equation (1).

This exclusion variable is the fact that the last repayment of the previous loan was made during the last week of the month: the results of the estimation of equation (1) show that, in this case, the probability of a loan being renewed is much lower, which is probably due to officers' heavier workload during this period. As previously explained, this week is supposed to be dedicated to collecting late repayments, and officers have much less time to spend for renewals. Consequently, the probability of a loan being renewed is negatively correlated with the previous loan's closing date falling during this period. However, if a loan is renewed, the fact that the last instalment was paid during the last week of the month is not expected to have any effect on the number of days overdue.

Following Wooldridge's procedure, the third step consists in estimating equation (3) using a pooled ordinary least squares estimator with bootstrapped standard errors:

$$y_{it} = \psi \bar{x}_i + \beta X_{it} + \rho \lambda_{it} + \varepsilon_{it} \quad (3)$$

With:

- y_{it} the number of days overdue by client i for the on-going credit cycle t , in log value (since the number of days overdue may drastically increase over months);
- \bar{x}_i the matrix of average values of X_{it} by individual;
- X_{it} the matrix of time-varying independent variables;
- λ_{it} the inverse Mills ratios;
- ε_{it} the idiosyncratic error term.

The inclusion of average values of observable characteristics enables us to take the unobserved individual heterogeneity into account; this corresponds to Mundlak specification which supposes that individual heterogeneity depends only on these average individual characteristics.

The matrix of independent variables consists of constant socio-demographic characteristics (a dummy variable for less than 35 years old, marital status, household size, education, housing tenure, the presence of another active member in the household), the value of first request, the loan's time-varying characteristics (credit cycle, loan amount, loan period, interest rate, collateral, a dummy variable for repayment of another parallel loan, type of credit use), the project's time-varying characteristics (activity sector, age, employees), financial time-varying characteristics (household expenses, the logarithms of fixed assets and of current assets), and organizational time-varying features (new officer compared to the previous loan or not, officer gender, officer experience, branch's rurality rate, a dummy variable for a new branch of less than 3 years, and branch's average granted amount).

The results of the estimation are presented in table 45. Considering the main variable of interest, female clients tend to repay their loans with 7% fewer days overdue than male clients all other things being equal; the average number being 21 days, this means that women tend to repay with 1,5 day overdue less than men on average. Consequently, female clients are less risky than male clients with regard to this risk factor as well.

Looking at the other determinants of late repayment reveals that they are sometimes different than those associated with dropping out. For instance, whereas single clients are more likely to leave the MFI, they tend to repay with fewer days overdue, conditionally to not leaving the MFI. Conversely, clients with another active member in their household are less likely to leave the MFI but more likely to repay with more days overdue. The same observation can be made concerning loan characteristics: reciprocal guarantee and physical collateral are associated with fewer days overdue than unique guarantors, so is higher interest rate or the creation of an activity

compared to working capital, conditionally to not dropping out. This implies that among the clients sharing the characteristics associated with a higher probability of leaving the MFI, only the best clients in terms of repayment behavior stay; in other words, if the clients the least likely to stay eventually stay, they show even better repayment behaviors than those who were originally more likely to renew their loans. There is a strong selection effect among the most probable dropouts.

Then, the fact that the number of days overdue tends to increase with credit cycles may not be surprising: the more credits clients take, the more chance they have to repay one or more installments with some days overdue. It could also reveal that clients feel more confident in their ability to get another loan as their relationship with the MFI lasts, leading them to ease pressure and feel a bit less compelled to repay timely.

Interestingly, agriculture and services appear as the two riskiest sectors in terms of late repayment; the irregularity of revenues in these sectors may explain this result. Moreover, it may be noticed that even controlling for activity sector, women still repay with fewer days overdue, which tends to refute the argument that women would show better repayment rates because they would be more represented in sectors where regular repayments are less constraining.

Finally, looking at officer characteristics, this time clients received by female officers tend to repay with fewer days overdue, whereas those received by a new officer compared to the previous loan or a more experienced officer are more likely to repay with more days overdue. This could indicate that these officers make a point of keeping their clients, whatever the repayment behaviors.

Overall, this confirms that repaying late and not renewing a loan are two different types of risks for MFIs, and that clients who engage in one of those behaviors are not necessarily the same as those engaging in the other one. Consequently, MFIs should accurately identify the profiles of both categories of clients to better manage risk.

Table 45. Estimation of the number of days overdue (pooled OLS)

<i>Socio-demographic profile</i>		
Female	-0.0705***	(0.00287)
Young (<35)	0.00630	(0.0110)
Education (vs. Illiterate)		
Primary	0.00594	(0.00399)
Secondary	-0.00939**	(0.00428)
Higher	-0.143***	(0.00739)
Single	-0.196***	(0.00399)
Household size	-0.0122***	(0.000798)
Housing (vs. Tenant)		
Free lodging	-0.0150***	(0.00566)
Owner	0.0336***	(0.00473)
Other active member in household	0.114***	(0.00345)
Household monthly expenses	-9.54e-06	(7.02e-06)
<i>Loan characteristics</i>		
Credit cycle	0.182***	(0.00535)
First requested amount	3.52e-06**	(1.78e-06)
Loan amount	8.66e-05***	(4.76e-06)
Loan term (in months)	0.00550***	(0.00125)
Interest rate	-0.0260***	(0.000453)
Parallel personal or opportunity loan	-0.0658**	(0.0311)
Collateral (vs. Unique guarantor)		
Reciprocal guarantee	-0.116***	(0.00662)
Physical guarantee	-0.0925***	(0.00729)
Credit use (vs. Working capital)		
Investment	-0.157	(0.108)
Creation	-0.167***	(0.0545)
Other	-0.160	(0.123)
<i>Project characteristics</i>		
Activity sector (vs. Agriculture)		
Trade	-0.0485***	(0.0105)
Production	-0.0546***	(0.0115)
Services	-0.00339	(0.0150)
Not documented	-0.149***	(0.0175)
Age of project	0.0314***	(0.00440)
Employees (vs. None)		
Seasonals only	0.0356**	(0.0142)
Regular workers only	-0.00862	(0.00795)
Both	-0.0358***	(0.0126)
Fixed assets (log)	0.00313***	(0.000715)
Current assets (log)	-0.00441***	(0.00108)
<i>Branch and officer characteristics</i>		
% of rural areas served by branch ([0;0,07])		
]0,07-0,35]%	0.0119***	(0.00341)
]0,35-0,55]%	0.00687*	(0.00395)
]0,55-100]%	-0.0333***	(0.00433)
New branch (less than 3 years)	-0.00767	(0.00841)
Branch mean amount	-8.35e-05***	(6.75e-06)
Female officer	-0.0565***	(0.00644)
Officer experience (years)	0.0236***	(0.00158)
New officer	0.127***	(0.00414)
Inverse Mills Ratio	4.257***	(0.00995)
Constant	0.299**	(0.127)
Average number of days overdue	20.94	
Average values of x included	yes	
Observations	161147	
Adjusted R-squared	0.800	

Bootstrapped standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

V. DISCUSSION

The first result of the previous analyses is that women do not appear as more loyal clients, since they are not less likely to dropout than men. As a consequence, on this point, male and female clients do not differ on average in terms of cost for the MFI. However, women are relatively more likely than men to leave the MFI without any day overdue compared to renewing. This indicates that women are probably more dissatisfied than men. Knowing that too low amounts is the first reason for voluntary departures, and that women especially receive low amounts, these women leaving the MFI without any day overdue may be particularly dissatisfied by the loan amounts they receive. Again, a survey distinguishing the reasons for departure by gender would be enlightening, as women may have specific reasons not to renew their loans.

Another difference in the types of exits is that men are more likely to default than women all other things being equal, and defaulting incurs an additional loss compared to simply dropping out. As a consequence, men appear as more costly than women on this point.

In terms of repayment behavior, men tend to repay with more days overdue all other things being equal, which again implies that men are more costly than women on this point as well, since late repayments may cause liquidity concerns, and compel the MFI to make more provisions for credit losses.

Finally, women receive lower amounts, and consequently are probably less gainful clients than men, even though they mechanically pay higher interest rates.

Taking all these results into account and without claiming to completely deal with the issue, we attempt to compare the costs and revenues incurred by male and female clients in order to estimate the potential advantage of lending to women, if existing.

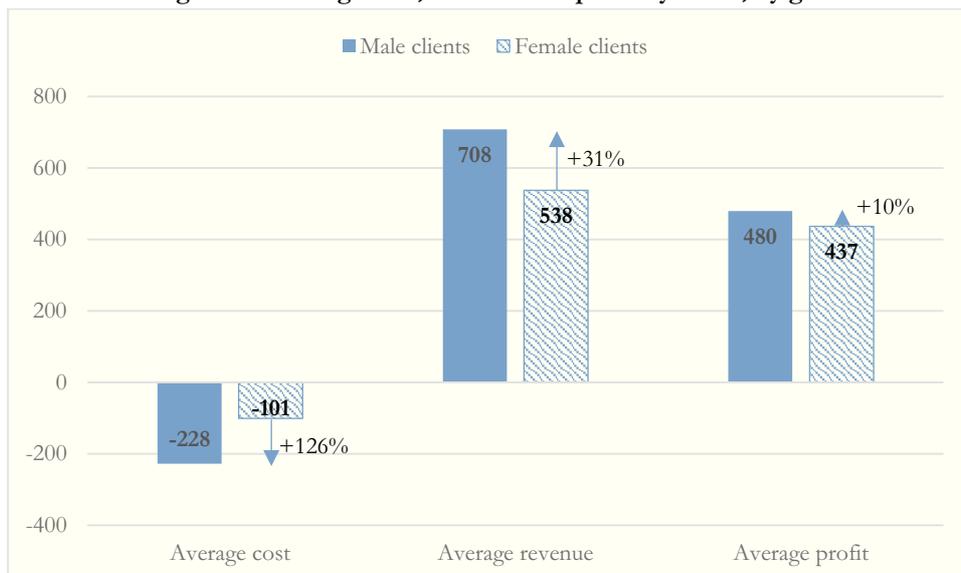
A first indicator of interest is the average revenue generated by loan by gender given the interest rate charged on each loan; considering only all repaid loans of our dataset and the interests charged, the average revenue generated is 245 TND for a loan disbursed to a woman and 333 TND for a loan disbursed to a man. Considering all the repaid loans disbursed to a client, the average revenue by client (and not by loan) is 708 TND for a male client and 538 TND for a female client.

With regard to costs, only default and late repayments are considered. Defaults are totally counted as losses, whereas we consider only PAR30 as a cost, since a general guideline for MFIs is to make provisions for credit losses equaling to 100% of PAR30, which is as much money

immobilized and which cannot be used another way by the MFI. As a consequence, we estimate costs by gender by adding the amounts of written-off credits and the PAR30, and by dividing the total by the number of clients: the result represents an average cost by client, considering only default and PAR30. Other sources of costs are not included: for instance, late repayments probably incur other costs than only provisions for losses, but quantifying such costs would be more arbitrary; as a consequence, we chose to limit the calculation of costs, which implies that they are probably minimized. The resulting average cost for a male client is 228 TND and 101 TND for a female client.

Consequently, in terms of ratios, a male client generates a revenue 31% higher than the one generated by a female client, but incurs a costs 126% higher, which results in an average profit (revenue minus cost) of 480 TND for a male client against 437 for a female client, or a profit 10% higher only. As a result, lending to women does not appear as clearly less advantageous than lending to men, even though they receive lower amounts. Considering only default and late repayment behaviors as costs, men are relatively more costly than gainful. A deeper analysis of costs would probably lead to a more accurate assessment of the advantage of lending to women, but given that men and women are equally likely to drop out (apart from defaulting), that there is a specific and fixed period of time dedicated to collecting late repayments for loan officers, and that lending methodologies do not differ between men and women, the other sources of costs which could differ between men and women do not seem numerous. A possible improvement certainly concerns the way of estimating costs incurred by late repayments.

Figure 20. Average cost, revenue and profit by client, by gender



VI. CONCLUSION

This chapter aimed at shedding new light on the question whether lending to women is advantageous for MFIs or not, by analyzing in particular two kinds of clients' behaviors which may represent a risk for MFIs and become costly, which are dropping out and repaying late. Indeed, dropouts are not well understood yet, and deserve more attention since client retention is a factor of both social and financial performances. A common belief is that women would be more loyal clients, which this case study denies: within Enda, female clients are not less likely to drop out than men. However, since they are more likely to leave without any day overdue, dissatisfaction is probably a more frequent reason for their departure, which implies that there may be a mismatch especially between supply and women's demand.

Conversely, men are more likely to default and more likely to repay late, all other things being equal. This implies that women appear as less risky clients than men, and that this is not due to specific activity sectors or project size. More sensitiveness to officer or peer pressure and more cautiousness with repayments because of a lack of alternative credit opportunities are more plausible explanations for this gender difference.

In contrast, women manage smaller projects and receive lower amounts, which means that their credits generate less profit than those disbursed to men. This is often an argument to claim that lending to women is not as much advantageous in financial terms. However, this analysis shows that if the average profit generated by women's loans is indeed inferior to the one resulting from men's loans, the difference in terms of profit is much lower than the one in terms of costs that late repayment and default represent. Given that profits directly result from loan amounts, granting slightly higher amounts to women would probably increase profits without increasing costs, since women show less risky repayment behaviors than men everything else being equal. The average gain by client could hence rapidly become equal for men and women, and lending to women as much advantageous than lending to men. Furthermore, this analysis does not take into account the fact that lending to women also enables an MFI to show better social performance indicators, and hence to attract more social investors, which usually grant credits under preferential conditions.

Thus, in the case of Enda, female clients show less risky repayment behaviors than men, and if they are not more loyal, they are not more likely to drop out either. As a consequence, granting credits to women does not appear as especially costly, and there does not seem to be any economically rational justification for granting them lower amounts, all other things being equal.

CHAPTER 4

RELATIONSHIP LENDING IN MICROFINANCE: DO WOMEN BENEFIT AS MUCH AS MEN?

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I. INTRODUCTION

Despite various polemics in recent years, microfinance keeps growing, with double-digit growth rates in the number of borrowers in 2013, 2014, and 2015⁴⁹ (Convergences, 2015, 2016, 2017) reaching 132 million clients throughout the world in 2016. These numbers confirm that microfinance is still considered today as a lever of development thanks to its significant role in financial inclusion, which is intended to contribute to the reduction of poverty and the empowerment of vulnerable people. The term “financial inclusion” has been gaining importance since the early 2000s, especially following a speech given on 29 December 2003 by the former General Secretary of the United Nations Kofi Annan, who said: “the stark reality is that most poor people in the world still lack access to sustainable financial services, whether it is savings, credit or insurance. The great challenge before us is to address the constraints that exclude people from full participation in the financial sector”. Since then, media have been highlighting the number of people excluded of financial services, and financial inclusion has gradually become one of the primary objectives of international institutions such as the World Bank or the various agencies of the United Nations.

As a consequence, attention has been focused for about a decade on the number of people holding a bank account, or more recently a mobile account thanks to technological progress, with microfinance becoming only a tool to help increase this number. The creation of new organizations such as the Centre for Financial Inclusion in 2008 in Washington or the Alliance for Financial Inclusion in Bangkok the same year, as well as the words “financial inclusion” in the headlines of main specialized organizations’ publications such as the Microfinance Barometer by Convergences, Global Findex by the World Bank or the Mix Market, illustrate the current tendency to mainly focus on the issue of *access* to financial services. However, these striking numbers, showing the progress made towards financial inclusion, not only demonstrate the increasing reach of microfinance worldwide, with even more new clients or “banked” people every year, they also exhibit another concomitant phenomenon, which is the retention of older clients. Once people get access to microfinance, they remain “financially included”, meaning that they keep returning to these products and services.

So far, client retention in the microfinance sector has not appeared as a major issue of interest. Instead, being inherent to microfinance’s *modus operandi*, it is included in impact assessment studies as a way to control for the duration of inclusion in a microfinance program.

⁴⁹ Microfinance Barometer 2016. Numbers are based on the data provided by the microfinance institutions reporting to the Mix Market.

However, client retention is at the core of some recent scandals about the “mission drift” of microfinance. Indeed, over-indebtedness, in particular, is more likely to occur after a client has received several loans than after they have received the first loan—all the more so as loan amounts usually increase over credit cycles, which is called “progressive lending”. Thus, this paper aims at more deeply analyzing the conditions of loan renewals.

Additionally, it has been shown by Agier and Szafarz (2013) in relation to Brazil as well as in the previous chapters that women are not necessarily favored in the microcredit allocation process, particularly in terms of amounts granted. This paper therefore focuses on the conditions of loan renewals from a gender perspective. In particular, the objective is to analyze the policy of progressive lending by the MFI Enda inter-arabe to check if the initial gap observed between amounts granted to new male and female clients is persistent or not over credit cycles.

Indeed, this initial gap seems to be accounted for by great information asymmetry between new applicants and credit officers, which is usual in any lender-borrower relationship; because of such an asymmetry, officers tend to refer to stereotypes about women and their projects, most probably leading to statistical discrimination. In the same way, the main hypothesis in this chapter is that the same kind of stereotypes may have an effect on the application of a progressive lending policy. Since gender division of labor within the household remains significant in Tunisia (MAFFEPA, 2005),⁵⁰ female clients may still be considered to have less time to dedicate to their projects whatever the credit cycle. As a consequence, we assume that loan officers are likely to conclude that if women invest less time on average in their activity, their project is likely to evolve less quickly, and women should also need less money at any credit cycle. Such general consideration would lead to statistical discrimination taking the form of a slower progressive lending policy for women that cannot be justified by project characteristics, or by different risky behaviors between men and women as clients.

The alternative hypothesis is that credit officers gain information on clients as clients renew their loans, which should reduce the moral hazard issue. To that extent, the relationship between credit officers and microfinance clients would be similar to any lending relationship between financial intermediaries and firms, and several theoretical papers show that such lending relationships enable creditors to produce information about borrowers and to use it in their next credit decisions (Campbell & Kracaw, 1980; Diamond, 1991; Leland & Pyle, 1977). As a

⁵⁰ The time-use survey, carried out by the Tunisian Ministry of Women Affairs in 2005 (MAFFEPA 2005) on men and women in Tunisia and regularly referred to in reports on gender issues, indicates that women dedicate more than five hours a day to domestic work against an average of 39 minutes for men.

consequence, MFIs' credit officers could also learn from their relationships with their clients that female clients are eventually as able as men to manage their projects and even less risky in terms of repayment. In such a case, the progressive lending policy should be at least fairly applied between men and women.

To check our hypotheses, we use the same longitudinal client data from Enda as in the previous chapter, in order to integrate the information on clients' behaviors in the analysis. Thus, we analyze Enda's progressive lending policy by examining amounts granted over credit cycles on the one hand and the growth rate of these amounts granted on the other hand, while correcting the selection bias identified in the previous chapter and taking former repayment behavior into account.

The main results is that although female clients are less risky in terms of repayment behavior, loan amounts granted to women grow more slowly from one credit cycle to another than those granted to men, all things being equal.

Section 2 reports how progressive lending is applied in practice and considered in the literature, section 3 describes the data, section 4 details the empirical method and states the results, section 5 discusses them and section 6 concludes.

II. PROGRESSIVE LENDING IN PRACTICE AND IN THE LITERATURE

1. Progressive lending in microfinance

Few questions are generally raised, other than about the issue of impact, concerning what happens after clients have received their first microcredit. Yet, what happens is very specific to the microfinance sector. As Armendáriz and Morduch (2010) explain, microfinance institutions aim at serving vulnerable people, and hence offer very low loan amounts, leading them to face higher transaction costs than traditional banks. As a strategy to reduce these costs, MFIs implement "progressive lending" (Armendariz & Morduch, 2010, p. 143): they progressively increase the loan amounts over credit cycles, provided that the client has demonstrated good repayment behavior. This enables MFIs to remain profitable as their transaction costs progressively decrease relative to loan amounts. In a broader perspective, one of the strategies implemented by MFIs is to encourage client retention by creating "good dynamic incentives [...] through attractive long-term relationships with clients" (Armendariz & Morduch, 2010, p. 161). Progressive lending is one of these good dynamic incentives designed to encourage clients to

keep resorting to the MFI. Finally, progressive lending is also what enables MFIs to avoid potentially large losses as, in practice, loan officers can test borrowers' repayment behavior with small loans at first before allowing them to climb up the loan scale.

As a result, client retention and progressive lending are part and parcel of the microfinance system. As detailed in the previous chapter, client retention has recently been the subject of higher attention: it is today considered as an indicator of social performance in the Universal Standards for Social Performance Management, which has led to its integration in practical tools of social performance assessment such as SPI4.

However, no additional recommendation is provided in these standards and tools about how progressive lending is supposed to be implemented. More generally speaking, the conditions of what would be a responsible policy of client retention and progressive lending are not detailed. This lack of indicators has been recently pointed out in the Microfinance Barometer 2015 by Oikocredit (Convergences, 2015), a worldwide cooperative and social investor funding microfinance organizations as well as small to medium enterprises. Oikocredit considers that more attention should be paid to the evolution of MFIs' clients both by MFIs themselves and investors. Consequently, the organization decided to provide its partners in the sector with capacity building services in management and analysis of longitudinal client data to better assess the evolution of clients' lives. Up until now, it has mainly been researchers who have been collecting such panel data, mostly to implement specific impact studies at a certain time in a certain place. Conversely, Oikocredit started supporting directly the MFIs to adapt their management information system in order to better collect, report and analyze client data in a longitudinal perspective, and chiefly to enable them to do it in a systematic way. Introducing such a concept into the Universal Standards would enable practitioners as well as researchers to better analyze and understand the ins and outs of client retention and progressive lending.

2. Progressive lending in the literature

With regard to academic literature, progressive lending is usually not analyzed in itself; instead, the time component of client retention is sometimes considered, and appears mostly in impact studies as a way of distinguishing between treatment and control groups to assess the effects of benefiting from microfinance services. For instance, Banerjee, Duflo, Glennerster, & Kinnan (2009) analyze the impact of microfinance on several economic and social indicators with a randomized experiment in India, in which the average loan amount enables to control for how

long clients have been benefiting from a microfinance program, as loan amounts are supposed to increase gradually with credit cycles. In a more recent version of their study (Banerjee, Karlan, et al., 2015), the authors expect to assess the impact of microfinance by comparing the treatment group consisting of people benefiting from microfinance services for a longer time (3 years), and the control group consisting of new clients. Client retention is thus used to estimate the potential impact of microfinance after a certain time. It is considered as a phenomenon logically resulting from the first step, which is *accessing* microfinance services. Once again, the issue of access remains the main focus, and no question is raised about what happened during the 3-year period in terms of number of loans, amount increase or variation in credit cost (interest rates may differ according to loan amounts, low amounts usually being more expensive than higher amounts).

In the same way, Weber & Ahmad (2014) compare women in higher loan cycles of a Pakistani microfinance institution with those in the first loan cycle to assess the possible impact of microfinance on women's empowerment. The treatment group consists only of women having taken part in the microfinance program for five years, and if the number of loans they got is provided in descriptive statistics as additional information, it is not included in the analysis itself. Once again, the treatment and control groups are distinguished only by time, and the impact of microfinance is supposed to appear only over time, whatever the number of loans or the growth rate of loan amount.

In the study by OECD on the effects of microfinance on poor rural households and the status of women (OECD, 2007), several "treatment variables" are used to estimate the impact of microfinance services, these variables being "availed program loan" (yes or no), the number of months the loan program has been available, the cumulative total amount of loans (which blurs the possible evolution in loan amounts over cycles), and finally the number of loans. However, the last two treatment variables were eventually not used in final discussions as they did not appear statistically significant. This non-significance could have raised some new questions for further research, but classical treatment variables were used for the impact study instead.

The meta-analysis achieved by Chliova, Brinckmann, & Rosenbusch (2015) is very meaningful in this respect. They gathered the maximum possible number of quantitative studies about the impact of microfinance since 1980, ending up with 91 studies. In most of these studies, the independent variable of interest is dichotomous and represents the participation, or not, in a microfinance program, i.e. receiving at least one loan. Chliova et al. (2015) also used some other studies (representing a minority) in which participation is captured by a continuous variable and measured by time since the reception of the first loan. Nothing other than time is used to consider

client retention in impact analyses, and the other features of progressive lending are not examined.

Some recent studies focus on client retention from the MFI's point of view, such as Epstein & Yuthas (2013), who show that client retention is higher in rural parts in Malawi than in urban regions, or Pearlman (2014), who focuses on the determinants of dropouts, but again the other aspects of progressive lending such as growth rate of loan amounts or decrease in credit cost are ignored.

Thus, to the best of our knowledge the conditions of loan renewal have not been analyzed yet.

III. DATA

1. Data preparation and management

The dataset used is the same as in the previous chapter. Enda provided us with a complete panel dataset containing information about all new clients from June 2012 to December 2013 and about all the loans they received from June 2012 to March 2016. We decided to limit the dataset to new clients up to the end of December 2013 as the situation in the country changed in 2014, with the entry of new actors in the microfinance sector leading to the possibility that new clients in 2014 may have been selected in a different way.

The whole dataset consists of 69301 clients (63,5 per cent of whom are women) who received a total of 183109 loans. One client can hold two loans concurrently but not two project loans. The loans dedicated to personal projects or market opportunity (a tiny minority though, as they represent only 2636 loans, i.e. 1,42% of all the loans granted over the period) were removed from the dataset. However, as holding two credits at the same time could influence the evolution of projects and/or clients' financial situation, a dummy variable was created to take this information into account.

2. Descriptive statistics

2.1 Evolution of clients' projects

As already mentioned, all the loans considered in our dataset were disbursed to finance a project, which may be a low scale income generating activity or a micro or very small enterprise.

In order to analyze the progressive lending policy applied by an MFI, it is necessary to consider how clients' projects evolve, as the way loan amounts grow is likely to depend at least partly on the evolution of clients' projects.

The average age of projects when clients receive their first loan is 5,8 years, without statistical difference between projects led by men or women. The main activity sector is agriculture among both male and female clients, followed by trade (table 46). However, women are more likely to lead projects in the production sector (i.e. mainly textile production, food production, or handicrafts) whereas men are more likely to work in services (especially transport or mechanics).

Table 46. Activity sector by gender (in%)

	Men	Women	Total
Agriculture	41.96	36.79	38.67
<i>Culture</i>	15.68	7.46	10.71
<i>Breeding</i>	84.32	92.54	89.29
Trade	25.81	31.35	29.33
Production	13.11	22.78	19.25
Services	15.38	5.83	9.32
Not documented	3.75	3.25	3.43
Total	100.00	100.00	100.00

As often observed in microfinance, female clients tend to lead smaller projects than men. Here, the classification concerns the type of financial products which are intended to be tailored to each type of project (table 47). When clients receive their first loan, women are relatively more likely to receive a product designed for income-generating activities, or "micro projects", whereas men are relatively more likely to receive credit for very small enterprises, especially in the non-agricultural sector. In addition, a specific financial product is designed for young people only (under 35 years of age) to enable them to start an activity, and men are more represented in this category than women. The financial products differ, in particular, in terms of maximum amounts and interest rates. Although they are supposed to be tailored to the size and type of clients' projects, the choice of financial product is at the discretion of loan officers. For instance, if a loan officer estimates that a high amount (above 3000 TND) should be granted considering the project characteristics, he or she has no other choice than granting a financial product for very small enterprises. We therefore cannot conclude with certainty that a client's project exactly

corresponds to the category the product is supposed to be designed for—this classification only reflects the assessment of loans officers.

Table 47. Financial product by gender (in %)

	Men	Women	Total
Micro project	48.68	66.38	59.92
Very small enterprise	16.43	5.07	9.21
Creation	5.25	3.04	3.85
Agri. micro project	26.71	25.02	25.63
Agri. very small enterprise	2.93	0.50	1.39
Total	100.00	100.00	100.00

A striking gender difference concerns the evolution of financial products over credit cycles. If we estimate that the financial product granted actually corresponds to the project's size and type, a micro project may turn into a very small enterprise whether in the agricultural sector or not, or a project may regress and a small enterprise may decline into a micro project. In the same way, the creation of an activity by a young client may then turn into a micro project or a very small enterprise. In any case, the evolution of financial products from one credit cycle to another reflect at least the way officers see the evolutions of clients' projects, if not actual evolutions. The evolution of men's and women's projects (or received financial products) can be compared using tables 48 and 49 where the rows show the situations in t and columns the situations in $t+1$ (striking numbers in bold characters). Men who receive a first credit for a micro project are more likely to receive subsequent credits for small enterprises than women, who are more likely to keep receiving credits for micro projects. By contrast, women receiving credits for small enterprises seem more likely to decline in terms of financial product than men.

This could reflect the fact that women's projects develop less quickly than men's, possibly because of the gender division of labor in the household, differences in priorities and preferences, inequalities in access to resources and mobility, or starting inequalities in education, training and skills, etc. The second possibility is that this evolution reflects the evolution of loan officers' assessments, especially of their clients' financial needs, as financial products are distinguished not only by activity sector but also by their maximum amount. This is why we turn to other more objective indicators to take the size and type of projects into account in the econometric analyses, such as fixed assets, current assets or monthly profit.

Table 48. Transitions from a financial product to another (men)

	Micro project	Small enterprise	Creation – youth	Agri. micro project	Agri. small enterprise	Total
Micro project	55.59	32.38	0.15	10.09	1.88	100.00
Very small enterprise	11.98	83.74	0.43	1.91	1.9	100.00
Creation	13.47	20.62	59.95	3.81	2.15	100.00
Agri. micro project	7.89	4.40	0.04	69.56	18.10	100.00
Agri. very small enterprise	0.46	2.02	0.11	5.33	92.07	100.00
Total	27.67	34.64	1.43	22.20	14.06	100.00

Table 49. Transitions from a financial product to another (women)

	Micro project	Small enterprise	Creation – youth	Agri. micro project	Agri. small enterprise	Total
Micro project	76.16	15.24	0.15	7.86	0.59	100.00
Very small enterprise	23.57	71.91	0.29	2.69	1.54	100.00
Creation	35.36	14.74	41.93	7.27	0.70	100.00
Agri. micro project	8.48	2.18	0.06	78.53	10.75	100.00
Agri. very small enterprise	0.56	1.39	0.06	10.99	87.01	100.00
Total	52.83	17.05	0.71	24.21	5.21	100.00

The dataset has three more indicators for non-agricultural loans only, which are being part of the formal sector or not (which means the activity is officially registered), the location of the project (at home or in independent premises), and monthly profit. It has two other indicators for agricultural loans, which are the useful area for the activity and three categories of project size assessed by the value of fixed assets.

About non-agricultural loans, when clients receive their first loans, only 19,4% of their projects are officially registered on average, but this is even less the case for women, as 11,9% of them work in the formal sector against 33,7% of men. Additionally, gender differences exist in transitions as well (table 50): men working in the informal sector are respectively more likely to evolve towards the formal sector than women, as 18,6% of them make the transition against only 6,3% of women, and less likely to be back into the informal sector when being officially registered (25,1% lost the registration against 41,7% of women).

Table 50. Transitions between informal and formal sectors over credit cycles by gender

	Men			Women		
	Informal	Formal	Total	Informal	Formal	Total
Informal	81.38	18.62	100.00	93.68	6.32	100.00
Formal	25.12	74.88	100.00	41.65	58.35	100.00
Total	59.33	40.67	100.00	87.19	12.81	100.00

The same observations can be made with regard to location (table 51): not only are women more likely to run their project from home without any dedicated premises (63,9%) than men (25,12%), who are more likely to have independent premises (41,6% against 19,4% of women) or to be mobile (as a significant part of them work as taxi or minibus driver), but they are also less likely to move towards independent premises than men when running the activity from home, or less likely to keep their independent premises (tables 52 and 53).

