

## **Macroeconomic Determinants of Microfinance Institutions' Profitability: The case of Morocco**

### **Déterminants Macroéconomiques de la Rentabilité des Institutions de Microfinance : Le Cas du Maroc**

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**Date de soumission** : 09/02/2025

**Date d'acceptation** : 18/03/2025

**Pour citer cet article** :

HARKAT. T. & AL. (2025) « Macroeconomic Determinants of Microfinance Institutions' Profitability: The case of Morocco », Revue Française d'Économie et de Gestion « Volume 6 : Numéro 3 » pp : 526- 540.

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### Abstract

This study investigates the influence of various macroeconomic variables on the profitability of Moroccan microfinance institutions (MFIs) for the period from 1999 to 2019. Using data from the Mix Market and World Development Indicators data, and applying the generalized least squares regression technique, results indicate that GDP growth and inflation have no significant impact on the return on assets (ROA) of Moroccan MFIs. However, the results also show that unemployment and the rural population have a significant positive influence on the profitability of Moroccan MFIs. The results highlight the strategic importance of MFIs in mitigating the adverse effects of unemployment by supporting job creation through financing microenterprises. Additionally, the findings highlight the importance of using MFIs to foster the development of rural areas in Morocco.

**Keywords :** Microfinance Institutions ; Profitability ; Macroeconomic Impact ; GLS Panel Regression ; Morocco.

### Résumé

Cette étude analyse l'impact des variables macroéconomiques sur la rentabilité des institutions de microfinance (MFI) marocaines de 1999 à 2019, en utilisant les données de Mix Market et des Indicateurs du développement mondial. Une régression des moindres carrés généralisés examine les effets de la croissance du PIB, du chômage, de la population rurale et de l'inflation sur le retour sur actifs (ROA) de six IMF. Les résultats montrent que la croissance du PIB et l'inflation n'ont pas d'effet significatif, tandis qu'un taux de chômage plus élevé influence positivement le ROA, soulignant le rôle des IMF dans l'atténuation du chômage. De même, une population rurale en croissance améliore la rentabilité, mettant en avant la contribution de la microfinance à l'inclusion économique. Ces résultats soulignent l'importance stratégique des IMF dans la création d'emplois, le développement des microentreprises et la réduction de la pauvreté en milieu rural au Maroc.

**Mots clés :** Institutions de microfinance ; rentabilité ; impact macroéconomique ; régression en panel GLS ; Maroc.

## Introduction

Microfinance institutions (MFIs) have emerged as crucial players in fostering economic development, especially in regions facing extreme poverty and challenging economic conditions (Ullah & Khan, 2024). These institutions were primarily established to integrate the impoverished into the formal financial system, providing them with financial products and services to improve their economic well-being (Iyiola & Alfred, 2014). This is achieved through the provision of collateral-free microloans to support the establishment of micro jobs and microenterprises (Kusum Mukherjee, 2014). Furthermore, these microloans contribute to the financial stability of marginalized individuals, offering support for various needs, including addressing health emergencies and facilitating access to education, among other essential aspects.

To address various economic issues in Morocco such as poverty and unemployment, the Moroccan government established the microfinance sector in the early 1990s (Bennouna & Tkiouat, 2016). The first Moroccan MFI was initiated in a rural area in the Middle Atlas region, inspired by the globally known Grameen Bank model (Bennouna & Tkiouat, 2016). As this first experiment was successful, subsequent years witnessed the establishment of many other MFIs, including Zakoura Foundation in 1995, Karama and Fondép in 1996, and Al Amana in 1997, among others, reaching a total of 13 MFIs by 2019 (Aguenaou et al., 2019; Bennouna & Tkiouat, 2016; Harkat et al., 2023). These MFIs are regulated by various Moroccan authorities and the central bank, to ensure the regulation of interest rates and to safeguard the poorest segment of society (Ms, 2016).

In the microfinance literature, it is important to highlight that the field is divided (Kipesha & Zhang, 2013). Some scholars argue that the main objective of MFIs should revolve around their social mission, which is poverty alleviation. However, other scholars contend that MFIs should work on their profitability, as it is the only way to ensure their sustainability and long-term continuity (Ngumo et al., 2017). Advocates of this latter perspective argue that, when approached strategically, poor individuals remain viable clients for these institutions (Dokulilová et al., 2009).

