

## Microfinance and The Improvement of Social Welfare of Beneficiary Households: Evidence from Tunisia

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### *Microfinance and The Improvement of Social Welfare of Beneficiary Households: Evidence from Tunisia*

#### Abstract

*This study is a contribution in the field of evaluation of the effects of microfinance on the social status of its beneficiaries. In this article, we used the counterfactual approach that compares the evolution of the situation of beneficiaries of microcredit to a control group (which has the same initial characteristics of the group of beneficiaries). The results of our empirical study confirm previous findings on the positive effects of microfinance on social welfare. These effects are identified through rising food costs, access to health services, education for children and improved household living arrangements.*

## 1. Introduction

Economic growth Microfinance is considered by many economic and policy makers, as the best solution to the problem of the marginalization suffered by populations in developing countries. This discipline has developed as a tool for social and economic development, focusing specifically on people with low incomes. It has emerged as a consistent approach with the new strategies of social and human development who are interested, primarily, in the economic and social integration of the disadvantaged. Around the world, many microfinance institutions (MFIs) are trying to build human capital and improve the living conditions of their clients.

In Tunisia, the public authorities and stakeholders in the development seem to be aware of the socioeconomic scope of microfinance; they are fully convinced of the role it can play as an effective means of social and human development, particularly through its ability to reduce poverty and improve the living conditions of the beneficiaries. Indeed, improvement of income, access to health services and education and improved housing conditions, are just a few ways in which microfinance affects the poorest and excluded populations of financial systems traditional.

This study is part of a perspective for assessing the effects of microfinance on the social status of its beneficiaries. It expands the research in the area of the impact of microfinance. In this article, the question that we intend to answer is: What is the impact of access to microcredit and its use on the social conditions of the beneficiaries? The next section reviews the previous work has addressed the relationship between microfinance and the improvement of social welfare. Section 3 deals with the formulation of hypotheses of the study and present the research methodology. Section 4 presents the model results and their interpretation. Finally, the last section concludes this work.

## 2. Literature Review

In recent years, the Microfinance impact studies have begun to address more systematically the impact of credit in the beneficiary households. Most of them have found that microcredit may have "magical" effects on the living conditions of households (Sebstad & Chen, 1996). Most of these studies were conducted to highlight the role of microfinance in the economies of developing countries, where social and economic strategies implemented to improve the living conditions of their poorest people have not been successful.

In fact, contrary to economic impacts, social impacts of microcredit are less questionable. Indeed, the additional income generated by the business and other productive investments of microcredit beneficiaries enable them to improve the

living conditions of their households. Several studies have examined the impact of microcredit on the change in consumer spending habits and the structure of these expenditures to assess the improvement of living conditions. Mazumder and Lu (2015) show that access to microfinance services can improve the quality of life of beneficiaries.

To measure social well-being of participating households in a microfinance program, impact studies have often used the indicators of quality of life such as: food availability, access to health services, the education of children and housing conditions (Afrane, 2002; Brau, Hiatt, & Woodworth, 2009; Chen & Snodgrass, 2001). These quality of life measures were designed to evaluate the social impacts that are possibly overlooked in economic analyzes (Brau et al., 2009). These measures are chosen because of their use as poverty indicators by the World Bank, the International Labour Organization (ILO), the United Nations Development Programme (UNDP) and other major development agencies (Littlefield, Morduch, & Hachemi, 2003; Maxwell, 1999).

First, access to microcredit enables poor people to increase their income, which enables them to accumulate savings to improve their security levels and deploy additional spending on food needs and nutritional health (Alemu, 2004). Mknelly and Dunford (1999) have shown that joining a microcredit program led to increased food spending, which implies an improvement in the nutritional status of households. According to Khandker (2005), microcredit helps families to smooth their spending by reducing the pinch of hunger and need in difficult times, especially when women are borrowing.

To appreciate the improvement in the nutritional status of households, impact studies used different indicators. Alemu (2004) has proposed to evaluate the annual expenditure on durable food products, the percentage of households whose Nutritional diet has been improved, the percentage of households that have experienced food shortages and the strategies they adapted. On their part, Brau and Woller (2004) estimated the quality and the value of food purchased. Chen and Snodgrass (2001) measured the increase in food and beverage expenses per member per day.