Table 51. Activity location at first credit cycle by gender

	Men	Women	Total
No dedicated premises	25.12	63.85	50.24
Premises at home	12.79	14.75	14.06
Mobile	20.54	2.04	8.54
Independent premises	41.55	19.36	27.16
Total	100.00	100.00	100.00

Table 52. Transitions of location over credit cycles (men)

	No dedicated premises	Premises at home	Mobile	Independent premises	Total
No dedicated premises	44.69	12.51	18.74	24.06	100.00
Premises at home	15.63	40.58	9.71	34.08	100.00
Mobile	8.40	2.75	79.21	9.65	100.00
Independent premises	6.60	5.94	6.64	80.82	100.00
Total	15.39	10.12	28.28	46.21	100.00

Table 53. Transitions of location over credit cycles (women)

	No dedicated premises	Premises at home	Mobile	Independent premises	Total
No dedicated premises	77.83	11.01	2.12	9.04	100.00
Premises at home	30.83	43.90	1.66	23.61	100.00
Mobile	26.18	6.53	56.57	10.72	100.00
Independent premises	16.81	11.37	1.53	70.30	100.00
Total	56.81	15.75	3.35	24.09	100.00

Concerning agricultural loans, the useful area for men’s projects is 3,83 ha on average against 2,99 ha for women’s projects. The MFI also classifies the projects according to the value of fixed assets and considers that the project is an income generating activity (IGA) if fixed assets worth less than 8000 TND, a micro enterprise if they worth between 8000 and 100 000 TND, and a very small enterprise above 100 000 TND. Again, men are more represented in very small enterprises (2,58% against 0,56% of women’s projects), whereas women are more likely to run income generating activities (82,1% against 59,3% of men’s projects), for both culture and breeding, even though breeding tend to be smaller projects for both men and women (figure 21). The transitions towards greater activities are more likely to occur for men’s projects whereas decline is more common for women’s projects (table 54).

Figure 21. Project size according to activity and gender

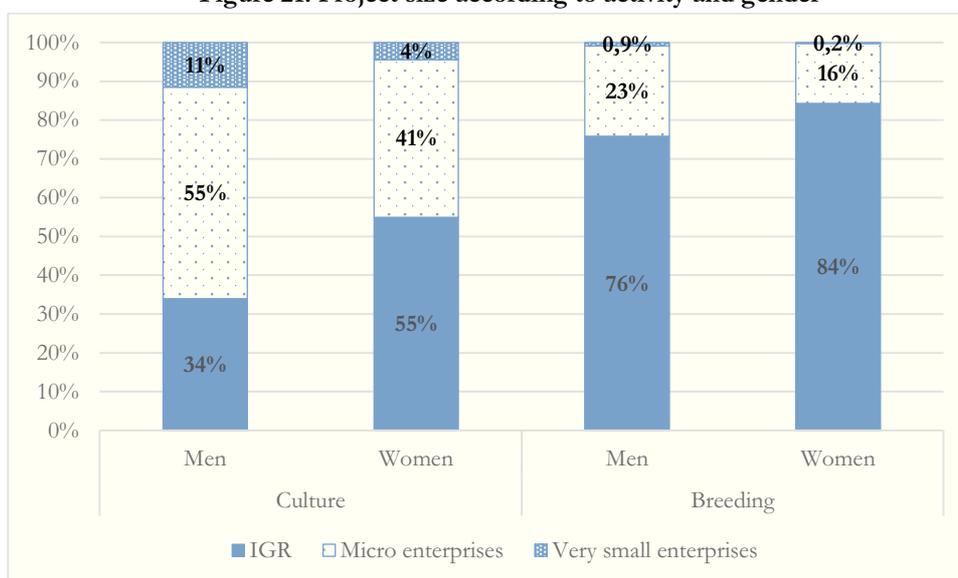


Table 54. Transitions between agricultural project size over credit cycles by gender

	Men				Women			
	IGA	Micro enterprise	Very small enterprise	Total	IGA	Micro enterprise	Very small enterprise	Total
IGA	76.58	22.36	1.06	100.00	84.75	14.86	0.38	100.00
Micro enterprise	19.45	73.48	7.07	100.00	26.42	69.91	3.66	100.00
Very small enterprise	5.10	38.90	55.99	100.00	9.82	39.27	50.91	100.00
Total	53.27	40.89	5.84	100.00	71.55	26.79	1.66	100.00

In the same way, 89,7% of women's projects did not have any employee against 83,9% of men's projects, since 10,5% of men's projects resorted to regular employees, 2,4% to seasonal workers and 3,3% to both, against respectively 6,4%, 1,3% and 2,7% of women's projects.

These indicators tend to show that women's projects would start from further behind and then develop less quickly. However, as project development also depends on financial investment, the role of the progressive lending policy in these evolutions remains unknown at this point.

2.2 Evolution of clients' financial situations

When receiving a loan, clients should provide a guarantee, which can take several forms as is usual in microfinance, since MFIs are supposed to be more flexible with people excluded from the traditional banking system. Once again, the types of collateral offered by clients vary according to gender (table 55). First, the share of unique guarantors (a loyal client acting as a guarantor, parental engagement or the client's own credit background) is similar among men and women. However, women tend to resort more to reciprocal guarantee: this includes joint surety, which involves several current clients, and mutual guarantee, which involves only one other client. Conversely, men have more recourse to financial or physical guarantees (salary or pledging of equipment). This could reflect the existing gender inequalities in terms of access and control over resources. In particular, most female clients are married and have another member of their household who is active, these proportions being higher among women than men. We can therefore expect women to be at least as likely as men to offer salary as collateral, but salary is the most common collateral offered by men and not by women, which would imply that women cannot use their household's resources as collateral or prefer not to.

Additionally, as showed in the previous chapter, reciprocal guarantee is riskier for the MFI, or at least less efficient than a unique guarantor (who is a loyal client most of the time), as clients with reciprocal guarantee are more likely to repay late or to leave the MFI. It is also riskier for clients, as clients offering reciprocal guarantee commit themselves as well as guarantors. Indeed, when clients have not repaid their installment on time, loan officers start by calling them, then visit them at their place in order to try to find a solution, but if clients still do not repay, officers contact guarantors, either to ask them to convince clients to repay, or to pay themselves for clients if the latter do not. Officers explain that calling guarantors is the last resort before engaging in recovery procedures, and that they always try to find a solution before doing so, but

resorting to guarantors sometimes happens. As a consequence, the fact that female clients have more often recourse to this kind of guarantee puts them in a riskier situation.

Table 55. Type of collateral by gender (in %)

	Men	Women	Total
<i>Unique guarantor</i>	<i>35.84</i>	<i>34.05</i>	<i>34.7</i>
Loyal client	22.74	22.83	22.79
Parental engagement	1.10	0.97	1.02
Own background	12.01	10.25	10.88
<i>Reciprocal guarantee</i>	<i>25.98</i>	<i>38.75</i>	<i>34.17</i>
Joint surety	2.70	5.57	4.54
Mutual guarantee	23.39	33.17	29.63
<i>Physical guarantee</i>	<i>38.18</i>	<i>27.2</i>	<i>31.13</i>
Salary	35.58	25.53	29.13
Pledging of equipment	2.60	1.67	2.00
<i>Total</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>

With regard to specific financial indicators, if the household's financial situation does not differ much between men and women, the project's financial indicators are higher for men than women when all credit cycles are taken together (table 56). Households' median expenses and revenues are comparable, whereas median fixed assets, current assets, and monthly profits (applicable to non-agricultural projects only) are higher for men's projects than for women's.

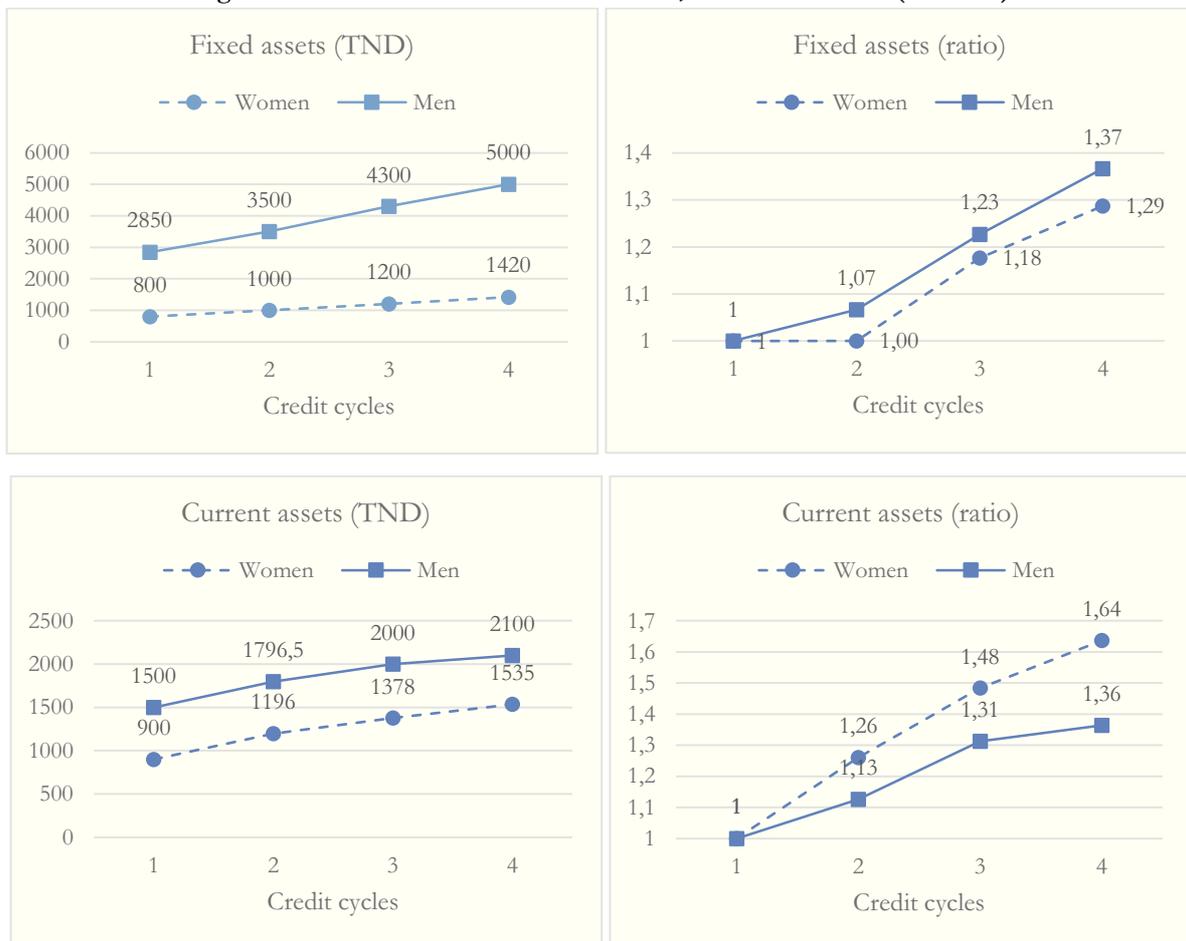
Table 56. Median financial indicators by gender, all credit cycles combined

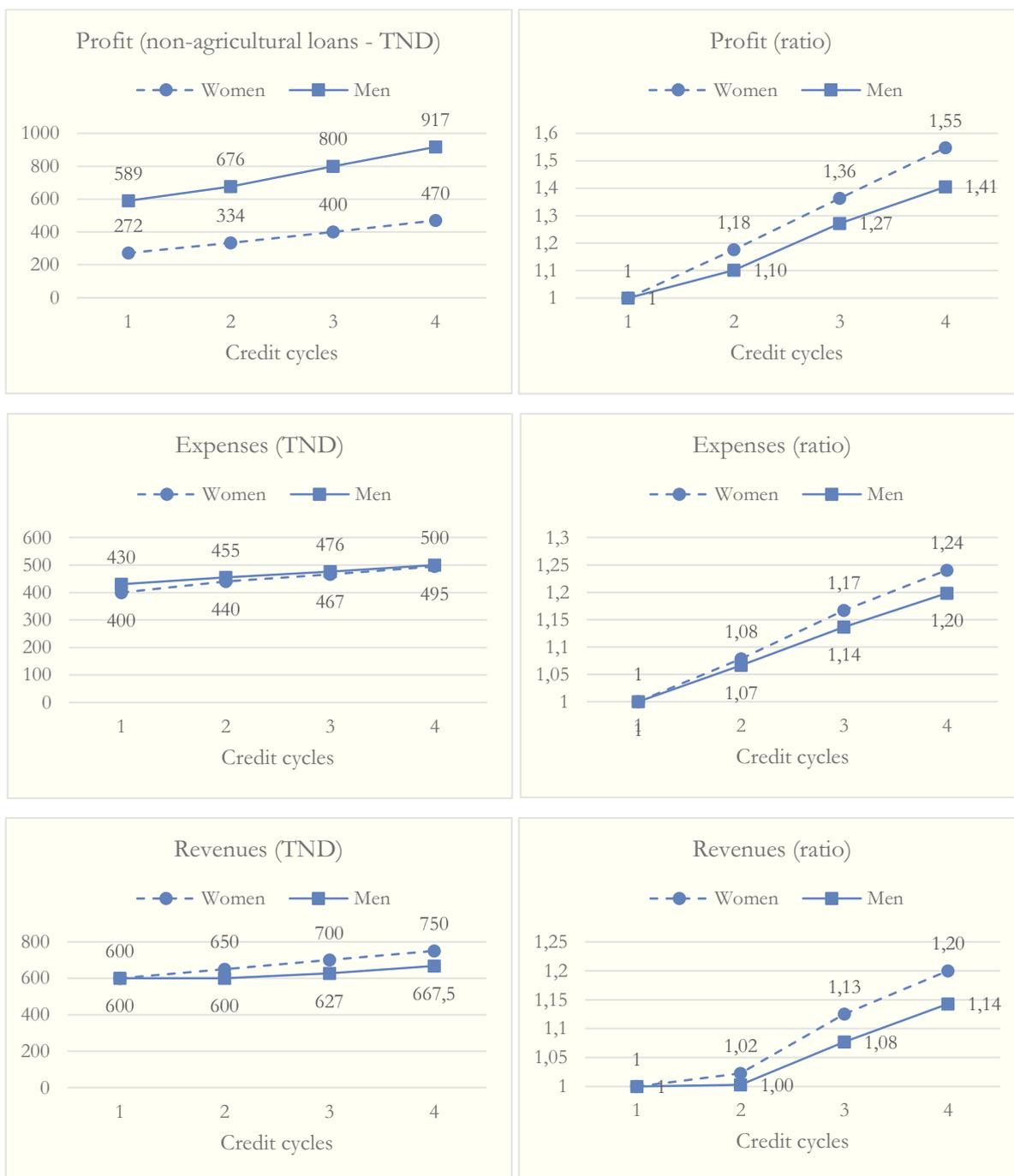
	Household's monthly expenses	Household's monthly revenues	Fixed assets	Current assets	Monthly profit (non-agri. projects)
Men	445	600	3740	1800	700
Women	425	650	1000	1150	337

To take a first look at the evolution of these indicators over credit cycles, we consider only clients who got four credit cycles (15572 clients from our dataset) to avoid selection bias and compare comparable clients (figure 22). The evolutions in terms of value and of ratio (with the baseline being the value of the indicator when the client took his or her first loan) show that all financial indicators evolve positively for both male and female clients, but some gender differences may be observed: fixed assets of men's projects increase more quickly than those of women, which widens the initial gap. Concerning current assets, the gap in value between men's and women's projects persists, but current assets of women's projects still increase more quickly.

In the same way, the existing gap between men's and women's monthly profits (for clients getting non-agricultural loans) slightly widens, but women's profits grow more quickly. This questions the assumption that women's projects grow more slowly: the initial gaps are sizeable between men's and women's projects, but then men and women seem to manage their projects differently and to make different choices in terms of investments: men seem in particular more likely to invest in fixed assets. With regard to households' financial indicators, both revenues and expenses increase slightly more quickly for women than for men, which could also indicate different choices in terms of allocation of resources. Given these contrasted figures, both values and evolutions in ratios of financial indicators will be taken into account in the analysis of loan renewals.

Figure 22. Evolution of financial indicators, in value and ratio (medians)





2.3 Loan amounts over credit cycles

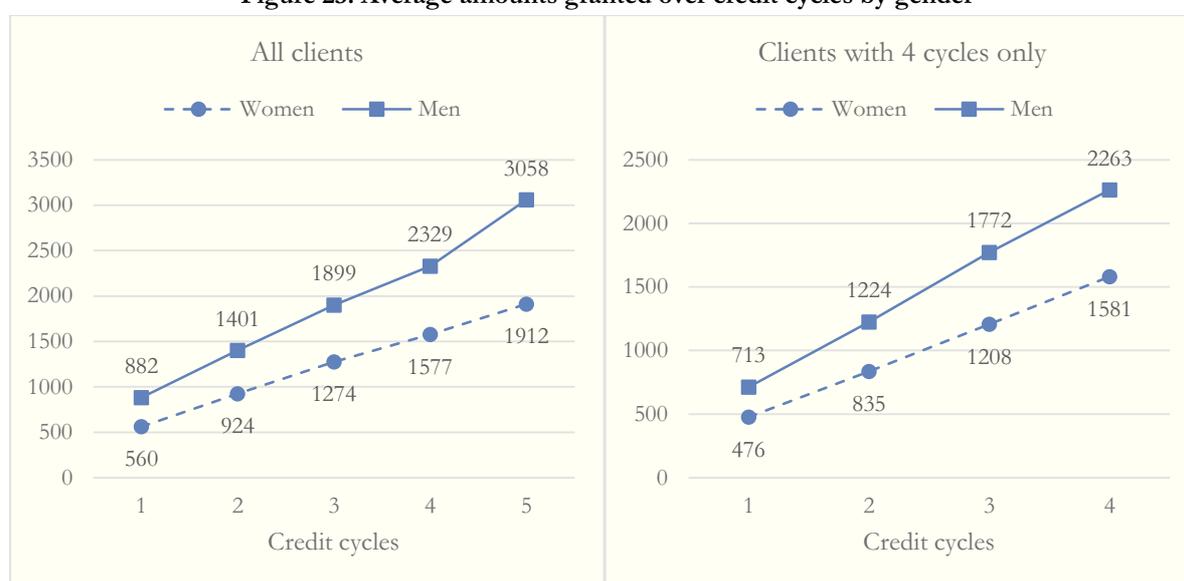
As it is the case for most microfinance institutions, Enda applies a policy of progressive lending: amounts granted go from an average of 678 TND for the first loan up to 2364 TND for the fifth loan (table 57). Not surprisingly, the amounts are higher for male clients, which could be explained by the differences between men's and women's projects in terms of size, type, or financial indicators. The econometric analysis will attempt to check if these differences totally

explain the gaps observed in amounts granted or not. It also seems that amounts granted increase more quickly over credit cycles for men than for women, as the gaps between amounts granted to men and women become increasingly higher over cycles (figure 23).

Table 57. Average loan amount by credit cycle and by gender

Cycle	1	2	3	4	5
Men	882	1401	1899	2329	3058
Women	560	924	1274	1577	1912
Total	678	1093	1494	1838	2364

Figure 23. Average amounts granted over credit cycles by gender



To consider the evolution of these loan amounts in greater detail, we again consider ratios; this time, as loan amounts are limited (the ceiling being 5000 TND), we do not expect extreme values and use average ratios. However, the evolution of loan amounts over credit cycles can be considered in two ways: the growth rate of loan amounts from one credit to the next one and the growth rate of the first amount over credit cycles.

First, it should be noticed that if loan amounts increase from a credit cycle to another in 95% of the cases, they still may decrease: thus, the minimum ratio from a cycle to the next one is 0,10 while the maximum is 12,5. Moreover, the maximum growth rate from the first credit cycle to the last one is 25. The evolution of the first type of growth rate is represented in figure 24 and the second in figure 25. Unsurprisingly, if the first type of growth rate is substantial from the first credit to the second, it tends to be lower afterwards. Indeed, the leeway for increasing

the amount is high after the first loan and then decreases. The evolution of both growth rates is similar for men and women. Nonetheless, knowing that the amounts at the first credit cycle are much lower for women, such similar growth rates can result in increasing gaps in terms of loan amounts, as seen in figure 23. Moreover, as financial indicators evolve differently for men and women, we cannot know at this stage if these similar growth rates represent a fair progressive lending policy which takes the evolution of projects into account.

Figure 24. Evolution of loan amounts from one credit cycle to another by gender (in ratios over the previous amount)

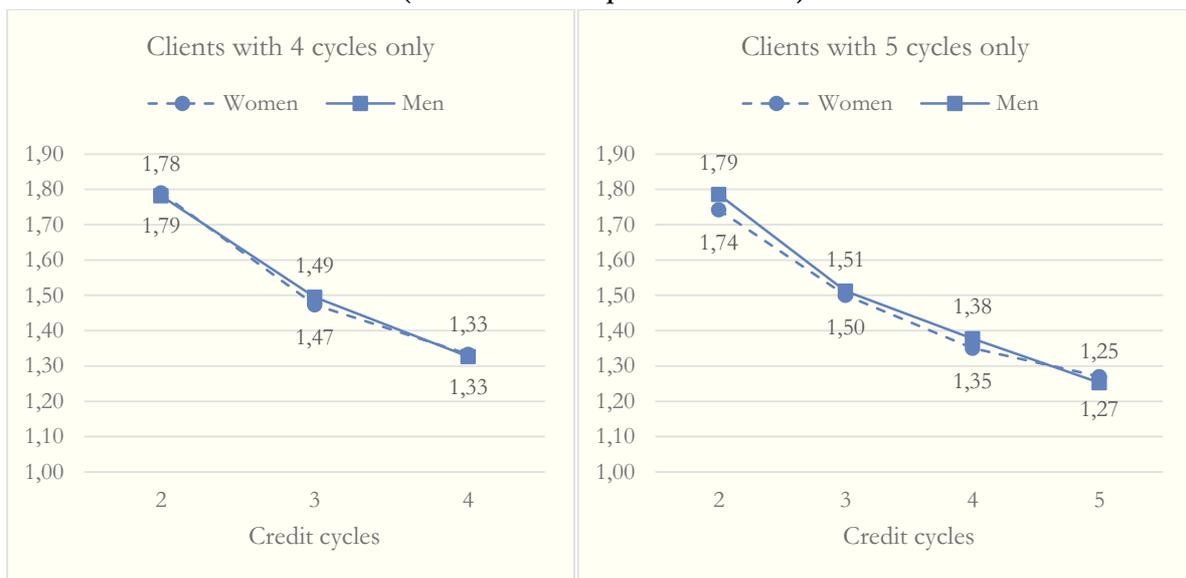
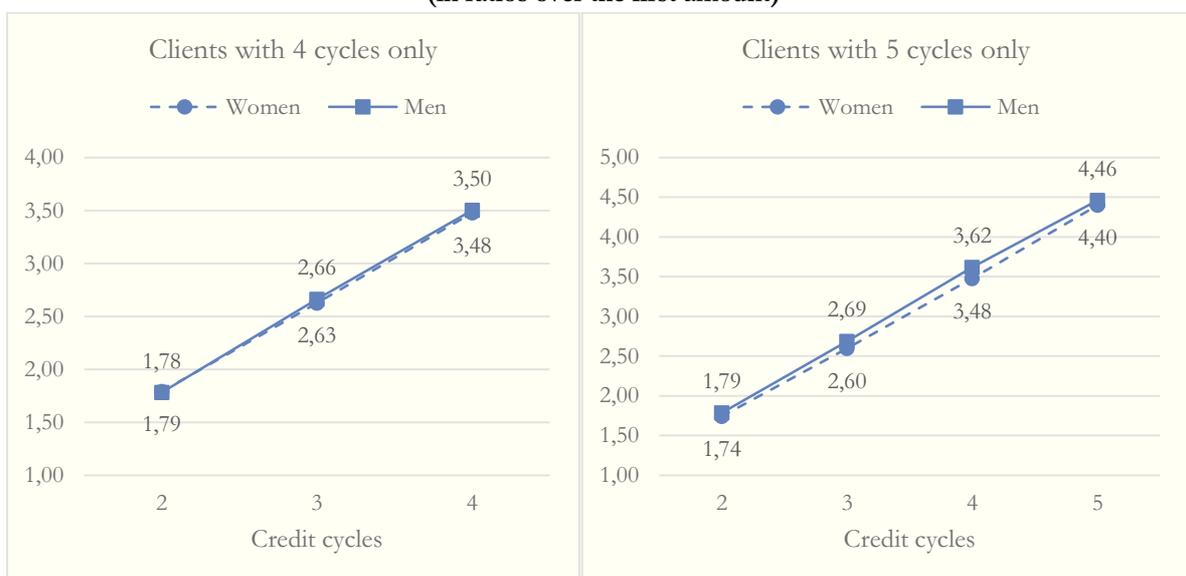


Figure 25. Evolution of loan amounts over credit cycles by gender (in ratios over the first amount)



IV. METHODS AND RESULTS

The aim of the chapter is to analyze the conditions of loan renewals and, in particular, to check if the loans are renewed in a fair manner between men and women, given the evolution of their respective projects and situations, and knowing that on average, female clients are not riskier. However, the first emerging issue is the fact that not all clients renew their loans. There is a significant amount of natural attrition⁵¹ in our dataset, which corresponds to the clients who left the MFI. As dropouts seem to have specific characteristics as showed in the previous chapter, whether they left the MFI after defaulting or not, we suspect that the selection (whether it is self-selection by clients themselves or exclusion by the MFI) is not random. Therefore, the analysis includes a correction for selection bias on panel data.

The variable of interest is first the amount granted when a loan is renewed, and second the growth rate of loan amounts, knowing that the growth rate can be understood as the evolution from one credit to the next one or as the overall evolution from the first loan.

Whatever the variable of interest considered, the selection bias should be corrected. In order to do that, we follow the same Wooldridge's procedure to correct selection bias in panel data models as in chapter 3. Indeed, again unobservable variable(s) could have an effect on both the probability of renewing a loan and the loan amount granted, in level or growth rate. These characteristics could be tenacity or perseverance which could push the client to renew their loan to keep their activity running, as well as insisting that the loan officer should increase loan amounts more significantly; they could also be better entrepreneurial skills in general. These unobservable variable(s) could also be correlated to the client's or project's observable characteristics, particularly the project's financial indicators such as fixed assets, current assets, or profits for non-agricultural projects. This possible correlation is an allowed hypothesis in Wooldridge's procedure.

The procedure is composed of the same three steps as previously: after estimating equation (1) of chapter 3 with T standard probit models, the second step consists in computing T inverse Mills ratios for $s_{it}=1$, and these ratios are included in subsequent equation to correct the selection bias. The exclusion variable is still the fact that the last repayment of the previous loan was made during the last week of the month, since in this case, the probability of a loan being renewed is much lower. As previously explained, this week is supposed to be dedicated to collecting late repayments, and officers are even not supposed to proceed to any renewal during

⁵¹Here attrition does not correspond to data collection issues but to an actual phenomenon.

the period. If a closing date falls during this period, officers are expected to anticipate and launch the renewal procedure before. If they do not, there is higher risk that there is no renewal at all. Consequently, the probability of a loan being renewed is negatively correlated with the previous loan's closing date falling during this period. By contrast, if a loan is renewed, the fact that the last instalment was paid during the last week of the month is not expected to have any effect on the next amount granted.

1. The amounts granted after the first credit cycle

We first focus on the amounts granted in level, in order to check if the gap observed between amounts granted to men and women at first cycle persists or not for the next cycles. There are two main differences between the granting procedure of the first amount and of the next ones: first, officers better know their clients from the second cycle, and do not resort to a moral enquiry any longer, since clients' repayment behavior during the first cycle is a sufficient indicator to anticipate moral hazard; second, there is no official amount requested by clients after the first cycle. Indeed, at the time of our study, the renewal procedure consisted for officers in discussing with clients before the end of the previous cycle, and in determining a loan amount together given clients' financial conditions and needs. Since early 2017, the procedure has changed and there is an official amount requested by clients for each cycle which is registered in the system; however this is a recent improvement and the procedure was less transparent between 2012 and 2016. Consequently, there is no official amount requested by clients which can be taken into account in the estimation of amounts granted from cycle 2.

Following Wooldridge's procedure, loan amounts from cycle 2 are estimated using equation (1) and a pooled ordinary least squares estimator with bootstrapped standard errors:

$$y_{it} = \psi \bar{x}_i + \beta X_{it} + \gamma Request_{i1} + \varphi Year_1 + \delta Nbdelay_{it-1} + \rho \lambda_{it} + \varepsilon_{it} \quad (1)$$

With:

- y_{it} the loan amount granted for each individual i at a time t , t being a credit cycle > 1 ;
- \bar{x}_i the vector of average values of X_{it} by individual;
- X_{it} the matrix of time-varying independent variables;
- $Request_{i1}$ the amount requested at cycle 1;
- $Year_1$ a dummy variable indicating the year (2012 or 2013) when the first credit cycle was granted, as amounts tend to grow from a year to another;
- $Nbdelay_{it-1}$ the number of days of delay of the previous credit cycle (in log);
- λ_{it} the inverse Mills ratios;
- ε_{it} the idiosyncratic error term.

The matrix of independent variables consists of constant socio-demographic characteristics (age, marital status, household size, education), and the loan's time-varying characteristics (credit cycle, time interval between two loans, collateral), the project's time-varying characteristics (activity sector, age, employees), financial time-varying characteristics (household expenses, fixed assets, current assets), and organizational time-varying features (new officer compared to the previous loan or not, officer's gender, branch fixed effect, branch's age and branch's rate of rural areas).

The model is run on all loans first (table 58), and then on non-agricultural and agricultural loans separately (table 59), in order to introduce the additional information available for each type of financial product. The coefficients of average values of X_{it} by individual have been dropped from the table for more clarity.

Concerning all loans first, a first model is run including a linear effect for credit cycles (model 1), a second one introduces dummy variables for cycles 2 to 5 (model 2) and a third one keeps dummy variables and includes an interaction term between women and each cycle (model 3). Indeed, introducing dummy variables enables the effects of credit cycles to be heterogeneous, which seems relevant in our case given the results. Looking at model 1, the first striking result is that Enda indeed applies a progressive lending policy: loan amounts increase by 365 TND on average from a cycle to another all other things being equal, which means that this increase is not due to project evolution but only to the fact that clients start an additional credit cycle. Model 2, with dummy variables for credit cycles from 2 to 5, confirms this result, and shows that the increase from a cycle to another seems regular. This implies that the relationship building between clients and the MFI all along clients' credit history enables these clients to benefit from better loan conditions, and especially from higher loan amounts than if it had been their first credit. Relationship lending takes the form of progressive lending in the case of this MFI, since other credit conditions such as interest rates cannot change for a specific financial product, whatever the credit cycle.

These two models also show that the effect of being a woman is to get 113 TND less than a man on average, all other things being equal, and especially for a same repayment behavior, represented by the number of days overdue during the previous credit cycle (which has a strong negative effect on amounts granted, as expected).

