

## **Analysis and modeling of social performance of panel data on Moroccan microfinance institutions**

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Analysis and modeling of social performance of panel data on Moroccan microfinance institutions

### **Abstract**

In this study, the social performance of Moroccan Microfinance institutions (MFIs) is measured by the number of clients and the percentage of female clients using data from 10 Moroccan MFIs (available on the Mix platform) from 2003 to 2012. With a model and data analysis, our results show that the portfolio at risk (PAR30) does not impact social performance. Age has a positive impact on the social performance of these institutions. The results also demonstrate that the outreach of MFIs microfinance programs positively affects social performance. Furthermore, we find a significant impact of the share of equity in total assets, economic profitability, and the percentage of women among clients on the social performance of MFIs. This study shows that MFIs tend to give more individual credit than group loans, and the percentage of female clients decreases over time.

Keywords: 2008 crisis, social performance, microfinance, woman, Morocco.

JEL: D63, S35, G23, I32.

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## **1. Introduction**

“I want to practice economics as a true human science. A science, rigorous, impartial, serious. a science of man in all its richness and complexity. but ultimately a human science: generous, ambitious, committed”. (Esther Duflo, Nobel Prize 2019).

The purpose or mission of microfinance institutions (MFIs) is to provide access to financial services for poor families and small businesses located primarily in developing and newly industrialized countries. Microfinance Institutions (MFIs) are inclined to serve widely the women-led micro-businesses. Women borrowers make up the highest market share for MFIs, and loans to women are considered one of the main reasons for the success of microfinance all over the world (Armendariz and Morduch, 2010; Parvin et al., 2020).

Microfinance came with the idea of providing financial and non-financial services to the poor, otherwise considered unbankable or unworthy of credit. Modern microfinance revolves around the activities of Grameen Bank, pioneered by Nobel Prize winner Dr. Mouhammad Yunus from Bangladesh. Grameen Bank's initial success in reducing poverty put microfinance in the global spotlight. It led to microfinance becoming, among other instruments, a beacon in the fight against poverty and underdevelopment worldwide. The innovation of microfinance is that a group of individuals becomes more bankable than a single individual, and the innovation of microcredit is that the loan is granted without the requirement of any collateral security, and the lender has nothing on which to fall back; other than the intangible insurance of the borrower's group. Group formation with the prospective clients of the MFIs is considered one of the most important innovations in offering MFIs.

In Morocco, these microcredit activities only started in the middle of years-1990, with the support of the Moroccan Association for Solidarity and Development (AMSED), and have since been gradually consolidated through the initiative PUND MicroStart<sup>2</sup> and the intervention of the United States Agency for International Development (USAID). In addition to these efforts to support the microfinance sector, there was a grant of 100 million Moroccan Dirhams (MAD)<sup>3</sup> (approximately 10 million Dollars) from the His Majesty King Hassan II fund in 2000. Faced with the development

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<sup>2</sup>Under this program (started in February 1998), technical and financial support was provided by the UNDP to the microfinance sector in order to strengthen its institutional capacities and increase the number of its clients.

<sup>3</sup>, One Dirham (DAM) square 10 Dollars

of microcredit activities, the public authorities adopted, in 1999, a regulatory framework (Law No. 18-97 on Microcredit) and entrusted the supervision of the sector to the Ministry of Finance via Bank Al-Maghrib. Despite its young age, microfinance in Morocco represents a fairly rich experience and an example for the countries of the Maghreb and the Middle East. Indeed, the sector has experienced remarkable development: today there are 13 Micro-credit Associations (MAC) of different sizes operating in Morocco (for data reasons we point out that our work only counts for the 10 associations that have published their data on the Mix Market) and serve more than 1.3 million active customers in 2007<sup>4</sup>.

In order to meet the needs of poor populations and micro-entrepreneurs, and in light of the emergence of microfinance throughout the world, the first micro-credit operations began in Morocco in 1993 (a loan granted to five women "group lending"), with the support of the NGO "AMSED". Subsequently, at the end of the 1990s, several actions were initiated either by the public authorities, or by donors, or by (NGOs) with the aim of consolidating the micro-credit sector and strengthen the institutional and financial capacities of micro-credit associations (MFIs). Empirical literature on the social performance of microfinance institutions is scarce. Indeed, Strom et al. (2014) study the relationships between female leadership, MFIs performance and governance in a global group of 329 microfinance institutions (MFIs) in 73 countries covering the years 1998-2008. They find that the microfinance sector is particularly suited for studying the impact of female leadership on governance and performance because of its mission orientation, institutional nature, diverse institutional conditions, and the high percentage of female leaders. They also find female leadership is significantly associated with bigger cards, younger businesses, non-business legal status, and more female customers. Furthermore, they find that having being a female board member is positively related to MFIs performance, but this finding is not driven by better governance.