Secondly, microcredit enables the poor a better access to education and health services. Indeed, the availability of a stable and profitable source of income helps the poor to send their children to school and to benefit from public health services. Studies that focused on the effect of microcredit on children's education examined either expenditures on school fees, children's school attendance or education levels. Suturo (1990) and Buckley (1996) showed that schooling expenditure increases in a remarkable way following the granting of microcredit, which suggests a positive impact on schooling. According to Pitt and Khandker (1998), microcredit has a significant impact on the education of boys and girls. Chen and Snodgrass (2001), by measuring schooling rates, show that access to microfinance services enables children of beneficiaries with a better education. In the same way,

Maldonado and González-Vega (2008) show that microfinance has a positive effect on the education of children in rural areas, reducing, thereby, child labor.

Regarding the improvement of access to health services, studies show that poor households that granted microcredit improved their health conditions and access to family care (Gubert & Roubaud, 2005; Sebstad & Chen, 1996). Pitt et al (2003) show that loans to women help improve the health status of their children while loans to men appear to be ineffective. Several authors have even thought the effect of access to microfinance services on mental health of children by reducing poverty and the risk of depression in children. According to these authors, microfinance has the potential to improve psychosocial functioning of these children. This is further confirmed by DeLoach and Lamanna (2011) which show that the presence of microfinance institutions in communities significantly improves children's health. According to these authors, Microfinance can facilitate the sharing of health-related information among parents, and assist in the development of family health infrastructure.

In addition to food, schooling for children and health conditions, improved housing conditions are another factor in enhancing the living conditions of households. Indeed, the variable "housing conditions" was used in most of the microcredit impact studies (Afrane, 2002; Chen & Snodgrass, 2001; Gubert & Roubaud, 2005; Merrill, 2012). More than 67% of the respondents of Gubert and Roubaud (2005) reported that they have improved their housing conditions and home equipments. According to Merrill (2012), Microfinance is playing an increasingly important role in financing housing conditions, helping to provide more adequate shelter and facilities. The basic idea is that participation in a microfinance program helps the poor to accumulate capital and thus invest in the improvement of their homes (McIntosh, Villaran, & Wydick, 2011), either as a living space or to draw an income from it, through its renting.

### 3. Methodology

#### 3.1. The hypotheses

The review of the literature allowed us to construct the following assumptions:

**H1:** Access to microcredit has a positive effect on the beneficiary's schooling of children.

**H2:** Access to microcredit has a positive effect on the beneficiary's and his household's nutritional status.

**H3:** Access to microcredit has a positive effect on the health of the beneficiary and his household.

**H4:** Access to microcredit has a positive effect on housing conditions

### 3.2. The impact assessment

To understand the social change that can induce access to microcredit in Tunisia and verify our assumptions, we chose to use the "counterfactual" approach that seeks to compare the results of the access to microcredit with a simulation of what the results would have been in case of non-access. We chose to use the control group method. In fact, the choice of this approach is justified by its comparative feature which places it among the most robust methods of impact assessment (Hardy & Koontz, 2009; Yin, 2003). To construct a control group formed by individuals who would have had similar results to those achieved by the treatment group members, if they had not borrowed, we used the simplest approach that consist to include, in the control group, individuals whose credit application is approved but who have not yet received the loan amount.

In this study, we intend to assess the impact of microfinance in the governorate of Kairouan (Tunisia). Our comparison will focus on microcredits given by the development association AKDI and those distributed by the NGO ENDA. We chose, deliberately, to carry our study on a large sample size (300 people) to ensure its representativeness and to maximize the quality of the results that will be provided by the estimates. We used the survey as a data collection means, which cover the period 2014-2015.

### 3.2. The analysis model

The impact of microcredit is estimated by a single equation that relates the social impacts (as perceived by respondents) with the explanatory variables. Our model to estimate is:

$$y_i = C_0 + \alpha A_i + \beta X_i + \gamma Z_i \quad (1)$$

$Y_i$  is a vector of variables of change that are qualitative data collected from questions with dichotomous responses. These variables take the value 1 if there is a positive change and 0 if there is no change or if there is a negative change. The indicators we used to evaluate social well-being of beneficiary and his household are the following: increase in school spending, increase in food spending, increase in health spending, housing improvements.

$A_i$  (ACCES) is a dummy variable for access and use of microcredit. It takes the value 1 if the individual belongs to the treatment group (borrower since 2013), and 0 if it belongs to the control group (who have not yet access to microcredit). The confirmation of our main hypotheses, assuming that access to microcredit has a positive effect on the various welfare measures listed above ( $Y_i$ ), requires the coefficients  $\alpha_i$ , estimated on the variables  $A_i$  to be statistically significant and positive.