Table 58. Estimation of amounts granted from cycle 2 (all loans)

	Model (1)		Model (2)		Model (3)	
Female	-113.9***	(4.353)	-113.7***	(4.289)	-12.18**	(5.214)
Credit cycle (linear effect)	365.4***	(2.586)				
Credit cycle (vs. 2)						
3 rd cycle			387.7***	(3.890)	481.4***	(8.067)
4 th cycle			712.0***	(7.159)	882.1***	(12.69)
5 th cycle			1116***	(18.38)	1367***	(30.86)
Female # credit cycle						
Female # 3 rd cycle					-143.2***	(8.534)
Female # 4 th cycle					-260.0***	(13.31)
Female # 5 th cycle					-400.5***	(34.37)
Loan						
Previous number of days overdue (log)	-144.6***	(3.099)	-144.0***	(3.039)	-146.0***	(2.907)
Number of days between 2 cycles	-0.224***	(0.0400)	-0.236***	(0.0332)	-0.223***	(0.0370)
Requested amount at cycle 1 (100 TND)	26.6***	(0.282)	26.6***	(0.299)	26.5***	(0.264)
First amount received in 2013 (vs. 2012)	35.11***	(4.808)	34.47***	(4.210)	33.35***	(4.442)
Parallel personal or opportunity loan	124.7***	(35.39)	120.9***	(36.53)	108.9***	(35.05)
Collateral (vs. unique guarantor)						
Reciprocal guarantee	-5.913	(8.905)	-7.539	(8.317)	-6.479	(7.983)
Physical guarantee	-30.00***	(10.83)	-30.48***	(10.88)	-19.88**	(9.934)
Credit use (vs. working capital)						
Investment	354.4**	(166.6)	353.9**	(168.9)	347.3**	(159.9)
Creation	-175.6***	(64.02)	-176.0***	(67.07)	-177.1**	(70.55)
Other	-114.2	(152.6)	-114.5	(165.7)	-130.7	(154.2)
Project						
Activity sector (vs. agriculture)						
Trade	68.35***	(13.70)	68.01***	(13.19)	63.31***	(14.09)
Production	30.91**	(13.23)	30.98**	(13.74)	22.48	(15.04)
Services	122.1***	(20.10)	122.5***	(21.01)	118.7***	(22.97)
Not documented	-17.14	(18.13)	-16.30	(19.93)	-14.87	(22.29)
Age of project	-0.834***	(0.312)	-0.847***	(0.263)	-0.885***	(0.285)
Employees (vs. none)						
Seasonals only	68.62***	(24.66)	68.87***	(23.46)	60.96***	(23.14)
Regular workers only	108.3***	(13.47)	108.8***	(13.15)	102.3***	(13.31)
Both	109.0***	(23.06)	109.0***	(21.81)	105.3***	(23.12)
Fixed assets (100 TND)	0.268***	(0.0256)	0.268***	(0.0262)	0.257***	(0.0279)
Current assets (100 TND)	2.19***	(0.118)	2.19***	(0.120)	2.19***	(0.123)
Socio-demographic profile						
Young (<35)	-43.66***	(16.24)	-42.91***	(16.42)	-39.29**	(15.99)
Education (vs. illiterate)						
Primary	17.86***	(5.981)	17.86***	(5.231)	17.56***	(5.388)
Secondary	58.52***	(6.619)	58.57***	(6.358)	58.76***	(6.382)
Higher	139.6***	(10.39)	139.9***	(10.82)	139.7***	(10.46)
Housing (vs. tenant)						
Free lodging	22.28***	(7.585)	22.33***	(7.133)	23.04***	(7.191)
Owner	29.40***	(6.128)	29.20***	(5.976)	29.69***	(5.637)
Other active member in household	-43.62***	(5.713)	-43.92***	(5.505)	-44.51***	(5.527)

Household size	-2.061*	(1.134)	-2.017*	(1.118)	-1.989*	(1.087)
Single	4.096	(5.356)	4.572	(5.063)	5.151	(5.267)
Household monthly expenses (100 TND)	2.50*	(1.46)	2.52*	(1.45)	0.0293*	(0.0160)
<i>Officer and branch</i>						
Other officer than previous loan	48.00***	(6.132)	47.82***	(6.080)	48.87***	(5.739)
Officer gender	9.901	(8.868)	10.18	(9.103)	11.30	(7.945)
Officer experience (years)	8.210***	(0.879)	8.239***	(0.808)	8.342***	(0.840)
Branch rate of rural areas (vs. less than 0.07%)						
0,07-0,35%	201.0***	(16.22)	200.7***	(15.00)	202.4***	(15.87)
0,35-0,55%	394.2***	(16.96)	392.1***	(15.54)	390.3***	(17.12)
>0,55%	601.4***	(21.55)	596.7***	(21.59)	595.2***	(23.13)
New branch	-66.64***	(11.03)	-64.02***	(10.83)	-66.19***	(10.12)
Inverse Mills Ratio	-485.5***	(10.52)	-495.7***	(10.92)	-507.7***	(11.76)
Constant	-26.62	(159.1)	697.4***	(165.4)	650.2***	(157.7)
All average Xi included	Yes		Yes		Yes	
Branch fixed effect	Yes		Yes		Yes	
Observations	110608		110608		110608	
Adjusted R-squared	0.647		0.647		0.650	

Bootstrapped standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Model 3 gives more details on this gender effect, and shows that even though women benefit from the progressive lending policy as well, the negative effect associated with being a woman is increasingly stronger over credit cycles. Looking at models 4 and 5 enables us to get a more accurate view of the gender effect by introducing the additional information available for non-agricultural and agricultural loans. Interestingly, women do not seem to get lower amounts at cycle 2, since those receiving non-agricultural loans even appear advantaged in terms of amount; however, from cycle 3 the negative effect associated with being a woman appears as increasingly stronger, as illustrated by figure 26. The same model as model 5 was run by introducing a triple interaction term between women, credit cycle and type of agricultural activity (breeding or culture) and the results, reported in figure 26 in the form of predictions of amounts, show that women receiving agricultural loans are disadvantaged in terms of amounts whatever the type of activity, breeding projects receiving lower amounts for both men and women.

With regard to other determining factors of loan amounts, having requested higher amounts at cycle 1 has a positive effect on future loan amounts, so has a first credit received in 2013 compared to 2012 for agricultural loans. Indeed, over the last years, Enda has implemented a policy consisting in encouraging officers to grant higher amounts than before, all other things being equal; as a consequence, loans granted in 2013 were likely to be greater than those granted in 2012,

even though they were first loans. The introduction of this dummy variable enables us to isolate this effect.

As already mentioned, having showed a bad repayment behavior with a high number of days overdue during the previous credit cycle has a negative effect on amounts granted. Interestingly, collateral does not seem as determining as for the first loan, as there is no significant effect of any type of guarantee. By contrast, higher financial indicators such as fixed assets, current assets or monthly profits still have a positive effect on amounts granted, as well as being officially registered or having independent premises: this indicates that the progressive lending policy is not just an automatic increase in loan amounts, but also takes project characteristics into account. Being young still has a negative effect as well but for non-agricultural loans only, while it is not determining for agricultural loans.

Finally, concerning officers, being received by a new officer compared to the previous loan has a positive effect on amounts granted, which may reflect officers' willingness to get back and keep the clients previously followed by their colleagues. More experienced officers also tend to grant higher amounts, which might correspond to higher confidence and less risk aversion for these officers. Moreover, just for first loans, female officers do not tend to grant lower amounts, as there is no effect of officer gender for agricultural loans, and even a slightly positive effect for non-agricultural ones.

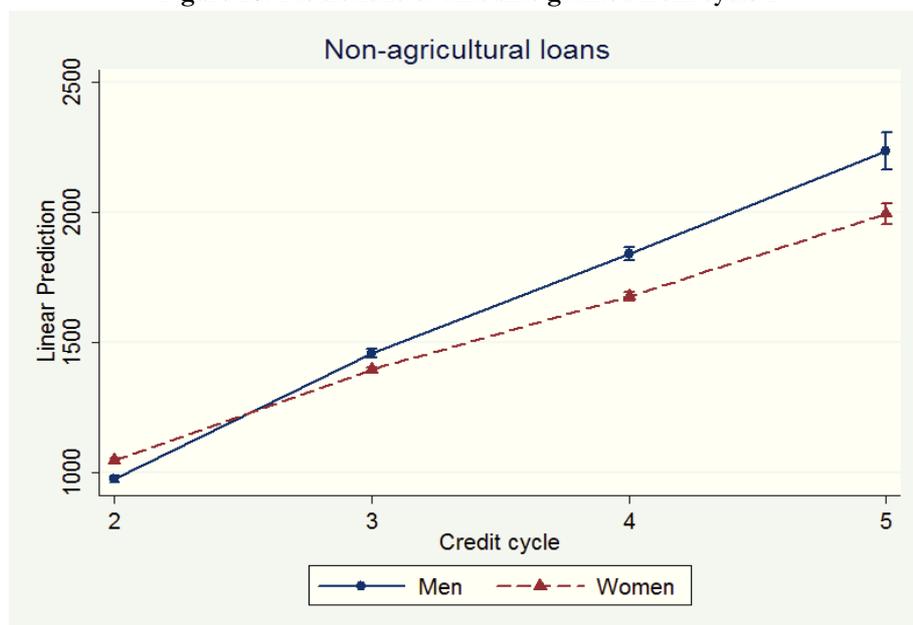
Table 59. Estimation of amounts granted from cycle 2 (non-agri. and agri.loans separately)

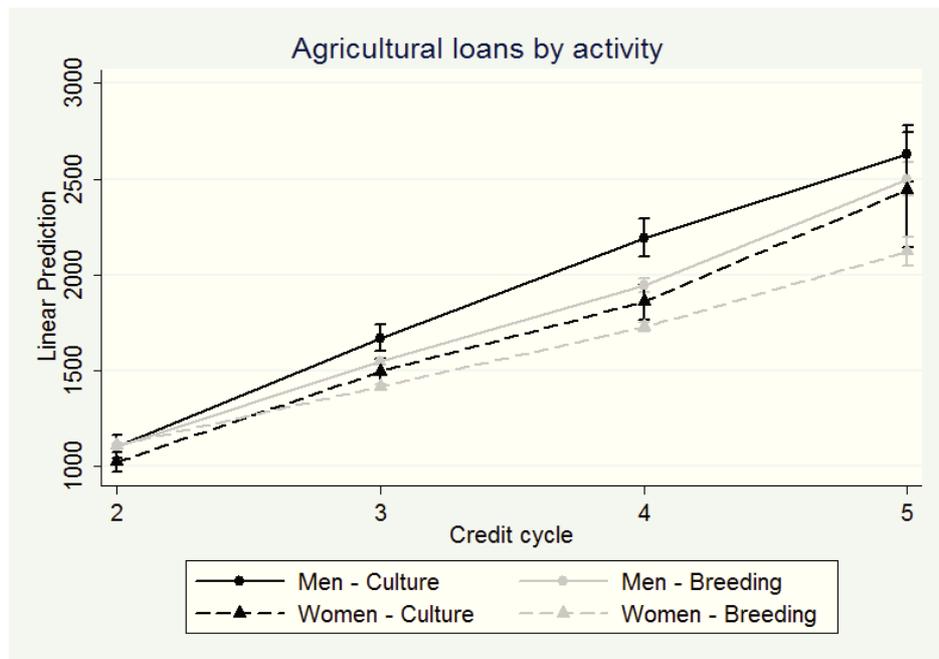
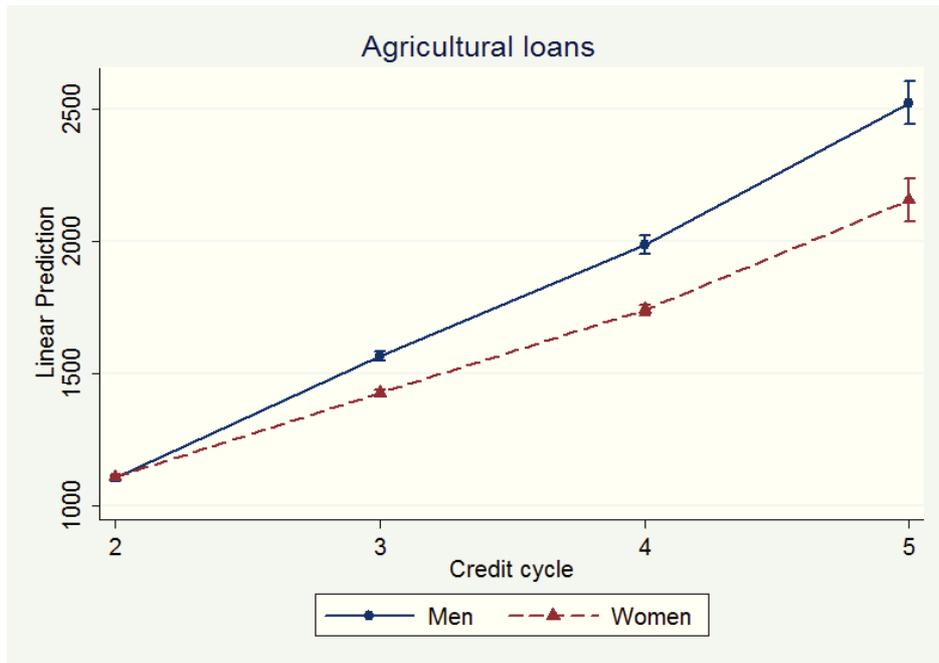
	Non-agricultural loans (4)		Agricultural loans (5)	
Female	71.04***	(7.199)	3.600	(7.348)
Credit cycle (vs. 2)				
3 rd cycle	481.9***	(9.873)	461.0***	(11.61)
4 th cycle	864.9***	(14.34)	884.3***	(19.86)
5 th cycle	1260***	(37.78)	1422***	(40.82)
Female # credit cycle				
Female # 3 rd cycle	-132.6***	(10.91)	-141.5***	(13.49)
Female # 4 th cycle	-234.3***	(15.19)	-250.5***	(21.98)
Female # 5 th cycle	-312.5***	(41.15)	-370.8***	(55.63)
Loan				
Previous # of days overdue (log)	-134.7***	(3.247)	-146.5***	(4.226)
Number of days between 2 cycles	-0.216***	(0.0423)	-0.230***	(0.0669)
Requested amount at cycle 1 (100 TND)	22.2***	(0.309)	26.1***	(0.462)
First amount received in 2013 (vs. 2012)	3.246	(4.618)	88.96***	(7.708)
Parallel personal or opportunity loan	96.06***	(34.53)	128.1**	(62.33)
Collateral (vs. unique guarantor)				
Reciprocal guarantee	-8.177	(10.00)	7.923	(14.97)
Physical guarantee	-13.15	(11.98)	-13.05	(18.72)
Credit use (vs. working capital)				
Investment	182.2	(169.4)	573.3*	(326.7)
Creation	-194.9***	(70.65)	-18.41	(150.7)
Other	107.9	(204.9)	-189.7	(268.2)
Project				
Activity sector (vs. agriculture)				
Trade	25.54	(17.39)	NA	NA
Production	-16.19	(17.86)	NA	NA
Services	67.30***	(24.51)	NA	NA
Not documented	-17.33	(23.01)	NA	NA
Age of project	-1.640***	(0.314)	-0.751	(0.460)
Employees (vs. none)				
Seasonals only	80.23***	(27.08)	1.957	(43.71)
Regular workers only	75.76***	(13.71)	18.03	(24.14)
Both	87.42***	(22.03)	43.76	(37.56)
Fixed assets (100 TND)	0.234***	(0.0563)	0.260***	(0.0309)
Current assets (100 TND)	2.07***	(0.148)	1.67***	(0.158)
Monthly profit (100 TND)	9.03***	(0.855)	NA	NA
Formal sector	81.70***	(10.82)	NA	NA
Independent premises	53.27***	(8.798)	NA	NA
Culture (vs. breeding)	NA	NA	64.10***	(20.75)
Socio-demographic profile				
Young (<35)	-64.69***	(18.13)	-1.342	(27.55)
Education (vs. illiterate)				
Primary	19.89***	(6.909)	19.71***	(7.358)
Secondary	59.52***	(7.748)	51.23***	(8.719)
Higher	135.3***	(12.26)	138.5***	(20.60)
Housing (vs. tenant)				

Free lodging	35.65***	(6.970)	-19.42	(23.62)
Owner	39.97***	(5.791)	-16.41	(21.45)
Other active member in household	-26.09***	(7.090)	-45.41***	(7.534)
Household size	-3.860***	(1.319)	3.911**	(1.699)
Single	10.58*	(5.840)	7.520	(8.798)
Hh monthly expenses (100 TND)	1.88	(1.94)	-3.19	(2.29)
Officer and branch				
Other officer than previous loan	45.38***	(6.301)	55.89***	(10.29)
Female officer	23.80***	(8.897)	-5.699	(15.48)
Officer experience (10 years)	8.032***	(0.942)	7.116***	(1.201)
Branch rate of rural areas (vs less than 0.07%)				
0,07-0,35%	165.0***	(15.09)	206.6***	(72.98)
0,35-0,55%	229.2***	(18.84)	556.5***	(73.44)
>0,55%	535.5***	(67.59)	622.6***	(74.57)
New branch	-43.94***	(10.34)	-78.27***	(16.46)
Inverse Mills Ratio	-469.4***	(12.76)	-424.1***	(20.54)
Constant	578.6***	(210.6)	512.2*	(281.2)
All average Xi included	Yes	Yes	Yes	Yes
Branch fixed effect	Yes	Yes	Yes	Yes
Observations	75226		41285	
Adjusted R-squared	0.673		0.671	

*** p<0.01, ** p<0.05, * p<0.1

Figure 26. Predictions of amounts granted from cycle 2





2. The evolution of amounts from a credit cycle to the next one

We now focus on the evolution of the loan amount from one credit cycle to the next, implying that the dependent variable is the ratio between the on-going credit amount and the previous amount received. Indeed, looking at the progressive lending policy in terms of growth rate may provide additional information: if loan amounts grow over credit cycles, the growth rate

may remain constant all along clients' credit history, or increase itself, which would represent an even stronger advantage for clients resulting from their relationship with the MFI.

Technically, the magnitude of the ratio should depend on the previous amount: we expect the ratio to be higher if the previous amount was low, as the MFI would have more leeway to increase the amount given the credit ceiling fixed at 5000 TND. Therefore, we would expect these ratios to decrease over credit cycles if previous amounts were not included, since amounts increase over credit cycles. This is why we include previous amounts in explicative variables to isolate this mechanical effect, and to properly observe the effect of the growing relationship between clients and the MFI through credit cycles.

As a consequence, growth rates are estimated using equation (2):

$$y_{it} = \psi \bar{x}_i + \beta X_{it} + \gamma Request_{i1} + \varphi Year_1 + \tau Amount_{it-1} + \alpha Install_{it-1} + \delta Nbdelay_{it-1} + \rho \lambda_{it} + \varepsilon_{it} \quad (2)$$

With:

- y_{it} the ratio between the on-going loan amount and previous loan amount observed for each individual i at a time t , t being a credit cycle;
- \bar{x}_i the vector of average values of X_{it} by individual;
- X_{it} the matrix of time-varying independent variables;
- $Request_{i1}$ the amount requested at cycle 1;
- $Year_1$ a dummy variable indicating the year (2012 or 2013) when the first credit cycle was granted;
- $Amount_{it-1}$ the amount received at the previous credit cycle;
- $Install_{it-1}$ the duration in months of the previous credit cycle;
- $Nbdelay_{it-1}$ the number of days of delay of the previous credit cycle;
- λ_{it} the inverse Mills ratios;
- ε_{it} the idiosyncratic error term.

The matrix X_{it} includes the same independent variables as before, adding the growth rates of financial indicators in addition of their levels.

The model defined by equation (2) is estimated by adding an interaction term between women and credit cycle in dummies, as we are especially interested in the effect of gender on the growth ratio over credit cycles. The model is estimated by separating non-agricultural loans (model 6), and agricultural ones (model 7). Indeed, we have additional information (in particular, monthly benefit, location of the activity, and official registration or not for non-agricultural projects, and

activity for agricultural projects) about the projects for these specific types of loans and consider that such information is relevant as it could have an impact on the growth rate of the amount of loan and should be included. Furthermore, separating loans enables us to check whether the observed effects are similar for all types of loans or not. The results of the two models are presented in table 60.

First and foremost, in accordance with what was expected, we observe that the effect of the amount previously received is statistically significant and negative in the two models: the higher the previous amount, the lower the ratio between the on-going amount and the previous one.

Having taken account of the effect of the previous amount, we observe significant and clear positive effect of credit cycles for non-agricultural loans (model 6). Looking at the interaction term with female, women seem to benefit from increasing growth rates just as men, even though the effect of credit cycles is significantly less positive for women. This means that at equal amount previously received, the growth rate is higher between two later credit cycles than between two early ones, for both men and women. Descriptive statistics could not have suggested such an effect, as ratios directly depend on the previous amount. In some way, this positive effect of credit cycle could reflect the increasing trust of the MFI in its clients over time, especially as the ratio is estimated all other things being equal, including financial characteristics. This result is discussed in more detail in the next section. Overall, this means that the progressive lending policy is indeed applied to both men and women, not only on average but also all other things being equal, and that it is even increasingly progressive, since not only amounts but also growth rates increase. However, considering only the coefficient of the interaction term between female and credit cycle, it reveals that if ratios increase over credit cycles for both men and women, this increase is less substantial for women, as the coefficient of the interaction term is statistically significant and negative. As a consequence, this result implies that the progressive lending policy would be applied differently for men and women, and more precisely that it would be more favorable to men (figure 27).

Looking at the results of model 7, if growth rates also eventually increase for agricultural loans, it is not the case for second and third cycles. This does not mean that clients receiving agricultural loans do not benefit from the progressive lending policy, since amounts in levels increase over credit cycles as showed previously; however, the progressive lending policy is not increasingly progressive from a cycle to another as for non-agricultural loans: the amounts grow more slowly between second and third cycles than between first and second ones, but they still increase. This difference between agricultural and non-agricultural loans may be due to the specificity of agricultural activity, and to the fact that financial needs and repayment capacity may

be less regular than for clients running non-agricultural projects. Looking at the interaction effect with women, it is also less positive (or even more negative for third cycles) than for men.

With regard to the other characteristics of the loan, the effect of the duration of the previous loan is also controlled for and is significantly negative, meaning that clients who receive longer previous loan terms also receive lower new amounts in terms of ratio. This is logical, as the duration is taken into account at equal previous amount: this means that a client with a previous longer loan but with the same amount benefited from a longer duration in order to enable him or her to repay. As a consequence his or her capacity for repayment, which is not directly observed, was most probably lower. Therefore, such a client is more likely to still show a lower capacity for repayment at the end of the previous credit period and then to get a lower new amount in terms of ratio. Regarding clients' repayment behavior, in accordance with descriptive statistics and the analysis of loan amounts in levels, clients who accumulate more days of payment being overdue during the previous cycle see their credit amount growing less rapidly than the others, as the number of days overdue has a significant and negative impact on the ratio in the two models.

Concerning financial characteristics, both current and fixed assets in levels have a significant and positive effect on the ratio: the higher the current and fixed assets, the higher the growth rate of loan amounts. This is understandable as fixed and current assets are indicators of the project size and of financial needs. We expect that clients with greater projects and/or higher needs at a given time get greater amounts in terms of ratios. Interestingly, the evolution of these indicators is not determining: officers rather refer to current financial information than to their evolution to grant specific amounts. This is in keeping with procedures, which do not detail how loan officers would be supposed to consider projects' history in their application of the progressive lending policy. Officers just know that they are supposed to increase loan amounts over credit cycles, and hence certainly consider immediately available information only: indeed, they use the same sheet to carry out the financial analysis of projects for first credits cycles as for the next ones; there is no specific sheet for cycles following the first ones, which would request officers to consider project evolution.

For non-agricultural loans, higher monthly benefits, a registered activity, and independent premises logically tend to increase the growth rate, as these variables also reflect greater projects. For all types of loans, having some employees also increases the growth rate.

Table 60. Growth rate of loan amount from one credit cycle to another (in ratio)

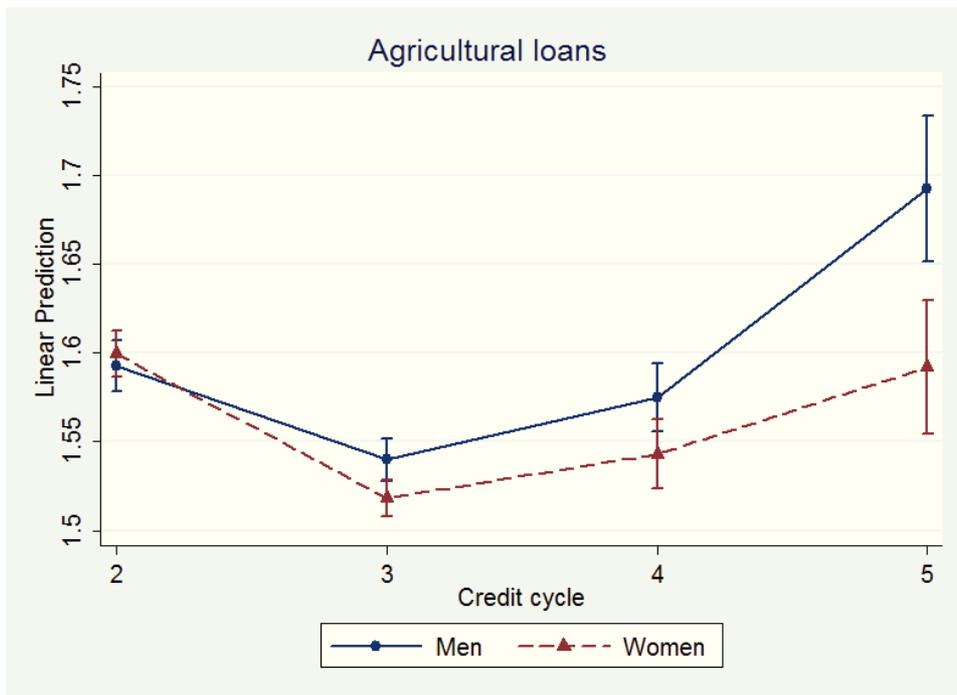
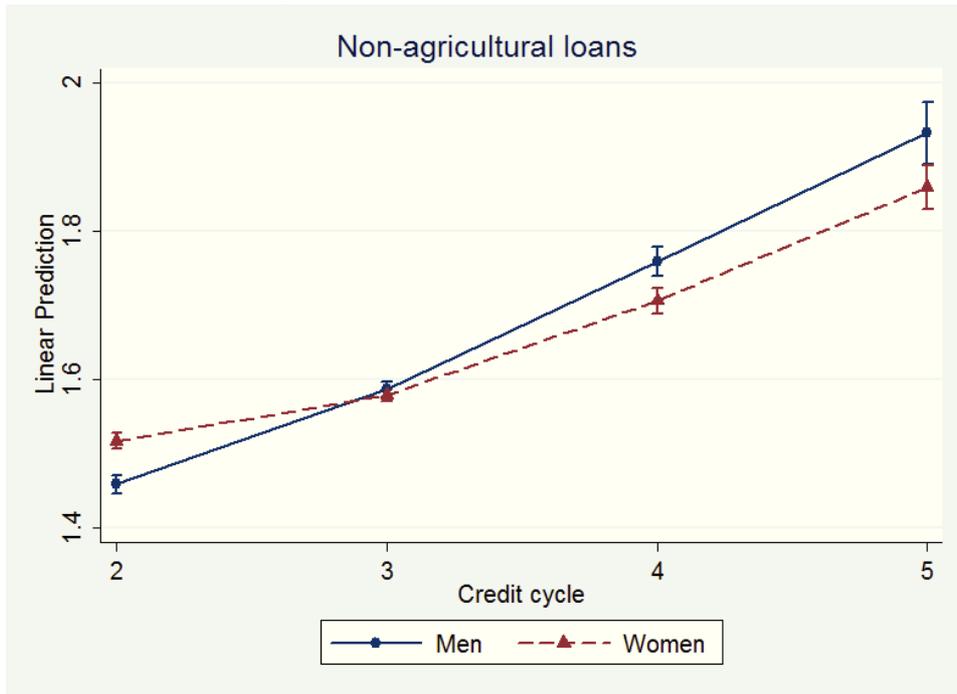
	Non-agricultural loans (6)		Agricultural loans (7)	
Female	0.0583***	(0.00555)	0.00690	(0.00862)
Credit cycle (vs. 2)				
3 rd cycle	0.128***	(0.00889)	-0.0529***	(0.00981)
4 th cycle	0.302***	(0.0146)	-0.0178	(0.0139)
5 th cycle	0.475***	(0.0239)	0.100***	(0.0234)
6 th cycle	0.754***	(0.0968)	0.183***	(0.0337)
Female # credit cycle				
Female # 3 rd cycle	-0.0658***	(0.00710)	-0.0285***	(0.00940)
Female # 4 th cycle	-0.112***	(0.00935)	-0.0388***	(0.0120)
Female # 5 th cycle	-0.131***	(0.0191)	-0.108***	(0.0250)
Female # 6 th cycle	0.0300	(0.152)	0.0107	(0.0748)
Loan				
Previous loan amount (TND 1000)	-0.321***	(0.00562)	-0.343***	(0.00680)
Previous loan term (months)	-0.110***	(0.00234)	-0.0501***	(0.00302)
Previous number of days overdue (log)	-0.117***	(0.00391)	-0.121***	(0.00552)
Number of days between 2 cycles (10 days)	-0.00110**	(4.74e-04)	-0.000298	(6.99e-04)
First amount received in 2013 (vs. 2012)	0.0322***	(0.00358)	0.0567***	(0.00581)
Requested amount at cycle 1 (1000 TND)	0.0505***	(0.00274)	0.0980***	(0.00366)
Parallel personal or opportunity loan	0.0494**	(0.0244)	0.116**	(0.0528)
Collateral (vs. unique guarantor)				
Reciprocal guarantee	-0.0400***	(0.00799)	-0.0538***	(0.00913)
Physical guarantee	0.0285***	(0.00887)	0.0382***	(0.0139)
Credit use (vs. working capital)				
Investment	-0.0697	(0.170)	0.290	(0.366)
Creation	0.245***	(0.0629)	0.274*	(0.150)
Other	-0.0892	(0.249)	-0.0140	(0.327)
Project				
Activity sector (vs. agriculture)				
Trade	0.0309**	(0.0145)	NA	NA
Production	-0.00332	(0.0151)	NA	NA
Services	0.0713***	(0.0186)	NA	NA
Not documented	-0.0330*	(0.0191)	NA	NA
Age of project	-0.000231	(0.000269)	-0.000357	(0.000413)
Employees (vs. none)				
Seasonals only	0.0468***	(0.0181)	0.0582**	(0.0248)
Regular workers only	0.0353***	(0.00924)	0.00397	(0.0213)
Both	0.0200	(0.0147)	-0.00310	(0.0316)
Fixed assets (1000 TND)	0.00140***	(2.68e-04)	0.00210***	(2.19e-04)
Current assets (1000 TND)	0.0163***	(0.00103)	0.0141***	(0.00128)
Evolution of fixed assets (ratio)	-1.43e-08	(1.11e-06)	5.90e-06***	(1.53e-06)
Evolution of current assets (ratio)	-7.71e-06	(5.13e-06)	1.28e-05*	(7.01e-06)
Monthly profit (1000 TND)	0.0727***	(0.00501)	NA	NA
Evolution of profits (ratio)	1.56e-05	(2.32e-05)	NA	NA
Formal sector	0.0570***	(0.00851)	NA	NA
Independent premises	0.0612***	(0.00613)	NA	NA
Culture (vs. breeding)	NA	NA	0.0907***	(0.0175)

<i>Socio-demographic profile</i>				
Young (<35)	-0.0149	(0.0135)	-6.30e-05	(0.0194)
Education (vs. illiterate)				
Primary	0.00773	(0.00700)	0.00424	(0.00639)
Secondary	0.0104	(0.00740)	4.36e-05	(0.00828)
Higher	0.0193*	(0.0103)	0.00777	(0.0154)
Housing (vs. tenant)				
Free lodging	-0.00223	(0.00606)	0.00201	(0.0161)
Owner	0.00265	(0.00447)	-0.0106	(0.0140)
Other active member in household	-0.000339	(0.00467)	-0.0117**	(0.00576)
Household size	0.000569	(0.00108)	0.00420***	(0.00136)
Single	0.00684	(0.00470)	0.0183***	(0.00682)
Household monthly expenses (1000 TND)	0.0340***	(0.0109)	0.0324*	(0.0168)
Evolution of expenses (ratio)	-0.00101	(0.00130)	0.000351	(0.00205)
<i>Officer and branch</i>				
Other officer than previous loan	0.0173***	(0.00473)	0.0258***	(0.00790)
Officer gender	-0.00187	(0.00752)	0.00455	(0.0145)
Officer experience (years)	0.000843	(0.000671)	0.00214*	(0.00114)
Branch rate of rural areas (vs less than 0.07%)				
0,07-0,35%	0.0886***	(0.0126)	0.103	(0.0715)
0,35-0,55%	0.0660***	(0.0155)	0.220***	(0.0698)
>0,55%	0.0352	(0.0352)	0.168**	(0.0691)
New branch	0.0581***	(0.0107)	0.0228*	(0.0119)
Inverse Mills Ratio	-0.0858***	(0.0205)	-0.123***	(0.0250)
Constant	1.230***	(0.254)	1.285***	(0.343)
All average Xi included	Yes		Yes	
Branch fixed effect included	Yes		Yes	
Observations	70707		40918	
Adjusted R-squared	0.386		0.315	

Bootstrapped standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 27. Predictions of growth rates of loan amounts from a cycle to another (in ratio)



With regard to projects' other characteristics, the growth rate is significantly higher for activities in trade or services compared to agriculture, while for agricultural loans only, it is higher for culture compared to breeding. In terms of collateral, offering physical guarantee has a positive effect on the growth rate compared to unique guarantor, whereas reciprocal guarantee still seems considered as the least secure kind of guarantee.

About officer characteristics, being served by a different officer from the previous loan tends to increase the growth rate of the loan amount in all cases. This could be explained by the fact that a new officer will do his/her best to keep the client. Indeed, as seen in the previous chapter, being served by a new officer decreases the probability of renewing the loan as clients probably feel a less strong relationship with the MFI when the officer changes. As a consequence, a new officer is more likely to apply a more generous progressive lending policy, even in terms of growth rates, in order to make sure the client will renew the loan at the end of the term.

