

THE DETERMINANTS OF FINANCIAL PERFORMANCE OF MICROFINANCE INSTITUTIONS IN MOROCCO: A PANEL DATA ANALYSIS

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Abstract

This paper studies the determinants of financial performance of microfinance institutions (MFIs) in Morocco. Results show that the Portfolio at Risk (PAR30) and the age of the MFIs are the main determinants of financial performance of these institutions. Results also indicate that the outreach of MFIs' microfinance programs positively affects their financial performance. Moreover, there is a significant impact of the share of equity in total assets, staff productivity and the percentage of female clients on MFIs' financial performance.

Key words: microfinance, financial performance, portfolio at risk, Morocco, 2008 crisis.

JEL: D63, G01, G15, G23, G32.

1. INTRODUCTION

In recent years, the use of microfinance as an innovative tool for poverty alleviation among people who are economically active but financially constrained and vulnerable has gained increasing attention by both policy makers and regulators in many countries. Indeed, in 2011, microfinance institutions (MFIs) provided microcredit to more than 124 million households living in extreme poverty, according to the 2013 State of the Sector Report published by the Microcredit Summit Campaign.

In particular, the Moroccan microcredit industry has experienced one of the most rapid and significant growths seen in the microfinance industry. In just four years, from 2003 to 2007, MFI loan portfolios multiplied 11 times and client outreach by four, according to the Microfinance Information Ex-

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change (MIX)². These results make the microfinance industry in Morocco as one of the most extensive and vibrant sector in the Arab world. This success was largely attributed to the support of the Moroccan Government having established the Microfinance Law in 1999 and established the Hassan II Fund to help capitalize the first MFIs, as well as foreign funders and donors who supported the growth of the sector, and the local talent in Morocco.

This rapid growth soon proved unsustainable and signs of stress resurfaced in 2007. Nonperforming loans started to rise significantly from one of the lowest levels in the world, 0.42 percent in 2003 to 1.9 percent in 2007. From late 2008, the portfolio risk began to increase considerably from an average less than 1% at sector level between 2003-2007 to over 5% in 2008 and over 10% in 2009 and 2010. The cost of write offs became one of the major costs for MFIs, weighing heavily on their profitability and solvency. Consequently, many MFIs were restructured in order to achieve financial sustainability and finance their growth. Indeed, the Moroccan MFIs have to be financially sustainable in order to guarantee a large-scale outreach to the poor on a long-term basis. Currently, there is no evidence about the key determinants of financial performance of Moroccan MFIs. Therefore, this study attempts to fill a gap in the literature by analyzing the main drivers of the financial sustainability in the Moroccan microfinance industry.

The empirical literature investigating the financial performance of microfinance institutions is scarce and still growing. Hartarska (2005) analyses the impact of governance on the sustainability of microfinance institutions (MFIs) in Central and Eastern Europe and the Newly Independent States. The results indicate that performance-based compensation of managers is not associated with better-performing MFIs; however, managers' experience improves performance. Cull et al. (2007) examine patterns of profitability, loan repayment, and cost reduction with unusually high-quality data on 124 institutions in 49 countries. Their results show the possibility of earning profits while serving the poor, but a trade-off emerges between profitability and serving the poorest. Mersland and Strøm (2009) explore the relationship between firm performance and corporate governance in MFI using a self-constructed global dataset on MFIs collected from third-party rating agencies. Results show that financial performance improves with local rather than international directors, an internal board auditor, and a female CEO. Mersland et al. (2011) examine how various aspects of international influence affect MFIs' financial and social performance. They find that the inter-

² MIX is a non-profit organization that acts as a business information provider in the microfinance sector. (www.mixmarket.org).

nationalization of MFIs enhances social performance to a large extent, but does not enhance financial performance. Tchakoute (2011) investigates the relationship between the legal status of MFIs and their performance. He shows that the performance of private corporations is better than that of NGOs only when portfolio quality is used as an indicator for measuring performance. Ben Soltane (2013) studies the relationship between MFIs governance quality and repayment performance using data of 250 African MFIs. He finds a negative link between the governance quality and the percentage of portfolio at risk. Esubalew et al. (2013) examine the effect of competition among MFIs on their performance. Their results show that intense competition is, overall, negatively associated with performance of MFIs.