Agier & al. (2013) find that most clients of microfinance institutions are women. But men and women benefit from the same credit conditions. They investigate this question by presenting an original model and testing its predictions on an exceptional database comprising 34,000 loan applications from a microfinance institution in Brazil. Their model determines the optimal loan size set by a kind lender, depending on the borrower's creditworthiness and the intensity of bias. Empirical lender analysis does not detect gender in loan denial, but uncovers different treatment with respect

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<sup>4</sup>According to the National Federation of Microcredit Associations "NFMA", and Mix Market.

to credit terms. In particular, they find a "ceiling" effect. The gender gap in loan size increases disproportionately with the scale of the borrower's project. The results are insensitive to the gender of the loan officer.

Dirk & al. (2013) investigate why and under what institutional circumstances female membership in microfinance institutions (MFIs) improves MFIs performance in terms of debt repayment. Specifically, they find that women's membership in MFIs improves their performance by strengthening debt repayment, especially under adverse cognitive and regulatory institutional conditions. They worked with unique qualitative and quantitative data covering. They worked with unique qualitative and quantitative data covering 26 microfinance projects in 22 countries in Africa, Eastern Europe, Latin America, and Asian countries. Their study has implications for the microfinance literature in that it challenges the widely held assumption that women's participation positively affects MFIs performance under all institutional circumstances.

Copestake (2007) explores the possibilities for pursuing explicit development goals in the context of the increasing integration of the specialized microfinance and commercial banking sectors. According to him, this issue and the idea of mission drift are primarily analyzed using a model that distinguishes the financial and social performance possible for institutions.

Kumari & al. (2020) studied the change in income and its association with socio-economic determinants. Their results show a considerable improvement in the income of the respondents of the minority community and illiterate beneficiaries. This is a successful story of a self-help group program that helped develop the poor section of society. Furthermore, formal training and distributions of loans to start income generation activities have also significantly influenced the change in beneficiaries' income.

In the context of Morocco, one of the best studies by Aguentaou & al. (2019) is the profitability and sustainability of the socio-economic situation of the kingdom of Morocco. Their results show that personnel productivity contributes significantly to the MFIs' return on assets (ROA) and their sustainability. They also found that the loan repayment level of MFI customers is an important determinant of their sustainability. Another interesting study is done by Chedad, & al, (2022). They studied the financial performance and sustainability of microfinance institutions in Morocco utilizing a

structural equation model; their results Show no evidence of the impact of the regulatory environment and PAR30 quality on these institutions' profitability. Furthermore, personnel productivity significantly positively and directly impacts profitability and sustainability.

Studies addressing the social performance issue utilizing data from a single country are scarce. To fill this gap, this research has been conducted. In this study, social performance is measured by the number of clients and the percentage of female clients using data from 10 Moroccan MFIs over a period ranging from 2003 to 2012. Our results show that the portfolio at risk (PAR30) does not impact social performance. Age has a positive impact on the social performance of these institutions. The results also demonstrate that the reach of MFIs microfinance programs positively affects social performance. In addition, we find a significant impact of the share of equity in total assets, economic profitability, and the percentage of women among clients on the social performance of MFIs. This study shows that MFIs tend to give more individual credit than grouped loans, and the percentage of female clients decreases over time.

The article is organized as follows: Section two presents the Literature review by analyzing the different points of divergence and convergence of the institutionalization approach and the welfare approach and studies the determinants of social performance. Section three presents the model, statistics, and estimation. Section four presents our results and discussion, and the conclusion is presented at the end.

## **2. Literature review and hypothesis**

### **2.1 Schism in microfinance**

Microfinance practitioners estimate that 500 million of the world's poor demand financial services, while microfinance institutions (MFIs) reach only 15 to 70 millions of them (Olszyna-Marzys, 2006). How best to help the poor gain access to financial services is, therefore, an open question. It raises debates between two schools of thought: the welfare approach and the institutionalization approach.

Welfarists and even Grameen Bank founder Muhammad Yunus strongly criticized this nonprofit organizational transformation. The welfare argument is that this financially highly rewarding strategy

has a negative social impact on the poor. Banco Compartamos was charging its customers interest rates higher than 100%, and its investors earned an average return on equity of 53%.

There are two main theories of microfinance performance in the literature. The first (demand side) emphasizes the social demand for the fight against poverty (defended by the Welfare school: Brody et al. 2003; Morduch, 1998, 1999 and 2000; Woller et al. 1999; Dunford, 1998) This theory assesses success by how it improves the immediate well-being of customers. While the second theory (supply side) emphasizes the requirement of the institution's durability (defended by the Institutionalization school: Gonzalez-Vega, 1993; De Briey, 2005).