$X_i$  is a vector of variables that characterize individuals and their households (household size, poverty level and which are likely to influence the results. We have:

- AGE is a continuous variable that indicates the age of the respondent.
- GENDRE is a dichotomous variable that indicates the gender of respondent. It takes the value 1 if the respondent is a woman and the value 0 otherwise.
- NIVEDU is a binary variable that indicates the respondent's level of education. It takes the value 1 if the respondent has a secondary or university level of education and the value 0 if he has a primary level or if he is illiterate.
- ETATMAT is a binary variable that indicates the respondent's marital status. It is set to 1 if the respondent is married and 0 if the respondent is single, divorced or widowed.
- MILGEO is a binary variable that indicates the respondent's area of residence. It takes the value 1 if the environment is rural and the value 0 if it is urban.
- TMENAG is a continuous variable that indicates the number of persons in the respondent's household.
- NIVPAUV is a binary variable that indicates the respondent's level of poverty (measured by average monthly expenditures). It is set to 1 if the respondent's monthly expenses are less than 250 Tunisian Dinars (i.e., very poor) and 0 otherwise (non-poor).
- SECTACTV is a binary variable that indicates the economic sector in which the respondent operates. It takes value 1 if the sector is agriculture or production and value 0 if the sector is trade or services.

$Z_i$  is the set of micro-credit related variables when it exists. Indeed, in addition to access to credit, factors related to the degree of participation in the microcredit program are also likely to influence the variables of interest. The variables related to the characteristics of microcredit are given below:

- INSTITMC is a binary variable that indicates the institution that granted the microcredit. It is set to 1 for ENDA clients and 0 for AKDI clients.
- MTCDDT is a continuous variable that indicates the amount of microcredit.
- ANCNT is a nominal variable that indicates the length of the credit relationship, that is, the number of credits received.

However, the correlation matrix revealed a perfect correlation between the variable access to credit ( $A_i$ ) and the characteristic variables of the microcredit ( $Z_i$ ).

To solve this problem and improve the significance of the model, we opted for the following solution:

In a first step, we estimated a first model (general model) with only the variable access to credit ( $A_i$ ) and the personal characteristics of the respondents ( $X_i$ ) to verify the signification of the granting of credit:

$$y_i = C_0 + \alpha A_i + \beta X_i \quad (2)$$

In a second step, and once the significance of the access variable is verified, we will specify a model with only the individual variables of the beneficiaries ( $X_i$ ) and the variables related to the credit characteristics ( $Z_i$ ). This model is estimated only for beneficiaries (that is, for whom  $A_i = 1$ ).

$$y_i = C_1 + \beta X_i + \gamma Z_i \quad (3)$$

The purpose of this specification is to explain the other factors involved in the changes generated by microcredit and to verify the importance of credit-related characteristics in achieving the social impact.

Since our dependent variables are dichotomous, we used logistic regression to estimate our models. Finally, the data from our field survey are processed using the STATA software. For each estimated model, the overall significance and the fitting quality are tested, respectively, using the Wald chi-square statistic and the McFadden Pseudo-R2.

## 4. Results

### 4.1. Effect of Access to Microcredit on school spending

To evaluate the impact of microcredit on the social status of its beneficiaries, firstly, we have regressed the "increase in school spending" variable (which takes the value "1" if the school spending of the household has increased and "0" if not) on the set of explanatory variables (already presented in the previous paragraph). The increase in school spending is an indicator for measuring the improvement of education of household members or children to the beneficiary.

The first specification of the model shows the significance of the variable "access to microcredit" ( $p = 0,000$ ) that is positively correlated with the dependent variable. Therefore, access to microcredit allows the increase in school spending. This is either through direct access to credit resources, either by improving household income following the granting of microcredit.