The present paper contributes to the existing literature by analyzing the financial performance of Moroccan MFIs using single country data. Results show that credit volume, productivity ratio and the equity-to-asset ratio improves financial performances. However, the portfolio at risk over 30 days and the percent of female borrowers decrease financial sustainability.

The remainder of the paper is organized as follows: Section two presents a literature review that focuses on issues and assumptions on financial performance. Section three describes the methodology and data. Section four reports and discusses estimation results and Section five concludes.

2. BACKGROUND AND HYPOTHESES

There are two main approaches to microfinance in the literature. The first approach focuses on the social exigency of poverty alleviation (defended by the Welfarists' School: Morduch, 2000; Dunford, 1998; Woller et al., 1999 and Brody et al. 2003). This approach assesses success by how well improves the immediate welfare of clients. The second focuses on the economic exigency of institution viability (defended by the Institutionalists' School: Gonzalez-Vega, 1993; De Briey, 2005). This approach evaluates success by the progress of the institution in achieving financial self-sufficiency.

In this study, we were inspired from the Institutionalists' approach in order to determine the financial performance drivers because the followers of this school believe that the best method of reaching the great majority of poor persons without accessing financial services³ is to incorporate microfinance industry in the formal financial system.

³ Nowadays, the share of Moroccan people who access to financial services does not exceed 40% (Honohan, 2008).

2.1. Financial Performance of MFIs

The financial performance of a MFI can be defined as its ability to cover its operational and financial costs. The common indicator of the financial performance is the return on assets (ROA), which reflects the profit margin as well as the effectiveness of the institution (Bruett, 2005; Cull et al., 2007; Hartarska, 2005; Lafourcade et al., 2006; Mersland and Strøm, 2009). MFIs offer loans at subsidized rates (below the rate of the market) that reduce the financial burden and therefore increase net income. These MFIs are heavily subsidized and then realize at the same time strong profitability.

2.2. Interest rates and equity

Unlike commercial banks, the compensation structure of lending to MFIs should include the interest rate as the cost of money, the board of education, the Monitoring Committee and the advisory committee of recovery. As the share of MFIs' equity, MFIs can also increase their lending, either through debt or accepting larger deposits from their customers. This result leaves to a further increase of the scope of their work, and their financial sustainability. Hence, in order to achieve financial sustainability, MFIs should set sufficient high interest rates to cover its expenses.

Hypothesis 1: The application of interest rates that increases equity should contribute significantly to the achievement of the financial viability of MFIs. We expect a positive relationship between the share of equity in assets and the financial performance.

2.3. Quality of the loan portfolio

Group loans with joint and several guarantees are often used as a mechanism to minimize the risk of failure, improve the performance of MFI portfolios, and achieve financial viability (Pitt and Khandker, 1998; Ghatak 1999; Armendariz de Aghion and Morduch, 2000; Laffont and Nguessam, 2000). Cull et al. (2007) note that group loans have a positive impact on the quality of the loan portfolio of MFIs. Indeed, they show that the portfolio risk increases the interest rate applied to most MFIs using individual loans, and that beyond the threshold of 60%, an increase of these rates is not associated with long-term profits for the latter, which is not the case for MFIs that rely on lending methodology to solidarity groups.

Hypothesis 2: The risk reduction in the overall portfolio of the MFI would profit MFI more meaningful and therefore has a positive impact on the financial performance of MFIs. We expect a negative relationship between portfolio risk and financial performance.

2.4. Staff productivity

MFIs that affect a portion of the salary to the financial performance lead to positive expressed satisfaction outcomes (CGAP, 2006). Staffs with proven technical expertise in the field of microfinance are also a prerequisite for the selection and monitoring of projects for funding. Furthermore, MFIs should adopt practices by focusing more on the customer relationship in order to increase their performance management (Churchill, 2000; Schreiner, 2003; Norell, 2001).

Hypothesis 3: An efficient management through investment in human and technological resources and financial incentive mechanisms should decline staff costs and increase the productivity of loan officers. Therefore, we expect a positive relationship between the ratio of personal productivity and financial performance.