### **2.2.1 Welfare approach**

The welfare approach has been identified as the school for measuring poverty (Asselin and Anyck, 2000). According to this school, “an individual is considered poor when he is below a minimum level of economic well-being. The concept of well-being is related to that of utility which is apprehended as the satisfaction of the desire procured for a person by the consumption or possession of goods and services. Indeed, a person is considered poor when he does not reach a minimum of reasonable satisfaction with a “thing,” that is to say, a minimum of economic well-being. But, according to Asselin and Anyck (2000), it is difficult to observe this well-being for an individual directly. Consequently, this school favors the very poor, who are generally more risky and less accessible (rural areas, landlocked areas, etc.). This school of thought is comprised of solidarity institutions such as NGOs or cooperatives that consider microfinance a key means of reducing poverty among the poorest (Hamed, 2004). However, According to “Welfare Studies,” the effectiveness of a microfinance program can be assessed. It is integrated into a strategy to fight against poverty and vulnerability and improve poor populations' well-being (Mayoux, 1998). Described as “well-being” by Woller, Dunford, and Woodworth (1999), this type of study seeks to measure the impact of micro-credit on the living conditions of the target populations, i.e., to measure the change in terms of welfare and quality of life of beneficiaries. Indeed, these welfarists emphasize the level of poverty of the clients and focus on rapidly improving the living conditions of the participants, even with extensive recourse to subsidies. As a result, although they emphasize the rationality of resource management, they do not eliminate the need for and benefit subsidies bring to MFIs, even in the long term (Olszyna-Marzys, 2006). However, they do not refrain from having a profitable activity. However,

This welfarist approach has generated reimbursement rates below 50% and very high operating costs leading to the failure and disappearance of certain MFIs, although it is based on a logic of subsidies and dependence on beneficiaries. Indeed, these MFIs come up against obstacles (problem of viability and sustainability) which are so many limits to their development and their ability to contribute to the development of the people they support and to poor performance. Thus, the welfarist approach has been the subject of numerous criticisms because of its subjectivity, cost, and methodological difficulties (De Briey, 2005). A renewal of economic and financial thought was necessary in order to study again the conditions for the success of microfinance institutions where the interest shown by economists and practitioners in the study of the effectiveness of MFIs in the fight against poverty pave the way for a treatment of increasing efficiency in financial and accounting terms.

### **2.2.2 Institutionalization Approach**

The approach of institutionalization supported by international bodies such as the World Bank and the United Nations, a new approach has emerged: the institutionalists or “financial market” approach (Woller, Dunford and Woodworth, 1999). They consider that the only way to reach the vast majority of the poor without access to financial services is to increase the movement of microfinance through its integration into the formal financial system. Thus, they seek to include MFIs within a market logic by insisting on the desire to set up sustainable microfinance systems and the desire to massify credit (De Briey, 2005). Every MFI should aim for financial sustainability by maximizing its efficiency and productivity. Consequently, sustainability necessarily involves access to financial autonomy. This interest in self-sufficiency emerged from recognition of the scarcity of funds. Indeed, institutionalization believes in the need for large-scale intervention that requires financial resources beyond what donors can provide. They fear the versatility of these national or international donors because an MFIs that wants to be part of the long term, by becoming structurally dependent on the subsidy, would risk being a program without a future. However, the only way to get the financial resources you need is through private sources (savings, trade debt, equity, and venture capital)<sup>1</sup>. To access it, rigorous, transparent, and efficient management is required, but it requires a profitable institution.

## **2.2 Social performance**

It assesses the institution's success in achieving financial self-sufficiency. In other words, MFIs must be able to cover their operational and financial costs through their activities and generate profits to ensure their sustainability and social performance.

Social performance is defined by the "Social Performance Task Force" (SPTF) as "the effective translation of the social mission of the institution into practice by accepted social values that relate to serving a greater number of people poor and excluded; improving the quality and relevance of financial services, creating benefits for clients and improving the social accountability of an MFIs". It is not only based on the study of the impact of microfinance programs. It also assesses the social objectives set by the MFIs and the measures taken to achieve them.

The definition of social performance according to the literature review can, therefore, be summarized through three major elements: "the ability to reach the greatest number of clients during a given period (breadth of outreach), the ability to reach people who's social situation is initially disadvantaged (depth of outreach), and finally, the ability to improve, directly or indirectly, their well-being and that of their household (quality of outreach)".

Accordingly, a social performance assessment (SPA) allows an institution to measure its social performance against its mission and social goals. It includes analyses of an MFI's social performance at different levels:

- Process: institutional process and internal systems. An analysis of an MFI's stated social goals and an assessment of the effectiveness of its system and services in meeting those goals are needed.
- Results: the state of the client. A customer-level social performance assessment to determine the products and associated successes in effecting positive changes in customers' lives.

Microfinance institutions concerned with improving their social performance have examined the whole process of translating the MFI mission into social impact and analyzing several dimensions of the social performance pathway. However, there is a difference between social impact and social performance. Social impact assessment – assessing the impact on beneficiaries and analyzing the

breadth, depth, reach, cost, and value of outreach – comes only after evaluating MFI products and results. Karlan & Zinman (2008, 2011) & Copestake (2007) conducted impact studies.