3. The evolution of amounts from the first credit cycle

Finally, we consider the evolution of loan amounts in terms of ratio between the on-going amount and the first one received by the client. This enables us to get an overview of how loan amounts grow over the whole clients' credit history: we run the same model as presented in equation (2), replacing only the dependent variable, the previous amount received by the amount received at cycle 1, and the evolution of financial indicators by ratios between the current indicators and the ones at cycle 1 instead of previous cycle. The results are presented in table 61 and differ slightly from the first ones.

With regard to our variable of interest, the growth rate of loan amounts, as defined with such a ratio, still increases over credit cycles for both men and women, which confirms that the MFI applies a progressive lending policy for all clients, all other things being equal. However, there is no difference between ratios applied to men and women when ratios are defined such a way: women receiving non-agricultural loans even benefit from a small advantage (figure 28). This implies that the evolution of amounts all along clients' credit history is similar for men and women all other things being equal, and that the progressive lending policy seems fairly applied for men and women when it is considered through this ratio. However, given that women receive lower amounts from the beginning, mainly for objective reasons but not only, such a similar growth rate of loan amounts all along credit history necessarily results in an increasing gap between loan amounts granted. Additionally, it may be noticed that depending on the way the progressive lending policy is considered or defined, the results in terms of fair application between men and women

differ; this confirms that questioning this concept and thinking about how to measure, analyze and assess it is necessary for practitioners, rating agencies and researchers.

Looking at the other results of interest, the expected negative effect of high first amounts is confirmed, and is very likely to be due to the credit ceiling applied at that time. Higher financial indicators still have positive effects, whereas their evolution in ratio does not have any significant effect either with such a definition (except for the evolution of fixed effects for agricultural loans), confirming that officers probably take account of current indicators only to grant loan amounts and not of their evolution, in accordance with existing procedures.

The main difference in relation to the other factors concerns officer gender. Concerning non-agricultural loans, female officers tend to be more generous in terms of progressive lending policy defined this way, than their male colleagues, which again contradicts the idea that they would be more risk averse.

Table 61. Growth rate of loan amount from the first credit cycle (in ratio)

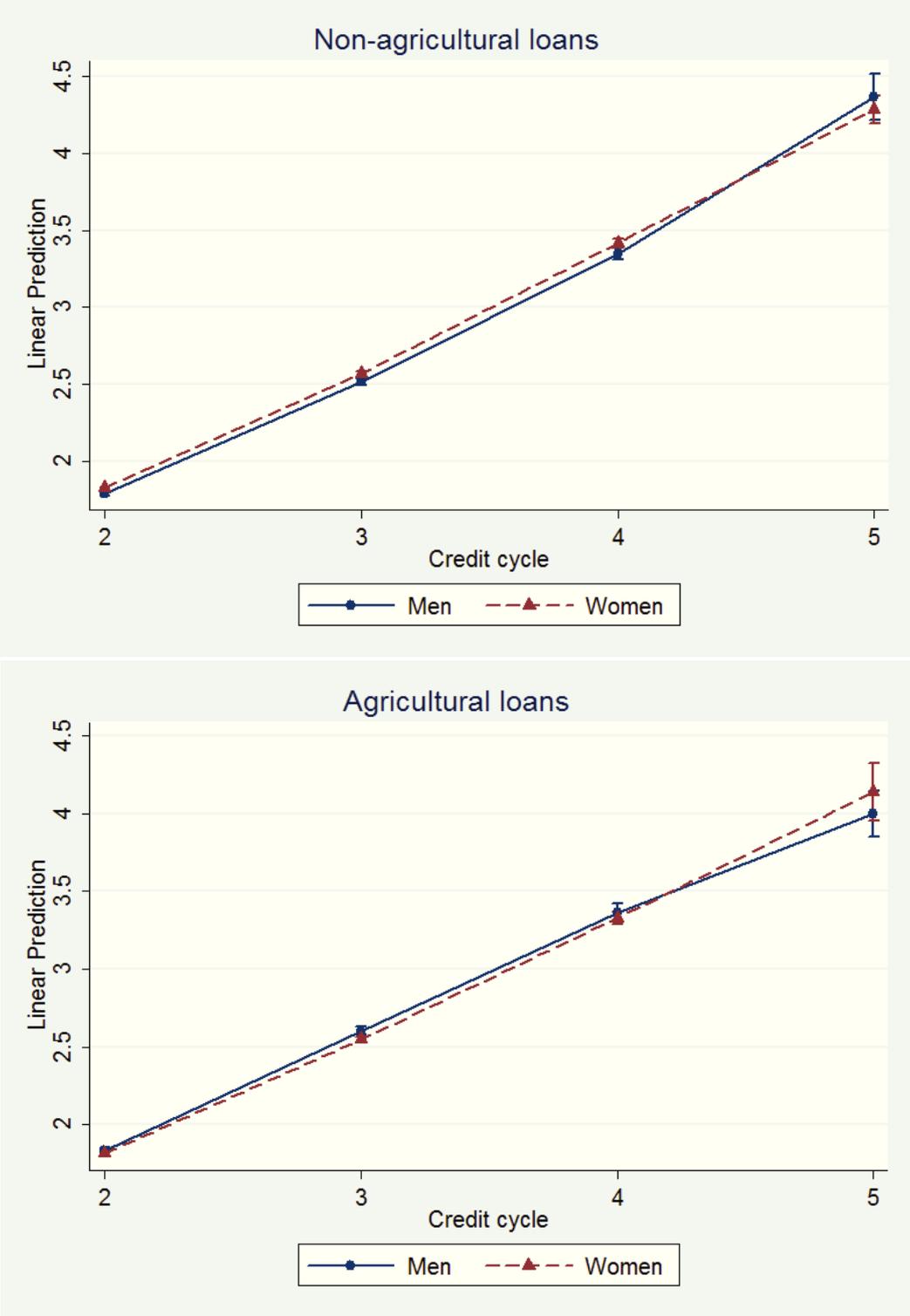
	Non-agricultural loans (8)		Agricultural loans (9)	
Female	0.0347***	(0.00826)	-0.0199*	(0.0109)
Credit cycle (vs. 2)				
3 rd cycle	0.724***	(0.0124)	0.769***	(0.0161)
4 th cycle	1.556***	(0.0207)	1.530***	(0.0296)
5 th cycle	2.575***	(0.0760)	2.166***	(0.0766)
6 th cycle	3.790***	(0.478)	2.195***	(0.171)
Female # credit cycle				
Female # 3 rd cycle	0.0194	(0.0144)	-0.0352*	(0.0182)
Female # 4 th cycle	0.0362	(0.0237)	-0.0161	(0.0349)
Female # 5 th cycle	-0.114	(0.0872)	0.161	(0.123)
Female # 6 th cycle	0.625	(0.686)	0.467	(0.388)
Loan				
Loan amount at cycle 1 (TND 1000)	-1.27***	(0.0207)	-1.35***	(0.0280)
Previous number of days overdue (log)	-0.0437***	(0.0111)	-0.0177	(0.0135)
Number of days between 2 cycles (10 days)	-0.00249***	(8.35e-04)	-0.00466***	(0.00113)
First amount received in 2013 (vs. 2012)	0.0621***	(0.00774)	0.104***	(0.0105)
Requested amount at cycle 1 (1000 TND)	0.161***	(0.0049306)	0.283***	(0.00749)
Parallel personal or opportunity loan	0.170**	(0.0710)	0.210*	(0.118)
Collateral (vs. unique guarantor)				
Reciprocal guarantee	-0.0776***	(0.0196)	-0.0480*	(0.0252)
Physical guarantee	0.0677***	(0.0180)	0.130***	(0.0288)
Credit use (vs. working capital)				
Investment	2.266*	(1.316)	1.364	(4.214)
Creation	1.374***	(0.245)	-0.238	(3.938)
Other	2.100	(2.515)	0.929	(4.087)
Project				
Activity sector (vs. agriculture)				
Trade	0.0500*	(0.0295)		
Production	-0.0555*	(0.0311)		
Services	0.148***	(0.0388)		
Not documented	-0.136***	(0.0361)		
Age of project	-0.00105*	(0.000582)	-0.00163**	(0.000770)
Employees (vs. none)				
Seasonals only	0.164***	(0.0387)	0.185***	(0.0695)
Regular workers only	0.111***	(0.0191)	-0.0402	(0.0438)
Both	0.104***	(0.0319)	-0.0771	(0.0568)
Fixed assets (1000 TND)	0.00297***	(6.24e-04)	0.00470***	(4.65e-04)
Current assets (1000 TND)	0.0409***	(0.00208)	0.0377***	(0.00285)
Evolution of fixed assets (ratio)	2.49e-06	(2.23e-06)	5.79e-06***	(1.87e-06)
Evolution of current assets (ratio)	-4.08e-06	(1.04e-05)	-1.36e-05	(1.58e-05)
Monthly profit (1000 TND)	0.186***	(0.0106)		
Evolution of profits (ratio)	-0.000102*	(5.32e-05)		
Formal sector	0.121***	(0.0191)		
Independent premises	0.134***	(0.0151)		
Culture (vs. breeding)			0.214***	(0.0355)
Socio-demographic profile				

Young (<35)	-0.0896***	(0.0329)	0.0289	(0.0503)
Education (vs. illiterate)				
Primary	-0.00771	(0.0132)	0.00813	(0.0126)
Secondary	0.00439	(0.0135)	-0.00256	(0.0165)
Higher	0.0342**	(0.0174)	0.0532*	(0.0297)
Housing (vs. tenant)				
Free lodging	-0.0150	(0.0131)	-0.00288	(0.0372)
Owner	-0.00340	(0.00909)	-0.0588*	(0.0335)
Other active member in household	-0.0334***	(0.0107)	-0.0598***	(0.0131)
Household size	0.00339	(0.00222)	0.0112***	(0.00277)
Single	0.0385***	(0.00872)	0.0728***	(0.0168)
Household monthly expenses (1000 TND)	0.0845***	(0.00285)	0.0147	(0.0431)
Evolution of expenses (ratio)	-0.0126*	(0.00691)	-0.00812	(0.0134)
<i>Officer and branch</i>				
Other officer than previous loan	0.0327***	(0.0101)	0.0287*	(0.0159)
Officer gender	0.0746***	(0.0153)	-0.000405	(0.0302)
Officer experience (years)	0.00291**	(0.00133)	0.00595**	(0.00240)
Branch rate of rural areas (vs less than 0.07)				
0,07-0,35%	0.308***	(0.0276)	0.300**	(0.137)
0,35-0,55%	0.260***	(0.0328)	0.615***	(0.121)
>0,55%	0.0443	(0.0799)	0.399***	(0.119)
New branch	0.0176	(0.0180)	-0.113***	(0.0260)
Inverse Mills Ratio	-0.880***	(0.0501)	-1.000***	(0.0598)
Constant	-1.673	(2.518)	0.328	(4.099)
All average Xi included	Yes		Yes	
Branch fixed effect included	Yes		Yes	
Observations	73518		40915	
Adjusted R-squared	0.533		0.506	

Bootstrapped standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 28. Predictions of growth rates of loan amounts from the first credit cycle (in ratio)



V. DISCUSSION OF INITIAL HYPOTHESES

The main results of this analysis is that the progressive lending policy is not only applied on average but also all other things being equal: this means that at equal characteristics, amounts as well as their growth rates are more generous between two late cycles than between two early cycles. In other words, the more loans a client takes out, the higher the loan amounts, and the faster the increase, therefore the more generous the progressive lending policy. Referring to contract theory in a situation of imperfect information, this is in keeping with the idea that the moral hazard issue between the principal and the agent decreases in the case of repeated games or contracts: the necessity to acquire or maintain a reputation for agents comes into play (Kreps & Wilson, 1982; Milgrom & Roberts, 1982). Applied to the credit market, this means that as the lending relationship between the creditor and the borrower lasts and strengthens, creditors get to know their clients better and obtain proves of their clients' ability to manage projects and repay. As a consequence, theoretical models (Boot & Thakor, 1994; Diamond, 1989; Petersen & Rajan, 1995) predict that such long-term lending relationships should result in decreasing interest rates, which usually represent credit costs. Some empirical studies show that there is indeed a positive effect of such long-term relationships for borrowers, either in terms of future access to credit (Petersen & Rajan, 1994) or of interest rates (Berger & Udell, 1995). Similar models predict the same decrease in insurance costs over time as the insurer gets information on the insured agent's behavior through his or her past record (Rubinstein & Yaari, 1983).

In the microfinance sector, interest rates are fixed by financial by-product, and cannot vary from a client to another according to their credit history only. Consequently, our result may be interpreted this way: the gain in terms of information for the MFI induced by such a long-term lending relationship is rather translated into an increasingly generous progressive lending policy. This would be in accordance with the theoretical model developed by Egli (2004) to account for progressive lending policy in the microfinance sector. Another way of seeing it is that the value of assets and/or collateral required to get a specific amount decreases as clients take out more loans. Simple descriptive statistics confirm this idea with regard to collateral, since a client's own credit history or background may serve as guarantee from the second credit cycle, the share of such a guarantee quickly increasing with credit cycles.

Finally, it should be noticed that in the case of Enda, renewing loans is the only way to keep clients: indeed, Enda is not allowed to offer saving products since the Tunisian legislation only allows banks to do it; as a consequence, contrary to other MFIs which may retain their clients with several kinds of financial products, Enda can only grant other credits to do so. A generous progressive

lending policy is therefore a way to foster client retention. Moreover, at the time of the study, there was no real competition yet between different MFIs in Tunisia; however, as showed by Baraton & Leon (2017), when there is competition between MFIs or between MFIs and banks, loan amounts tend to increase. As a result, progressive lending policies of Enda and of other MFIs in Tunisia may become even more generous soon, since new MFIs are now operating on the Tunisian territory.

The second main result is that despite the progressive gain in information on clients as clients take out more loans, both at the individual level and at the social category level since women actually show less risky behavior, the initial gap between amounts granted to men and women persists over time and credit cycles: whereas the gap concerning first loans could have been accounted for by great information asymmetry, such a supposition does not hold after several credit cycles, but women still receive lower amounts all other things being equal. Four explanations for this result remain plausible and are not exclusive: first, the initial stereotypes on women, their projects, and their ability to fulfil their roles of project manager and housekeeper at the same time persist over time as well, leading officers to apply slower progressive lending policy to female applicants all other things being equal, because they think that women need or are able to manage smaller loans. In such a case, discrimination, either statistical or not, keeps influencing amounts granted, all the more so as at that time, loan amounts of credits granted after the first one were discussed between officers and clients, without any official request from clients: therefore, officers might have suggested lower amounts for female clients.

A second explanation is that, since the common belief within Enda is that women are more loyal than men (even though this is not true), it might be possible that officers make more effort to attempt to keep male clients than female clients: they would offer higher amounts to men to encourage them to keep resorting to their services.

A third explanation is that because of the initial statistical discrimination, women invest less in their projects, which develop less and remain on average smaller than those of men, which confirm the initial stereotypes shared by loan officers, who keep granting lower amounts to women because their representations are confirmed by their observations *a posteriori*. This is in keeping with the explanations for persistent statistical discrimination over time provided by Arrow (1972) and Spence (1973): for these authors, because minorities expect fewer returns of their investment, they invest less in the increase of their productivities, which finally gives more reasons to employers to statistically discriminate them. In our case, this weaker investment made by women could not only come from their knowledge of such statistical discrimination against them, but also directly from the consequence of this discrimination, which is the fact that they get lower amounts: indeed, getting

lower amounts has a direct impact of the possible investments they are able to make in their projects. In other words, it is possible that initial statistical discrimination creates a vicious circle leading to the persistence of this discrimination.

The fourth possible explanation applies to all credit cycles, including the first one, and may add to the other two. Despite the observable characteristics of their projects, their better repayment behavior and their lower propensity to default, female clients may still convey a bad signal about their projects: indeed, some officers reported during the training evoked in chapter 5 that women were less likely than men to pound on the table if they were offered less than 100% of their requests for first loans, or to show their dissatisfaction if they do not get what they expect at the time of renewal. Consequently, if women also tend to accept lower amounts for a similar project in such a case of information asymmetry, this could also be considered as a bad signal as theorized by Akerlof (1970) or Leland & Pyle (1977): their general tendency to accept lower amounts would signal that they want to invest less in their projects, which hence would imply that their projects are of lower quality or less profitable. Such a signal, even if it does not reflect the real quality of their projects, could reinforce existing stereotypes.

VI. CONCLUSION

In the microfinance sector, progressive lending is a very commonly applied policy as it enables the burden of transaction costs to be reduced and favors client retention as it is a good dynamic incentive. It also helps MFIs to avoid large losses by testing clients' repayment behavior before lending high amounts. However, the way such a progressive lending policy is applied has rarely been analyzed and this chapter has attempted to fill this gap. In particular, as some recent studies have revealed that women may face less favorable loan conditions than men while being favored in terms of access to microcredit, the analysis has focused on the conditions of loan renewals from a gender perspective within the main Tunisian microfinance institution Enda inter-arabe.

Having taken account of the selection bias since not all clients renew their loans, and of repayment behavior, the conditions of loan renewal were analyzed in terms of amounts granted and growth rates of these amounts, defined as ratios between on-going amount and previous one on the one hand, and as ratios between on-going amount and the first one on the other hand. All things being equal, including previous or first loan amount, amounts and ratios tend to increase over credit cycles, reflecting an increasingly favorable progressive lending policy over credit cycles. This could be explained by an increasingly trusting relationship between the MFI and the clients over cycles as

MFI's tend to know their clients better from one contract to another. Logically, amounts and ratios tend to be lower for clients who repaid their previous loans with more days overdue, confirming the importance of trust in the application of the progressive lending policy. However, the most striking result concerns our item of interest, as the progressive lending policy appears to be less favorable to women, all other things being equal. Indeed, if amounts and ratios increase over cycles, women still receive lower amounts all other things being equal, and these amounts increase less quickly. As a result, the initial gap between the first loan amounts granted to men and women found in chapter 1 persists over time and even increases: women benefit from a progressive lending policy just as men do, but it is less favorable. Consequently, existing inequalities between men and women can only be reproduced: indeed, women already start from a lower position as they tend to run smaller projects in terms of assets and profits, and then tend to request lower first amounts. If Enda inter-arabe, as other MFIs, actually favors women in terms of access to credit in attempting to counterbalance these starting inequalities, they fail to do so entirely, as we still observe a gap between amounts granted, which increases over time as the progressive lending policy is less favorable to women, all other things being equal. As a consequence, if women keep receiving lower amounts, their projects will evolve less quickly too, and catching up with men in terms of economic power will become almost impossible.

However, this unfair application of the progressive lending policy is probably involuntary and the consequences, in terms of reproduction of inequalities, unknown, as this kind of longitudinal analysis is not systematically achieved by credit officers. That is why we tend to support Oikocredit's initiative consisting in improving information systems in order to better manage, use, and analyze clients' data from a longitudinal perspective. We would recommend that MFIs carry out such longitudinal analyses in a more systematic way to get a better view of the evolution of clients and then to adapt their progressive lending policy accordingly. The inclusion of new indicators in rating agencies' tools would also encourage MFIs to adapt their progressive lending policies by making their granting procedures more objective over credit cycles. We would also recommend taking account of the characteristics of MFIs' progressive lending policies in future research works, particularly in impact assessment studies, as the growth rate of loan amounts could have a more significant impact than time alone.

CHAPTER 5

PROMOTING GENDER-FAIR PRACTICES IN MICROFINANCE: DOES TRAINING WORK?

This chapter was co-written with my supervisor Philippe De Vreyer.

I. INTRODUCTION

Promoting gender equality and empowering women was the third out of the eight Millennium Development Goals (MDGs) established following the Millennium Summit of the United Nations in 2000. However, according to international organizations and institutions, this goal today remains “unfinished business” across countries (OECD, 2012a), since critical gaps persist in economic opportunity and agency of women and girls (World Bank, 2015). Therefore, the way to address this issue was modified in the new Sustainable Development Goals (SDG) that make up the Post 2015 Development Agenda (UN General Assembly, 2015): whereas it is still a stand-alone goal (the fifth among 17), there is also a consensus on the necessity to turn gender equality into a cross-cutting issue, which should be translated into gender-specific targets and indicators across each of the other 16 SDGs (OECD, 2015).

Improving the definition and tools to achieve this goal was concurrent with reflections about what has hindered it until now. Among various obstacles, law is still one of them, since women’s rights and gender equality are not ensured by law and/or enforced at all levels in every country, but something far more deeply anchored and difficult to reform or change concerns “informal institutions” as defined in the report by Jütting & OECD (2007). According to this report, informal institutions consist of family and kinship structures, traditions, civil and social norms, which may substitute for, compete with or complement formal institutions, often poorly established in developing countries. Informal institutions can either help or hinder the development process, including some of its elements such as gender equality. More recent reports also identify social norms and practices as well as representations of gender roles as root causes of gender inequalities (Muñoz Boudet, 2013; OECD, 2012b). Consequently, one key towards more gender equality would be to make these norms evolve.

Coming back to microfinance, it has been considered for a long time as one tool to contribute to the fulfillment of some MDGs, among which women’s empowerment. The recent multiplication of impact studies resulted in the same acknowledgement of failure: the mitigated results imply that microfinance does not automatically lead to women’s empowerment. As a result, a debate emerged around the question of whether microfinance works; however, it may seem more productive to wonder what hinders microfinance from fulfilling its core objectives. Such a question requires focusing on the mechanisms and channels through which the expected effects are more likely to appear, or on the contrary on the sources and nature of obstacles. According to the results found in the previous chapters, our hypothesis is that gender norms and representations still pervade microfinance institutions and are therefore one of these obstacles. This is in keeping with what

Johnson finds: “gender relations, both within the household and more widely, both facilitate and constrain the impact of microcredit” (Johnson, 2005, p. 224).

Thus, tackling gender norms and representations within microfinance institutions could be a first step towards more efficiency and perhaps more impact. However, changing gender norms is challenging and consists in a long-term, even sometimes non-linear process. Several mechanisms and levers should be activated at the same time, while resistance and backlash may arise (Marcus, Page, Calder, & Foley, 2014). As a consequence, the success of any individual attempt may depend on many external and circumstantial factors which are hardly controllable. Nonetheless, even such attempts might provide learning opportunities.

Thus, this chapter consists in the impact evaluation of an initiative launched by Enda, aiming at shaking up gender representations among loan officers and raising awareness on gender inequalities existing in Tunisia in general and possibly affecting their work. This initiative consisted in a training about gender and development dedicated to a sample of Enda’s field staff in a first phase, which had to be evaluated before a potential generalization to the whole staff of Enda and of other partner civil society organizations. The evaluation part used both qualitative and quantitative methods. This chapter focuses on the quantitative analysis using the monthly portfolios of participating loan officers and of a group of control officers, on which a difference-in-differences method is applied to check if the training had any impact on a series of various outcomes, such as the average amount granted to women or the number of new female clients. Potential effects on men are also verified, as well as the evolution of the effects over time and the existence of possible spill-over effects.

The main result is that the training had heterogeneous effects depending on officers’ profiles: the more direct and significant effects were observed on new female officers, who tended to grant higher amounts to women after the training, whereas indirect effects were observed on more experienced female officers, who tended to select different types of new female clients. Less effect was observed on male officers. Overall, if the effects of this experimental phase remain modest and might decline over time, they still exist and such an initiative should be generalized and inspire new ones in the future.

The structure of the chapter is as follows: section 2 introduces the literature on change in social and gender norms, section 3 details the context and objectives of the training, section 4 presents the data on treatment and control groups, section 5 explains the method and shows the variety of results, section 6 discusses them and section 7 concludes.

II. LITERATURE REVIEW ON CHANGE IN SOCIAL AND GENDER NORMS

Social norms, as part of the above-mentioned “informal institutions”, as well as institutions in general, including formal ones, have eluded economists for a while. Whereas mainstream economics have focused on economic activity for a long time, the New Institutional Economics (NIE) and its various branches have recently broadened the analytical framework and focused on what frames the economic activity, i.e. institutions. One of the representative figures of NIE, Douglas North, defines institutions as “humanly devised constraints that structure political, economic and social interactions”, and include “formal rules” and “informal constraints”, such as “sanctions, taboos, customs, traditions, and codes of conduct” (North, 1991, p. 97). About social norms especially, economic works often refer to the sociologist James Coleman for definitions, stakes and links with social capital and rational choice theory (Goodwin, Harris, & Gallagher, 1996; Radnitzky, Bernholz, & Professors World Peace Academy, 1987). Coleman distinguishes between proscriptive norms, which discourage action, in particular thanks to sanctions, and prescriptive norms, which encourage it (J. S. Coleman, 1986, 2000). He states that social norms emerge and maintain because they frame the exchanges between rational individuals who therefore find self-interest in such norms. For North, a change in institutions also comes from self-seeking individuals, but is necessarily slow: if formal institutions are difficult to change because of the power of the actors who built them, informal institutions would be slow to change by nature.

About gender norms in particular, Becker explains the sexual division of labor, consisting in men specializing in market work and women in housework, using the basic economic assumptions of maximizing behavior and stable preferences: such a division of labor would be efficient because specialized human capital results in increasing returns (Becker, 1981, 1985). However, the author concedes that if division may be accounted for by economic theory, his model cannot explain the traditional division implying that women are especially those specializing in housework.

A few decades before him, classical institutionalists such as Commons and Veblen also showed an interest in sexual division of labor while analyzing family institution, and actually questioned its origin. Both authors consider the origins of inequality between men and women as linked to the appearance of rights of property: the beginning of mankind is marked by the appropriation of women by men. For Commons, from there comes the sexual division of labor: men are responsible for material welfare whereas women are in charge of affective welfare. Such power balance is constant through history, even though cultural evolution brought some progress and made natural inequalities decrease. While Commons considers reforms as possible and necessary, he also sees institutions, including family, as stabilizing and intangible (Commons, 1934). Conversely, for

Veblen, not only is the original appropriation of women by men barbarian, but the resulting sexual division of labor also is: for him, living and thinking habits reproduce and strengthen initial inequalities, and traditional family institutionalizes women's submission to men (Veblen, 1898, 1899).

More recently, other economists have also questioned the origin of the norms and beliefs about the role of women in society, and found evidence that historical differences in agricultural systems have shaped current differences in gender roles and female behavior (A. Alesina, Giuliano, & Nunn, 2013). In particular, they show that historical use of plough is associated with a lower female labor force participation rate today.

Despite this consensus on the fact that gender norms have been deeply anchored for a very long time and constitute informal institutions very slow to change, some studies focus on the drivers of change in gender norms. A review by Marcus et al. (2014) lists the various drivers which have been identified in diverse studies; if change is often pushed forward by multiple drivers at the same time (Jackson, 2012b, 2012a; Rao, 2012; Seguino, 2007), some studies focus on specific drivers, such as legal change of course (Deininger, Goyal, & Nagarajan, 2010; Hallward-Driemeier, Hasan, & Bogdana-Rusu, 2013; Shell-Duncan, Wander, Hernlund, & Moreau, 2013), or education (Evans, 2014; Lloyd & Young, 2009; Stromquist, 2006), but also economic change (Jensen, 2012; Kabeer, 2008; Newman, 2001) that can be facilitated by microcredit, migration (Jolly & Reeves, 2005; Lopez-Ekra, Aghazarm, Kötter, & Mollard, 2011), political and social mobilization (Beaman, Duflo, Pande, & Topalova, 2012; Htun & Weldon, 2010; Weldon & Htun, 2013), or even conflict (Buvinić, Das Gupta, Casabonne, & Verwimp, 2013).

The closest driver from the one under study in this chapter is perhaps media and communications: in some studies, the power of mass media such as TV and radio is especially highlighted (Ferrara, Chong, & Duryea, 2012; Jensen & Oster, 2007; Pulerwitz, Michaelis, Verma, & Weiss, 2010), but the last one also insists on the relevance of “small-group educational workshops about gender norms” and on the “importan[ce] for program implementers to include [...] effective interactive group activities as role-playing, debating, and sharing personal stories” (Pulerwitz et al., 2010, p. 291). This is exactly the kind of initiative which is evaluated in the next sections.

III. CONTEXT AND OBJECTIVES OF THE TRAINING

The Arab spring that started in Tunisia in 2010 and spread throughout the Middle East and North Africa (MENA) region lifted the veil on the problematic socioeconomic situations in these countries, which were seemingly stable until then, at least politically. It drew attention on existing and persistent inequalities within these societies despite their status of low-middle or upper-middle income countries, and raised new questions on development factors. In particular, gender equality was mentioned as one of the main stakes by international organizations (Vishwanath, 2012)⁵² and cooperation agencies (Gribaa & Depaoli, 2014; Triki & Touiti, 2013)⁵³, as the region and especially Tunisia faced paradoxically low female labor force participation rates compared to their significant progress in terms of girls and women's education. As a consequence, development organizations were strongly encouraged to achieve gender diagnostics and to include a gender perspective in their activities, including those which were already acting in favor of women. Particularly in Tunisia, since the legislation had been already favorable to gender equality for decades, it became obvious that the legal framework was not the main obstacle and that deeper analysis and work had to be done regarding the division of domestic labor and social representations.

For these reasons, even a microfinance institution historically committed into the promotion of women's empowerment such as Enda started considering that more could and had to be done in terms of gender equality. From the beginning, women's empowerment has appeared as one of its main objectives and women have always represented a priority target. However, as they are not the exclusive one, men can also be found among the MFI's clients, and their share has kept increasing for 2007, to reach 35% in 2015. This evolution was one more reason for the MFI to launch a large project aiming at better analyzing its clients with a gender perspective, and training the whole staff on gender issues.

This project was conceived in cooperation with a foreign consultant specialized in gender and funded by the French Institute in Tunisia. It lasted from March 2014 until September 2015 and included the conception of a training workshop on gender and development issues specifically dedicated to Enda's staff, from both the headquarters and the field. During the project phase, four training sessions were planned in order to train a first sample of 150 members of Enda's field staff. The field staff refers to the staff members working within one of the 78 branches of Enda, which are spread on the whole Tunisian territory and directly serve clients. The field staff includes mainly

⁵² VISHWANATH T. (2012), *Opening Doors: Gender Equality in the Middle East And North Africa*. MENA Knowledge and Learning Quick Notes Series; No. 60. World Bank, Washington, DC.

⁵³ TRIKI S. & TOUITI H. (2013), *Règlementation du travail et participation des femmes au marché du travail en Tunisie*, report, German Cooperation, GIZ.

GRIBAA B. & DEPAOLI G. (2014), *Profil Genre de la Tunisie*, report, Agence Française de Développement.

credit officers, but also cashers, administrative assistants, supervisors and even deputy supervisors in big branches. All the positions were represented among the participants to these first four training sessions, with a majority of credit officers. The idea was to implement and evaluate a pilot phase before generalizing the training, as the objective was to train everyone in the end. During the pilot phase, the foreign consultant was supposed to assist the trainers from Enda's training department to help them master and appropriate the contents and tools and make sure they would be able to train the remaining staff by themselves later.

The training aimed at raising awareness on existing gender inequalities in Tunisia by confronting laws, facts and social representations, to make participants reflect upon Enda's achievements and failures to deal with these inequalities, and to generate ideas and suggestions to improve Enda's action⁵⁴. The methods used were mixed and included formal presentations of facts and numbers, the screening of a short movie on women's working conditions in rural areas followed by a collective debate, participative and creative methods to reveal gender representations in general and highlight the diversity of issues faced by Enda's male and female clients in their daily life, and brainstorming in small groups to reflect upon one's action in one's personal and professional life and possible improvements.

One of the messages conveyed during the training was that treating male and female clients in a fair way could be sometimes tricky, especially because male and female clients differ on many levels. In particular, it was highlighted that the gap between amounts granted to men and women should be questioned, as it could reveal unfair treatments instead of only reflecting project or profile differences. The last workshop of the training was dedicated to making suggestions of actions to implement in order to better apply gender equality into one's work. Among the suggestions made by the participants, some concerned changes in procedures, especially regarding required collateral for female clients or interest rates, and were not directly applicable by credit officers without prior decision and action from the board of directors. However, some others were possible to implement immediately, such as taking only objective project characteristics into account to make a decision and granting fairer amounts to men and women. As a consequence, the expected short-term effects of the training mainly concerned credit officers' portfolios, in terms of amounts granted to women or possibly in terms of clients' profile. More precisely, the outcome variables we consider are the average amount granted to women, whatever the credit cycle, as clients usually renew their loans, as well as the average amount granted to women's first cycles, as credit officers could have more leeway to change their habits with new clients. The average amount requested by female clients⁵⁵ is

⁵⁴ The training program may be referred to in Appendix IV.A.