Given that the majority of MFI clients are women, and the experience of MFIs over the years can help them to refine their selection strategies of clients and portfolio management at risk, we decided to assess the impact of these elements on the financial performance of MFIs through the following hypothesis:

Hypothesis 4: The age of MFIs, the outreach of their actions (credit volume and number of clients) and the percentage of female clients should have a positive impact on the financial performance of MFIs.

3. METHODOLOGY AND DATA

3.1. Model specification

This paper is focused on Moroccan MFIs' financial performance – the dependent variable. According to the microfinance literature (Bruett, 2005; Hartsarska, 2005; Cull et al. 2007; Lafourcade et al., 2006; Mersland and Strøm, 2008 and 2009, Adair and Berguiga, 2010), the return on assets, the operational self-sufficiency, and the financial self-sufficiency are the main indicators that attempt to capture the complexity of financial performance within the microfinance industry. In this study, we used return on assets (ROA) and return on equity (ROE) to proxy financial performance because the micro financial intermediation in Morocco is specific⁴ and MFIs were subsidized. The ROA is a general indicator that measures the profitability regardless of

⁴ Morocco has specific legislation on microcredit, which also allows competition between MFIs to develop in a favorable climate. Indeed, the country has created a unique law in 1999 for MFIs (NGOs) in the territory. This law sets the maximum amount of loans, the maximum lending rates and prohibit the collection of deposits.

the financial structure underlying the institution. Moreover, as Moroccan MFIs are heavily subsidized, the ROE allow us to capture this specificity.

We include seven independent variables, which are commonly used in recent microfinance financial performance research. The first variable is the portfolio at risk over 30 days (PAR> 30). It measures the percent of the total loan portfolio that has at least one payment overdue by more than 30 days. Recall that the functioning of MFIs is characterized by the logic of revolving credits, that is loanable funds are restored almost completely by credits. The second variable is the equity-to-asset ratio, which assesses the solvency of MFIs. It measures the amount of capital required to cover additional unexpected losses to ensure that the MFI is well capitalized for potential shocks. The third variable is the productivity ratio, which measures the number of active clients compared to the number of loan officers or staff. This ratio works with the following logic: the higher the ratio is the more productive the MFI. The remaining independent variables capture institutional and outreach indicators, namely the percentage of female borrowers, the size of credit, the age of MFIs and the number of clients (See table 1).

Based on the above discussion, a model of MFI financial performance can be estimated following the two specifications (1 and 2):

$$ROA_{it} = f(\text{Ratioass}_{it} + \text{Lncredit}_{it} + \text{Lnclient}_{it} + \text{Pfem}_{it} + \text{Empr_Ef}_{it} + \text{Mature}_{it} + \text{Par30}_{it}) \quad [1]$$

$$ROE_{it} = g(\text{Ratioass}_{it} + \text{Lncredit}_{it} + \text{Lnclient}_{it} + \text{Pfem}_{it} + \text{Empr_Ef}_{it} + \text{Mature}_{it} + \text{Par30}_{it}) \quad [2]$$

Where $i = 1, \dots; N$ for each MFI in the panel and $t = 1, \dots; T$ refers to the time period. Table 1 presents the variables.

3.2. Data

Table 2 presents some economic and financial indicators for Morocco. In 2009, 8.8% of Moroccan population is considered poor compared with 14.3% in 2006 – a notable achievement for a country of 32 million people that lacks significant natural resources. GDP per capita has sharply increased from 2006 to 2009, jumping by an average of more than 7%. This economic growth seems contribute to the Morocco's declining poverty rate. Indeed, according to the Moroccan High Commissariat of Planning, a per capita economic growth of 1% reduces the poverty rate by 2.9 percent. Moreover, MFIs have played an important role in poverty reduction, due to their activities in local development through formal partnerships with the government and local authorities.

Table 1: Description of variables

Variables	Definitions
Dependant variables	
ROA	Return on asset ratio = net operating income / total assets
ROE	Return on equity ratio = Net Income / Average equity
Independent variables	
<i>Ratioass</i>	Equity-to-asset ratio = Total equity / total asset
<i>Lncredit</i>	Number of Loans in natural logarithm
<i>Lnclient</i>	Number of Active Borrowers in natural logarithm
<i>Pfem</i>	Percent of female Borrowers = Number of active female borrowers / Adjusted Number of Active Borrowers
<i>Empr_Ef</i>	Productivity ratio = total number of active borrowers / total number of staff
<i>Mature</i>	Age of MFIs = number of years functioning as an MFI
<i>Par30</i>	Portfolio at risk > 30 days = (Outstanding balance on arrears over 30 days + total gross outstanding refinanced (restructured) portfolio) / total gross portfolio.