## **2.3 Research Hypotheses**

According to the literature review previously, we retain six hypotheses to be tested on Moroccan MFIs:

**Hypothesis 1:** There is a positive relationship between the staff member productivity and the Social Performance of the MFIs in Morocco.

**Hypothesis 2:** We hypothesize a negative relationship between social performance and long term PAR30 of the MFIs in Morocco.

**Hypothesis 3:** We propose a positive relationship between social performance and The age of MFIs.

**Hypothesis 4:** We propose a positive relationship between social performance and capital assets of the MFIs.

**Hypothesis 5:** We propose a positive relationship between social performance and return on assets (ROA)

**Hypothesis 6:** We propose a positive relationship between social performance and return on equity (ROE).

## **3. Model, data and estimation**

### **3.1 Model Specification**

This paper focuses on the determinants of the social performance of Moroccan MFIs. The concept of social performance has been developed from the theoretical literature on microfinance (Duflo E. 2009; Guérin I. 2009 and 2014; Servet J. 2010; Lapneu C. 2004 and 2009; Copestake, 2007; Jegourel, 2008), and also from the empirical literature (Skhodra, J. 2019, Diaz-Martin, S. & al 2022, AGUENAOU S. & al, 2019 et 2022; Adair and Berguiga, 2010 and 2014; Mersland and Strøm, 2008 and 2009; Cull et al. 2006 and 2007; El Kharti L. 2014; Lafourcade et al. 2006; Bruett, 2005; Hartarska, 2005). In our study, social performance is measured by the percentage of female clients and/or the number of client borrowers.

In our case, we integrate six independent variables:

The first is the portfolio at risk more than 30 days (PAR30), It measures the percentage of the entire loan portfolio that has at least one late payment of more than 30 days. Recall that the operation of microfinance institutions is characterized by the logic of revolving credits, i.e. the loanable funds are restored almost entirely by credits. The second variable is the ratio of equity to total assets (Ratioass), which assesses the solvency of MFIs, It measures the amount of capital needed to cover unexpected losses and to ensure that the MFIs is well capitalized for potential shocks. The third variable is the productivity ratio (Empr\_Ef), which measures the number of active clients in relation to the number of managers or employees, The higher this ratio, the more productive the MFI. The fourth variable is the size of the credit (Lncredit). The fifth is the age of the MFIs. Finally, the last independent variable is return on asset (ROA) and return on equity (ROE), [ROE=net income / average equity] (see Table 1).

On this basis, and to determine the socio-economics factors of social performance a model following two different regressions ([1] and [2]):

$$SP_{it} = f(\text{Ratioass}_{it} + \text{percento}_{it} + \text{ROE}_{it} + \text{ROA}_{it} + \text{Empr\_Ef}_{it} + \text{Age}_{it} + \text{Par30}_{it}) \quad [1]$$

$$SP_{it} = g(\text{Ratioass}_{it} + \text{Lncredit}_{it} + \text{Lnclient}_{it} + \text{ROE}_{it} + \text{Empr\_Ef}_{it} + \text{Age}_{it} + \text{Par30}_{it}) \quad [2]$$

Where  $I = 1, \dots, N$  for each IMF in the panel and  $t = 1, \dots, t$  refers to the time period. Table 1 presents the description of the variables.

**Table 1: Description of variables**

Variables	Definitions
<b>Dependent Variables</b>	
<b>SP (1)</b>	Number of borrowers Actifs
<b>SP (2)</b>	Percent of female borrowers: %FEM= [number of female clients/total client]*100%
<b>Independent Variables</b>	
<i>Ratioass</i>	Share of equity in total assets= total equity/total assets
<i>Lncredit</i>	Number of active borrowers in natural logarithm
<i>ROA</i>	Return on assets [Net operating income/total assets]
<i>Empr_Ef</i>	Productivity ratio=Number of borrowers/Number of staff,
<i>Age</i>	Age of MFIs = number of years functioning as an MFIs

<i>Par30</i>	Portfolio at risque > 30 days = outstanding balance on arrears over 30 days + total gross outstanding refinanced (restructured) portfolio / total gross portfolio
<i>ROE</i>	Return on equity ratio: $ROE = [\text{net income} / \text{average equity}]$

### 3.2 data

Table 2 presents some economic and financial indicators of Morocco. In 2010, 7.9% of the Moroccan population is considered poor against 15.3% in 2001, a significant proportion for a country of 33 million people without many natural resources. GDP per capita increased by more than 7.13% between 2001 and 2010. This growth rate has contributed to the decline in the poverty rate in Morocco. According to the Moroccan High Commission for Planning, economic growth per capita 1% reduces the poverty rate by 2.7%. In addition, MFIs have played an important role in poverty reduction through their activities in local development through formal partnerships with local authorities.