**Table 1: Effect of Access to Microcredit on school spending**

<b>Dependent variable : Increase in school spending</b>		
<b>Independent variables</b>	<b>1<sup>st</sup> model</b>	<b>2<sup>nd</sup> model</b>
ACCES	1,55*** <sub>(4,91)</sub>	-
AGE	0,03* <sub>(1,80)</sub>	0,02 <sub>(0,97)</sub>
GENRE	0,24 <sub>(0,84)</sub>	-0,24 <sub>(-0,59)</sub>
NIVEDU	-0,27 <sub>(-0,88)</sub>	-0,16 <sub>(-0,37)</sub>
ETATMAT	1,16*** <sub>(4,15)</sub>	1,80*** <sub>(4,65)</sub>
MILGEO	0,57* <sub>(-1,89)</sub>	-1,04** <sub>(-1,99)</sub>
TMENG	0,49*** <sub>(5,45)</sub>	1,03*** <sub>(6,10)</sub>
NIVPAUV	0,05 <sub>(0,20)</sub>	0,12 <sub>(0,34)</sub>
SECTACT	-0,05 <sub>(-0,19)</sub>	0,04 <sub>(0,09)</sub>
Const 1	-5,25*** <sub>(-5,36)</sub>	-
INSTITMC	-	0,85* <sub>(1,94)</sub>
MTCDT	-	-0,00 <sub>(-1,09)</sub>
ANCNT	-	0,28 <sub>(1,13)</sub>
Const 2	-	-6,49*** <sub>(-4,38)</sub>

Statistical Z-values in brackets

\*\*\* :Significant at the 1% level (p <0,01)

\*\* :Significant at the 5% level (p <0,05)

\*: Significant at the 10% level (p <0,10)

**Source:** Author's own calculation using STATA software

The second model specification reveals the significant factors that confirm the impact of microcredit on improving school expenditure, namely marital status, area of residence, family size and the microcredit institution.

The marital status variable (ETATMAT) is significant at the 1% level and is positively correlated with the dependent variable. That is, married beneficiaries are more likely than unmarried, divorced or widowed individuals to increase their school expenditures. This seems to be evident since single beneficiaries do not have children in school and are not affected by the increase in school expenses. For the other two statuses: divorced and widowed, they represent only a negligible proportion of our sample. Thus married beneficiaries represent the only category concerned by the increase in their children's schooling expenses.

In addition, the variable area of residence (MILGEO) is significant at the 5% level; it has a negative coefficient in the model. This shows that urban beneficiaries are more likely than their rural similar to increase spending for education, which is the same with the school enrollment rates that are higher in urban areas.

The size of the household is also a significant variable in the model (at 1% level). It is positively correlated with the dependent variable. This means that the larger the size of the household, the greater the likelihood of an increase in school



expenditures. This can only be explained by the fact that the number of school-age members in the household increases with the size of the latter. Thus, for larger households, part of the additional resources will be automatically used to finance school expenses.

Among the variables that characterize microcredit, the only significant variable in the model is the type of credit, in other words, it is the variable (INSTITMC). It is significant at the 10% level, with a positive coefficient. Therefore, the beneficiaries of the microfinance institution ENDA are more likely to increase their spending on schooling than those of the AKDI association. This can be explained by the seminars and awareness-raising activities organized by the ENDA institution for the benefit of its clients, which focused on the importance of schooling on several occasions.

#### 4.2. Effect of Access to Microcredit on food spending

The second well-being indicator we have modeled is “Increase in food expenses”. In fact, investment in food expenditures reflects the improvement on the beneficiary's and his household's nutritional status. So in this model we propose to examine the role of access to microcredit in improving the food situation of the beneficiary and his household.

**Table 2: Effect of Access to Microcredit on food spending**

<b>Dependent variable : Increase in food spending</b>		
<b>Independent variables</b>	<b>1<sup>st</sup> model</b>	<b>2<sup>nd</sup> model</b>
ACCES	1,42*** (4,77)	-
AGE	0,00(0,07)	-0,02(1,07)
GENRE	0,94*** (3,07)	1,49*** (3,95)
NIVEDU	-0,13(-0,43)	0,26(0,68)
ETATMAT	1,54*** (5,05)	1,37*** (3,55)
MILGEO	0,06(0,21)	-0,05(-0,10)
TMENG	0,03(0,42)	0,03(0,29)
NIVPAUV	-0,44(-1,56)	-0,63* (-1,75)
SECTACT	-0,52* (-1,75)	-0,59(-1,09)
Const 1	-2,20*** (-2,39)	-
INSTITMC	-	0,37(0,95)
MTCDT	-	-0,00(-0,58)
ANCNT	-	0,12(0,53)
Const 2	-	-1,94(-1,54)

Statistical Z-values in brackets  
 \*\*\* :Significant at the 1% level (p <0,01)  
 \*\* :Significant at the 5% level (p <0,05)  
 \* : Significant at the 10% level (p <0,10)

**Source:** Author's own calculation using STATA software

The first specification of the model shows that the "access to microcredit" variable is significant at the 1% level. It is positively correlated with the dependent variable which affirms that access to microcredit allows improving the diet of the beneficiary and his family through higher food expenditures. This is explained by the access to new resources (credit itself or income from new activities).