Table 2: Macroeconomic Indicators of Morocco

Indicators	2006	2009
Population (millions)	31,224	31,276
GDP per capita, PPP	3890\$	4167.5\$
Population below national poverty line (2\$/ jour) (%)	14,3%	8.8%
Number of MFIs	11	10
Number of active borrowers	1,045,310	915,839

Source: Word bank databank, MIX Microfinance World: 2010 Arab Microfinance Analysis & Benchmarking Report and High Commissariat of Planning, *MDG Report Morocco*.

Our analysis is based on a panel of 10 MFIs covering the period 2003-2010. These are *Al Amana*, AMOS, AMSSF/MC, *Al Karama*, ATIL/MC, FBPMC, *Zakoura*, FONDEP, INMAA and ARDI. The dimensions of the panel data set are chosen to include as many MFIs as possible each of them a reasonable time length of observations. Data came from the Microfinance Information Exchange (MIX) database.

According to Morvant-Roux et al. (2014), four organizations dominated the sector: *Al Amana*, *Zakoura*, *Fondation Banque Populaire pour le Micro-crédit* (FBPMC), and *Fondation pour le Développement Local et le Partenariat* (FONDEP). These four leaders shared 97% of the sector's loan portfolio in

the end of 2009, and ranked among North Africa's biggest microcredit institutions. Al Amana had issued 45% of all the active loans.

While Table A1 in the appendix reports the means and standard deviations as well as the minimum and maximum, Table A2 in the appendix reports the mutual correlation coefficients for the dependent and explanatory variables in the econometric analysis, respectively. According to table A1, Moroccan MFIs have a ROA of 3.44% over the entire period from 2003 to 2010. The difference between Min and Max clearly shows that there are large differences in profitability among the Moroccan MFIs. The same holds true for our second main profitability measure, the ROE, which amounts to 4.53% on average. However, as indicated by the Min values, the 2008 crisis has largely dropped the profitability of MFIs. The average value of the equity-to-asset ratio is 0.47. The average PAR ratio (3.33%) is less than the threshold of 5% (CGAP, 1999). This indicates that, on average, the credit portfolio in our sample is healthy. The mean percentage of female borrowers is nearly two-thirds (64.51%), ranging from only 31.84% to a 97.98%.

Following Kennedy (2008), correlations need to exceed the limit value of 0.8 to detect collinearity between two variables. All the correlation coefficients in Table A2 are smaller than 0.8. Then, there is no problem of multicollinearity (see table A2 in Appendix).

3.3. Estimation strategy

Between 2003 and 2007, the Moroccan microfinance sector has experienced an amazing growth phase and prosperity, characterized by high-performing institutions and supported not only by the local authorities but also by international donors. However, since late 2007, the microfinance industry has been facing a severe economic and managerial crisis since institutional capacity of MFIs has been enjoyed an unprecedented growth. This has resulted in lax credit policies, obsolete information and management systems, deficiencies in internal control and weak governance. Therefore, it is essential to consider the crisis in our model estimation. For this, we divide our study period into two sub-periods: a sub-period before the crisis (2003-2007), reflecting the growth of microfinance phase and a sub-period after the crisis (2008-2012), characterized by a restructuring of the microfinance sector. In the latter sub-period, there are nine MFIs because *Zakoura* was taken over in May 2009 by FBPMC when it proved financially inefficient. For this reason, the overall sample period is from 2003 to 2010 because data for *Zakoura* do not exist after 2010 and we cannot remove *Zakoura* from the sample data since it is the second largest MFI in the country.

4. EMPIRICAL RESULTS AND DISCUSSION

Table 3 summarizes the results of panel regression for the whole sample period 2003-2010. The results of the Hausman test ($\text{Prob}>\chi^2 > 10\%$) show that the random effects model should be chosen over the fixed effects model.