**Table 2: Morocco's macroeconomic indicators**

Indicators/years	2001	2010
<b>Poverty rate (less than \$2 a day)</b>	15,3%	7,9%
<b>Population (in millions)</b>	30,06	31,20
<b><u>GDP</u> Per capital (en dollar)</b>	3890\$	4167,5\$
<b>Number of MFIs</b>	10	9

Source: World Bank, 2015

The data comes from the Microfinance Information Exchange (MIX)<sup>5</sup> database and our analysis is based on a panel of 10 MFIs<sup>6</sup> covering the period 2003-2012. The MFIs are: Al Amana, Zakoura, AMSSF/MC, Al Karama, ATIL/ MC, FBPMC, AMOS, FONDEP, INMAA and ARDI. According to EL KHARTI, L. (2014), four organizations dominated the sector: Al Amana, Zakoura, Fondation Banque Populaire de MicroCredit (FBPMC), and the Foundation for Local Development and Partnership (FONDEP). These four MFIs shared 97% of the sector's loan portfolio at the end of 2009 and ranked among the largest microcredit institutions in North Africa. Table A1 (see appendix)

5 MIX is a non-profit organization that acts as an information and data provider for the microfinance sector. ([www.mixmarket.org](http://www.mixmarket.org)).

6 AMSSF: Moroccan Association Solidarity Without Borders; FONDEP: Foundation for Local Development and FBP MC Partnership; Banque Populaire Foundation for INMAA microcredit; Moroccan micro-enterprise support institution; AMOS: Oued Srou Microfinance Association; ARDI: Non-profit microcredit association.

offers the means and standard deviations, and the minima and maxima, and table A2 (see appendix) present the correlation coefficients of the explained variables and the explanatory variables. On average, women represent almost two-thirds (64.51%) of borrowers, ranging from only 31.84% to 97.98%; this ratio decreases over time, and MFIs tend to serve more men using individual credit. Moroccan MFIs have a return on assets (ROA) of 3.44% over 2003-2012. The difference between Min and Max reflects the large differences in profitability between Moroccan MFIs and the competition. The same remark applies to the return on equity (ROE), which amounts to 4.53% on average. However, as indicated by the Minimum values, the 2008 crisis has greatly reduced the profitability of MFIs. The average value of the equity-asset ratio is 0.47. The average of the portfolio at risk (PAR) ratio is (3.33%) but remains below the 5% threshold (CGAP, 2006). This means, on average, that the loan portfolio of the sample is healthy. According to Kennedy (2008), correlations should not exceed the cutoff value of 0.8 to detect collinearity between variables. However, the correlation coefficients in Table A3 are smaller than 0.8. Then, there is no problem of multi-collinearity (see the correlation matrix in Table A3 in the appendix).

### **3.3. Estimation strategy**

With time series panel data, the estimated models are usually random effects models and/or fixed effects models. Both models are based on the assumption of variation of the constant (individual effect). On the one hand, the fixed-effect model assumes that the effects are independent of time for each observation and asserts the need to control for unobserved heterogeneity when it is constant over time. On the other hand, the random effects model assumes that the individual effects are randomly distributed. In other words, while the fixed-effect model uses dummy variables to assume a correlation between the independent variable and the error term, the random-effect model assumes no correlation between the independent variable and the error term. there is no correlation between the two. The Hausman test will be used in the choice of the estimation method between the two models. In this case, the null hypothesis is that the error term is not related to independent variables. The fixed effect model will be selected if the null hypothesis is rejected, while the random effect model will be selected if the null hypothesis is not rejected.

#### 4. Econometric results and discussion

##### 4.1 Period (2003-2010)

**Table 3: Econometric results (2003-2010)**

<b>Variables</b>	<b>Lnclient</b>	<b>Percento</b>
<b>Ratioass</b>	-0.032 (0.18)	-31.27 (159.5)
<b>Logcredit</b>	<b>0.42*** (0.06)</b>	-56.28 (48.56)
<b>ROA</b>	<b>0.07*** (0.01)</b>	<b>-28.23** (15.15)</b>
<b>ROE</b>	-0.002 (0.002)	-0.4 (2.21)
<b>PAR30</b>	-0.011 (0.03)	-11.5 (24.7)
<b>Empr_Eff</b>	0.0001 (0.0001)	0.027 (0.09)
<b>Age</b>	<b>0.53** (0.27)</b>	328.08 (247.6)
<b>Constant</b>	<b>3.02 (0.96)</b>	<b>962.4 (679.9)</b>
<b>Number of MFIs</b>	10	10
<b>Number of observations</b>	80	80
<b>R-sq: within</b>	0.38	0.045
<b>Hausman test (Prob&gt;chi2)</b>	0,1236	0,1340

\*\*\*, \*\* & \* : results significant at senile 1%, 5% & 10%

our results show that the portfolio at risk (PAR30) does not have any impact on the social performance. Age has a positive impact on the social performance of these institutions. The results also demonstrate that the outreach of MFIs microfinance programs positively affects on social performance. Furthermore, we find a significant impact of the share of equity in total assets, economic profitability and the percentage of women among clients on the social performance of MFIs. This study shows that MFIs tend to give more individual credit than group loans and the percentage of female clients decreases over time.