⁵⁵ The average amounts requested considered in the analysis concern only successful applications, since requests corresponding to rejected applications are not part of officers' portfolios.

considered to analyze possible changes in clients' selection, since requests may reflect clients' poverty or ambition level, as well as the ratio between amounts granted and requested. Finally, since Enda was already favoring women in terms of access to credit, there was less expectation concerning the share of women among clients, however this is considered as a possible outcome as well.

IV. DATA

The organization of the four training sessions was designed on the basis of Enda's geographical structuration: at the time of the project, Enda consisted of 78 branches spread on the whole Tunisian territory and supervised by 15 regional coordinators, meaning that each regional coordinator had from three to seven branches under one's supervision. It was decided to dedicate each training session to a part of the Tunisian territory, which resulted in each session being dedicated to the branches supervised by three to five regional coordinators. Once the division set, each regional coordinator was required to appoint eight credit officers to be trained, on the basis of three main criteria: the group of eight officers had to be balanced in terms of sex and type of portfolio (mainly agricultural or not), and a maximum of branches had to be represented. Additionally, it was recommended to regional coordinators to appoint neither officers known to be reticent to the gender issue, nor already convinced officers. The idea was to avoid making things too complicated for the trainers during the pilot phase on the one hand, while not introducing biases with too favorable groups on the other hand. As a consequence, if the sample of trained credit officers was not randomly selected, and if the regional coordinators could only be trusted regarding the respect of the appointment rules, we estimate that the possible biases in the selection of participants are unlikely to be related with our variables of interest. However, some checks on this point will be detailed below.

To evaluate the effect of the training, we focus on credit officers only. The distribution of participants to the 4 training sessions is summarized in table 62.

Table 62. Distribution of participants to the training sessions

Session #	1	2	3	4	Total
Date	11-12 Dec. 2014	2-3 Feb. 2015	23-24 Feb. 2015	13-15 May 2015	-
Number of regional coordinators concerned	5	3	3	4	15/15
Number of branches represented (all staff)	15	16	10	14	55/78
Number of branches represented (credit officers only)	11	16	8	13	48/78
Number of branches with the supervisor trained only	1	0	1	0	2/78
Number of supervisors trained	2	1	3	0	7
Other staff trained	3 cashers, 4 assistants	1 other	1 cashier, 1 assistant	1 cashier, 1 other	11
Number of credit officers trained	15	27	20	20	82
Total number of participants	24	29	25	22	100

The total number of participants was lower than expected, as some staff members were finally not able to participate or as the regional coordinators appointed fewer officers than required. Consequently, our treatment group consists of 82 credit officers.

In parallel of these four sessions, one more session was organized for 24 officers but lasted only one day and did not make the foreign consultant intervene. As these officers can neither be considered as fully trained nor as pure controls, we exclude them from our dataset, as well as those working in the single branch where the few officers who were trained received this partial training only. We keep only the 82 participants to the full training as well as all the other credit officers working within Enda.

To evaluate the impact of the training, we consider all these credit officers' monthly portfolios from June 2014 until December 2015, meaning from six months before the first session until seven months after the fourth one. Therefore, we use a panel dataset consisting of 19 periods and 750 credit officers in total. However, the panel is unbalanced, as some officers were observed for the first time after June 2014 and/or disappeared before December 2015. These late appearances and early disappearances could be due to the officer's arrival or departure to/from Enda, but also to a change of position within Enda⁵⁶. As a consequence, if there are 750 officers in total in our dataset,

⁵⁶ However, since each employee of Enda has an identification number, an officer who disappeared cannot have reappeared without us noticing it.

the number of active officers at each period is inferior and varies over time, for both treatment and control groups (table 63).

Table 63. Number of officers by date and group

Date	Total number of officers	Number of controls in not-treated branches	Number of controls in treated branches	Total number of controls	Number of treated officers	Proportion treated/ controls
Jun.14	632	202	349	551	81	14,7%
Jul.14	636	199	357	556	80	14,4%
Aug.14	641	203	359	562	79	14,1%
Sep.14	632	198	354	552	80	14,5%
Oct.14	641	203	358	561	80	14,3%
Nov.14	659	211	367	578	81	14,0%
Dec.14	673	214	379	593	80	13,5%
Jan.15	686	215	392	607	79	13,0%
Feb.15	691	219	394	613	78	12,7%
Mar.15	695	221	395	616	79	12,8%
Apr.15	696	222	397	619	77	12,4%
May.15	691	219	397	616	75	12,2%
Jun.15	689	222	394	616	73	11,9%
Jul.15	682	218	390	608	74	12,2%
Aug.15	677	220	385	605	72	11,9%
Sep.15	673	216	385	601	72	12,0%
Oct.15	671	215	384	599	72	12,0%
Nov.15	672	215	385	600	72	12,0%
Dec.15	669	215	382	597	72	12,1%

Since not all officers were treated within a branch, we consider that controls from the branches where other officers were treated could also be affected by the training and that spill-over effects could bias our estimates, since officers are likely to talk with each other, including about the training. Therefore we first consider the group of controls from not-treated branches only, and second, we also distinguish between these two types of controls so as to check the existence of such spill-over effects.

Looking at officers' sociodemographic and portfolio characteristics, the treatment group does not appear as much different from any control group (table 64).

Table 64. Officers' sociodemographic and portfolio characteristics by group

	Treated group	All controls		Controls in not-treated branches only		Controls in treated branches only	
	Mean/ Prop.	Mean/ Prop.	Diff, with treated	Mean/ Prop.	Diff, with treated	Mean/ Prop.	Diff, with treated
Women (%)	42.0%	34.4%	-0.076	31.8%	-0.102	36.0%	-0.060
Graduated (%)	19.8%	26.6%	0.069	28.0%	0.082	25.9%	0.061
Left before Dec, 2015 (%)	11.1%	7.4%	-0.037	5.7%	-0.054	8.4%	-0.027
Experience at first obs., (years)	2.865	2.857	-0.008	2.929	0.064	2.816	-0.049
Age	31.4	31.0	-0.470	30.7	-0.731	31.1	-0.321
Monthly number of clients ^a	15.4	12.8	-2.608***	13.2	-2.259**	12.6	-2.808***
% of women in portfolios ^a	63.3	59.4	-3.849*	57.9	-5.419*	60.3	-2.947
% of agricultural credits in portfolio ^a	37.9	26.8	-11.11**	22.3	-15.62***	29.4	-8.523*
Average amount granted to women ^a	1006	1205	199.0***	1190	183.8**	1214	207.7***
Average amount granted to men ^a	1468	1609	141*	1530	62	1655	187.3**
Average amount granted to women's first cycle ^a	862	1028	165.5***	1022	159.7**	1031	168.9***
Average amount granted to men's first cycle ^a	1248	1416	168**	1370	121	1443	195**
Average amount requested (women's first cycle) ^a	1443	1627	184*	1614	171*	1635	192*
Average amount requested (men's first cycle) ^a	2028	2318	290**	2246	219*	2359	332***
Average ratio amount granted/requested for women's first cycle ^a	66.5	69.0	2.4	68.7	2.2	69.1	2.6
From Greater Tunis (%)	9.9%	29.6%	0.197***	44.1%	0.342***	21.3%	0.114*
From North East (%)	12.3%	15.4%	0.031	21.8%	0.095	11.7%	-0.006
From North West (%)	17.3%	13.7%	-0.036	3.8%	-0.135***	19.3%	0.021
From Center East (%)	11.1%	14.2%	0.031	19.9%	0.088	10.9%	-0.002
From Center West (%)	24.7%	13.5%	-0.112**	4.7%	-0.200***	18.5%	-0.062
From South East (%)	16.0%	6.9%	-0.0913**	4.3%	-0.118***	8.4%	-0.0760*
From South West (%)	8.6%	6.7%	-0.019	1.4%	-0.0722**	9.8%	0.012
Observations	81	578	659	211	292	367	448

^a: average value over the first six months of the period (before the first training session)

* p<0,05, ** p<0,01, *** p<0,001

Overall, in November 2014, that is to say the month before the first training session, 35% of the credit officers were women, this proportion being slightly but not significantly higher among the treatment group, as regional coordinators were initially requested to appoint as many women as men.

The officers were 31 years old on average, they had 2,8 years of experience within Enda, and 26% of officers had a higher level of education.

The first significant difference concerns the share of agricultural credits in portfolio, which was logically higher among treated than control officers, since regional coordinators were required to appoint as many officers with a relatively high share of agricultural credits as the others whereas the total share of agricultural credits falls between 35 and 40%. The other less expected differences concern the number of clients, which was higher among treated officers, and the average amount granted, either to women or men, both for first credit cycles only or all cycles together, which was lower. This can actually be explained by the fact that treated officers have a higher share of agricultural credits in their portfolios than control officers: indeed, amounts of agricultural credits are lower on average than amounts of other types of credits, especially for first cycles, therefore it seems less surprising that treated officers tend to grant lower amounts on average than control officers. This is also what explains the difference between average amounts requested, either by men or women, between treated and control officers: these amounts are lower for treated officers most probably because a higher share of these amounts concern agricultural credits. These differences do not necessarily represent a problem if the trends were parallel for treated and control officers, which is checked below. Finally, in terms of attrition, the rates do not differ between treated and control officers, therefore the selection bias concerning the officers who stayed should not affect our results.

Regarding the trends of our main variables of interest, which are the outcomes on which we may expect an effect of the training, descriptive graphs of the period prior to the first training session do not tend to show significant differences between treated and control groups, even though the differences in levels in terms of amounts granted and requested, most probably due to the difference in terms of share of agricultural loans, clearly appear (figure 29). In particular, the trends of amounts granted and of the number of clients seem parallel, whereas the trend of women's average requested amounts slightly differ between the treatment group and the group of controls in not treated branches. This variable could reflect different female clients' profiles and therefore different portfolios composition between groups. In the same way, the trend of the average ratio between amounts granted and requested for women's first credits seems to differ between the treatment and control groups. An econometrical analysis will allow us to conclude on the parallel trend assumption.

Figure 29. Trends of main outcomes for treated and control groups before the first training session (descriptive)



V. EVALUATION TECHNIQUE AND RESULTS

The structure of the data, which contains information before and after the treatment for a treatment group and a control group, allows us to use a difference-in-differences approach. This technique allows for unobserved heterogeneity that could have led to selection bias, which is relevant in our case as we cannot be sure that regional coordinators did not appoint participating officers on the basis of criteria that remain unobserved by evaluators. However, this unobserved heterogeneity is supposed to be time-invariant so that the potential selection bias cancels out through differencing. This is the parallel-trend assumption we have to verify.

1. The parallel-trend assumption

To check that the differences between the treatment and control groups do not change over time, we consider a panel fixed-effects model using pre-treatment data only, that is to say the first six periods of our dataset, since the seventh period corresponds to the month of the first training session. Such a model enables us to control for the unobserved time-invariant individual heterogeneity that could be correlated with the treatment and other unobserved characteristics. For instance, some officers could be averse to gender equality, which we do not observe in our dataset, and regional coordinators could have made their appointment decision on this basis, in one or the other way, whereas this could affect the effect of the training. Our model allows controlling for such unobserved individual characteristics.

The model is written as follows:

$$Y_{it} = \alpha + \gamma d_t + \beta T_i d_t + w_i + \varepsilon_{it} \quad (1)$$

With:

- Y_{it} our various variables of interest;
- d_t a monthly time dummy from June 2014 to November 2014;
- $T_i d_t$ the interaction term between treatment group and time dummies;
- w_i the unobserved individual heterogeneity which contains the belonging to treatment or control group;
- ε_{it} the idiosyncratic error term.

In this model, the coefficient γ represents the time trend and β the possible difference in time trends between control and treatment groups.

At first, we run the model on the treatment group and the group of controls in not-treated branches, as this is our reference control group (table 65), and second with all controls (table 66).

We consider five outcome variables on which we expect some effects of the training, and for which we want to check the parallel trend assumption.

The period of reference is November 2014. Whatever the control group considered, trends appear as parallel, as the coefficients of the interaction terms between the treatment group and time dummies are not significant in all cases, except for the ratio between amounts granted and requested at the first period for both control groups, and for amounts granted to women's first credit cycles at the first period when all controls are included. However, these significant differences being exceptions, we may consider that the parallel trend assumption is verified. The same analysis was run with controls in treated branches only (appendix IV.B.), and the difference in trends is not significant in this case either. As a consequence, a difference-in-differences approach seems appropriate.

Table 65. Parallel trend assumption between treated and controls in not-treated branches

	Average amount granted to female clients	Average amount granted to female clients (1st cycle)	Average amount requested by female clients (1st cycle)	Average ratio request/ amount for female clients (1st cycle)	Share of female clients in portfolio
<i>Ref: Nov. 14</i>	-	-	-	-	-
Jun. 14	-130.6*** (44.10)	-124.1** (48.18)	-267.8** (105.3)	0.409 (2.475)	1.278 (1.671)
Jul. 14	-18.58 (46.60)	-20.30 (55.22)	-95.31 (102.8)	2.794 (2.216)	-0.934 (1.699)
Aug. 14	19.88 (49.22)	51.63 (54.21)	16.93 (99.28)	4.915* (2.531)	-2.929* (1.736)
Sep. 14	1.253 (44.83)	53.23 (69.18)	-75.21 (97.54)	3.221 (2.141)	-0.690 (1.675)
Oct. 14	-60.20 (39.12)	-39.02 (53.84)	-153.8* (92.51)	3.267 (2.507)	-0.573 (1.613)
Treatment group*Jun. 14	63.57 (70.08)	-88.53 (67.56)	119.8 (149.7)	-9.848** (3.959)	-2.258 (3.009)
Treatment group*Jul. 14	15.13 (74.85)	-8.688 (82.98)	126.8 (152.6)	-5.003 (3.501)	0.195 (2.896)
Treatment group*Aug. 14	-85.24 (68.01)	-89.87 (87.24)	-84.29 (175.3)	-5.495 (3.905)	0.352 (2.950)
Treatment group*Sep. 14	-95.75 (63.30)	-122.3 (87.96)	33.53 (146.8)	-5.869 (3.688)	-1.422 (3.012)
Treatment group*Oct. 14	6.818 (57.22)	-1.603 (82.43)	180.4 (161.1)	-6.910* (3.913)	0.693 (2.602)
Constant	1147*** (22.12)	993.4*** (25.38)	1610*** (51.87)	67.34*** (1.070)	59.82*** (0.824)
Observations	1637	1454	1454	1454	1689
R-squared	0.016	0.019	0.014	0.012	0.006
Number of officers	302	291	291	291	312

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 66. Parallel trend assumption between treated and all controls

	Average amount granted to female clients	Average amount granted to female clients (1st cycle)	Average amount requested by female clients (1st cycle)	Average ratio request/ amount for female clients (1st cycle)	Share of female clients in portfolio
<i>Ref- Nov. 2014</i>	-	-	-	-	-
Jun. 14	-89.86*** (27.40)	-66.95** (29.60)	-147.5** (63.18)	-1.336 (1.331)	0.0950 (1.087)
Jul. 14	-17.55 (26.89)	-44.68 (31.21)	19.24 (89.12)	0.198 (1.433)	-1.372 (1.055)
Aug. 14	11.28 (27.45)	23.02 (34.38)	11.98 (58.35)	3.401* (1.876)	-3.513*** (1.104)
Sep. 14	-17.47 (24.98)	15.17 (34.47)	-75.52 (52.39)	2.181 (1.340)	0.202 (1.066)
Oct. 14	-37.71 (25.13)	-18.95 (31.93)	-83.84 (63.14)	0.554 (1.422)	-0.945 (1.077)
Treatment group*Jun. 14	22.80 (60.84)	-145.7*** (55.73)	-0.514 (123.5)	-8.103** (3.357)	-1.075 (2.723)
Treatment group*Jul. 14	14.09 (64.32)	15.69 (69.20)	12.29 (143.5)	-2.406 (3.059)	0.633 (2.566)
Treatment group*Aug. 14	-76.64 (54.26)	-61.25 (76.34)	-79.34 (155.4)	-3.981 (3.509)	0.936 (2.622)
Treatment group*Sep. 14	-77.02 (51.11)	-84.24 (64.20)	33.84 (121.3)	-4.830 (3.280)	-2.314 (2.714)
Treatment group*Oct. 14	-15.67 (48.64)	-21.67 (69.95)	110.5 (145.9)	-4.197 (3.316)	1.065 (2.304)
Constant	1182*** (15.50)	1016*** (17.26)	1613*** (32.85)	68.27*** (0.753)	60.38*** (0.605)
Observations	3744	3245	3244	3244	3885
R-squared	0.008	0.008	0.004	0.007	0.006
Number of officers	693	662	662	662	709

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

2. The main effects of the training

Considering the panel structure of our data, we define a fixed-effects model as follows:

$$Y_{it} = \alpha + \delta X_{it} + \gamma d_t + \theta T_i p_t + w_i + \varepsilon_{it} \quad (2)$$

With:

- Y_{it} the various outcomes;
- X_{it} time-varying control variables concerning the average characteristics of women's projects in loan officer's monthly portfolio;
- d_t a monthly time dummy from June 2014 to December 2015;
- $T_i p_t$ the interaction term between treatment group and a post-treatment dummy, which is not the same for all treated officers as the four training sessions occurred at different periods;
- w_i the unobserved individual heterogeneity, which contains the belonging to treatment or control group;
- ε_{it} the idiosyncratic error term.

In this model, θ represents the possible effect of the training. First, the model is run without any control variable on the main outcome of interest, that is the average amount granted to female clients, using treated officers and the group of controls in not-treated branches, which appears as the most appropriate control group to highlight a possible treatment effect, as these control officers' behavior could not have been affected by spill-over effects (table 67). All officers are first gathered together (model 1), and then split between male (model 2) and female officers (model 3), and finally between new officers, that is to say officers with less than the average level of experience, which is 2,7 years (model 4) and those who are more experienced (model 5).

In the first three models, the effect of the training is inexistent, however, it appears as strongly positive for less experienced officers (model 4) and surprisingly negative for more experienced ones (model 5). This could indicate that officers who started more recently are less likely to have deeply anchored habits and are more open to awareness raising, whereas the oldest ones are less likely to change their behavior, and could even do the contrary than what was suggested during the training sessions. These explanatory hypotheses are discussed in the next section. Another striking fact is the strong effect of time dummies, which reflects Enda's recent policy consisting in continuously increasing loan amounts⁵⁷. This effect being identified, it will not be displayed any longer in the

⁵⁷ This information was provided by Enda's management staff.

following tables for the sake of concision, except in table 68 which includes controls, to show that this time effect holds in this case as well.

To more deeply analyze the treatment effect, the sample is split again between male and female officers among the new and the experienced ones, and some control variables are added concerning women's projects average characteristics, which are average request for first cycles, average fixed assets, average current assets, average household expenses, average number of projects officially registered, and average number of agricultural projects, since they usually receive lower amounts (table 68).

This addition of controls does not affect the positive effect of the treatment on new officers (model 6), but makes the significance of the negative effect on older ones disappear (model 9). Splitting the samples between men and women reveals that the positive effect among new officers is entirely pulled up by female officers (model 7), whereas the number of male officers in the sample is higher. As a consequence, it seems that only new female officers were affected by the training. Moreover, not only is the positive effect statistically but also economically significant, since an average increase of 210 TND represents 16% of average amounts granted to women.

The same splitting of the sample is applied to analyze the effect of the training on the other outcomes, in particular on the average amount granted to women's first loans (table 69), on the average first amounts requested by female clients (table 70), on the ratio between amounts granted and requested for female clients (table 71), and on the share of female clients in portfolio (table 72).

Table 67. Estimation of the treatment effect on the average amount granted to women (FE)

	Model 1	Model 2	Model 3	Model 4	Model 5
	All officers	Male officers	Female officers	All new officers	All experienced officers
Treatment group* post-treatment	22.47 (29.11)	20.61 (36.87)	40.78 (47.22)	147.5*** (46.46)	-73.17** (36.18)
<i>Ref.: Dec. 15</i>	-	-	-	-	-
Jun. 14	-423.8*** (40.48)	-444.9*** (52.65)	-375.4*** (60.01)	-314.3*** (52.98)	-507.3*** (57.90)
Jul. 14	-317.2*** (40.63)	-325.2*** (48.13)	-294.3*** (75.56)	-244.4*** (66.07)	-375.2*** (51.69)
Aug. 14	-308.5*** (38.36)	-349.1*** (49.99)	-223.8*** (56.70)	-176.4*** (46.88)	-410.5*** (56.73)
Sep. 14	-334.5*** (36.25)	-380.8*** (45.91)	-237.4*** (57.68)	-215.3*** (60.90)	-428.4*** (43.55)
Oct. 14	-358.0*** (34.39)	-393.9*** (42.80)	-282.2*** (57.43)	-240.2*** (48.03)	-452.9*** (47.79)
Nov. 14	-295.0*** (33.97)	-311.2*** (37.14)	-257.7*** (69.57)	-226.9*** (55.51)	-352.1*** (41.86)
Dec. 14	-263.5*** (34.18)	-305.7*** (36.49)	-176.1** (71.09)	-168.0*** (54.83)	-345.2*** (42.19)
Jan. 15	-208.6*** (37.45)	-237.9*** (40.94)	-147.6* (76.13)	-91.63 (57.66)	-312.2*** (47.24)
Feb. 15	-200.6*** (29.34)	-224.4*** (36.90)	-153.1*** (48.68)	-130.7*** (43.21)	-266.8*** (39.09)
Mar. 15	-174.7*** (29.85)	-176.9*** (35.54)	-168.8*** (54.57)	-161.7*** (38.24)	-189.9*** (45.41)
Apr. 15	-183.8*** (29.71)	-216.2*** (34.32)	-121.3** (55.79)	-154.2*** (41.12)	-214.4*** (43.11)
May 15	-170.0*** (33.69)	-202.8*** (42.03)	-105.4* (55.94)	-161.2*** (40.17)	-182.2*** (53.07)
Jun. 15	-182.9*** (28.89)	-161.7*** (34.91)	-225.3*** (51.45)	-166.0*** (38.91)	-198.0*** (42.51)
Jul. 15	-17.29 (31.66)	-36.69 (36.64)	19.59 (60.26)	-31.83 (43.07)	-5.349 (46.27)
Aug. 15	-36.50 (32.07)	-43.32 (39.44)	-23.72 (55.50)	-22.90 (42.84)	-50.05 (47.54)
Sep. 15	-19.27 (32.25)	-26.49 (37.79)	-5.773 (60.39)	25.52 (44.67)	-61.69 (46.27)
Oct. 15	58.23 (35.51)	93.91** (47.62)	-11.07 (48.69)	72.17 (53.28)	44.32 (47.77)
Nov. 15	-26.18 (28.99)	-11.89 (37.77)	-54.41 (44.03)	-38.62 (35.20)	-15.16 (45.61)
Constant	1457*** (23.00)	1516*** (26.76)	1337*** (43.29)	1318*** (32.00)	1577*** (32.56)
Observations	5409	3555	1854	2521	2888
R-squared	0.099	0.119	0.072	0.076	0.132
Number of officers	326	207	119	158	168

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 68. Estimation of the treatment effect on the average amount granted to women (FE with controls)

	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	73.14* (37.36)	210.2*** (66.12)	2.535 (44.36)	-31.23 (35.40)	-57.50 (42.99)	-8.045 (49.64)
Average amounts requested by women (cycle 1)	0.152*** (0.0184)	0.187*** (0.0256)	0.125*** (0.0238)	0.0693 (0.0446)	0.124*** (0.0213)	0.0567 (0.0465)
Average fixed assets values of women's projects	0.00804*** (0.00129)	0.00499** (0.00210)	0.0100*** (0.00138)	0.00683*** (0.00209)	0.0101*** (0.00248)	0.00641*** (0.00225)
Average current assets values of women's projects	0.00515 (0.00598)	0.0184*** (0.00619)	-0.00219 (0.00875)	-0.00261 (0.00552)	-0.00245 (0.00917)	-0.00169 (0.00675)
Average household's expenses for women's projects	-0.0801* (0.0459)	-0.0480 (0.103)	-0.114** (0.0455)	-0.0775 (0.0531)	-0.0445 (0.0693)	-0.0882 (0.0735)
Average number of women's projects officially registered	43.51*** (6.676)	40.18*** (12.50)	43.89*** (8.015)	65.06*** (8.100)	62.30*** (10.63)	62.35*** (9.302)
Average number of agricultural women's projects	-4.994* (2.786)	-6.208 (6.712)	-5.523* (3.035)	-8.998*** (2.413)	-4.777 (4.503)	-10.23*** (2.629)
<i>Ref: Dec. 15</i>	-	-	-	-	-	-
Jun. 14	-332.8*** (36.65)	-261.2*** (47.62)	-347.8*** (51.13)	-407.3*** (48.23)	-437.4*** (59.51)	-380.5*** (61.86)
Jul. 14	-260.2*** (41.18)	-203.7*** (73.18)	-272.0*** (49.14)	-347.5*** (39.06)	-364.3*** (57.00)	-337.1*** (51.52)
Aug. 14	-169.4*** (40.03)	34.18 (61.53)	-266.6*** (49.63)	-323.1*** (40.79)	-326.2*** (64.86)	-321.1*** (53.87)
Sep. 14	-228.8*** (46.70)	-1.447 (107.4)	-314.0*** (49.69)	-360.3*** (38.43)	-360.1*** (47.53)	-363.8*** (53.17)
Oct. 14	-218.2*** (38.57)	-123.2** (60.40)	-263.3*** (49.40)	-340.9*** (41.70)	-350.9*** (71.81)	-331.0*** (49.86)
Nov. 14	-235.9*** (33.67)	-115.5** (51.89)	-293.1*** (43.83)	-312.5*** (38.99)	-408.3*** (58.58)	-265.7*** (52.76)
Dec. 14	-200.5*** (31.99)	-75.30 (63.17)	-260.5*** (38.34)	-308.6*** (36.93)	-294.4*** (59.86)	-312.6*** (46.17)
Jan. 15	-135.9*** (35.18)	-41.61 (65.08)	-174.5*** (43.90)	-225.0*** (41.41)	-309.0*** (75.49)	-182.4*** (48.49)
Feb. 15	-102.6*** (33.79)	-21.53 (60.82)	-134.0*** (40.33)	-187.7*** (36.16)	-230.9*** (60.68)	-169.9*** (46.44)
Mar.15	-138.0*** (32.11)	-84.54 (52.80)	-156.1*** (40.65)	-201.6*** (40.32)	-215.4*** (50.14)	-180.9*** (51.71)
Apr. 15	-127.9*** (32.52)	-82.52 (51.28)	-143.9*** (39.90)	-167.6*** (36.22)	-175.6*** (64.28)	-168.8*** (45.30)
May. 15	-151.9*** (32.95)	-59.86 (61.51)	-190.7*** (38.44)	-142.5*** (36.74)	-189.5*** (63.11)	-123.0*** (45.41)
Jun. 15	-152.1*** (33.39)	-141.8*** (50.78)	-143.7*** (43.04)	-162.0*** (34.38)	-157.0** (59.56)	-157.2*** (42.05)
Jul. 15	-19.19 (38.33)	3.233 (70.52)	-20.69 (43.94)	-66.41* (39.70)	-89.04 (71.80)	-58.12 (50.26)
Aug. 15	-25.73 (37.24)	55.32 (68.36)	-56.36 (46.41)	-57.35 (41.25)	-132.3** (60.02)	-8.451 (53.22)

Sept. 15	21.70 (40.65)	66.17 (62.63)	4.821 (49.66)	-109.6*** (41.58)	-160.9** (62.35)	-77.82 (53.70)
Oct. 15	55.05 (40.57)	99.79 (65.58)	35.57 (51.50)	-21.95 (35.60)	-104.9* (53.90)	22.61 (45.82)
Nov. 15	-16.26 (30.92)	8.852 (55.89)	-20.47 (39.03)	-39.65 (35.04)	-32.96 (61.91)	-39.46 (42.89)
Constant	998.2*** (48.96)	781.7*** (75.98)	1121*** (65.04)	1274*** (85.65)	1148*** (59.05)	1305*** (97.55)
Time dummies included	yes	yes	yes	yes	yes	yes
Observations	2209	741	1468	2523	867	1656
R-squared	0.337	0.371	0.353	0.275	0.343	0.265
Number of officers	156	57	99	166	59	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 69. Estimation of the treatment effect on the average amount granted to women's first loans (FE)

	Model 12	Model 13	Model 14	Model 15	Model 16	Model 17
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	63.03 (38.44)	183.0** (71.55)	-7.048 (40.54)	-30.47 (32.45)	-48.68 (48.43)	-0.650 (41.29)
Average amount requested by women (cycle 1)	0.342*** (0.0250)	0.401*** (0.0377)	0.298*** (0.0284)	0.140 (0.0859)	0.303*** (0.0401)	0.110 (0.0800)
Average fixed assets values for women's projects (cycle 1)	0.00349*** (0.000714)	0.00286* (0.00143)	0.00414*** (0.000871)	0.00540*** (0.00183)	0.00707** (0.00280)	0.00507** (0.00214)
Average current assets values for women's projects (cycle 1)	0.0416*** (0.00660)	0.0528*** (0.00731)	0.0338*** (0.00703)	0.0492*** (0.00934)	0.0350** (0.0153)	0.0508*** (0.00886)
Average household's expenses for women's projects (cycle 1)	0.244*** (0.0802)	0.350*** (0.0887)	0.130** (0.0591)	0.341*** (0.0787)	0.299*** (0.103)	0.321*** (0.0813)
Average number of women's projects officially registered (cycle 1)	8.694 (8.730)	5.262 (13.18)	7.845 (10.95)	3.990 (11.44)	-8.051 (16.50)	20.22 (14.89)
Average number of agricultural women's projects	-4.042* (2.172)	-5.886 (6.814)	-4.395* (2.268)	-6.578*** (2.448)	-3.101 (3.801)	-7.239** (2.817)
Constant	245.3*** (65.07)	12.21 (86.38)	423.6*** (59.06)	542.6*** (105.0)	333.7*** (81.51)	584.0*** (110.4)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2196	739	1457	2498	859	1639
R-squared	0.627	0.717	0.580	0.414	0.548	0.394
Number of officers	156	57	99	166	59	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 70. Estimation of the treatment effect on the average first amount requested by women (FE)

	Model 18	Model 19	Model 20	Model 21	Model 22	Model 23
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	30.94 (87.03)	21.13 (161.1)	57.11 (104.8)	-91.45 (68.91)	-234.3** (109.3)	3.246 (86.56)
Constant	1523*** (75.77)	1557*** (181.4)	1500*** (63.78)	1711*** (62.12)	1684*** (108.0)	1723*** (75.85)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2220	742	1478	2626	871	1755
R-squared	0.014	0.027	0.019	0.015	0.037	0.020
Number of officers	156	57	99	167	60	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 71. Estimation of the treatment effect on the average ratio granted/requested amount for women (FE)

	Model 24	Model 25	Model 26	Model 27	Model 28	Model 29
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	5.552** (2.493)	11.47** (4.665)	2.249 (2.752)	0.578 (2.511)	2.460 (5.522)	-0.00930 (2.847)
Constant	71.62*** (1.818)	66.51*** (3.034)	74.23*** (2.242)	77.33*** (1.817)	73.99*** (3.792)	78.81*** (2.052)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2220	742	1478	2626	871	1755
R-squared	0.019	0.064	0.025	0.017	0.025	0.023
Number of officers	156	57	99	167	60	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 72. Estimation of the treatment effect on the share of women in portfolio (FE)

	Model 30	Model 31	Model 32	Model 33	Model 34	Model 35
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	-1.643 (1.295)	1.226 (2.577)	-3.484** (1.367)	-0.152 (1.304)	0.298 (2.121)	-0.231 (1.717)
Constant	55.13*** (1.031)	53.79*** (1.901)	55.88*** (1.227)	57.86*** (1.209)	59.75*** (1.916)	56.84*** (1.549)
Time dummies included	yes	yes	yes	yes	yes	yes
Observations	2580	899	1681	2940	1001	1939
R-squared	0.010	0.025	0.015	0.011	0.025	0.012
Number of officers	159	58	101	170	61	109

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Regarding the average amount granted to women's first loans, the effect of the training on new female officers is still significant and positive, even when controlling for several financial characteristics of projects or households, which all logically have a positive effect on the amount granted. The average increase after the treatment is of 183 TND, which represents 17% of average amounts granted to women for their first loans. Looking at the effect on the average amount requested by female clients is interesting: indeed, we could imagine that the training effect on the amounts granted could come from the officers' portfolio composition, and more precisely from a change in the portfolio composition after the training. As officers usually solicit possible future clients as much as they wait for spontaneous requests, they have the possibility to solicit another type of clients after the training, and the average amount requested is commonly considered as an indicator of clients' poverty and/or level of ambition. As a consequence, since the training conveyed the message that women were more vulnerable and needed more support to become economically autonomous, some officers may have felt encouraged to solicit poorer potential female clients. The results in table 70 seem to support this idea: whereas the training effect on the average amount requested by women appears as inexistent on new officers, whether female or male, it is negative and significant in both statistical and economic terms for experienced female officers (model 22), with an average decrease of 214 TND, which represents 13% of average amounts requested by women. As a consequence, these experienced female officers apparently tended to solicit poorer women as new clients after the training.

