Responding letter to the referee report 2

February 5, 2016

1 General comments

a) First, as developed below, I cast some doubts about the research question which analyzes spatial competition with strongly differentiated bank and MFI. Namely,are MFIs able to compete with bank really differentiated from them?

Response: Competition between banks and microfinance institutions (MFI) is an absolute reality today. The latter have experienced a rapid development during recent years and the banks begin to feel the competitive pressure. In some regions, particularly in Latin America, some MFIs are even more profitable than the best commercial bank in the area. Moreover, many MFI have reconstructed to become banks, and several banks have established financial subsidiaries to serve the microfinance sector (Rhyne and Lopez, 2003; Isern and Porteous, 2005). Fall (2009) gives a detailed analysis of the interactions between the two types of institutions. The author underlines that both sectors find themselves increasingly competing in the segment of small and medium enterprises.

b) Second, effort should be dedicated to a better clarification of the two additional factors of product differentiation - which are the main originality of the paper -. As stated by the authors, psychological distance can also include customers' educational level. Therefore, the educational level's factor seems to be redundant. More generally, psychological distance is presented as a catch-all term and should be more delimited and referenced.

Response: Indeed, the level of education is a type of psychological distance. However, we decided to isolate it from psychological distance to better highlight (i) the role of cultural distance measured by education level and (ii) that of psychological distance (as revenue) in the credit relationship. For example in Senegal, the one who does not speak French is almost never client of a bank. This is a cultural distance. On the other hand, some people thinks that they do not have a regular revenue to open a banking account. That is a psychological distance.[1]

c) Third, from a theoretical point of view, results are not really value-adding because the three propositions are too intuitive. The two fist propositions should be labeled lemmas instead of propositions, and the third one is a corollary of the second. Hence, in its current form, the results of the model are not sufficiently significant.

[1]Basing on a CRES survey entitled "Information and communications technology, growth, and poverty in Senegal", it appears that 60.5% of interviewers said that they have not a banking account because they do not have a regular revenue. 24% of them said that their revenue is too low to have it. Authors calculated.

Response: We detail our response in points (f) and (g) of Section 3.

2 Detailed comments on the research contribution

a) The purpose of the paper is introduced with the help of numerous empirical observations in the first paragraph. Particularly, competition between banks and MFIs is considered to be more and more intensive in developing countries. But previous empirical studies and empirical figures are missing from the discussion. I suggest to rigorously reinforce the empirical illustration of the issue with the help of a literature survey and some stylized facts.

Response: We remedy this problem in the second version, including different empirical studies in the field. Indeed, at the beginning, we wanted to have a short paper. Hence, in the submitted version, there was not a discussion on the competition bank/MFI. In the new version, this discussion is added.

b) Some of the references (Fall 2009) describe a very complex and heterogeneous mapping of banks/MFIs relationships, which are mainly based on complementarity and partnership. The most common type of collaboration entails MFIs borrowing from banks in order to finance their microcredit, benefit from bank ownership of their equity, receive subsidies from them or share infrastructure with them (Cozarenco 2015). Then, could the research question be generalized to all the MFIs and theoretically based on a binary competitive relationship?

Response: We were aware of the need to further specify the type of banks and MFIs involved in this competition. In our model, the competition takes place between retail banking (being interested in the average customer in urban suburbs) and big MFIs (beginning to make their foray into the banking sector). The conditions of competition between the two sectors are analyzed in Fall (2009). The author shows different articulation patterns including competitive or complementary strategies.

c) Quoting Brière and Szafarz (2015) "*Microfinance has changed dramatically during the last decade, moving from a universe of donor-financed NGOs toward a widely disparate industry, including a growing number of commercial banks. The microfinance sector has experienced successful initial public offerings (IPOs) such as the highly publicized flotation of Banco Compartamos in Mexico in 2007. These IPOs have nevertheless been criticized by influential players, including Nobel Prize winner Muhammad Yunus, who views the Compartamos IPO as mission drift that compromises the sector's reputation.*".

   Starting from this quotation, and admitting that MFIs able to compete with banks in three different ways (1. trying to attract richer clients (upscaling strategy), 2. being involved on capital markets operations, and 3. meeting traditional banks' standards, regulation and agreements), can we consider them as really differentiated with banks anymore (especially if traditional banks competing with them are themselves involved in a downscaling strategy)? In that sense, the main assumption of the paper has to be rigorously justified, discussed or relaxed.