In the context of this contribution, this study serves as an extension of the work of Harkat et al. (2023) and Aguenau et al. (2019), who argue that MFIs should be autonomous and sustainable. Therefore, while maintaining a social aspect, these institutions should attempt to maximize their profitability to become sustainable and rely less on donations. While previous studies have explored the impact of firm-specific determinants on the profitability of Moroccan MFIs, this

research investigates the impact of macroeconomic variables on the profitability of these MFIs in the Moroccan context. Although many scholars and academics have examined how macroeconomic variables influence the performance of MFIs in the context of other economies, this study is the first to explore a similar relationship in Morocco.

In this regard, the study adopts a positivist approach and employs a quantitative method to confirm its hypotheses (developed in subsequent sections). Thus, the research question guiding this study is: **"To what extent do macroeconomic variables influence the profitability of Moroccan MFIs?"** This research question aligns with a confirmatory research design, which involves using a statistical approach to analyze the impact of macroeconomic factors. In other words, a generalized least squares regression is employed to investigate the impact of unemployment, GDP growth, rural population, and inflation on the financial performance of Moroccan MFIs.

Since understanding the influence that firm-specific variables exert on Moroccan MFIs is crucial for deriving sound policy recommendations and making informed decisions, understanding the impact of macroeconomic variables on MFI profitability is equally significant for several reasons. First, understanding how macroeconomic conditions influence the financial performance of MFIs provides valuable insights for policymakers, enabling the formulation of laws, policies, and strategies that foster a supportive environment, promoting the sustainable growth of MFIs in Morocco. Second, understanding the macroenvironment's influence on MFI profitability is essential in assessing whether these institutions are effectively fulfilling their social mission of alleviating poverty and improving the financial well-being of the impoverished. Third, gaining insight into the macro context of MFIs in Morocco helps shape the direction of financial services offered to the poorest segments.

This paper is organized as follows. Section 2 describes the literature review and develops the hypotheses for this study. Section 3 presents the data and the econometric model used. Section 4 presents the empirical findings of the study and discusses them. Section 5 concludes the paper.

### **1. Literature review and hypothesis development**

Because of the crucial importance of MFIs in supporting financial inclusion, economic development, and poverty alleviation, scholars have shifted their interest in the field to understanding the influence of the macroeconomic environment on the profitability of these institutions (Iyiola & Alfred, 2014; Javid & Abrar, 2015). In other words, scholars have been interested in understanding how various macroeconomic variables influence the financial performance and dynamics of MFIs (Adusei et al., 2017; Afrifa et al., 2019; Zamore, 2018).

This research also shares the same focus as previous scholars and contributes to the existing literature and practical discourse by providing insights that inform strategic decision-making and policy formulation in the Moroccan context.

Since the microfinance sector is continuously evolving and becoming an essential tool in economic development, the need for studies that investigate the link between macroeconomic indicators and MFIs' profitability has become increasingly evident (e.g., Barry & Tacneng, 2014; Churchill & Appau, 2020; Nasrin et al., 2018). By delving into the existing body of knowledge, this literature review aims to provide a comprehensive synthesis of research findings related to four key macroeconomic factors—GDP growth, rural population, inflation, and unemployment, each playing a pivotal role in shaping the economic landscape in which MFIs operate.

Initially, scholars were interested in examining the relationship between GDP growth, which is a key indicator of economic health (Williams et al., 2017), and MFIs' profitability (e.g., Afrifa et al., 2019; Awaworyi Churchill et al., 2018; Khachatryan et al., 2017). First, it is essential to highlight that higher GDP growth is often associated with a decrease in poverty rates, as economic expansion leads to the generation of more job opportunities, increased income for citizens, and an overall enhancement of living standards (Michálek & Výboš'ok, 2019).