Table 3: Econometric results, period 2003-2010

VARIABLES	ROE	ROA
Ratioass	0.49 (9.32)	1.18 (1.17)
Lncredit	-3.92 (3.68)	-1.61*** (0.46)
Lnclient	3.73 (5.12)	2.68*** (0.63)
Pfem	-0.005 (0.006)	-0.001** (0.0008)
Empr_Ef	0.0005 (0.005)	0.0001 (0.0007)
Mature	6.63 (14.65)	0.014 (1.85)
Par30	-4.65*** (1.37)	-0.327** (0.17)
Constante	37.84 (43.79)	1.6 (5.31)
Number of MFIs	10	10
Number of observations	80	80
R-sq: within	0.2	0.27
Hausman test ($\text{Prob}>\chi^2$)	0.5082	0.4574

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, Standard errors in parentheses.

Results do not support hypothesis 1, which share of equity in assets ratio is a determinant of Moroccan MFIs' financial performance since the coefficient on Ratioass is not significant in any of the two specifications. This finding can be explained by the fact that the volume of MFIs equity is not significant enough for the first years of the period studied.

Results indicate that productivity ratio and age did not influence ROA and ROE of MFIs. These findings are explained by the immaturity of MFI and the inefficiency of loan officers, respectively. Indeed, in the early period, the technological management and the management staff were not sufficiently developed to allow loan officers to acquire a proven technical expertise in the field of microfinance.

The coefficient of percent of female borrowers on ROA is negative and statistically significant at 5%, indicating that a decrease in percent of female borrowers leads to raising the ROA. This finding is contrary to the hypothesis 4. Recall that microfinance experience has confirmed that women make

the best borrowers, and it has been confirmed that they repay their loans more faithfully than men. This negatively impact for the Morocco case is explained by the payment default of these clients. Indeed, according to CGAP (2010), multiple lending to the same clients was an aggravating factor of the sharp rise in non-performing loans.

The strongest result of this study is the support for Hypothesis 2 that MFI with a higher portfolio at risk had worse sustainability. This finding is comparable to that found by Mersland et al. (2011) and Tchakoute T. (2011) but contrary to that suggested by Mersland and Strøm (2009). The estimated coefficients are equal to -4.65 and -0.327 in the ROE and ROA specifications, respectively. These results imply that a 1% increase in the PAR30 lowers ROE and ROA by 4.65% and 0.327%, respectively. The large impact on ROE is explained by the fact that credits distributed in early periods are primarily from the equity of MFIs, which originate from donors. This finding suggest that MFIs with high-risk portfolio would result in limiting revenues from microcredit and therefore less money to loan, as it was the case for MFI *Zakoura* (see box 1).

Box 1: Zakoura MFI

The Zakoura Foundation has taken micro-credit loans to finance the development in rural Morocco with the aim having successful and sustainable level. This brings tourists a preserved and credible experience and uplifts the wider rural communities of Morocco. This community development organization, founded in 1995, created the Rural Tourism Program in 2003 to extend microenterprises loans of USD 500 to USD 5,000 to individuals to develop tourism-related products focusing on financial, cultural and environmental sustainability. Zakoura provides these loans for the development of accommodation, restaurants, local products and tourism activities in three rural regions of Morocco. Zakoura was taken over in 2010 by FBPMC when it proved financially inefficient, due to an unsustainable PAR.

Moreover, the coefficient of the portfolio at risk over 30 days is the coefficient of the highest absolute value in regression (4.65). This implies that the portfolio at risk is the most important determinant of the MFIs' financial viability. Hence, MFIs should focus on preventive risk management for a portfolio of credit quality in order to be financially self-sufficient. It appears that to increase their financial viability, MFIs should favor the proactive risk management by considering their ability to anticipate problems of credit recovery in order to prevent contagion perverse among borrowers. Indeed, only a

small PAR30 is underlying the financial self-sufficiency of the MFIs in the context of low levels of savings mobilization and narrowing external funding opportunities. This should push to the professionalization of MFIs in order to demonstrate a relatively efficient management of their credit risk.