Another result in keeping with this idea concerns the estimation of the average ratio between amounts granted and requested for female clients' first loans: the results are presented in table 71 and show that there is no significant effect for these more experienced female officers. As a consequence, if experienced female officers tended to select another kind of female clients after the training, they did not change their way of treating requests. On the contrary, the training effect on this ratio is positive and significant in both statistical and economic terms for new female officers: as a consequence, the way this group of officers reacted to the training is different from the more experienced one, as the change in this case actually concerned the amounts granted, both in level and in ratio.

Finally, looking at the share of women in portfolio (table 72), the training effect seems inexistent, except for new male officers, for whom the share decreased after the training (minus 3 percentage points for an average share of 58%). Even though the magnitude of the coefficient is not high, it is still significant, while the average share of women in portfolio over the six months before the first training session was not significantly different between male and female new officers from

the treatment group⁵⁸. This result might be interpreted as a preference to avoid complications by soliciting more male clients after the training for this group of new male officers, but this can only remain a supposition.

Nonetheless, checking if the training also had some effects on male clients is possible. To do so, the same models were run on the same outcomes for male clients, and main results are presented from table 73 to 76. Interestingly, new female officers also seem to grant higher amounts to male clients after the training, both for all loans gathered together and first loans, but the coefficients are less statistically significant even though they remain high, so is the one of the effect on the ratio between amounts granted and requested for first loans, which is also positive. This result could imply that this group of officers did not want to disadvantage male clients while they were favoring women, even though the effect on men is less striking. This could also reflect a gain in self-confidence and/or in ambition for these new female officers after the training, which would have been beneficial for all clients, either male or female. This is discussed in the next section. Another striking effect concerns the group of more experienced female officers, who grant lower amounts to men, all credits gathered together, and more experienced male officers, who grant lower first amounts in terms of ratio. These results qualify the previous ones which tended to imply that the group of more experienced officers, and especially men, had not been affected by the training: actually, if the expected direct effect on amounts granted to women is not observed, it seems that the training has had more indirect effects instead, as more experienced female officers tend to select different female clients and grant lower amounts to men, and as experienced male officers decrease the ratio between amounts granted and requested for men's first loans.

⁵⁸ A t-test was conducted to check the significance of the difference.

Table 73. Estimation of the treatment effect on the average amount granted to men (FE with controls)

	Model 36	Model 37	Model 38	Model 39	Model 40	Model 41
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	-3.730 (55.13)	148.0* (79.13)	-75.90 (75.70)	-44.95 (54.27)	-131.0** (50.54)	20.99 (79.17)
Average amount requested by men (cycle 1)	0.172*** (0.0276)	0.236*** (0.0240)	0.137*** (0.0307)	0.0158 (0.0122)	0.135** (0.0569)	0.0110 (0.00918)
Average fixed assets values of men's projects	0.0104*** (0.00120)	0.00813*** (0.00172)	0.0122*** (0.00120)	0.00820*** (0.00134)	0.00916** (0.00361)	0.00788*** (0.00137)
Average current assets values of men's projects	-0.000212 (0.00357)	-0.00651 (0.00542)	0.00341 (0.00465)	0.00416 (0.00390)	0.0133* (0.00723)	0.000627 (0.00445)
Average household's expenses of men's projects	0.0182 (0.0368)	0.0878** (0.0409)	-0.0885** (0.0376)	0.0278 (0.0698)	-0.0886 (0.0914)	0.0910 (0.0879)
Average number of men's projects officially registered	35.51*** (6.381)	43.98*** (8.667)	29.24*** (8.403)	63.68*** (7.548)	56.32*** (13.02)	60.38*** (9.008)
Average number of agricultural projects	-7.262* (3.829)	-13.70** (5.378)	-6.656 (4.296)	-11.17*** (3.896)	-12.38 (8.472)	-9.028** (4.020)
Constant	1203*** (79.75)	973.6*** (100.1)	1360*** (91.00)	1627*** (70.74)	1430*** (177.3)	1596*** (83.37)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2188	750	1438	2417	807	1610
R-squared	0.365	0.406	0.375	0.249	0.304	0.269
Number of officers	157	58	99	166	59	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 74. Estimation of the treatment effect on the average granted amount to men's first loans (FE)

	Model 42	Model 43	Model 44	Model 45	Model 46	Model 47
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	70.15 (68.90)	270.4** (113.3)	-31.87 (86.60)	-37.21 (59.16)	-78.90 (67.37)	8.998 (81.94)
Average requested amount by men (cycle 1)	0.287*** (0.0482)	0.377*** (0.0337)	0.247*** (0.0569)	0.0328 (0.0214)	0.294*** (0.0608)	0.0239 (0.0153)
Average fixed assets values for men's projects (cycle 1)	0.00626*** (0.000850)	0.00618*** (0.00157)	0.00645*** (0.001000)	0.00626*** (0.00134)	0.00502*** (0.00177)	0.00608*** (0.00147)
Average current assets values for men's projects (cycle 1)	0.0360*** (0.00571)	0.0363*** (0.00951)	0.0328*** (0.00661)	0.0438*** (0.00390)	0.0409*** (0.00986)	0.0401*** (0.00445)
Average household's expenses for men's projects (cycle 1)	0.267*** (0.0559)	0.316*** (0.0711)	0.221*** (0.0637)	0.310*** (0.0969)	0.0369 (0.134)	0.309** (0.129)
Average number of men's projects officially registered (cycle 1)	-14.04 (10.29)	-24.63 (21.85)	-11.21 (9.806)	21.19** (10.00)	1.155 (13.24)	30.70** (12.81)
Number of agricultural projects	-5.339* (3.128)	-12.08* (7.201)	-4.754 (3.235)	-13.30*** (4.800)	-13.33** (5.825)	-12.07** (5.732)
Constant	443.7*** (104.5)	192.2* (104.1)	593.0*** (128.4)	1123*** (97.03)	724.5*** (189.2)	1151*** (124.9)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2164	742	1422	2373	800	1573
R-squared	0.529	0.602	0.507	0.285	0.490	0.283
Number of officers	157	58	99	165	58	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 75. Estimation of the treatment effect on the average first requested amount by men (FE)

	Model 49	Model 50	Model 51	Model 52	Model 53	Model 54
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	61.9 (102.8)	-8.694 (150.7)	96.71 (145.1)	125.8 (172.8)	-161.4 (178.8)	270.6 (255.6)
Constant	2287*** (82.76)	2234*** (145.7)	2326*** (101.7)	2511*** (124)	2653*** (205)	2451*** (155.8)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2192	750	1442	2495	811	1684
R-squared	0.017	0.031	0.023	0.008	0.034	0.01
Number of officers	157	58	99	166	59	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 76. Estimation of the treatment effect on the average ratio granted/requested amount for men (FE)

	Model 55	Model 56	Model 57	Model 58	Model 59	Model 60
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	4.002 (4.503)	12.90* (7.612)	0.171 (5.908)	-6.644*** (2.482)	-4.848 (3.95)	-7.661** (3.225)
Constant	68.90*** (2.89)	66.80*** (7.036)	69.50*** (2.537)	75.86*** (1.916)	72.97*** (3.38)	77.24*** (2.352)
Time dummies included	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2192	750	1442	2495	811	1684
R-squared	0.01	0.024	0.02	0.02	0.053	0.022
Number of officers	157	58	99	166	59	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Looking at the reports of the training sessions is enlightening about these results: indeed, during the last workshop, officers had to enumerate the gender inequalities among Enda's clients they became aware of, and to make suggestions of actions to improve the situation. The suggestion "implement fairer procedures" or "apply the procedures more fairly" was quoted several times, and referred sometimes to "collateral", "amounts", "repayment schedules", "required assets value" or even "reception conditions at the branch"⁵⁹. Especially, officers did not only mention the necessity of more equal treatment, but also of "fairer" treatment, meaning that the existing gender inequalities between men and women in the Tunisian society should be taken into account and the procedures be "more flexible for women". Given these remarks and suggestions, it is less surprising that the training had various kinds of effects, including negative effects on men: these negative effects could also be interpreted as a way for officers to apply procedures more fairly, by decreasing the existing gap between amounts granted. However, the effects are observed at the portfolio level only, which contains aggregated and average values, and detailed analysis at the client level would probably be more accurate, especially regarding the analysis of fairness. Indeed, arbitrarily decreasing amounts granted to men without objective justification based on project characteristics would not be fair either. As a consequence, these effects constitute a first step, but as many trained officers suggested it themselves, changing the official procedures and implementing new rules could help officers making objectively fairer decisions.

⁵⁹ The quotations come from the reports written by the training teams after each training session.

3. The effects over time

The next question arising is about the duration of the effect. Indeed, one of the doubts expressed by many persons within Enda, from the management staff to the training team, even including some participants to the training who mentioned this concern both at the beginning and at the end of the sessions, concerns the one-shot format of the training. Several people were afraid that such training might not have any effect without being repeated again and again, since raising awareness about gender inequalities and changing representations and behaviors usually take a long time.

Therefore, checking if the observed effects persist over time seems necessary. To do that, we estimate only the previous models where the strongest effects have been observed and include an interaction term between the treated group after the training and the post-treatment duration in months. The date delimitating pre- and post-treatment periods for control officers is the month when the training session was carried out for the treated officers working in the same branch, since the four training sessions were organized so that they were dedicated to specific groups of branches. The main results are presented in table 157.

Overall, the training effects do not seem to change over time in either direction and seems constant. This is surprising, as we could have expected a decreasing effect over time; nonetheless, in order to ensure an efficient training in the long term, a different format with several sessions for a same group spread over a longer period still remains preferable. This was even a recommendation made by some participants at the end of the training, when they filled the evaluation sheet.

This evaluation sheet also contained questions about officers' satisfaction level and how much they would recommend the training to their colleagues. Six of them did not give the evaluation sheet back, resulting in a participation rate of 93%. An overall grade expressed in percentages was created from these two questions (since Cronbach's $\alpha > 0,7$), and is distributed as shown in table 78.

Table 77. Treatment effects over time

	Model 61	Model 62	Model 63	Model 64	Model 65	Model 66	Model 67
Outcome	Average granted amount to women	Average granted amount to women's first loans	Average requested amount by women	Average ratio granted/requested amount to women's first loans	Share of women in portfolio	Average granted amount to men	Average ratio granted/requested amount for men's first loans
Sample	New female officers	New female officers	Experienced female officers	New female officers	New male officers	Experienced female officers	Experienced male officers
Treatment group* post-treatment	260.0** (116.8)	219.6** (97.47)	-150.7 (139.2)	13.24** (5.511)	-2.253 (1.878)	-115.7 (98.99)	-10.79*** (3.431)
Post-treatment duration (in months)	20.40** (8.232)	15.63*** (4.880)	32.45*** (10.61)	0.673** (0.330)	0.0665 (0.227)	47.74*** (6.687)	1.286*** (0.355)
Treatment group* post-treatment duration (in months)	1.110 (14.05)	-3.500 (11.50)	-6.651 (20.47)	-0.199 (0.527)	-0.281 (0.278)	10.52 (13.52)	0.794 (0.519)
Constant	853.4*** (80.24)	-163.3** (80.37)	1309*** (68.69)	59.16*** (2.479)	56.11*** (1.961)	1270*** (93.30)	63.32*** (2.537)
All relevant controls included	yes	yes	yes	yes	yes	yes	yes
Time dummies included	yes	yes	yes	yes	yes	yes	yes
Observations	850	739	872	742	1681	902	1684
R-squared	0.132	0.717	0.036	0.065	0.015	0.209	0.025
Number of officers	58	57	60	57	101	60	107

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 78. Overall evaluation grade of the training given by officers, by sex and experience

	Men	Women	Total
Experienced (+2,7 years)	81,3% (0,13) 23	84,0% (0,15) 20	82,6% (0,14) 43
New (- 2,7 years)	86,0% (0,13) 20	90,8% (0,10) 13	87,9% (0,12) 33
Total	83,5% (0,13) 43	86,7% (0,14) 33	84,9% (0,13) 76

Standard deviations in parentheses

N observations

On the whole, women gave a higher evaluation grade than men, so did new officers compared to more experienced ones; the first difference is not statistically significant, most probably because of the low number of observations, but the second one is at 10%. In particular, new female officers gave the highest grades on average, whereas more experienced male officers gave the lowest ones. More experienced female officers also gave lower grades on average than new male officers. Therefore, it is not surprising to observe more significant, positive and direct effects of the training on new female officers in particular, and more unclear ones among the other groups: higher evaluation grades show that the training was more favorably received by new female officers and consequently, they were more likely to turn their satisfaction into concrete and direct actions.

Another recommendation made by some officers in this sheet was to train all their other colleagues. Even if it was not planned in this experimental phase, training everyone on gender issues was Enda's objective. However, meanwhile some spill-over effects might have emerged.

4. Spill-over effects

Whereas only a sample of officers was trained during the experimental phase, Enda's management staff communicated about the project which was funding these first four training sessions, with a launching event in October 2014 at headquarters as well as flyers and posters to hang in branches. As a consequence, other officers were aware of the existence of this training, and it is likely that those working in the same branches as the treated ones talked about the training with the participants after the session. Therefore, including this group of control officers working in treated branches in the analysis could be informative about possible spill-over effects.

To do so, we run the same models as before, this time including this third group of officers and distinguishing it from the group of controls in not-treated branches. The main results are presented in the following tables, without displaying time dummies and control variables which remain the same as previously.

Table 79. Spill-over effects on control officers in treated branches: average amount granted to women

	Model 68	Model 69	Model 70	Model 71	Model 72	Model 73
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
<i>Ref: Controls in control branches</i>	-	-	-	-	-	-
Controls in treated branches* post-treatment	-3.044 (18.51)	55.11* (31.74)	-30.11 (23.19)	-56.68*** (20.18)	-95.22*** (31.69)	-34.10 (25.23)
Treated group* post-treatment	73.29** (32.36)	152.4** (60.52)	22.98 (36.49)	-41.85 (34.66)	-86.13* (43.63)	-16.19 (49.37)
Constant	964.1*** (33.15)	817.6*** (56.26)	1047*** (41.32)	1378*** (42.17)	1360*** (47.27)	1358*** (58.28)
All relevant controls included	yes	yes	yes	yes	yes	yes
Time dummies included	yes	yes	yes	yes	yes	yes
Observations	5438	1840	3598	5097	1846	3251
R-squared	0.342	0.329	0.358	0.229	0.279	0.230
Number of officers	390	140	250	350	128	222

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 80. Spill-over effects on control officers in treated branches: average amount granted to women's first loans

	Model 74	Model 75	Model 76	Model 77	Model 78	Model 79
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
<i>Ref: Controls in control branches</i>	-	-	-	-	-	-
Controls in treated branches* post-treatment	6.103 (17.34)	35.43 (28.98)	-10.67 (20.89)	-35.43 (25.72)	-84.37* (45.46)	-5.317 (29.82)
Treated group* post-treatment	52.47 (38.74)	157.8** (65.79)	-17.59 (41.93)	-46.88 (31.66)	-70.79 (46.79)	-5.975 (40.87)
Constant	240.5*** (46.08)	98.86 (69.31)	332.6*** (49.18)	585.5*** (61.97)	462.2*** (82.11)	609.9*** (71.53)
All relevant controls included	yes	yes	yes	yes	yes	yes
Time dummies included	yes	yes	yes	yes	yes	yes
Observations	5418	1836	3582	5046	1826	3220
R-squared	0.611	0.632	0.606	0.378	0.513	0.357
Number of officers	390	140	250	350	128	222

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 81. Spill-over effects on control officers in treated branches: average amount requested by women

	Model 80	Model 81	Model 82	Model 83	Model 84	Model 85
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
<i>Ref: Controls in control branches</i>	-	-	-	-	-	-
Controls in treated branches* post-treatment	-67.90 (54.77)	-125.4 (94.58)	-38.71 (67.25)	8.023 (85.31)	93.55 (155.5)	-48.41 (96.15)
Treated group* post-treatment	54.44 (79.01)	-53.67 (131.4)	132.9 (95.78)	-40.93 (70.67)	-163.7 (122.8)	47.74 (83.27)
Constant	1513*** (54.23)	1530*** (104.8)	1503*** (61.62)	1714*** (91.80)	1536*** (210.5)	1808*** (84.34)
Time dummies included	yes	yes	yes	yes	yes	yes
Observations	5453	1843	3610	5378	1873	3505
R-squared	0.007	0.018	0.008	0.005	0.012	0.007
Number of officers	390	140	250	351	127	224

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 82. Spill-over effects on control officers in treated branches: average ratio granted/requested amount to women

	Model 86	Model 87	Model 88	Model 89	Model 90	Model 91
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
<i>Ref: Controls in control branches</i>	-	-	-	-	-	-
Controls in treated branches* post-treatment	0.139 (1.517)	0.702 (3.326)	-0.309 (1.651)	1.556 (1.746)	0.476 (2.671)	2.189 (2.270)
Treated group* post-treatment	5.034** (2.480)	9.949** (4.428)	1.862 (2.804)	0.562 (2.401)	1.037 (4.655)	0.307 (2.775)
Constant	74.84*** (1.367)	71.05*** (2.356)	76.94*** (1.692)	77.73*** (1.831)	76.99*** (2.901)	78.10*** (2.341)
Time dummies included	yes	yes	yes	yes	yes	yes
Observations	5453	1843	3610	5378	1873	3505
R-squared	0.013	0.025	0.019	0.011	0.017	0.011
Number of officers	390	140	250	351	127	224

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 83. Spill-over effects on control officers in treated branches: share of women in portfolio

	Model 92	Model 93	Model 94	Model 95	Model 96	Model 97
	All new officers	New female officers	New male officers	All experienced officers	Experienced female officers	Experienced male officers
<i>Ref: Controls in control branches</i>	-	-	-	-	-	-
Controls in treated branches* post-treatment	-1.308 (0.997)	-1.215 (1.974)	-1.332 (1.126)	-0.220 (0.903)	1.445 (1.507)	-1.116 (1.146)
Treated group* post-treatment	-1.633 (1.190)	1.331 (2.124)	-3.588*** (1.279)	0.277 (1.266)	0.540 (1.924)	0.246 (1.712)
Constant	59.64*** (0.932)	60.45*** (1.697)	59.20*** (1.098)	56.66*** (0.952)	58.89*** (1.593)	55.38*** (1.193)
Time dummies included	yes	yes	yes	yes	yes	yes
Observations	6436	2229	4207	6229	2230	3999
R-squared	0.007	0.018	0.011	0.008	0.012	0.009
Number of officers	393	142	251	355	129	226

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

One of the few spill-over effects which appears as significant concerns new female officers, who tend to behave as their trained counterparts after the training, by granting higher amounts to women when considering all credits (model 69, table 79), even though the effect is less significant both statistically and economically. This may constitute the kind of spill-over effect we might expect from such a training, but it remains modest.

By contrast, the other spill-over effect which appears as significant concerns the experienced female officers and goes against expectations: indeed, the training seems to have had a negative effect on the average amount granted to women, whether considering all credits (model 72, table 79) or only first ones (model 78, table 80). Given that the reference group consists of control officers in control branches, control officers in treated branches may have felt more frustrated than the reference group of not being nominated to take part into the training, which may have led to the opposite of the intended effect.

However, if no effect can be observed on the average amount requested by women this time, there is no effect either on the ratio between amounts granted and requested. As a consequence, it is also possible that this negative effect on amounts granted actually reflects a change in portfolio composition, since women requesting their first loans after the training do not seem more rationed relatively to their requests than the ones who did it before the training. In other words, experienced female officers do not seem to be more severe with new female clients after the training. As a consequence, even though we control for average financial characteristics of women's projects, some other indicators such as the activity sector or collateral are not included, and could explain the lower amounts granted but similar amounts requested and ratios at the same time.

Apart from that, no other spill-over effect may be observed, especially no other positive one: as a consequence, training the whole staff seems indeed necessary in order to maximize the outreach of the training.

VI. DISCUSSION

The main striking result of this analysis is the heterogeneity of effects depending on officers' profiles. In particular, more effects were observed on female officers (especially new ones) than on males, which implies that female officers were either more receptive to the contents of the training, or more likely to put suggestions into actions, or to get rid of prescriptive behaviors resulting from gender norms, or a bit of everything at the same time. Additionally, not only did new female officers grant higher amounts to women after the training, but they also tended to do so with male clients. This positive effect may therefore reflect an overall gain in self-confidence: indeed, one of these new female officers I discussed with two years after the training explained that this training helped her become more open, assert her positions and take more initiatives. She added that the training also helped her better assess application files, and encouraged her to support rural women. Her opinion may not reflect the one of her colleagues but may help understand the positive effect observed on both female and male clients.

The gender differences observed in the effects on officers show that working on gender inequalities with vulnerable women is not trivial for women development workers, as Goetz (2001) name them in her eponymous book. In this book, Goetz studies female development agents in microfinance programs and shows that these women are often more responsive and sensitive to the social and economic constraints faced by their female beneficiaries. However, she also argues that gender biases exist in structures and cultures of development organizations, which restrains and affects female agents' actions. Therefore, the lighter effects observed on more experienced female officers in this study might be accounted for by the longer time they spent inside the organization, resulting in deeper impregnation of such biased systems. Indeed, one of the experimented female officers who participated to the training confessed to me that this training was carried out too late: she had been already working for Enda for 6 years at that moment, and she already had her working habits. Indeed, she explained that dealing with female clients is different from dealing with male clients, with whom it remains more complicated to discuss; as a consequence, it had already taken her some time to adapt her way of working, and when the training was organized, changing her habits would have been too difficult.

In contrast, another experienced female officer shared her enthusiasm about the training when I discussed with her two years later: she affirmed that it incited her to especially encourage more vulnerable and rural women to develop their projects. Indeed, she explained that working with urban women is different from working with rural ones: whereas urban women have stronger personalities, rural women face more difficulties, are less educated, and need more support even though they have great willpower. As a consequence, she focused on this kind of clients after the training, which may contribute to explain the negative effect observed on amounts requested by women in portfolios of more experienced female officers.

Finally, discussing with a third experienced female officer illustrated that reactions may be very heterogeneous: the latter simply told me that she did not like the training, which was too theoretical and not directly linked with daily work enough. She explained that she forgot everything, and expressed her frustration of not having followed other more concrete trainings on other topics since then. She added that most trainings are dedicated to newly recruited officers whereas she would need some as well. This officer appeared as dissatisfied with some features of internal organization, and during the interview, another field staff member added that high positions within Enda were mainly occupied by men. Such frustration may have been a source of resistance and explain the weak effects observed on this category of officers. Nevertheless, Enda applies a gender equality policy in terms of human resources, resulting in a high number of women in her staff, both at headquarters, with a female chief executive officer and several female heads of services, and in the field, with 49,8% of women among the field staff in January 2015. However, looking at the specific positions in the field, the share falls down to 34% for credit officers, 38% for supervisors or deputy supervisors, and 29% for regional coordinators, which is the highest field position. Conversely, 86% of cashiers are women, as well 100% of administrative assistants and reception officers. So many female employees in a country characterized by very low female labor force participation is good news, however, maybe it could be possible to do more to promote gender equality especially in field positions. The last activity report highlights the fact that as many women as men were promoted at a higher position in 2015, which reflects the recent strengthening of the gender equality policy in human resources.

In her above-mentioned book, Goetz also states that resistance, misunderstanding or lack of commitment are likely to appear in field work; resistance takes the form of verbal abuse against women workers from their male colleagues or from villagers, especially when these women attempt to exercise authority or simply because their position is uncommon for women and seen as a gender role violation. Other studies also point out backlash and resistance to change in gender norms: Silberschmidt (2001) focuses on the disempowerment perceived by men in East Africa after changes in gender relations driven by economic change, thanks to government action to promote gender

equality. These changes provoke backlash among those men, taking the form of physical violence or aggressive sexual behavior against women. In the same way, Chant (2002) examines reactions in Costa Rica after changes in gender relations due to economic change and equal rights legislation: he also reports a feeling of disempowerment among men, but shows that resistance to change in gender norms is more pronounced among older and low-income men than younger generations. The fact that the effects of the training are almost non-existent among male officers could be explained by such resistance.

Indeed, the way officers consider and react to the historic evolution of gender norms and social change in general in Tunisia was illustrated during the training sessions. During the plenary session of the exercise “Life stories” of the second training session, officers debated and some of them complained about this historic evolution. For instance, a group of male officers mentioned the fact that today, women are more demanding to marry, ask for more comfort and resources compared to the generation of their fathers and grandfathers, which postpones marriage age for men. Some other male officers wondered if men were weakened today, if they stopped being the heads of households, making the decisions, protecting, choosing their daughters’ husbands, etc. They expressed a “loss feeling”, and some wish they had kept more power, while acknowledging that more power for their wives is undeniable progress. Some others doubt that gender equality might be desirable; they see that money gives power to women, so do education and family planning, and women are more likely to ask for divorce today than in the past, which seems to frightens them. By contrast, other officers reminded that gender equality is still far from being fully achieved, as today in some regions, a woman eating a sandwich in the street still gives a bad image of herself. Some female officers also mentioned that some men still talk about their wives as goods, furniture, object belonging to them, and not as persons who make their own decisions for their lives.

During the same exercise of the fourth training session, a male officer told a short story about a man in a village who asked authorities to build a road and a school when Tunisia was still under French protectorate so that children get education. People from the village were furious and criticized him for wanting foreigners to see and maybe touch their daughters. However, authorities built the road and the school, and eventually, even the angry men sent their boys and girls to school. The group of participants reacted to the story by concluding that social change always starts with fights and sacrifices, sometimes provoked by anonymous and insignificant people: sometimes, evolution comes from the average man in the street, and evolution may not be a choice but a necessity.

Therefore, training sessions were very telling moments with regard to the heterogeneity of opinions and reactions towards the historic evolution of gender norms: some male officers indeed appeared as resistant, but some others did not. Discussing with some male officers two years after the training also confirmed this diversity: one of the young but experienced ones stated that he enjoyed the training, and that he especially reminded the movie about rural women's working conditions. He explained that the training made him aware of women's conditions and of some gender inequalities especially regarding work and household responsibilities, which led him to assess male and female clients' files another way: he may have become more severe with men after the training. Another experienced male officer also said that he had been satisfied with the training but that he had not learnt anything new, as he was already aware of gender inequalities.

As a consequence, the lighter effects on male officers may be explained by the heterogeneity of opinions and reactions, and perhaps more effects might be observed if more officers were trained.

VII. CONCLUSION

Given the existing gender inequalities in the Tunisian society and especially among its clients, the microfinance institution Enda decided to implement a project consisting in funding the conception and the experimentation of a training dedicated to its staff on gender issues. This experimental phase included four first training sessions dedicated to a sample of the field staff that has been evaluated. The main target group was credit officers, and the main effects of the training were expected on officers' monthly portfolio characteristics. In particular, changes in average amounts granted to women, whether all credit cycles considered or first ones only, female clients' profile approximated by the average amount requested, average ratio between amounts granted and requested for women's first loans, and the share of women in portfolio were considered as possible outcomes.

The strongest and most positive effects were observed on new female officers, who were also the most satisfied ones by the training: indeed, this group tended to grant higher amounts to women whatever the credit cycle, in level and in ratio, but also to men, even though the results were less statistically significant. As a consequence, they appear as the most receptive group to the training, and the most likely to change their behaviors, including thanks to a gain in self-confidence and/or motivation and ambition. Interestingly, more indirect effects were observed on more experienced female officers, who tended to select new female clients requesting lower amounts after the training. As a result, the training effect on female clients for this group consisted in a change in clients' profile. Moreover, experienced female officers trained also granted lower amounts to men after the training,

whereas more experienced male officers trained tended to grant lower first amounts to men in terms of ratio. Considering the remarks and suggestions made by participants at the end of the training concerning the fairness of procedures and decisions, these effects could be seen as an attempt to adopt fairer behaviors by decreasing the existing gender gap in amounts granted. However, a more detailed analysis at the individual client level would enable to check if this decrease indeed represents more fairness or just a way to arbitrarily advantage women without any objective justification. Finally, new male officers tended to decrease the share of women in their portfolio after the training, this effect constituting the only purely negative effect we may observe. We may interpret it as a way to avoid complications after the training, but this can only remain a suggestion.

Concerning the duration of these effects, they do not seem to change over time. Additionally, no directly positive spill-over effect could have been observed on not-treated officers in treated branches. This result tends to confirm a concern shared by many members of Enda's staff, including some officers who participated in the training: such awareness raising about existing gender inequalities and the way to reduce them cannot be effective in a long-term perspective without being repeated several times over a long period, and without involving every member of the target group, which is the whole Enda's staff in this case. Another implication emerging from these results is that officers should be trained on this issue from their arrival, since effects are less likely to emerge once officers have their habits.

Nonetheless, many stakeholders were skeptical about the emergence of possible effects of this first experimental training phase, whereas some positive effects, even modest, were effectively observed. This confirms the relevance of generalizing it and of holding efforts to get representations moving with various and innovative initiatives.