Other factors that explain the increase in food expenditure are mainly the gender of beneficiary (GENRE) and marital status (ETATMAT), which are significant at the 1% level, and the variable "poverty level" (NIVPAUV) which is significant at the 10% threshold. For the variable (GENRE), it is positively correlated with the dependent variable. This means that where the beneficiary is a woman, the likelihood of increased food spending is more important, which is to say that women are more interested than men by improving the nutritional status of their families.

Similarly, the "marital status" variable (ETATMAT) has a positive coefficient in the model, which shows that, if the beneficiary is married, the probability of increased spending on food is more interesting. In fact, married people have more responsibility for their households and are more conscious of the feeding conditions of their children and dependents. Thus, when they have access to additional income, they invest a part in improving the food status of their families (as opposed to singles who do not have to worry about diet, as we have already noted).

The variable level of poverty (NIVPAUV) is significant at the 10% level, it has a negative coefficient in the model. So, unless the recipient is poor, the greater the likelihood of increased spending on food is high. This can be explained by the fact that, for the least poor beneficiaries, when there is extra income; it will be used in the improvement of living conditions, in particular, improving the diet. In contrast, the poorest people will invest additional income in the satisfaction of their most necessary needs.

For the different variables that characterize microcredit, they are not significant. That is to say, they have no impact on increasing food expending and consequently on improved feeding conditions of the beneficiary and his family.

### 4.3. Effect of Access to Microcredit on Health spending

In a next step, we modeled the variable “increase in health spending”, to clarify the role of microcredit in improving the health of the beneficiary and his household.

**Table 3: Effect of Access to Microcredit on Health Spending**

Dependent variable : Increase in health spending		
Independent variables	1 <sup>st</sup> model	2 <sup>nd</sup> model
ACCES	1,33*** <sub>(4,75)</sub>	-
AGE	0,01 <sub>(0,76)</sub>	-0,04 <sub>(-1,40)</sub>
GENRE	0,26 <sub>(0,97)</sub>	1,67*** <sub>(3,46)</sub>
NIVEDU	-0,19 <sub>(-0,66)</sub>	-0,79* <sub>(-1,72)</sub>
ETATMAT	1,17*** <sub>(4,24)</sub>	1,64*** <sub>(3,31)</sub>
MILGEO	-0,08 <sub>(-0,32)</sub>	1,46** <sub>(2,52)</sub>
TMENG	0,14* <sub>(1,71)</sub>	0,19 <sub>(1,35)</sub>
NIVPAUV	0,65** <sub>(2,28)</sub>	1,16** <sub>(2,11)</sub>
SECTACT	0,20 <sub>(0,70)</sub>	-1,49** <sub>(-2,51)</sub>
Const 1	-2,92*** <sub>(-3,14)</sub>	-
INSTITMC	-	-1,52*** <sub>(-3,14)</sub>
MTCDD	-	0,00*** <sub>(6,15)</sub>
ANCNT	-	-0,12 <sub>(-0,41)</sub>
Const 2	-	-6,30*** <sub>(-3,86)</sub>

Statistical Z-values in brackets  
 \*\*\* :Significant at the 1% level (p <0,01)  
 \*\* :Significant at the 5% level (p <0,05)  
 \* :Significant at the 10% level (p <0,10)

**Source:** Author’s own calculation using STATA software

The results of the first specification of the model show that the "access to microcredit" variable is significant at the 1% level, with a positive coefficient. This confirms that access to microcredit enables the beneficiary to improve his health conditions and those of his family.

As for the other determinants that confirm this effect of microcredit, there are many. First of all we distinguish variables: gender (GENRE), marital status (ETATMAT), microcredit institution (INSTITMC), and amount of credit (MTCDD) that are significant at the 1%. Then the area of residence variable (MILGEO), poverty level (NIVPAUV) and sector of activity (SECTACT) are significant at the 5% level. Finally, the variable school level (NIVEDU) is significant at the 10% level.