Building on the connection between GDP growth and poverty, a noteworthy observation emerges—enhanced economic development appears to be inversely related to the profitability of MFIs (Awaworyi Churchill et al., 2018). The creation of new job opportunities and the overall improvement in living standards contribute to a decrease in the client base of MFIs. This inference aligns with the findings of Dabi et al. (2023), where the authors identified a negative association between GDP growth and MFIs' ROA in the context of Ghana. Nevertheless, a broader review of existing literature indicates varied perspectives. Many authors observed no significant relationship between GDP growth and MFIs' profitability on a global scale study, in Sub-Saharan countries, developing nations, and Nigeria (e.g., Afrifa et al., 2019; Ahmad et al., 2020; Awaworyi Churchill et al., 2018; Barry & Tacneng, 2014). Conversely, in distinct contexts such as the West African Economic and Monetary Union region, Central and Eastern Europe, and Central Asia, authors identified a positive association between GDP growth and MFIs' profitability (Gbandi et al., 2021; Khachatryan et al., 2017; Mumi et al., 2020). This positive correlation may be attributed to the strategic use of MFIs by certain economies to stimulate job creation and entrepreneurship, further fueled by the rise in income levels, which

concurrently reduces default rates among borrowers. Consequently, this study posits the hypothesis that overall:

- **H1: GDP growth has no impact on the profitability of Moroccan MFIs.**

Secondly, the existing literature has delved into examining the correlation between changes in the population of rural areas and the profitability of MFIs (e.g., Chmelíková et al., 2019; Cull et al., 2014). Notably, microfinance originated in village settings, where residents, often excluded from the financial system due to a lack of branches, ATMs, and financial services, became the primary focus. Across European countries, developing nations, and regions like Latin America and the Caribbean, an increase in the rural population tends to positively impact the profitability of MFIs (Chmelíková et al., 2019; Daher & Le Saout, 2015). This observation stands in contrast to the findings of Cull et al. (2014), which identified a negative association between the rural population and MFIs' ROA in a study encompassing 38 developing countries. However, for most studies, numerous authors found no substantiated evidence supporting any association between the rural population and the financial performance of MFIs (Awaworyi Churchill, 2017; Campbell & Rogers, 2012; Khachatryan et al., 2017). Hence, this study puts forth the proposition:

- **H2: Rural population has a positive impact on the profitability of Moroccan MFIs.**

In addition to examining GDP growth and rural population, scholars have shown a keen interest in investigating the influence of inflation on the profitability of MFIs (e.g., Ahmed et al., 2018; Tanin et al., 2019). Inflation, defined as the increase in the overall price level of goods and services within an economy, may result in a decrease in purchasing power (Goyal, 2014). Elevated inflation levels are indicative of higher interest rates on granted loans. Moreover, heightened inflation rates may lead MFIs to bear increased operational costs, consequently leading to a higher cost of funds to offset the low levels of profit margins.

It is important to note that an increase in interest rates or the cost of debt can potentially result in a decline in the number of MFIs' clients, an increase in default rates, and a rise in non-performing loans. This negative association has been confirmed in the findings of Ayayi and Wijesiri (2022), Cull et al. (2014), and Daher and Le Saout (2015). While a minority of authors have identified a positive association between these variables in Sub-Saharan countries, the Organization of Islamic Cooperation, and six other regions (Chikalipah, 2017; Ibrahim et al., 2018; Tanin et al., 2019), the prevailing consensus among most authors suggests no significant relationship between inflation and the profitability of MFIs (e.g., Afrifa et al., 2019; Ahmed et

al., 2018; Ali et al., 2023; Berguiga et al., 2020). Accordingly, the formulation of the following hypothesis is proposed:

- **H3: Inflation has no impact on the profitability of Moroccan MFIs.**

Regarding the fourth macroeconomic variable, scholars have shown an interest in assessing the relationship between unemployment and the profitability of MFIs. Intuitively, higher levels of unemployment are expected to result in an increased clientele for MFIs. This is primarily due to the financial challenges faced by individuals experiencing unemployment, leading them to seek credit solutions to address their financial difficulties and potentially create job opportunities through the establishment of microenterprises. This association between unemployment and profitability in the microfinance sector is confirmed in the contribution of Awaworyi Churchill et al. (2018), where the authors found evidence that high levels of unemployment lead to increased profitability for MFIs. While this study was a global analysis and included 90 economies, other regional and country-specific studies have found either a negative correlation or no relationship between the two variables (Awaworyi Churchill, 2017; Churchill & Appau, 2020). Therefore, this study suggests the following hypothesis:

- **H4: Unemployment has a positive impact on the profitability of Moroccan MFIs.**