Response: Indeed, we consider that the bank in our model applies a "dowscaling" strategy. As a consequence, it becomes the MFI's competitor. This phenomenon occurs in some segments, particularly those of SMEs. That is why we introduced two additional differentiation factors in our model: the psychological and the cultural distances.

In the new version, we will extend the discussion on the competition conditions between the two sectors.

d) Finally, the definition of the psychological distance factor seems to be too approximate and redundant with the educational level factor. Indeed, in page 2, the authors explicitly argue that "*the factors that create distrust between a bank and its client [...] can also include customers' educational level*". In the model, psychological distance refers to the level of distrust between the lender and the client. As a crucial factor in the model, I recommend to develop and contextualize this definition (with the help of related literature such as Tronnberg and Hemlin 2012, and by distinguishing with others educational level and spatial distance's factors). In the same way, what are the "sociocultural factors" mentioned at the top of page 2? The authors should give some examples.

Response: The cultural distance, captured by the customer's education level, is well differentiated from the psychological distance as aforementioned. We will further clarify the difference between them and the reasons for our choice.

3 Detailed comments on the theoretical analysis

a) Is the physical distance really determinant in the client choice between banks and MFI? Credit is not a basic good regularly consumed and it seems that its price is relatively expansive regarding geographical distance costs. The authors should justify this assumption.

Response: Yes, the physical distance remains important in the competition between the bank and the MFI if the service in question is identical. Here, the credit is used to finance a project. Therefore, the customer who believes that credit conditions are the same in the two institutions will take into account the physical distance. Overall, the literature still considers the proximity of the service as a determinant of access to financial services (see for example Allen et al., 2016).

b) The psychological cost should depend on the level of education given the authors' assumptions (cf. supra).

Response: We isolated the education level from psychological distance to show the importance of each distance, as we mentioned above.

c) The authors state that "for each additional year of study, we consider that his/her cost of financing with the bank decreases by an amount γ". Is that empirically relevant? Does the interest rate varies with the level of education?

Response: Yes. Indeed, individuals who are more educated have more bargaining power in their project, and can better convince the bank of the relevance of their proposal. This reduces the financing costs for the individuals in question. As for the bank, she has this information and takes into accounts it while determining the interest rate.

d) Equations (6) and (7) seem to indicate that the number of customers is normalized at 1. The authors should state it clearly.

Response: We in fact normalized the segment to 1, as in the case of Hotelling model. As a consequence, we have Equations (6) and (7).

e) Equations (10) and (11) are false. The right equilibrium interest rates are respectively: $r_b = \frac{1}{3}(3t + (\sigma_i - \sigma_b) + a_e\gamma)$ and $r_i = \frac{1}{3}(3t + (\sigma_b - \sigma_i) + a_e\gamma)$.

Response: We checked and recognized the error. We will rectify it in the new version.

f) Proposition 1 states that if the positive and negative elements added in the Hotelling model are canceled, we obtain the Hotelling initial case. This assertion is intuitive and cannot be presented as a contribution.

g) Proposition 2 and 3 describe respectively what happen if equation (12) is higher than 1 or lower than 0. These propositions thus explore the limit cases where there is a monopoly position. The discussion around these two limit cases is interesting but directly comes from assumptions. For example, the authors say that "Proposition 2 implies that when the educational level of the customer is relatively higher than the psychological and physical distances, the customer is going to choose the bank". Since educated clients prefer banks to MFI, this assertion is intuitive

Response: We will modify the model in the new version. Indeed, Proposition 1 becomes a remark, or a lemma. We keep Proposition 2 and Proposition 3 becomes a corollary of the former.

4 Minor comments

a) The article of Mayoukou and Ruffini (1998) is cited in the text while the bibliography indicates the year 2009.

Response: It was a mistake. 1998 is the correct year.

b) The authors should use the term "monopoly power" instead "monopolistic power" since they mention situations where there is only one lender in the market.

Response: We agree to use the term to use the term "monopoly power" instead of "monopolistic power".

c) The bibliography mentions an article of Fall 2011 which does not appear in the body of the text.

Response: We added the reference Fall (2011).

References

Allen, Franklin and Demirguc-Kunt, Asli et al. (2016), "The foundations of financial inclusion: Understanding Ownership and Use of Formal Accounts", *Journal of Financial Intermediation.*

Rhyne, Elisabeth and Lopez, Cesar (2003), "The Service Company Model: A New Strategy for Commercial Banks in Microfinance", *Accion's InSight Series*, No. 6.

Isern, Jennifer and Porteous, David (2005) "Commercial banks and microfinance : evolving models of success", *CGAP focus note*, no. 28. Washington, DC: World Bank.