The variable "gender" is positively correlated with the dependent variable, which means that the probability of increase in health spending is higher among beneficiaries "women" than among beneficiaries "men". Similarly, the variable "marital status" has a positive coefficient in the equation. So, if the beneficiary is married, the probability of increase in health spending is more important. This can be explained by the responsibility that support married beneficiaries to their

families and households and concerns they have for their health, unlike the singles who have no dependent children.

The microcredit institution variable (INSTITMC) has a negative relationship with the dependent variable. That is to say the likelihood of increase in health spending is higher for AKDI's beneficiaries than for those of ENDA. The credit amount variable (MTCDT) is positively correlated with the dependent variable. This means that the larger the amount of credit, the greater the likelihood of an increase in health care spending. Indeed, a larger amount of credit implies access to more resources, which the beneficiary can use to improve the living conditions of his household (including improved health).

For variables significant at the 5% level, we note that the variables "area of residence" and "poverty level" are positively correlated with the dependent variable. That is to say that the likelihood of increase in health spending is higher when the recipient is poorer and when resides in a rural area. This is due to the poor health conditions of the poor (who do not have the financial means to medical care) and the rural population (whose environment lacks infrastructure and health services). So access to additional resources (micro-credit) provided to these categories the financial means to move and seek the necessary health services. Unlike, the variable "sector of activity" is negatively correlated with the dependent variable. This shows that beneficiaries who are exercising a commercial or service offering activities are more likely to increase their health spending than their similar operating in the agriculture or production sector.

Finally, the variable "level of study", which is significant at the 10% level, has a negative coefficient in the equation. This means that the probability of increase in health spending is higher for illiterate beneficiaries and for those with a level of primary education, than for those with an advanced school level.

#### 4.4. Effect of Access to Microcredit on Housing Conditions

Among the most important indicators of the social status of individuals, are the conditions of their habitat. It is in this context that we questioned the beneficiaries of microcredit on the improvement of housing conditions.

**Table 4: Effect of Access to Microcredit on Housing Conditions**

<b>Dependent variable: Housing conditions</b>		
<b>Independent variables</b>	<b>1<sup>st</sup> model</b>	<b>2<sup>nd</sup> model</b>
ACCES	1,15*** <sub>(4,23)</sub>	-
AGE	-0,00 <sub>(-0,47)</sub>	-0,00 <sub>(-0,13)</sub>
GENRE	0,14 <sub>(0,52)</sub>	1,51*** <sub>(3,00)</sub>
NIVEDU	-0,15 <sub>(-0,51)</sub>	-0,76* <sub>(-1,74)</sub>
ETATMAT	0,68** <sub>(2,38)</sub>	1,73*** <sub>(3,99)</sub>
MILGEO	-0,25 <sub>(-0,93)</sub>	0,14 <sub>(0,25)</sub>
TMENG	0,14* <sub>(1,80)</sub>	0,20* <sub>(1,65)</sub>
NIVPAUV	-0,51** <sub>(-1,96)</sub>	-0,27 <sub>(-0,59)</sub>
SECTACT	0,29 <sub>(1,03)</sub>	-0,35 <sub>(-0,62)</sub>
Const 1	-1,22 <sub>(-1,45)</sub>	-
INSTITMC	-	-1,43*** <sub>(-3,03)</sub>
MTCDD	-	0,00*** <sub>(5,70)</sub>
ANCNT	-	-0,08 <sub>(-0,28)</sub>
Const 2	-	-6,24*** <sub>(-3,42)</sub>

Statistical Z-values in brackets  
 \*\*\* :Significant at the 1% level (p <0,01)  
 \*\* :Significant at the 5% level (p <0,05)  
 \* :Significant at the 10% level (p <0,10)

**Source:** Author's own calculation using STATA software

The first specification of our model shows that the variable access to microcredit is positively correlated with the dependent variable. It is significant at the 1% level (p = 0,000), indicating the difference between beneficiaries and non-beneficiaries in terms of the probability of improving housing: the beneficiaries have a higher probability. This shows the positive impact of access to microcredit on the improvement of housing conditions. Indeed, access to microcredit can enable the beneficiary to enhance its income and, consequently, have more financial means it can operate in the development of his home.