APPENDIX IV.A: TRAINING PROGRAM

DAY 1		DAY 2	
Law and gender equality in Tunisia		Gender and socioeconomics: social roles, inequality of access to labor and resources	
seq1 2h	<p>Introduction :</p> <ul style="list-style-type: none"> • Icebreaker (30min), presentation of participants • Exercise “Fears and Expectations” (45mn) • Program presentation and logistics (45mn) 	seq4 2h	<p><u>Topic:</u> Gender diagnostic of my project with social cartography</p> <p><u>Objective:</u> Identifying the activities of male and female beneficiaries, their mobility and constraints.</p> <p><u>Method:</u> Exercise « Social cartography », in small groups first and then presentation in plenary session</p>
<i>Break</i>		<i>Break</i>	
seq2 2h	<p><u>Topic:</u> Sociocultural evolution of gender relationships in Tunisia</p> <p><u>Objective:</u> Raising awareness about the on-going evolution of gender relationships in personal life and family history of each participant</p> <p><u>Method:</u> Exercise « Life stories », in groups then in plenary session: presentation of discussions through drawing, song or sketch.</p>	seq5 2h	<p><u>Topic:</u> Gender inequalities in labor in Tunisia</p> <p><u>Objective:</u> Raising awareness on structural inequalities in access and control of resources, quantifiable at national level.</p> <p><u>Method:</u> Screening of movie “Alfa d’or” and discussion. (1h) Presentation (PWPT) on gender socioeconomic inequalities in Tunisia (1h)</p>
<i>Lunch</i>		<i>Lunch</i>	
seq3 2h	<p><u>Topic:</u> Historic evolution of women’s rights and of law on gender equality in Tunisia</p> <p><u>Objective:</u> Informing and discussing on what has been gained and what still lacks about gender equality in Tunisian law</p> <p><u>Method:</u> Exercise: comparison of Constitutional articles of 1959 and 2014 in small groups (30mn) Interactive presentation (PWPT): reference points in evolution of law for women’s rights and gender equality since Independence (1h) Screening of CEDAW spot (4mn) ;</p>	seq6 2h	<p><u>Topic:</u> Acting to change stereotypes and apply gender equity.</p> <p><u>Objective:</u> Preparing beneficiaries to use “gender glasses” and contribute to change in their daily workspace.</p> <p><u>Method:</u> Group discussions on possible actions in branches.</p> <p>Plenary session on suggested actions and needs in terms of follow-up and support.</p> <p>Points of reference on 4 notions: equality, parity, equity, complementarity</p>
<i>Break</i>		<i>Break</i>	
1/2h	Evaluation of the day	1/2h	Evaluation of the training : Collective mark on expectations + individual questionnaire

APPENDIX IV.B: PARALLEL TREND BETWEEN TREATED AND CONTROLS FROM TREATED BRANCHES ONLY

Table 84. Parallel trend assumption between treated and controls in treated branches

	Average amount granted to female clients	Average amount granted to female clients (1st cycle)	Average amount requested by female clients (1st cycle)	Average ratio request/ amount for female clients (1st cycle)	Share of female clients in portfolio -
<i>Ref: Nov. 14</i>					
Jun. 14	-68.68* (35.17)	-33.23 (37.68)	-68.99 (79.04)	-2.637* (1.543)	-0.575 (1.423)
Jul. 14	-24.19 (33.18)	-55.14 (37.84)	95.19 (125.2)	-1.527 (1.859)	-1.183 (1.340)
Aug. 14	0.110 (33.73)	7.515 (44.39)	14.49 (71.78)	2.390 (2.586)	-3.953*** (1.430)
Sep. 14	-32.32 (30.00)	-6.915 (37.07)	-67.15 (60.07)	1.287 (1.711)	0.764 (1.367)
Oct. 14	-32.06 (33.32)	-4.342 (39.56)	-32.91 (83.95)	-1.190 (1.710)	-1.317 (1.416)
Treatment group*Jun. 14	1.616 (64.76)	-179.4*** (60.46)	-79.02 (132.4)	-6.802** (3.449)	-0.406 (2.875)
Treatment group*Jul. 14	20.74 (67.24)	26.16 (72.49)	-63.65 (168.3)	-0.682 (3.282)	0.444 (2.698)
Treatment group*Aug. 14	-65.46 (57.73)	-45.75 (81.40)	-81.85 (161.1)	-2.970 (3.937)	1.376 (2.777)
Treatment group*Sep. 14	-62.18 (53.77)	-62.16 (65.68)	25.47 (124.9)	-3.935 (3.451)	-2.876 (2.848)
Treatment group*Oct. 14	-21.32 (53.37)	-36.28 (73.80)	59.55 (156.1)	-2.453 (3.452)	1.437 (2.482)
Constant	1,184*** (18.97)	1,015*** (20.32)	1,578*** (36.49)	69.43*** (0.919)	61.39*** (0.757)
Observations	2575	2226	2225	2225	2669
R-squared	0.005	0.007	0.003	0.009	0.007
Number of officers	479	457	457	457	485

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

GENERAL CONCLUSION

“Is microfinance still working?” This is the title of the 8th edition of the Microfinance Barometer released in July 2017. “Undoubtedly provocative”, as confessed by one of the authors, this title is also a bit misleading: as a matter of fact, the actual question tackled in the publication is how to make microfinance work better. Indeed, financial inclusion remains a prime objective, as today two billion adults do not have access to any financial institution yet, and microfinance is still one relevant tool to take up this challenge. As a consequence, the primary question which matters is how to improve practices in order to ensure that objectives are met. The main answer suggested in the publication is to focus even more on social performance. If one of the articles especially acknowledges the increasing number of MFIs using SPI4, the universal tool created by Cerise to enable MFIs to assess their social performance themselves, another one highlights the improvements which can still be made: adapting information systems in particular, to collect and analyze longitudinal data on MFIs’ clients all along their credit history, would allow a better assessment of microfinance impacts. In other words, the message conveyed in the 2017 edition is that the currently existing indicators to assess social performance are necessary and mark a significant step towards more responsible practices in microfinance compared to the previous decades when the focus was on financial performance, but they may be insufficient and would still deserve reflection, adaptation and improvement.

This observation is at the core of this research work. Focusing on a specific microfinance institution which has always claimed acting in favor of women’s empowerment, it has been showed that a high share of women in portfolio does not necessarily reflect practices fully benefiting women. Whereas this number is today the only indicator of social performance with regard to women, this work especially highlights that it is insufficient to properly assess microfinance practices in terms of gender equality or fairness.

Microfinance was indeed born and has considerably developed in countries where gender inequalities are substantial, and this case study is no exception. The first analyses in chapter 1 show that these gender inequalities in the Tunisian society are not only reflected in female applicants’ projects, with women running smaller-scale projects than men, but also in their preferences and behavior in terms of amounts requested, as women tend to request smaller amounts all other things being equal. Despite these existing inequalities, the MFI under study effectively applies a targeting policy in favor of women, since women are more likely to see their application granted than men, all other things being equal. This advantage may be due to officers’ motivation, who are supposed to be aware and agree with the mission of the MFI when they are recruited, and/or to the specific procedure applied in terms of client selection, since being a female applicant is associated with a

lower risk score. In any case, this advantage clearly constitutes an affirmative action policy towards women with regard to access to credit.

However, the analyses of loan conditions and especially of loan amounts in chapters 1, 2 and 4 tell a different story: all other things being equal, women tend to receive smaller amounts, not only for their first credit cycles but also for the next ones. Whereas the gap observed for first cycles in chapter 1 could have been accounted for by a strong information asymmetry and/or unobservable characteristics, these explanations are refuted by chapter 4 which shows a persistent and increasing gap all along clients' credit history, and by chapter 2, the experimental format of which proving that no objective information can justify the gap observed. Even though this gap from the supply side remains lower than the one from the demand side, it still should not exist, especially within an MFI promoting women's empowerment.

As a consequence, the main explanatory hypothesis for this disadvantage undergone by women is discriminatory behavior from loan officers. One of the main questions is whether such discrimination is statistical only, given the existing gender inequalities in terms of access to resources, time allocation to housework, work experience, etc. Nonetheless, the magnitude of the gap observed in the experimental study of chapter 2 and the fact that women actually constitute less risky clients for the MFI as showed in chapter 3 rather imply that officers' gender-based stereotypes and representations exceed what could be considered as economically rational behavior. This is one of the reasons why Enda launched the initiative consisting in training its whole staff on gender issues analyzed in chapter 5: the objective was to raise awareness on existing inequalities, and on how they could affect officers' daily work. Even though the effects of the training remain modest in terms of positive impact on female clients, they have unexpectedly revealed that new female officers could also benefit themselves from such a training.

Nevertheless, dealing with social and gender norms and representations remains complex, and bringing them to light is especially arduous. It might have been useful for this research work to carry out more numerous interviews with loan officers in order to attempt to get more clues about their gender representations, however, the few I conducted as well as my discussion with the main trainer on gender issues within Enda, a sociologist specialized on these questions, rather validated what I suspected: such representations hardly show through in a context of individual interviews, especially when they are conducted by a foreign woman, no matter how subtle the questions are. Some interviews with clients, especially with some dropouts or with strongly rationed clients, could also have enabled me to get more information on their point of view and feelings about their treatment, however this idea raised several concerns: first of all, I was identified as a member of

Enda's staff and as a foreigner at the same time, which could have incomed some clients; second, my level of Arabic and their level of French would have made such interviews hard to carry out. Such qualitative studies in the future would constitute relevant extensions to this first research work though.

Nonetheless, in order to circumvent these difficulties, other strategies were adopted: according to the above-mentioned trainer, group exercises and participative methods are usually more efficient to unveil gender representations, and this was confirmed by the training sessions analyzed in chapter 5, as well as by the experimentation of chapter 2, which was more telling than the few interviews I conducted.

Thus, this research work has attempted to show that even within an organization committed to women's empowerment, gender-based stereotypes and representations may hamper the fulfillment of initial objectives. Indeed, it seems that in this case, stereotypes about women and their projects lead to the confinement of female clients in such representations, which does not give them the chance of getting out of it and emancipating, even though they benefit from an easier access to microcredit.

Several actions may be implemented in order to deal with this issue: raising awareness through participative trainings is one of them, and since the beginning of 2017, the NGO Enda inter-arabe, which is responsible for non-financial services, has received a 3-year funding to ensure that a maximum of newly recruited officers follow the training on gender issues. Another possible action which would be at least as much relevant would be, as officers have suggested it themselves, to adapt procedures. Since women are advantaged in terms of access to credit in granting procedures, it should be possible to ensure that these procedures also enable female clients to be treated at least equally in terms of amounts granted, if not advantaged in that regard as well.

About equal treatment first, today Enda tends to follow the recent recommendations in terms of adaptation of information systems: since early 2017, the system enables officers to record amounts requested for each cycle, and to get an overview of clients' credit history and evolution. Even though it constitutes only a first step, this adaptation at least ensures officers better conditions to apply progressive lending in a possibly more objective and equal way. Additionally, because the new credit ceiling could have a negative effect on the proportion of female clients, Enda has even opened discussions on how to integrate the share of female clients into the calculation of officers' bonuses; so far, instead of making bonuses increase with the share of female clients, the idea would rather be to make them decrease if the share does not reach a specific threshold. This would concern

the share of women but also of young people, who constitute two disadvantaged groups in terms of access to credit in Tunisia.

Going further would consist in advantaging women with regard to amounts granted as well. Of course, such an advantage to women would raise some ethical questions: since it could be especially considered as statistical discrimination against men, it is necessary for MFIs to question the stance they want and are ready to take. When some inequalities exist at the starting line between social groups, a policy of equality of treatment does not have the same consequences as a policy of equal opportunity. Assessing the fairness of these policies implies to choose between different conceptions of social justice. Whereas the first type of policy rather corresponds to the notion of procedural justice, which implies that fairness is assessed by examining the procedure leading to a result, the second one focuses on the result itself, and is rather in keeping with consequentialist theories of justice. In practice, a policy of equal treatment may seem fair in terms of procedure but is hardly able to compensate initial inequalities. By contrast, because a policy of equal opportunity is based on the idea that these initial inequalities should be compensated in order to ensure that everyone gets the same chances of success, it does not rest on equality of treatment, but rather on affirmative action, which consists in favoring the initially disadvantaged group. Rawls's theory of social justice (Rawls, 1971), which discusses the necessity of redistributing resources and introduces the concept of equal opportunity, inspired the concept of affirmative action. However, another famous theorist of social justice, Amartya Sen, criticized him for not taking account of the heterogeneity and differences between individuals (Sen, 2000). As a consequence, equally redistributing resources would not necessarily lead to more equality in the liberties enjoyed by people.

These reflections on social justice are useful to think about how to make microfinance work better, especially with regard to gender inequalities: some changes in procedures, such as more flexibility towards women concerning guarantees, different thresholds of assets to get access to specific financial products, etc., may constitute a way of compensating initial inequalities between male and female clients and a kind of redistribution supposed to ensure more equal opportunities. However, in our context, Sen's criticism is particularly relevant: redistributing resources is a first step, but because female clients tend to be less educated, to have less work experience, to have less access to resources and to be less aware of their rights, they most probably also have fewer possibilities to decide or to make choices being aware of all their possibilities. In other words, there are also inequalities of capabilities between male and female clients, and a way of improving microfinance social performance in terms of gender equality would be to ensure that microfinance tackles these inequalities as well. In practice, this could consist in offering specific non-financial services to women, such as workshops on money management, entrepreneurial skills, marketing of products,

women's rights, etc. So far, if Enda inter-arabe has been offering such services for a long time, a very tiny proportion of clients have effectively benefited from them (less than 10%). Redefining the conditions of delivery of such non-financial services and maybe combining them with financial products could be a way of improving practices. This would be probably costly, but the mid-term impacts remain unknown, and if MFIs' social performance is likely to benefit from such measures, this might actually be the case of financial performance as well. As a matter of fact, it all depends on the mission MFIs choose to pursue: acting in favor of equality of opportunity is a more demanding aim than ensuring equality of treatment in daily practices. Once the objective is clearly set, actions can be taken to reach it, but sometimes, daily management and short-term goals may prevent decision-makers from taking time to think about policy choices.

To enlighten such reflections and get a better sense of the possible impacts of initiatives in favor of more equal opportunity, it appears necessary to adopt a long-term view: indeed, such initiatives may be costly for MFIs and negatively affect their financial performance in the first instance, but the impact on clients after a few years or credit cycles may eventually benefit everyone. More research on the impact of changes in practices and procedures in a longitudinal perspective, both from clients' and from MFIs' point of view, would bring new answers to the question of how to make microfinance work better.

RÉSUMÉ

La remise du prix Nobel de la paix en 2006 à Muhammad Yunus, fondateur de la Grameen Bank au Bangladesh, a rappelé les espoirs et attentes considérables suscités par la microfinance, longtemps considérée comme un remède miracle à la pauvreté. Elle a également consacré la Grameen Bank en tant qu'incarnation du modèle de la microfinance : l'idée centrale est que l'accès au crédit "favoriserait l'esprit entrepreneurial et le développement économique, autonomiserait les femmes et réduirait la pauvreté en générant davantage de revenus et d'emplois" (Ledgerwood, Earne, Nelson et Banque mondiale, 2013, p. 6).

Cet ambitieux projet est porté par les institutions de microfinance (ci-après IMF) : l'IMF emblématique a un statut d'organisation non gouvernementale et cible les personnes vulnérables exclues du système bancaire traditionnel en raison de leur manque de ressources et de garanties. Parce que les femmes sont particulièrement pauvres, vulnérables et exclues des services financiers d'une part (Narayan-Parker, 2002), mais ont tendance à montrer de meilleurs taux de remboursement que les hommes d'autre part, elles sont devenues les cibles exclusives des IMF pionnières telles que la Grameen Bank, ou encore Pro Mujer et BancoSol en Bolivie. Que les motivations de départ des IMF soit financières ou sociales, les femmes d'âge moyen menant des activités génératrices de revenus sont donc rapidement apparues comme les clients typiques des IMF. Conformément au principe initial de la microfinance, ces clients vulnérables sont censés se voir accorder des microcrédits sans qu'aucune garantie individuelle ne soit requise ; pour que cela fonctionne, les IMF s'appuient sur des prêts de groupe : un crédit est accordé à un groupe d'emprunteurs, dont les membres sont responsables du remboursement des autres membres.

Néanmoins, aujourd'hui, la microfinance est devenue beaucoup plus complexe et diversifiée que ce modèle emblématique incarné par la Grameen Bank : tout d'abord, les IMF offrent de plus en plus de prêts individuels et moins de prêts de groupes. Par conséquent, la garantie est redevenue la principale incitation au remboursement.

De plus, si les femmes représentent 84% des clients des IMF en 2015, ce nombre moyen cache d'importantes disparités au niveau mondial : les femmes sont la cible quasi exclusive des IMF en Asie du Sud (92%), en Asie de l'Est et dans le Pacifique (94%), mais ce n'est pas le cas partout, puisque la part est de 66% en Afrique ainsi qu'en Amérique latine et dans les Caraïbes, de 60% au Moyen-Orient et en Afrique du Nord (MENA), et de 46% en Europe de l'Est et en Asie centrale (Khamar, 2017). Ces chiffres montrent que la moyenne mondiale élevée est tirée vers le haut par l'Asie du Sud et de l'Est, qui représente une part substantielle du marché ; cependant, le modèle de microfinance en Asie du Sud semble spécifique à la région et n'est pas représentatif de la

microfinance dans le monde. Ailleurs, les femmes restent une cible prioritaire (excepté en Europe de l'Est et en Asie centrale) mais de toute évidence, elles ne constituent pas la cible exclusive.

Enfin, étant donné que les ONG représentent une part décroissante des prestataires de services financiers, notamment parce que certaines d'entre elles se sont transformées en sociétés privées après quelques années, le système de financement des IMF a également changé : alors que les ONG étaient principalement financées par des subventions gouvernementales, les institutions financières non bancaires suivent davantage une approche commerciale et travaillent selon les principes du système financier, tout comme les banques. Une telle commercialisation a conduit à l'explosion des taux d'intérêt au sein de certaines IMF, ce qui a été illustré par le scandale de Compartamos Banco, une IMF mexicaine facturant à ses clients des taux d'intérêt de 100 % tout en générant un rendement des capitaux propres de 53 %. La pression financière subie par les IMF a également poussé certaines d'entre elles à appliquer des politiques agressives de vente de crédit et/ou de recouvrement, entraînant parfois des crises de surendettement comme celle, très médiatisée, qui a éclaté en 2010 dans l'Andhra Pradesh et s'est soldée par une vague de suicides. Ces cas saillants ont montré les possibles conséquences négatives de la commercialisation, ce qui a amené les observateurs et les chercheurs à s'interroger sur la dérive potentielle de la microfinance depuis les années 2000 (Christen, 2001 ; Dichter, Harper, & Practical Action, 2007 ; Mersland & Strøm, 2010 ; Rhyne, 1998). Des analyses d'impact plus rigoureuses se sont alors avérées nécessaires, afin de dépasser le débat idéologique (Mersland & Strøm, 2010).

Ainsi, les deux dernières décennies ont été marquées par un nombre croissant d'études d'impact. Malgré tout, les résultats de ces études sont encore mitigés : certains travaux aboutissent à des effets positifs de la microfinance (Dunford, 2001 ; Morduch, 1999 ; Nawaz, 2010) alors que d'autres ne trouvent aucun impact ou un impact négatif (Kondo, Orbeta, Dingcong, & Infantado, 2009 ; Simanowitz, 2000 ; Weiss & Montgomery, 2005). Ces résultats incertains ont contribué à la désillusion voire à la défiance croissante à l'égard de la microfinance.

En effet, la couverture médiatique de ces études d'impact a davantage insisté sur les résultats négatifs, sous-entendant que la microfinance ne parvient pas à atteindre ses objectifs initiaux. Même si certains chercheurs ont regretté les simplifications excessives et les interprétations négatives inexacts de leurs travaux que l'on a pu trouver dans la presse (O'Dell, 2010), la diversité des résultats tend à montrer que les effets positifs potentiels de la microfinance ne sont pas automatiques. Cela peut être dû au moins en partie au fait que la microfinance recouvre un ensemble d'outils différents, mis en œuvre par divers types d'organisations, dans une multitude de contextes variés où diverses règles et réglementations sont appliquées.

Pour cette raison, la question « la microfinance fonctionne-t-elle ? » ne semble plus faire sens et devrait probablement être reformulée de cette façon : « quelles sont les conditions dans lesquelles la microfinance fonctionne le mieux ? ». Afin de comprendre l'absence de résultats positifs ou même l'existence de résultats négatifs, une autre perspective pourrait être : « quels sont les obstacles empêchant la microfinance d'atteindre ses objectifs ? ». C'est cette perspective qui est adoptée dans ce travail de recherche, en se concentrant sur un objectif spécifique de la microfinance, à savoir la réduction des inégalités hommes-femmes.

L'un des principaux objectifs de la microfinance est en effet de contribuer à l'autonomisation et l'émancipation des femmes. Cependant, la première problématique qui apparaît est qu'il n'existe pas de conception claire et consensuelle de la notion d'autonomisation et d'émancipation, ou "empowerment" en anglais. Selon le livre de la Banque mondiale *Empowerment and Poverty Reduction : a Sourcebook*, les pauvres manquent de pouvoir et un moyen de lutter contre la pauvreté serait de leur redonner un peu de ce pouvoir (Narayan-Parker, 2002). S'il n'y a pas de véritable débat sur l'objectif, il n'y a en revanche pas de vision claire sur la manière de l'atteindre (Guérin, Palier, & Prévost, 2009). En particulier, une typologie bien connue développée par Csaszar (2005) distingue quatre catégories de pouvoir : "power with", "power to", "power within" et "power over". La quatrième catégorie reflète une dimension conflictuelle de l'autonomisation, puisqu'elle implique d'inclure certaines personnes dans les processus décisionnels dont elles étaient auparavant exclues. En d'autres termes, si les dimensions sociales et économiques de l'autonomisation ne sont généralement pas remises en question, la dimension politique implique un changement dans les relations de pouvoir, qui peuvent être plus conflictuelles et donc moins consensuelles. Étant donné que toutes les dimensions de l'autonomisation sont liées, la réalisation de l'autonomisation peut finalement créer davantage de conflits (Woolcock, 2005).

En ce qui concerne l'autonomisation des femmes, les mêmes questions s'appliquent, mais s'intéresser à la notion de "genre" est tout d'abord nécessaire pour aborder la question de façon appropriée. Ann Oakley est souvent considérée comme l'auteur ayant introduit cette notion dans les sciences sociales ; dans son livre *Sex, gender and society* (Oakley, 1972), elle affirme que les rôles et identités sexuels sont liés aux stéréotypes sociaux et aux modèles familiaux, et sont donc en grande partie produits par la culture. Dans cette mesure, le genre est différent du sexe, le sexe étant considéré comme biologique et le genre comme social, culturel et psychologique. Les stéréotypes sociaux relatifs au genre sont descriptifs et prescriptifs, ce qui signifie qu'ils se réfèrent à comment les hommes et les femmes sont, mais aussi à ce que l'on attend d'eux qu'ils soient (Heilman, Wallen, Fuchs, & Tamkins, 2004) ou qu'ils fassent (West & Zimmerman, 1987). Ces stéréotypes de genre tendent également à être intégrés par les femmes, transmis d'une génération à l'autre et

contribueraient ainsi à maintenir et à reproduire les inégalités entre hommes et femmes, telles que la division sexuelle du travail ou la ségrégation sexuelle dans l'emploi, comme le constatent également certains économistes (Becker, 1993 ; Farré & Vella, 2013 ; Fernández, Fogli, & Olivetti, 2004).

La prise en compte de ces questions de genre est au cœur de l'approche "Genre et développement" développée par Moser (1993), qui a inspiré l'agenda des institutions internationales sur les questions de genre au cours des deux dernières décennies. La promotion de l'égalité des sexes et de l'autonomisation des femmes a d'ailleurs été fixée comme troisième objectif du Millénaire pour le développement en 2000 et comme cinquième objectif de développement durable en 2015. Ces initiatives illustrent l'intérêt croissant des institutions internationales pour le rôle des femmes dans le développement économique et la lutte contre la pauvreté : l'idée est qu'un investissement accru dans les femmes et l'égalité des sexes se traduirait par un meilleur retour sur investissement pour le développement. Cependant, pour être pleinement en mesure de jouer ce rôle, les femmes doivent être autonomisées. C'est pourquoi la promotion de l'égalité des sexes et de l'autonomisation des femmes est devenue un objectif prioritaire.

La microfinance est l'un des outils de développement qui devrait contribuer à l'autonomisation des femmes : en donnant plus de pouvoir économique aux femmes, ces dernières devraient également gagner en autonomie, en responsabilité et en pouvoir de décision, et éventuellement faire bénéficier l'ensemble de leur ménage et notamment leurs enfants de ces gains. Ainsi, l'autonomisation économique des femmes est l'un des principaux objectifs de la microfinance parce qu'elle est censée être un canal crucial de développement. Néanmoins, tout comme pour les autres objectifs tels que la réduction de la pauvreté, les études d'impact sur la microfinance montrent que les effets sur les femmes sont mitigés. Guérin (2009) cite même plusieurs études qui aboutissent à des résultats négatifs : après avoir bénéficié de microcrédits, la spécialisation des femmes dans les secteurs à faible productivité peut s'être accrue (Fernando, 2004) ; l'activité supplémentaire peut entraîner des responsabilités plus importantes, une charge de travail plus lourde et davantage de fatigue pour les femmes (Ackerly, 1995) ; la violence domestique et la domination patriarcale des agents de crédit peuvent s'accroître (Rahman, 1999) ; les entreprises des femmes peuvent être détournées lorsqu'elles deviennent rentables (Grasmuck & Espinal, 2000) ; les inégalités entre les femmes peuvent également s'aggraver (Guérin & Palier, 2005 ; Mayoux, 2001).

En raison de ces résultats mitigés sur l'autonomisation des femmes, une attention particulière a également été accordée dans la littérature aux mécanismes qui entravent l'émergence d'effets plus positifs : par exemple, en se basant sur le cas indien, Guérin (2009) mentionne le fait que les produits financiers ne sont pas toujours adaptés à la demande locale, que l'organisation structurelle des

marchés n'est pas favorable aux petits entrepreneurs, et que par conséquent les services financiers devraient être complétés par des services non financiers pour renforcer les capacités entrepreneuriales des clients, et notamment des femmes, et leur fournir les ressources nécessaires. D'autre part, Kabeer (1997) rappelle que si la microfinance peut conduire à plus d'autonomie financière pour les femmes et donc leur donner plus de marge de manœuvre, elle ne peut le faire que dans un contexte social qui évolue très lentement. Ce contexte consiste en des normes sociales et de genre qui régissent les actions et les comportements des hommes et des femmes dans une société spécifique, sur laquelle la microfinance n'a que peu d'impact. Cela expliquerait le peu d'impact de la microfinance sur l'autonomisation des femmes et les externalités négatives possibles. De la même manière, Mayoux (2000) affirme que la microfinance se concentre principalement sur la dimension économique de l'autonomisation, comme si elle était censée entraîner les autres aspects avec elle dans un cercle vertueux, alors que négliger la dimension politique conduit à oublier que donner plus de pouvoir économique aux femmes peut ébranler d'autres relations de pouvoir et aboutir à des conflits, des réactions négatives et des résistances. En d'autres termes, ce serait parce que la microfinance ne s'attaque pas aux causes structurelles des inégalités entre les sexes qu'elle ne parvient pas à atteindre ses objectifs sur ce point.

Ce travail de recherche s'inscrit dans ce pan de la littérature : au lieu d'analyser de manière critique les impacts potentiels de la microfinance, il se concentre sur les mécanismes censés favoriser ou empêcher l'atteinte de leurs objectifs par les IMF en termes d'autonomisation économique des femmes. Alors que les exemples de mécanismes mentionnés précédemment concernent plutôt le contexte externe dans lequel la microfinance agit, ce travail se concentre sur les procédures internes des IMF et leur potentielle contribution à la réduction des inégalités de genre. Plus précisément, il analyse dans quelle mesure la manière dont les IMF traitent les femmes dans le processus d'allocation de microcrédit contribue à réduire les inégalités existantes entre hommes et femmes, candidats au crédit et clients. Pour ce faire, les inégalités préexistantes sont examinées, mais le comportement des agents de crédit est au cœur de l'analyse.

En effet, comme déjà mentionné, le modèle de la microfinance actuel ne fait pas des femmes la cible exclusive des IMF : les hommes représentent une part croissante de la clientèle des IMF. De nombreux hommes pauvres sont également exclus du système financier traditionnel, et il semble pertinent de les inclure également dans les programmes de microfinance. Cependant, comme l'intègre l'approche Genre et Développement, les femmes sont toujours confrontées à des problématiques spécifiques, en particulier dans les pays en développement où elles n'ont pas toujours

les mêmes droits que les hommes ; par conséquent, la manière dont les IMF gèrent cette réalité complexe mérite une attention particulière. L'inclusion des hommes pourrait avoir des externalités positives, en favorisant les échanges entre clients masculins et féminins au sein des IMF et contribuer ainsi à faire évoluer les relations et les représentations de genre ; mais si les IMF ne prennent pas en compte les problématiques spécifiques auxquelles les femmes sont confrontées, elles pourraient aussi manquer leur objectif initial.

Par conséquent, le premier point d'intérêt de ce travail de recherche est l'identification des différences initiales entre hommes et femmes, candidats au crédit et clients. Il s'agit notamment d'analyser leur profil sociodémographique et leurs ressources économiques, ainsi que les caractéristiques du projet lorsqu'ils demandent leur premier prêt, qu'ils l'obtiennent ou non. Ces différences peuvent représenter les inégalités existantes entre les hommes et les femmes dans la société étudiée, ainsi que les politiques de ciblage des IMF, dans la mesure où les IMF peuvent choisir de cibler des profils différents de clients potentiels masculins et féminins. Cela inclut également les différences en termes d'évolution des projets, qui peuvent être révélées par l'évolution d'indicateurs opérationnels et financiers spécifiques observés d'un cycle de crédit à l'autre, tels que la valeur des actifs, le bénéfice mensuel, le nombre d'employés, etc. Enfin, une dernière différence déterminante à prendre en compte, si elle existe, concerne le comportement des clients vis-à-vis des IMF, en termes de remboursement, de défaut de paiement et de renouvellement de prêt. En effet, si les clients masculins et féminins ne se comportent pas de la même manière, les IMF peuvent les traiter différemment en retour.

Toutes ces différences prises en compte, le deuxième point d'intérêt est la manière dont les clients masculins et féminins sont traités dans le processus d'attribution du microcrédit. Cela implique d'analyser le processus de sélection lorsque les candidats demandent leur premier prêt, ce qui est censé illustrer la manière dont les IMF traitent la question de l'accès au crédit. En effet, l'un des principaux objectifs des IMF est de faciliter l'accès au crédit à ceux qui sont exclus du système bancaire traditionnel. Etant donné que les femmes sont particulièrement exclues des banques en raison de leur manque de ressources, les IMF sont censées favoriser particulièrement l'accès des femmes au crédit. L'un des objectifs de ce travail de recherche est d'analyser dans quelle mesure les IMF facilitent l'accès des femmes au crédit et les potentielles différences de traitement entre les candidats masculins et féminins dans le processus de sélection.

Cependant, l'accès au crédit n'est qu'une première étape. Il est également nécessaire d'examiner les conditions de prêt accordées aux clients masculins et féminins une fois que leurs demandes ont été acceptées. Une spécificité de la microfinance est que les taux d'intérêt sont fixés

par sous-produit, ce qui signifie qu'à sous-produit égal, les IMF ne peuvent pas accorder des crédits à des taux différents. Pour cette raison, les conditions examinées dans le cadre de ce travail de recherche sont uniquement les montants de prêts. Un troisième objectif de ce travail de recherche est donc d'examiner les montants accordés aux clients masculins et féminins, afin de vérifier si, à caractéristiques égales, les clients masculins et féminins sont traités au moins également. En effet, l'égalité de traitement entre les hommes et les femmes apparaît comme le résultat minimum attendu des IMF ciblant à la fois les clients masculins et féminins. Comme l'asymétrie d'information entre les agents de crédit et les clients n'est pas de même nature et de même ampleur lorsque les demandeurs demandent leur premier prêt et lorsqu'ils le renouvellent, il semble nécessaire de faire la distinction entre les montants accordés pour les premiers prêts et ceux accordés pour les renouvellements. En effet, dans le second cas, les agents de crédit connaissent mieux leurs clients que dans le premier, et l'évolution du projet doit être prise en compte.

Enfin, un dernier point d'intérêt concerne les représentations de genre ; en effet, puisque d'autres études mentionnées ci-dessus ont déjà souligné que les représentations des rôles des hommes et des femmes dans la société pourrait limiter les effets positifs de la microfinance sur l'autonomisation des femmes, l'une des hypothèses de ce travail est que les représentations des clients masculins et féminins est également susceptible d'influencer le comportement des agents de crédit. En particulier, l'idée que les clientes rencontrent des difficultés spécifiques peut avoir des effets négatifs en les enfermant dans une telle image au lieu de favoriser leur autonomisation. L'objectif est d'examiner dans quelle mesure le travail des IMF et en particulier des agents de crédit peut être affecté par les représentations de genre, et comment les IMF traitent cette question. Une initiative visant à faire évoluer les représentations des agents de crédit et à les sensibiliser aux problématiques de genre est également analysée en termes d'impact sur leur travail quotidien.

De toute évidence, ces questions de recherche ne sont pertinentes que pour un modèle spécifique de microfinance : elles s'appliquent notamment aux IMF qui ciblent à la fois les hommes et les femmes ; cependant, pour analyser dans quelle mesure les IMF contribuent à réduire les inégalités de genre et comment les représentations de genre peuvent entraver la réalisation de cet objectif, il est nécessaire de se concentrer sur les IMF qui affichent clairement une politique en faveur des femmes. En effet, aujourd'hui, certaines IMF ressemblent davantage à des banques traditionnelles qu'à des organisations ayant des objectifs de développement spécifiques, et ces IMF ne visent pas nécessairement à réduire les inégalités entre les sexes en termes d'accès aux services financiers. Dans ce cas, ces questions de recherche ne s'appliquent pas.

D'autre part, la microfinance a fait l'objet de nombreuses études dans certaines régions et pays, tels que l'Inde, le Bangladesh, la Bolivie, le Maroc, etc., et il semble plus utile de se concentrer sur un nouveau contexte, d'autant plus que le contexte est déterminant pour le fonctionnement des IMF, que ce soit en termes de droit et de réglementation ou d'aspects sociaux, culturels et économiques. Par conséquent, ce travail de recherche se concentre sur la région MENA : mis à part le Maroc, peu de pays ont fait l'objet d'études sur la microfinance jusqu'à présent, probablement parce que la microfinance ne s'est pas autant développée dans cette région qu'ailleurs, bien que cela commence à changer, avec un taux de croissance du portefeuille de la région de 9,6% en 2015 (Convergences, 2017).