• Customer positively impacts financial performance PF Between 2003 and 2007, the Moroccan microfinance sector, characterized by successful institutions and supported by local authorities and international donors, experienced a phase of growth and astonishing prosperity. Since the end of 2007, it has been confronted with an economic and management crisis induced by the institutional capacities of MFIs overwhelmed by unprecedented growth. This has resulted in lax credit policies, information and management systems obsolete, deficiencies in internal control and weak governance. Therefore, it is essential to take into consideration the crisis in our estimation of the model. For this, we divide our study period into two sub-periods: a sub-period before the crisis (2003-2007), reflecting the phase of growth and a sub-period after the crisis (2008-2012), characterized by the restructuring of the microfinance sector, In this second sub-period, the number of IMF is 9 because Zakoura (the second largest IMF in The Kingdom of Morocco created by Mr. Nourredine Ayouch) was taken over in May 2009 by FBPMC. For this reason, the total duration of the sample goes from 2003 to 2010 because data from Zakoura no longer exist after 2010.

The evaluation of the social impact of microfinance remains the main subject of most microfinance surveys. The difference between social impact measurement and social performance has recently been highlighted, allowing practitioners to establish a new framework for social performance management and evaluation, as well as the identification of performance indicators social, table 4 reports the estimation results.

#### 4.2 Period (2003-2012): Before and after the crisis

**Table 4: Econometric results, period (2003-2012)**

Variables	(2003-2007) before crisis	
	Lnclient	Percento
Ratioass	-0.25** (0.12)	0.52 (2.42)
Logcredit	0.56*** (0.07)	-3.34** (1.6)
ROA	0.06** (0.02)	1.29** (0.63)
ROE	-0.006 (0.009)	-0.31 (0.19)
PAR30	-0.003 (0.05)	0.78 (1.07)
Empr_Eff	0.0001** (0.00008)	0.001 (0.002)
Age	0.12 (0.29)	3.88 (6.59)

Constant	1.38 (0.97)	108.56 (22.33)
Number of MFIs	10	10
Number of observations	50	50
R-sq: within	0.65	0.32
Hausman test (Prob>chi2)	0.0983	0.2193
	(2008-2012) after crisis	
Variables	Lnclient	Percento
Ratioass	0.98 (0.83)	361.7 (853.5)
Locgedi	0.16 (0.1)	-15.33 (94.8)
ROA	-0.09** (0.05)	3.87 (52.8)
ROE	-0.005 (0.009)	-19.79** (11.18)
PAR30	0.01 (0.05)	-19.75 (49.34)
Empr_Ef	0.03*** (0.003)	3.18 (3.96)
mature	0.19 (0.64)	444.08 (781.9)
Constant	2.86 (2.17)	-178.7 (1964)
Number of MFIs	9	9
Number of observations	45	45
R-sq: within	0.69	0.14
Hausman test (Prob>chi2)	0,1948	0,1732

\*\*\*, \*\* & \* : results significant at senile 1%, 5% & 10%

Finding in Table 4 indicate that the coefficient of equity-to-asset ratio has impact negative and significant at 5% for the period (2003-2007) on social performance but don't have impact on Social Performance in the period (2008-2012) this result is supported by hypothesis four.

The results also show that Return on asset has an impact positive and statistically significant at 5% during the period (2003-2007) on social performance of MFIs, moreover, Return on asset and return on equity has an impact negative on social performance (2008- 2012), this results supported hypothesis five and hypothesis six that existing the ambiguous relationship between social performance and financial performance.

The productivity has an impact positive and statistically significant at 1% percent on social performance in the period (2003-2007) and period (2008-2012), this result is comparable with that found by El Kharti (2014) and this result is supported by hypothesis one that a higher human resource impact social performance.

The results demonstrate that the portfolio at risk (PAR30) does not has any impact on the social performance for both periods (2003-2007) and (2008-2012). This result is supported by hypothesis two.

## **CONCLUSION**

Microfinance is often discussed in the literature as a tool that allows those excluded from the formal financial system to have access to sources of financing, thus constituting a means of combating exclusion and poverty. This research presents the originality of studying the performance of MFIs from the perspective of their social objective. The main objective of this article is to determine the most relevant indicators of the social performance of MFIs. Our results show that the portfolio at risk (PAR30) has no impact on the social performance, and age has a positive impact on the social performance of these institutions. The results also demonstrate that the reach of MFIs microfinance programs positively affects social performance. In addition, we find a significant impact of the share of equity in total assets, economic profitability and the percentage of women among clients on the social performance of MFIs. This study shows that MFIs tend to give more individual credit than grouped loans. However, we find a negative and significant impact of the share of equity in total assets as well as an influence of staff productivity and the percent of women among clients on the social and financial performance of MFIs. Finally, our results show that MFIs tend to reduce their microcredit offer rather than increase it and the percentage of female clients decreases over time. One perspective of the research is to make a comparative study of several countries including Morocco.