The coefficient of the number of client is positive and significant at 1%. This finding is in line with Hypothesis 4 formulated above. However, the impact of credit volume (Lncredit) on financial performance is negative and statistically significant at 1%. This is due to the credit rationing from Moroccan MFIs, which is the consequence of the high rate of payment default in their operations at the end of the period of growth (2003-2007). Indeed, the MFI did not take into account risk assessment in granting credit during the period of growth.

To cope with these difficulties and under proper framework for credit risk management, Moroccan MFIs created a "center of risk" to reduce the cross-debt, allowing the exchange and a better flow of information on the borrower's credit worthiness. In fact, when MFIs begin to compete on customers, the default rate rises quickly if they do not have access to a database showing the appropriate elements of their customer's behavior. In the absence of a center of risk, a much greater control MFIs on individual and group loans with joint liability group members (Conning, 1999; Laffont and Nguessam, 2000; Ahlin et al., 2007) should play a leading role in some environments marked by solidarity of its members as in Morocco. The joint liability is a guarantee to fight ex ante and ex post against the default risk (Stiglitz 1990 Ghatak 1999 and Morduch 1999). Therefore, a proper credit risk management causing a high rate of loan repayment could allow MFIs to increase their average loan portfolio to identical level loads and therefore lower their effective interest rates, whose improve their competitiveness.

As indicated in the estimation strategy, we estimate the two specifications (1 and 2) for the period of growth (2003-2007) and the period of decline (2008-2012) in order to investigate the determinants of Moroccan MFIs by taking into account the 2008 crisis. Indeed, in response to this crisis, MFIs are tightening their credit processes, putting together teams dedicated solely to loan recovery, and taking judicial action against delinquent borrowers. Table 4 reports the estimation results.

Findings indicate that the coefficient of equity-to-asset ratio is positive and significant at 5% for the (2008-2012) period. This result highlights the change in the funding structure of MFIs in increasing their share of equity in assets, suggesting that MFIs financing capacity is improved.

Results show that the impact of the number of customers and the percentage of female on the financial performance of MFIs is positive and statistical-

Table 4: Econometric results, period 2003-2012

2003-2007 (before crisis)		
Variables	ROE	ROA
Ratioass	-0.81 (3.71)	0.22 (1.14)
Lncredit	-0.76 (3.10)	-1.41 (0.95)
Lnclient	6.98** (4.04)	3.03** (1.24)
Pfem	0.08 (0.14)	0.08** (0.045)
Empr_Ef	-0.002 (0.002)	-0.0004 (0.0007)
Mature	-2.12 (8.65)	-0.69 (2.67)
Par30	0.26 (1.30)	-0.62 (0.40)
Constante	-47.95 (29.93)	-7.83 (9.24)
Number of MFIs	10	10
Number of observations	50	50
R-sq: within	0.16	0.04
Hausman test (Prob>chi2)	0.2408	0.2350
2008-2012 (after crisis)		
Variables	ROE	ROA
Ratioass	-0.86 (11.26)	6.94** (2.83)
Lncredit	2.02 (1.46)	0.59** (0.36)
Lnclient	-6.32** (2.48)	-1.55*** (0.53)
Pfem	-0.005** (0.002)	-0.0005 (0.0004)
Empr_Ef	0.36*** (0.09)	0.08*** (0.018)
Mature	17.46 (12.43)	3.89** (2.26)
Par30	1.03** (0.63)	-0.16 (0.18)
Constante	-29.46 (25.45)	-7.99 (7.07)
Number of MFIs	9	9
Number of observations	45	45
R-sq: within	0.4	0.55
Hausman test (Prob>chi2)	0.1173	0.3661

*** p<0.01, ** p<0.05, * p<0.1, Standard errors are in parentheses. For the period 2008-2012, we selected nine MFIs. Indeed, in May 2009, Zakoura decided to merge with FBPMC.

ly significant at 5% during the period 2003-2007. In contrast, the number of customers and the percentage of female negatively affect the financial performance during the period 2008-2012. This is explained by the fact that MFIs have considerably slowed growth and reduced the size of their balance sheets. They also carry out major recovery plans by strengthening their credit methodologies, build teams dedicated exclusively to loan recovery and initiate legal proceedings against borrowers in arrears. Moreover, they regularly exchange information on their outstanding customer to control cross credit. Consequently, MFIs reduced the risk to a manageable level and, for this reason, the impact of PAR30 on the ROE is significantly positive after the crisis.