By moving to the second specification of the model, we note the existence of other determinants of the improvement of housing, namely, the variables "gender", "marital status", "microcredit institution" and "amount of credit", which are significant at the 1% level, and the variable "level of study" and "household size" that are significant at the 10% threshold. The gender variable is positively correlated with the dependent variable. This means that the probability of housing improvement is greater when the beneficiary is a woman. This seems very logical, since in most cases, it is women who are interested, more than men, to the layout

of their homes, their appearances and their aesthetics. For marital status, it is also a positive correlation with the dependent variable, which means that married beneficiaries are more likely to improve their housing conditions than others. In fact, single people often do not have individual households, they reside in most cases with their parents and have no interest in spending in the home, unlike married beneficiaries who have their own family dwelling And which always tend to improve.

The other two variables significant at the 1% level are related to the credit conditions. We first note that the variable "microfinance institution" (INSTITMC) has a negative coefficient in the equation, Showing that the probability of housing improvement increases when the beneficiary of the microcredit is a client of the AKDI association and decreases when he is a client of the NGO ENDA. Moreover, the variable amount of the microcredit is positively correlated with the dependent variable. Therefore, the greater the amount of credit, the greater the likelihood of housing improvement. This seems to be obvious, as the development and improvement of the home requires relatively large financial resources, which is only possible with large amounts of credit.

Turning to sparsely significant variables, the "level of study" variable is negatively correlated with the dependent variable, which means that the probability of improving housing conditions is higher for illiterate beneficiaries or with a primary education level. In addition, the household size variable has a positive coefficient in the model. So the size of the household is large, the more likely the development of housing.

## 5. Discussion and Conclusion

The results of our empirical study confirm previous findings on the positive impact of microfinance on the welfare of households (Afrane, 2002; Brau et al., 2009; Chen & Snodgrass, 2001). These effects are identified through rising food spending, access to health services, education of children and improvement on household living that are poverty indicators used by the World Bank, the international organization of work and the UNDP. Several studies have examined the impact of microcredit on the change in beneficiary spending habits to assess the improvement of living conditions. On our part, we have focused on increasing food, health and children's education related spending to assess the impact of access to microcredit in these three areas of life.

First, microfinance allows poor people to increase their income, which enables them to accumulate savings to improve their security levels and deploy additional spending on food needs and nutritional health (Alemu, 2004). Indeed, the main preoccupation of the poor, in terms of consumption, does not seem to concern

leisure or social consumer goods. Rather, it concerns the satisfaction of basic needs, namely, food, education or health. This is why the effect of the microfinance institutions' intervention seems very significant on food expenditure. We found a significant difference in the increase in food expenditures among beneficiaries and non-beneficiaries ("Access" is significant to the 1% level). This is consistent with the findings of Mknelly and Dunford (1999) which confirmed that membership in a microcredit program led to rising food spending, suggesting improving the nutritional household diet. In addition, we noticed that being a beneficiary "woman" improves the likelihood of rising food spending. Similarly, Khandker (2005) states that Microcredit helps families to smooth their spending and to reduce the pinch of hunger and necessity, in hard times, especially when women are the beneficiaries.

On the other hand, we can conclude that microfinance allows poor better access to education and health services. Indeed, the availability of a stable and profitable source of income helps the poor to send their children to school and to benefit from public (or private) health services. Previous studies that examined the effect of microcredit on children's school attendance or their educational attainment have shown a positive effect: (Suturo, 1990) and (Bucley, 1996) showed that school expenditures increase in a remarkable way following the granting of microcredit. Thus, microcredit has a significant impact on the education of children of beneficiaries, the boys and girls (M. Pitt & Khandker, 1998). The study of Maldonado and González-Vega (2008) showed the positive impact of microfinance on the education of children in rural areas, which has been accompanied by the reduction of child labor.

Similarly, we have confirmed the results of most empirical studies and have shown that poor households can improve their health conditions and access to family care services as a result of access to microcredit. Our results show the importance of the "gender" variable in explaining the increase in health expenditure for microcredit recipients. This coincides with the findings of Pitt et al (2003) showing that loans to women help improve the health status of their children while loans to men seem to be ineffective.

Improving housing conditions are, next to food, health and education of children, another factor in improving social welfare. In the same sense as Afrane (2002); Chen and Snodgrass (2001) and McIntosh et al (2011), we have shown that access to microcredit makes it possible to improve housing conditions following the construction or maintenance of the home or the purchase of new equipment or furniture. This comes from the idea that the intervention of microfinance institutions helps the poor to accumulate capital and therefore to invest in improving their homes, either as a space for permanent living or to earn income through its rental.

At the social level, we have shown that microfinance, and particularly microcredit allows the improvement of living conditions of beneficiary households.

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