## REFERENCES

- ADAIR P. & I. BERGUIGA, (2014) Causality between social performance and financial performance of microfinance institutions in the MENA region (1998-2011): A panel data study, *Saving and Development*, Vol, 38(1), pp. 1-20.
- AGUENAOU, S., ALLOUCH, S., EL MALIKI N., ABRACHE J., (2019) Financial performance and sustainability of morrocan microfinance institutions: An emperical study, *Accounting and finance Research*, 8(4). 144-156.
- BAKLOUTI I., (2013) the determinants of microcredit repayment: case of Tunisian microfinance bank, *African Development Review* Volume 25, Issue 3, pp. 370–382.
- BANQUE MONDIALE (2015) Rapport sur la pauvreté au Monde, Washington D.C, USA.
- BLOYE & al., (2011) Surplus et responsabilité sociale en microfinance : étude de cas d'institutions péruviennes, *Management & Avenir*, 6 (46), 244-260.
- BOYE S. & al., (2006) Le guide de la microfinance, microcrédit et épargne pour le développement, Editions d'Organisations, Paris.
- CHEDAD, K., BOUKIR, A., CHAABI, S., AGUENAOU, S., ABRACHE J., (2022), Financial performance and sustainability of microfinance institutions in Morroco: A Structural equation model, *International Journal of Economics and Financial Issues*, 2022, 12(1), 51-57.
- COPESTAKE j., (2007) Mainstreaming Microfinance: Social Performance Management or Mission Drift? , *World Development* Vol. 35, No. 10, pp. 1721–1738
- CORNEE S., (2007) Une proposition d'évaluation conjointe des performances sociales et financières en micro-finance, *Document de travail SPI 3*, CERISE.
- COUNTS A. ZAFAR R. CONNOR E. (2006) Factors that Contribute to Exponential Growth: Case Studies for Massive Outreach to the Poor and Poorest, in *Daley-Harris and Awimbo* (Eds), 41-93.
- CULL R. DEMIRGUC-KUNT A. MORDUCH J., (2006) Financial performance and outreach: a global analysis of leading micro banks, *Policy Research Working Paper Series 3827*, The World Bank: Washington. D.C, USA.
- D'ESPALLIER, B. GUERIN, I. & MERSLAND, R., (2011) Women and repayment in micro-finance: A global analysis, *World Development*, 39(5), 758-772.
- Diaz-Martin, S., & al, (2022) Are microfinance institutions' financial performance gender driven? Evidence from Argentina. *Business strategy & development*, 5(3), 197-208.
- DRAKE D. RHYNE E., (Eds) (2002) *The Commercialization of Microfinance*, Accion International (Organization) Stylus Pub Llc.

- DUFLO E., (2009) *Lutter contre la pauvreté (2) : La politique de l'autonomie*, Paris, Éditions du Seuil, Coll., La république des idées, pp. 110.
- EL KHARTI L., (2014) The determinants of financial performance of microfinance institutions in Morocco: A panel data analysis, *Saving and Development*, Vol. 38(1), pp. 1-18.
- GHATAK M. and GUINIANE T., (1999) The Economics of Lending with Joint Liability: Theory and Practice, *Journal of Development Economics*,(60),pp. 195-228.
- HAMED Y., (2004) *Microcrédit et financement de la microentreprise au Maghreb*, Thèse de Sciences économiques, Université Paris 12.
- HARTARSKA V. & MERSLAND R., (2012) Which governance mechanisms promote efficiency in reaching poor clients? Evidence from rated microfinance institutions, *European Financial Management*, 18(2), 218-239.
- HONOHAN P., (2008), Cross-country variation in household access to financial services *Journal of Banking & Finance*, Vol. 32(11), pp. 2493-2500.
- GHEBRETINASAE, A. et WILLY, M. (2014) Socio-economic determinants of Eritria's saving and micro-credit program loan repayment performance: a case of Dekemhare SUZ-ZONE, *International Journal of Development and Economic Sustainability* Vol,2, No,2, pp., 48-63.
- KENNEDY P., 2008, "A Guide to Econometrics", 6th ed. Blackwell Publishing, Malden, MA.
- LABIE M., LELART M., MONTALIEU T., (2010) Microfinance : le temps de la maturité ?, *Mondes en développement* 4/ (n° 152), pp. 7-11.
- LABIE M. (1996). Perspective d'autonomie et pérennisation des systèmes financiers, *Tiers-Monde* vol, 37, 145, pp 85 – 97.
- LAPNU C. & al., (2004). Performances sociales : une raison d'être des institutions de microfinance et pourtant encore peu mesurées, *Quelques pistes*, *Mondes en développement*, 2 (126), 51-68.
- LAPNU C. & al., (2009) Évaluation de la performance sociale : les enjeux d'une finance sociale-responsable, *Tiers Monde*, 1 (197), 37-54.
- LELART, M. (2007). Le père du microcrédit honoré par le prix Nobel..., de la paix *économie politique*2 (117) 197 - 208,
- COPESTAKE, J., (2007) Mainstreaming Microfinance: Social Performance Management or Mission Drift? *World Development*, 35 (10), 1721–1738.
- JEGOUREL Y., (2008) La microfinance: entre performance sociale et performance financière, *Regards croisés sur l'économie*, 1 (3), 197-205.