The results also show that age of MFIs and the productivity ratio have a positive and significant impact on MFIs' financial performance for the period 2008-2012. This result is expected because the Moroccan MFIs mature and improve their productivity. It seems that financial performance tends to increase with the number of years of existence of the structure (Cull et al., 2007). Alongside with seniority, MFIs tend to change their relationship with their users, substituting the customer strategy by the beneficiary strategy, and giving priority to the establishment of clear rules for structuring an efficient and stable market.

5. CONCLUSION

The objective of this paper is to examine the determinants of Moroccan MFIs' financial performance. Indeed, the financial performance is crucial because the viability of MFIs increases financial services access to the poor and to all those excluded from traditional financial sector.

Our estimation results indicate that the portfolio at risk over 30 days and the age of the MFI are the main determinants of financial performance. They also show that the outreach of MFIs' programs positively affects financial self-sufficiency. Moreover, we find a significant impact of the equity-to-asset ratio, personal productivity, as well as the percentage of female clients on the financial performance of MFIs.

The Moroccan crisis has shown that risk across the market exists, even in the case of credit institutions. As competitive microcredit markets often lead to multiple loans, MFIs are de facto connected and defaults can spread as fast as the rumors of a client to another. To avoid such a contagion, the Moroccan case provides valuable lessons in governance, infrastructure and market supervision.

In retrospect, we can note that MFIs having performed better governance are those received technical skills of their members in banking and finance. They focused on the long-term sustainability, more slowly but more often than their counterparts whose have significantly increased their risk profile without changing their management practices of credit risk.

New challenges are already emerging for the traditional Moroccan actor's microcredit. In the medium term, finding the right market niche in the global financial system will be crucial to incorporate an increasingly diversified market.

An interesting topic for future research would be the broadening of the scope of this study to encompass other determinants of financial performance such as subsidies and managerial aspects. Indeed, these data are only available in the MIX for a few MFIs. It would be interesting to collect these data during field surveys on Moroccan MFIs.

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Appendix
Table A1: Descriptive statistics

Variables	Obs.	Mean	Std. Dev	Min	Max
ROA	80	3.44	7.13	-19.18	18.37
ROE	80	4.53	49.92	-382.27	114.66
Ratioass	80	0.47	0.63	-0.5	4.29
Lncredit	80	14.92	2.57	9.55	19.39
Lnclient	80	9.93	1.82	6.12	13.06
Pfem	80	64.51	18.22	31.84	97.98
Empr_Ef	80	480.42	1108.2	0.005	6161.88
Mature	80	0.65	0.47	0	1
Par30	80	3.33	4.23	0	17.79

Table A2: Correlation matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[1] ROA	1.0000								
[2] ROE	0.4673	1.0000							
[3] Ratioass	0.0796	0.0213	1.0000						
[4] Lncredit	-0.070	-0.054	-0.3657	1.0000					
[5] Lnclient	0.2638	0.0819	-0.3417	0.7719	1.0000				
[6] Pfem	-0.235	-0.109	-0.0454	-0.0302	-0.0900	1.0000			
[7] Empr_Eff	0.1696	0.0993	-0.0834	0.2685	0.3722	-0.0574	1.0000		
[8] Mature	-0.082	-0.033	-0.3104	0.5514	0.4394	0.1162	-0.1026	1.0000	
[9] Par30	-0.309	-0.391	0.0544	-0.0464	-0.1999	0.0311	-0.235	0.0368	1.0000

Résumé

Cet article étudie les déterminants de la performance financière des institutions de microfinance (IMF) au Maroc. Nos résultats montrent que le portefeuille à risque (PAR30) et l'âge des IMF sont les éléments les plus déterminants de la performance financière de ces institutions. Les résultats démontrent également que la portée des programmes de microfinance des IMF affecte positivement la performance financière. Par ailleurs, nous trouvons un impact significatif de la part des fonds propres dans l'actif total, de la productivité des personnels et du pourcentage des femmes parmi les clients sur la performance financière des IMFs.

Mots-clés: microfinance, performance financière, portefeuille à risque, Maroc, crise 2008.

JEL: D63, G01, G15, G23, G32.