De plus, afin d'assurer une certaine cohérence, ce travail de recherche se concentre sur une unique institution de microfinance pour toutes les analyses, avec une taille suffisante en termes de clients, de portefeuille et de part de marché. Cette institution est Enda inter-arabe, la principale institution de microfinance tunisienne. Enda inter-arabe répond aux exigences de la recherche puisqu'elle cible à la fois les hommes et les femmes et a toujours promu son action en faveur des femmes. En outre, la Tunisie est un contexte pertinent à étudier pour plusieurs raisons : d'une part, le secteur de la microfinance a explosé depuis la Révolution grâce à un fort potentiel de développement et aux récents changements réglementaires, et n'a pas été beaucoup étudié jusqu'à présent ; d'autre part, le pays se distingue par une législation très progressiste en termes de droits des femmes et d'égalité hommes-femmes, en particulier en ce qui concerne le travail. Pourtant, le taux d'activité reste très faible chez les femmes (25% en 2015) et n'a presque pas augmenté depuis 20 ans (23% en 1996). L'origine de ce paradoxe peut se situer à un autre niveau que les seules politiques publiques, tel que les normes et représentations de genre, qui est l'un des points d'intérêt de ce travail de recherche.

Par conséquent, ce travail de recherche ne prétend pas s'appliquer à la microfinance en général : un tel objectif serait voué à l'échec étant donné la complexité et la diversité de la microfinance aujourd'hui. Au lieu de chercher à tirer des conclusions générales sur la microfinance, ce travail entend plutôt identifier certains paramètres et circonstances susceptibles de faciliter ou au contraire d'entraver la réalisation des objectifs de la microfinance. Cela implique néanmoins que les résultats sont censés être utiles à d'autres professionnels du secteur, aux régulateurs et aux chercheurs, actuels et futurs, compte tenu de leurs objectifs et contextes spécifiques. Dans cette mesure, ce travail s'inscrit plutôt dans la perspective pratique et pragmatique adoptée dans la littérature récente que dans la perspective plus idéologique des décennies précédentes.

Enda inter-arabe (ci-après Enda) a été créée en 1990 à Tunis par son actuel directeur exécutif et secrétaire général en tant qu'ONG œuvrant en faveur de la protection de l'environnement et de l'intégration socioprofessionnelle des personnes vulnérables des zones urbaines défavorisées. Enda a commencé à offrir des services de microcrédit en 1995 et a décidé en 2000 de s'engager entièrement à soutenir les micro-entrepreneurs, principalement par le biais de services financiers mais aussi non financiers (tels que les formations collectives, le coaching individuel, etc.). Alors que la collecte des dépôts était et n'est toujours pas légalement autorisée pour les institutions non bancaires en Tunisie, Enda a réussi à devenir financièrement autonome en 2003, ses revenus d'exploitation couvrant ses dépenses. Depuis lors, elle n'a cessé de croître régulièrement, jusqu'à atteindre un nombre cumulé de 600 000 clients servis entre 1995 et 2015, ce qui représente 2 008 300 crédits accordés pour un total de 1 952 millions de DT (~ 803 millions de dollars US). Enda est ainsi active sur l'ensemble du territoire tunisien, avec 79 agences réparties sur les 24 gouvernorats et dans plus de 200 délégations sur 264 en 2016.

Si Enda a commencé ses activités dans les zones urbaines, elle couvre aujourd'hui également les zones rurales, avec 42% de ses clients vivant en zone rurale fin 2015. Enda sert des clients travaillant dans tous les secteurs d'activité : commerce, artisanat, production alimentaire, élevage, agriculture, etc. Pour répondre aux besoins de cette grande variété de clients, Enda offre différents produits financiers : par exemple, certains d'entre eux ont été spécifiquement conçus pour des projets agricoles, avec des échéanciers irréguliers, des délais de grâce et des taux préférentiels, censés être adéquats pour les activités saisonnières. Les taux d'intérêt ne varient pas selon les clients mais dépendent des caractéristiques des sous-produits ; comme habituellement dans le secteur de la microfinance, ils sont plus élevés pour les produits correspondant à des montants plus faibles et plus petits pour les produits permettant d'accorder des montants plus élevés. Ainsi, Enda sert des clients très divers de toute la Tunisie, assurant une certaine représentativité des clients potentiels de la microfinance.

Selon le rapport d'activité de 2015, en décembre 2015, Enda servait 271 000 clients actifs (+10% depuis 2014) et avait déboursé 278 300 prêts (+5%). Son portefeuille à risque à 30 jours était de 1,07% en 2015, ce qui est très faible par rapport à la moyenne mondiale du secteur (3,7% en 2014), et le taux de défaut était de 0,68%, ce qui est également très faible, même si les taux de défaut sont généralement inférieurs à 2% en microfinance. Ces bons chiffres sont en accord avec les différentes récompenses et reconnaissances mondiales que l'IMF tunisienne a obtenues au cours des dernières années, tant pour ses performances financières que sociales : en effet, Enda a reçu un Certificat de Transparence avec la plus haute note du MIX Market et Sanabel Network en 2009 ; elle a été reconnue comme la deuxième meilleure IMF au monde en termes de performances sociales en

2015 par Planet Rating, et a été la première IMF de la région MENA à obtenir la Smart Campaign Certification, qui reconnaît l'engagement envers la protection des clients, en 2015 également.

De 2000 à 2014, Enda était la principale institution de microfinance en Tunisie, car elle détenait la plus grande part de marché. Cependant, depuis 2014, grâce à la nouvelle réglementation, quatre sociétés privées étrangères actives dans le secteur de la microfinance dans le monde entier ainsi qu'une institution de microfinance islamique tunisienne ont lancé leurs activités dans le pays, et Enda a dû faire face à une concurrence réelle pour la première fois de son histoire. Etant donné que la loi fixe des plafonds de crédit différents pour les organisations à but non lucratif et les sociétés privées, Enda a décidé de créer une filiale sous statut privé, afin de pouvoir répondre aux besoins de ses clients.

Depuis le début de ses activités, Enda a toujours mis un point d'honneur à soutenir les personnes vulnérables et en particulier les femmes, et sa politique de ciblage des femmes a toujours été clairement affichée. Néanmoins, afin d'éviter certains effets négatifs tels que l'utilisation des femmes par les membres masculins du ménage pour accéder au crédit, Enda a modifié sa politique en 2008 et a choisi de ne donner que la priorité aux femmes et non plus l'exclusivité. Pour cette raison au moins, le nombre de femmes parmi les clients a régulièrement diminué au cours des dernières années, puisque 80,4% des clients étaient des femmes en 2007 contre seulement 65% en 2015. Compte tenu de la transformation d'Enda en société privée en 2016, qui permet à l'IMF d'accorder des montants plus élevés, la part des hommes pourrait continuer à augmenter jusqu'à devenir majoritaire, étant donné que les hommes demandent généralement des montants plus élevés.

Par conséquent, les objectifs internes ont été questionnés : bien qu'il y ait encore un objectif quantifié de 65% de femmes parmi les clients en 2015, la pertinence de maintenir cet objectif a été discutée depuis lors. En particulier, compte tenu des difficultés sociales et économiques croissantes en Tunisie, Enda a décidé d'étendre ses objectifs prioritaires aux jeunes et aux populations rurales, en plus des femmes, afin de prendre en compte toutes les catégories de personnes vulnérables. Néanmoins, jusqu'à présent, l'autonomisation des femmes demeure l'un des principaux objectifs officiels. Afin de nourrir la réflexion sur cette question, Enda a ainsi commencé à développer des activités de recherche, certaines d'entre elles visant à se concentrer sur les questions de genre.

A la même période, je m'intéressais à la microfinance en Tunisie et souhaitais en faire mon terrain de recherche. J'ai alors contacté Enda, qui m'a proposé de travailler pour eux et avec eux sur les questions de genre. Ce travail de recherche résulte ainsi de la rencontre entre mon intérêt personnel initial pour la microfinance en Tunisie et les besoins et préoccupations spécifiques d'Enda à l'époque. Profondément convaincue qu'il est dans l'intérêt des chercheurs et des acteurs de terrain

de mieux se connaître et de travailler davantage ensemble, notamment en ce qui concerne les questions de développement, je me suis efforcée de réaliser un travail en accord avec cette vision.

Au cours de cette année sur le terrain, j'ai eu l'occasion de visiter quelques agences et de suivre quelques agents de crédit dans leur travail quotidien, au bureau et au domicile des clients, tant en banlieue tunisienne qu'en milieu rural. Cependant, j'ai passé la majeure partie de mon temps à siège à Tunis, travaillant principalement avec un chercheur-statisticien et avec d'autres membres de divers départements, tels que le marketing, la formation, le crédit, l'agriculture, les services non financiers et le service informatique. J'ai participé à diverses études qui ne sont pas toutes incluses dans ce travail, mais qui ont nourri mes réflexions.

Les échanges que j'ai eus avec les cadres supérieurs et intermédiaires, certains agents de crédit et formateurs (d'agents et de clients), ainsi que ce que j'ai entendu et observé au cours de cette année sur le terrain ou lors de mes visites suivantes de courte durée ont également permis de construire des hypothèses et d'interpréter les résultats.

Pour effectuer les analyses quantitatives de ce travail de recherche, j'ai travaillé avec les gestionnaires du système d'information interne pour accéder aux données sur les demandes, les clients et les prêts. Cela exigeait de travailler en étroite collaboration avec le service informatique, qui était chargé de répondre à ce type de demandes techniques. Les données brutes devaient ensuite être nettoyées et comprises. Pour ce faire, le service informatique a contribué à détailler la signification de chaque indicateur tandis que le service Marketing a fourni des informations sur leur fiabilité. Sans une telle coopération, il aurait été beaucoup plus ardu d'utiliser ces données et d'éviter les erreurs d'interprétation.

C'est donc grâce à un travail de collaboration fructueux avec Enda que ces recherches ont pu aboutir.

La thèse est structurée en cinq chapitres. Le chapitre 1 se concentre sur le processus d'attribution du premier microcrédit dans l'historique de crédit des clients. En utilisant 61 353 observations correspondant aux demandes faites par les nouveaux candidats entre le 1er janvier 2014 et le 23 septembre 2014, les trois étapes du processus sont examinées : d'une part, le montant demandé, d'autre part, le processus de sélection, et enfin, le montant accordé. L'objectif est de révéler les éventuelles inégalités hommes-femmes à chaque étape. L'analyse de la première étape met en évidence les différences initiales entre les candidats hommes et femmes en termes de profils, de ressources et de projets, et montre que les femmes partent dès le départ de bien plus loin à tous les

niveaux. Ces différences initiales prises en compte, l'analyse du montant demandé révèle que les femmes ont également tendance à demander des montants inférieurs toutes choses égales par ailleurs. Du côté de l'offre, l'analyse montre qu'Enda favorise effectivement les femmes en termes d'accès au crédit, puisque les femmes sont plus susceptibles de voir leur demande approuvée que les hommes ; cependant, une fois sélectionnées, les femmes ont tendance à recevoir des montants inférieurs à ceux des hommes, en particulier les plus ambitieuses qui demandent des montants plus élevés, ce qui révèle un effet plafond de verre. Par conséquent, les inégalités de départ ne sont que partiellement compensées, avec un accès au crédit facilité mais des conditions de prêt moins favorables.

Parce que le chapitre 1 utilise des données réelles provenant du système d'information complété par les agents de crédit, il existe un risque que l'information observée par le chercheur ne corresponde pas totalement à celle observée par les agents de crédit : ces derniers peuvent avoir recueilli des informations supplémentaires lors de leurs visites qui n'ont pas été rapportées dans le système, même si les informations déterminantes pour prendre une décision sont censées l'être. Par conséquent, l'écart observé entre les montants accordés aux hommes et aux femmes au chapitre 1 pourrait s'expliquer par ces informations inobservables. Néanmoins, la principale hypothèse est plutôt que les femmes sont effectivement désavantagées en termes de montants et subissent de la discrimination.

Pour vérifier cette hypothèse, le chapitre 2 consiste en une étude expérimentale impliquant des agents de crédit. Un échantillon d'agents d'Enda a participé à un exercice consistant à allouer un montant de prêt à des demandes de prêts fictives. Ces cas fictifs ont été construits de façon à contenir des informations sur les facteurs de risque les plus déterminants selon les procédures officielles, mais ont été considérablement raccourcis par rapport à un dossier de demande réel. Le but était d'inciter les agents de crédit à recréer une histoire imaginaire autour de l'information disponible, sur la base de leur expérience et leurs représentations. L'analyse montre que, dans l'ensemble, les agents ont évalué les différents facteurs de risque conformément aux procédures, ce qui prouve que ces procédures sont assimilées et que l'exercice a été pris au sérieux ; cependant, tous autres facteurs de risques égaux par ailleurs, les cas fictifs impliquant des candidates ont reçu des montants inférieurs à ceux impliquant des candidats masculins. Étant donné le faible nombre d'observations, un test de robustesse a été effectué en remplaçant tous les autres facteurs de risque par un score de risque, et les résultats restent robustes. L'expérimentation conforte donc l'hypothèse explicative des résultats du chapitre 1, à savoir que les femmes sont probablement victimes de discrimination.

Afin d'analyser dans quelle mesure cette discrimination peut être statistique, le chapitre 3 consiste à examiner les comportements des hommes et des femmes en tant que clients tout au long de leur historique de crédit. En effet, la discrimination statistique telle que théorisée par Phelps (1972) renvoie à une situation dans laquelle un individu appartenant à une catégorie sociale se voit défavoriser en raison de son appartenance à cette catégorie. Dans les faits, cette catégorie se trouve être moins productive ou plus risquée en moyenne que les autres, ce qui justifie le traitement spécifique du point de vue de la rationalité économique, d'où la dénomination « statistique » ; malgré tout, le traitement d'un individu basé uniquement sur son appartenance à une catégorie plutôt que sur l'ensemble de ses caractéristiques individuelles demeure un traitement discriminatoire.

Ainsi, si les femmes apparaissent comme des clientes plus risquées en termes de remboursement ou de défaut de paiement, la discrimination à leur égard serait effectivement statistique, ce qui constituerait une explication objective de l'écart observé entre les montants accordés pour les premiers prêts, même si cela ne serait pas pour autant justifiable. Par conséquent, abandon, défaut de paiement et remboursement tardif sont les trois types de comportements à risque analysés à partir d'un ensemble de 183 109 observations qui correspondent aux crédits accordés entre juin 2012 et mars 2016 aux 69 301 clients ayant obtenu leur premier prêt entre juin 2012 et décembre 2013. Les résultats montrent que les femmes sont au contraire moins susceptibles que les hommes de faire défaut ou de rembourser avec du retard, toutes choses égales par ailleurs; en d'autres termes, elles ont un comportement moins risqué, qui n'est pas dû à des caractéristiques spécifiques de projet ou de profil. Néanmoins, cela peut ne pas être suffisant pour affirmer que les prêts aux femmes sont plus avantageux pour les IMF : en effet, si les femmes apparaissent comme des clientes moins risquées, elles empruntent malgré tout des montants moins importants, ce qui les rend potentiellement moins rentables. Par conséquent, ce chapitre tente également de contribuer à la discussion sur l'avantage financier de prêter aux femmes, et conclut que si les profits générés par les prêts des femmes sont légèrement inférieurs à ceux des hommes, l'écart reste inférieur à celui des coûts générés par les comportements à risque, qui sont plus élevés pour les hommes.

En tenant compte des informations sur les comportements passés des clients, ainsi que de l'évolution de leurs projets, et en corrigeant le biais de sélection au fil des cycles de crédit puisque certains clients quittent l'institution, le chapitre 4 examine la politique de prêt progressive au fil des cycles de crédit appliquée par Enda, en utilisant le même ensemble de données qu'au chapitre 3. L'analyse de l'évolution des montants des prêts au fil des cycles, en niveau et en taux de croissance, montre que les hommes et les femmes bénéficient d'une politique de prêt progressive toutes choses égales par ailleurs : cela signifie que les montants accordés augmentent plus rapidement que les indicateurs financiers reflétant l'évolution des projets. Une telle politique de prêt progressive

implique que l'IMF fait montre d'une confiance croissante envers ses clients au fil des cycles de crédit. Cependant, la politique de prêt progressive est un peu moins rapide pour les femmes que pour les hommes, confirmant ainsi l'existence d'un effet plafond de verre, qui ne disparaît pas au fur et à mesure que la relation entre l'IMF et ses clients dure et se renforce. Étant donné que les femmes ne sont pas des clientes plus risquées, ce résultat remet en question la nature purement statistique de la discrimination à laquelle elles sont confrontées en termes de montants. En effet, les stéréotypes genrés négatifs semblent prévaloir sur l'information positive concernant le comportement de remboursement des femmes dans le processus d'allocation de microcrédit.

De ce fait, le chapitre 5 consiste en une étude d'impact d'une initiative lancée par Enda pour sensibiliser son personnel aux questions de genre. En effet, Enda avait dès le départ prévu de former l'ensemble de son personnel sur cette question, et a commencé par une phase expérimentale en 2014 et 2015 au cours de laquelle seul un échantillon du personnel de terrain a été formé. La formation de 2 jours a consisté à donner des informations factuelles sur les inégalités de genre existantes en Tunisie en général et chez les clients d'Enda en particulier, et à faire réfléchir les participants sur ce qu'ils pourraient entreprendre dans leur travail au quotidien pour améliorer la situation. En utilisant l'information concernant les portefeuilles mensuels des agents de crédit participants et non-participants, l'objectif du chapitre 5 est de vérifier si une telle formation peut avoir un effet sur divers indicateurs tels que le montant moyen des prêts accordés aux femmes ou la part des femmes parmi les clients. La méthode des doubles différences est appliquée à un ensemble de données de panel composé de 19 périodes mensuelles, 82 agents formés et de 200 à 500 agents de contrôle selon le groupe de contrôle choisi, et cinq variables dépendantes différentes sont examinées. Les résultats montrent que les effets ont été hétérogènes selon le sexe et l'expérience des agents, avec des effets plus significatifs, directs et positifs sur les agents de crédit femmes nouvellement recrutées. Dans l'ensemble, si les effets restent modestes, ils encouragent plutôt le renouvellement régulier de ce type d'initiatives.

Ainsi, en montrant que la microfinance n'atteint pas toujours pleinement ses objectifs en termes de réduction des inégalités hommes-femmes et en cherchant à identifier les obstacles internes à l'atteinte de cet objectif, ce travail de recherche vise à contribuer à la réflexion sur la manière de faire en sorte que la microfinance fonctionne mieux. En effet, l'inclusion financière reste aujourd'hui un objectif prioritaire, dans la mesure où deux milliards d'adultes n'ont toujours pas accès à une institution financière, et la microfinance reste un outil pertinent pour relever ce défi. Par conséquent, la première question qui importe est de savoir comment améliorer les pratiques afin de s'assurer que

les objectifs sont atteints. La principale réponse suggérée dans le *Baromètre de la Microfinance 2017* est de se concentrer toujours plus sur la performance sociale. Des améliorations peuvent en effet encore être apportées sur ce sujet : en particulier, adapter les systèmes d'information, collecter et analyser les données longitudinales sur les clients des IMF tout au long de leur historique de crédit permettrait une meilleure évaluation des impacts de la microfinance. En d'autres termes, les indicateurs existants pour évaluer la performance sociale des institutions de microfinance sont nécessaires et marquent un pas significatif vers des pratiques plus responsables en microfinance par rapport aux décennies précédentes où l'accent était mis sur la performance financière, mais ils semblent être insuffisants et mériteraient encore réflexion, adaptation et amélioration.

Cette observation est au cœur de ce travail de recherche. En se concentrant sur une institution de microfinance spécifique qui a toujours prétendu agir en faveur de l'autonomisation des femmes, il a été démontré qu'une forte proportion de femmes dans le portefeuille ne reflète pas nécessairement des pratiques qui profitent pleinement aux femmes. Alors que ce chiffre est aujourd'hui le seul indicateur de performance sociale à l'égard des femmes, ce travail souligne en particulier son insuffisance pour évaluer correctement les pratiques de la microfinance en termes d'égalité ou d'équité entre les sexes.

La microfinance est en effet née et s'est considérablement développée dans des pays où les inégalités entre les sexes sont importantes, et cette étude de cas ne fait pas exception. Les premières analyses du chapitre 1 montrent que ces inégalités hommes-femmes dans la société tunisienne ne se reflètent pas seulement dans les projets des candidates, les femmes menant des projets à plus petite échelle que les hommes, mais aussi dans leurs préférences et leur comportement en termes de montants demandés, les femmes ayant tendance à demander des montants inférieurs toutes choses égales par ailleurs. Compte tenu de ces inégalités préexistantes, l'IMF étudiée applique effectivement une politique de ciblage en faveur des femmes, puisque les femmes sont plus susceptibles de voir leur demande acceptée que les hommes, toutes choses étant égales par ailleurs. Cet avantage peut être dû à la motivation des agents, qui sont censés connaître et adhérer à la mission de l'IMF lorsqu'ils sont recrutés, et/ou à la procédure spécifique appliquée en termes de sélection des clients, puisque le fait d'être une femme candidate est associé à un score de risque plus faible. Quoi qu'il en soit, cet avantage constitue clairement une politique de discrimination positive à l'égard des femmes en ce qui concerne l'accès au crédit.

Cependant, les analyses des conditions de prêt et en particulier du montant des prêts dans les chapitres 1, 2 et 4 racontent une autre histoire : toutes choses égales par ailleurs, les femmes ont tendance à recevoir des montants moins élevés, non seulement pour leur premier cycle de crédit,

mais aussi pour les cycles suivants. Alors que l'écart observé pour les premiers cycles au chapitre 1 aurait pu s'expliquer par une forte asymétrie d'information et/ou des caractéristiques non observables, ces explications sont réfutées par le chapitre 4 qui montre un écart persistant et croissant tout au long de l'historique de crédit des clients, et par le chapitre 2, dont le format expérimental prouve qu'aucune information objective ne peut justifier l'écart observé. Même si cet écart du côté de l'offre reste inférieur à celui du côté de la demande, c'est son existence même qui doit être questionnée, en particulier au sein d'une IMF qui met un point d'honneur à promouvoir son action en faveur des femmes.

Par conséquent, la principale hypothèse explicative de ce désavantage subi par les femmes est le comportement discriminatoire des agents de crédit. L'une des principales questions est de savoir si une telle discrimination n'est que statistique, étant donné les inégalités hommes-femmes existantes en termes d'accès aux ressources, d'allocation du temps aux travaux ménagers, d'expérience professionnelle, etc. Néanmoins, l'ampleur de l'écart observé dans l'étude expérimentale du chapitre 2 et le fait que les femmes constituent de fait des clients moins risqués pour l'IMF, comme le montre le chapitre 3, impliquent plutôt que les stéréotypes et représentations de genre des agents de crédit excèdent ce qui pourrait être considéré comme un comportement économiquement rationnel. C'est l'une des raisons pour lesquelles Enda a lancé l'initiative consistant à former l'ensemble de son personnel sur les questions de genre analysées au chapitre 5: l'objectif était de sensibiliser sur les inégalités existantes et sur la façon dont elles peuvent affecter le travail quotidien des agents. Même si les effets de la formation restent modestes en termes d'impact positif sur la clientèle féminine, ils ont révélé de façon inattendue que les agents femmes nouvellement recrutées pourraient également bénéficier d'une telle formation.

Néanmoins, traiter des normes et représentations sociales et de genre reste complexe et leur mise en lumière est particulièrement ardue. Pour contourner ces difficultés, certaines stratégies ont été adoptées : les exercices de groupe et les méthodes participatives sont généralement plus efficaces que les entretiens pour dévoiler les représentations de genre, ce qui a été confirmé par les sessions de formation analysées au chapitre 5, ainsi que par l'expérimentation du chapitre 2, plus révélatrices que les quelques entretiens menés. Malgré cela, davantage d'études et d'enquêtes qualitatives auprès des agents de crédit comme des clients constitueraient des prolongements pertinents à ce premier travail.

Ainsi, ce travail de recherche a tenté de démontrer que même au sein d'une organisation engagée envers l'émancipation et l'autonomisation des femmes, les stéréotypes et représentations de genre peuvent entraver la réalisation des objectifs initiaux. En effet, il semble que dans ce cas, les

stéréotypes sur les femmes et leurs projets conduisent à enfermer les clientes dans de telles représentations, en particulier les plus ambitieuses, et ne leur laissent pas la chance de s'émanciper, même si elles bénéficient d'un accès facilité au microcrédit.

Plusieurs actions peuvent être mises en œuvre pour faire face à ce problème : la sensibilisation par des formations participatives en est une, et depuis le début de 2017, l'ONG Enda inter-arabe, qui est responsable des services non financiers, a reçu un financement sur trois ans pour s'assurer qu'un maximum d'agents nouvellement recrutés suivent la formation sur les questions de genre. Une autre action possible qui serait au moins tout aussi pertinente serait, comme les agents l'ont eux-mêmes suggéré, d'adapter les procédures. Étant donné que les femmes sont favorisées en termes d'accès au crédit dans les procédures d'octroi, il devrait être possible de garantir que ces procédures permettent également aux clientes d'être traitées au moins également en termes de montants accordés, si ce n'est pas également favorisées à cet égard.

A propos de l'égalité de traitement tout d'abord, Enda tend aujourd'hui à suivre les recommandations récentes en matière d'adaptation des systèmes d'information : depuis début 2017, le système permet aux agents d'enregistrer les montants demandés pour chaque cycle, et d'avoir une vue d'ensemble de l'historique et de l'évolution du crédit des clients. Même s'il ne s'agit que d'une première étape, cette adaptation assure au moins aux agents de meilleures conditions pour appliquer la politique de prêt progressive d'une manière peut-être plus objective et plus égalitaire. De plus, parce que le nouveau plafond de crédit pourrait avoir un effet négatif sur la proportion de femmes clientes, Enda a entamé des discussions sur la façon d'intégrer la part de femmes clientes dans le calcul des bonus des agents.

Pour aller plus loin, l'IMF pourrait également avantager les femmes en ce qui concerne les montants accordés. Bien sûr, un tel avantage pour les femmes soulèverait des questions éthiques : étant donné que cela pourrait être considéré comme de la discrimination statistique à l'égard des hommes, il est nécessaire que les IMF questionnent la position qu'elles sont prêtes à prendre. Lorsque certaines inégalités existent dès le départ entre des groupes sociaux, une politique d'égalité de traitement n'a pas les mêmes conséquences qu'une politique d'égalité des chances. L'évaluation du caractère juste de ces politiques implique de choisir entre différentes conceptions de la justice sociale. Alors que le premier type de politique correspond plutôt à la notion de justice procédurale, qui implique que le caractère juste est évalué en examinant la procédure menant à un résultat, le second se concentre sur le résultat lui-même, et en ce sens est plutôt conforme aux théories conséquentialistes de la justice. Dans la pratique, une politique d'égalité de traitement peut sembler équitable en termes de procédure, mais n'est pas en mesure de compenser les inégalités initiales. En

revanche, parce qu'une politique d'égalité des chances est basée sur l'idée que ces inégalités initiales doivent être compensées afin d'assurer à tous les mêmes chances de succès, elle ne repose pas sur l'égalité de traitement, mais plutôt sur la discrimination positive, qui consiste à favoriser le groupe initialement défavorisé. La théorie de la justice sociale de Rawls (Rawls, 1971), qui traite de la nécessité de redistribuer les ressources et introduit le concept d'égalité des chances, a inspiré le concept de discrimination positive. Cependant, un autre célèbre théoricien de la justice sociale, Amartya Sen, lui reproche de ne pas tenir compte de l'hétérogénéité des individus (Sen, 2000). Ainsi, une redistribution égale des ressources ne conduirait pas nécessairement à une plus grande égalité dans les libertés dont les individus jouissent.

Ces questionnements sur la justice sociale sont nécessaires à la réflexion sur les moyens d'améliorer le fonctionnement de la microfinance, notamment en ce qui concerne les inégalités hommes-femmes : certains changements de procédures, tels qu'une plus grande flexibilité vis-à-vis des femmes en matière de garanties, des seuils d'actifs différents pour accéder à des produits financiers spécifiques, etc., peuvent constituer un moyen de compenser les inégalités initiales entre les clients masculins et féminins, et un mode de redistribution censé assurer une plus grande égalité des chances. Cependant, dans notre contexte, la critique de Sen est particulièrement pertinente : redistribuer les ressources est une première étape, mais parce que les clientes ont tendance à être moins instruites, à avoir moins d'expérience professionnelles, moins d'accès aux ressources et à être moins conscientes de leurs droits, elles ont probablement moins de capacité à prendre des décisions ou à faire des choix en étant conscientes de toutes leurs possibilités. En d'autres termes, il existe également des inégalités de capacités entre les clients masculins et féminins, et un moyen d'améliorer les performances sociales de la microfinance en termes d'égalité entre les sexes serait de veiller à ce que la microfinance s'attaque également à ces inégalités. En pratique, cela pourrait consister à offrir des services non financiers spécifiques aux femmes, tels que des ateliers sur la gestion du budget, l'esprit d'entreprise, la commercialisation des produits, les droits des femmes, etc. Jusqu'à présent, si Enda inter-arabe offre de tels services depuis longtemps, une très faible proportion de clients en ont effectivement bénéficié (moins de 10%). Redéfinir les conditions de prestation de ces services non financiers et éventuellement les combiner avec des produits financiers pourrait être un moyen d'améliorer les pratiques. Cela serait probablement coûteux, mais les impacts à moyen terme restent inconnus, et si la performance sociale des IMF est susceptible de bénéficier de telles mesures, cela pourrait aussi bien être le cas de la performance financière.

Finalement, tout dépend de la mission que les IMF choisissent de poursuivre : agir en faveur de l'égalité des chances est un objectif plus exigeant que celui d'assurer une égalité de traitement dans les pratiques quotidiennes. Une fois l'objectif clairement défini, des mesures peuvent être prises pour

l'atteindre ; toutefois, la gestion quotidienne et les objectifs à court terme empêchent parfois les décideurs de prendre le temps de la réflexion sur leurs choix politiques.

Pour éclairer ces réflexions et mieux comprendre les impacts possibles des initiatives en faveur d'une plus grande égalité des chances, il apparaît nécessaire d'adopter une vision à long terme: en effet, de telles initiatives peuvent être coûteuses pour les IMF et affecter négativement leur performance financière dans un premier temps, mais l'impact sur les clients après quelques années ou cycles de crédit peut finalement profiter à tous. Des recherches plus approfondies sur l'impact des changements de pratiques et de procédures dans une perspective longitudinale, tant du point de vue des clients que des IMF, apporteraient certainement de nouvelles réponses à la question de savoir comment améliorer le fonctionnement de la microfinance.

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Résumé

La microfinance vise à favoriser l'accès aux services financiers pour les personnes vulnérables exclues du système bancaire traditionnel. Elle apparaît en cela comme un outil de réduction des inégalités, notamment de genre, vis-à-vis de l'accès au crédit. Toutefois, en s'appuyant sur le cas de la principale institution de microfinance tunisienne, ce travail de recherche montre que lorsque les conditions de crédit octroyées sont examinées, l'objectif de réduction des inégalités ne semble pas pleinement atteint. En effet, si l'institution favorise effectivement les femmes en ce qui concerne l'accès au microcrédit, et malgré le moindre risque qui représentent les femmes pour l'institution, celles-ci reçoivent malgré tout des montants de crédit inférieurs aux hommes, et ce tout au long de leur historique de crédit. En particulier, les femmes les plus ambitieuses sont les plus rationnées. La mise en perspective des analyses sur microdonnées, données expérimentales et sur l'impact d'une formation sur les agents de crédit laisse penser que les inégalités hommes-femmes existantes en Tunisie et chez les clients participent de la construction de stéréotypes de genre chez les agents de crédit. Dans la mesure où une certaine place est laissée à la subjectivité dans les procédures d'octroi actuelles, certaines inégalités se reproduisent plus qu'elles ne se réduisent.

Mots Clés

Genre; Microfinance; Inégalités; Discrimination; Stéréotypes; Expérimentation; Tunisie;

Abstract

Microfinance aims at facilitating access to financial services for vulnerable people excluded from the traditional banking system. In that regard, it appears as a key tool to reduce inequalities, especially between men and women, to access credit. However, on the basis of a case study about the main Tunisian microfinance institution, this research work shows that when considering the loan conditions granted, the objective of inequality reduction is not fully achieved. If the institution indeed favors women in terms of access to credit, and despite the lesser risk female clients represent for the institution, women still receive lower loan amounts than men all along their credit history. The most ambitious women are in particular the most rationed ones. Putting the analyses on microdata, experimental data and impact assessment of a training on loan officers into perspective suggests that gender inequalities existing in Tunisia and among clients contribute to create gender-based stereotypes among loan officers. Since current granting procedures leave some room for subjectivity, some inequalities are reproduced instead of reduced.

Keywords

Gender; Microfinance; Inequalities; Discrimination; Stereotypes; Experiment; Tunisia;