- MAYOUKOU, C. and KERTOUS, M. (2015). L'accès au crédit individuel par les clients des institutions de microfinance du Congo : une analyse des déterminants de l'auto-exclusion et de l'obtention du prêt, *Mondes en développement*, /1 n°169, pp. 121-138.
- MATTHEW, W. & al. (2002). The Social Performance and Distributional Consequences of Contract Farming: An Equilibrium Analysis of the Arachide de Bouche Program in Senegal, *World Development* 30 (2), pp. 255–263.
- MORDUCH J., (1998) Does Microfinance Really Help the Poor? New Evidence from Flagship Programs in Bangladesh, *Working Papers* 198, Princeton University.
- MORDUCH J., (1999b). The Microfinance Promise, *Journal of Economic Literature*, XXXII, pp. 1569-1614.
- MORDUCH J., (2000). The microfinance schism, *World Development*, 28 (4), pp. 617-629.
- MORNET P. & al., (2014). La décomposition de l'indicateur de Gini en sous-groupes, *Revue française d'économie* n°2 (Volume 26) pp. 179-243.
- NAWAZ A., (2010). "Performance of microfinance: The role of subsidies", *Saving and Development*, Vol, 34(1), pp. 97-138.
- Parvin, S. S., Hossain, B., Mohiuddin, M., & Cao, Q. (2020). Capital structure, financial performance, and sustainability of micro-finance institutions (MFIs) in Bangladesh. *Sustainability*, 12(15), 6222.
- Patil & GOPAL, (2015). performance analysis Through ration analysis of microfinance institutions of Karnataka. *International journal of research in commerce and management*, 6(1), 1-6.
- RAVAILLON M. CHEN S., (2008). The developing world is poorer than we thought, but no less successful in the fight against poverty, *Policy Research Working Paper 4703*, World Bank Development Research Group.
- OLIVERA SPOLONCO, F. (2005). Commercializing Microfinance and Deepening Outreach? Empirical Evidence from Latin America, *Journal of Microfinance*, 7 (2), pp. 47-69.
- Ritu Kumari & al., (2020), Change in income and its association with socio economic determinants : A study of self-help group beneficiaries from rural NUH-HARYANA, *International Journal of Humanities and social science invention*, 09(10), 01-05
- SERVET, J. M., (2010) l'inclusion financière au Maroc par la microfinance : une responsabilité sociale sous tension TFD n°117 - Décembre 2014.
- Skhodra, J., (2019) Financial performance of MFIs in Kosovo. *Journal of international studies*, 12(3), 31-37.

**Appendix**

**Table A1: Descriptive statistics**

<b>Variables</b>	<b>Obs,</b>	<b>Mean</b>	<b>Std, Dev</b>	<b>Min</b>	<b>Max</b>
<b>ROA</b>	80	3,44	7,13	-19,18	18,37
<b>ROE</b>	80	4.53	49.92	-382.27	114.66
<b>Ratioass</b>	80	0,47	0,63	-0,5	4,29
<b>Lncredit</b>	80	14,92	2,57	9,55	19,39
<b>Lnclient</b>	80	9,93	1,82	6,12	13,06
<b>Empr_Ef</b>	80	480,42	1108,2	0,005	6161,88
<b>Age</b>	80	0,65	0,47	0	1
<b>Par30</b>	80	3,33	4,23	0	17,79

**Table A2: Correlation matrix**

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
<b>[1] ROA</b>	1,0000								
<b>[2] ROE</b>	0,4673	1,0000							
<b>[3] Ra- tioass</b>	0,0796	0,0213	1,0000						
<b>[4] Lncre- dit</b>	-0,070	-0,054	-	1,0000					
			0,3657						
<b>[5] Lnclient</b>	0,2638	0,0819	-	0,7719	1,0000				
			0,3417						
<b>[6] %FEM</b>	-0,235	-0,109	-	-	-	1,0000			
			0,0454	0,0302	0,0900				
<b>[7] Empr_Eff</b>	0,1696	0,0993	-	0,2685	0,3722	-	1,0000		
			0,0834			0,0574			
<b>[8] Age</b>	-0,082	-0,033	-	0,5514	0,4394	0,1162	-	1,0000	
			0,3104				0,1026		
<b>[9] PAR 30</b>	-0,309	-0,391	0,0544	-	-	0,0311	-0,235	0,0368	1,0000
			0,0464	0,1999					