Finally, this contribution also investigates the influence of MFIs' size on their profitability. In this regard, size, which is considered a control variable, is represented by the logarithmic transformation of the total assets of these institutions, as seen in the contribution of Abu Wadi et al. (2022). Based on the findings of the existing literature, only a limited number of contributions have found that size has a negative influence on the profitability of MFIs (Adusei et al., 2017; Cull et al., 2014; Saeed et al., 2018). Similarly, a limited number of contributions have found that size has a significant positive influence on MFIs' financial performance (Chikalipah, 2018; Cull et al., 2007; Gbandi et al., 2021). However, the majority of scholars and academics investigating the association between size and profitability have found no association between the two variables (e.g., Afrifa et al., 2019; Ahmad et al., 2020; D'espallier et al., 2013; Kar, 2012; Kar & Bali Swain, 2018). Therefore, this study proposes the following hypothesis:

- **H5: Size has no impact on the profitability of Moroccan MFIs.**

The next section presents the method used to investigate the formulated hypotheses.

## 2. Methodology

This study investigates the influence that some macroeconomic determinants exert on the profitability of Moroccan MFIs from 1999 to 2019. In the existing literature, the profitability

of MFIs has been proxied mainly by return on assets (ROA), return on equity (ROE), profit margin (PM), and financial revenue (Aguenaou et al., 2019; Ayayi & Wijesiri, 2022; Chikalipah, 2018; Harkat et al., 2023). In the context of this study, MFIs' profitability is represented by ROA, extracted from the Mix Market dataset. Using this same database, the size of the MFIs, proxied by their total assets, was also extracted. While the initial extracted dataset included 12 MFIs, six of them were removed due to a lack of data, leading to the use of only the remaining six.

The macroeconomic variables, including GDP growth (GDPG), unemployment rate (UNP), population of rural area (POPR), and the inflation rate (INF), were sourced from the World Bank. Precisely, these data were extracted from the World Bank Indicators, covering the period from 1999 to 2019. Table 1 presents descriptive statistics for the discussed variables.

**Tableau N°1: Summary descriptive statistics of the variables**

	<b>GDPG</b>	<b>UNP</b>	<b>POPR</b>	<b>INF</b>	<b>ROA</b>	<b>TA</b>
<b>Mean</b>	4.05	10.33	13,550,579	0.92	3.45	76,303,172
<b>Standard Error</b>	0.39	0.33	25,086	0.31	0.60	10,996,585
<b>Median</b>	3.73	9.67	13,611,765	0.86	2.96	9,998,155
<b>Standard Deviation</b>	1.80	1.52	114,958	1.42	5.71	108,860,635
<b>Range</b>	7.27	5.03	403,630	6.60	38.20	390,572,883
<b>Minimum</b>	0.52	8.91	13,241,216	-1.77	-15.25	308,320
<b>Maximum</b>	7.79	13.94	13,644,846	4.83	22.95	390,881,203
<b>Count</b>	21	21	21	21	90	98

For GDP growth, the mean was 4.05%, exhibiting low volatility at 1.80%. The variable ranged from 0.52% to 7.27%, indicating that the Moroccan economy did not experience a yearly decrease in its GDP. Regarding unemployment, Table 1 reveals an average rate of 10.33%, signifying its significance, with low volatility. Throughout the study period, between 8.91% and 13.94% of the labor force remained unemployed. Concerning the rural population, Table A shows little noticeable change, fluctuating only between 12.24 million and 13.64 million Moroccan citizens. In terms of inflation, this variable demonstrates high volatility with a standard deviation of 5.71%. Its mean of 0.92% fluctuates rapidly over a range between -1.77% and 4.83%. Similarly, the ROA of Moroccan MFIs appears highly fluctuant. Moroccan MFIs can generate a return on assets reaching 22.95% and may incur losses as substantial as -15.22%. This underscores the importance of deepening the understanding of their profitability for the continuity of operations. Lastly, according to Table 1, Moroccan MFIs encompass a mix of

small-scale and large-scale institutions, with total assets ranging from \$308 thousand to \$390 million.

To evaluate the impact of macroeconomic variables on the profitability of MFIs, an examination of the assumptions of fixed-effect and random-effect panel correlations was conducted. The results revealed the presence of endogeneity and heteroskedasticity issues. To address these concerns, the generalized least squares (GLS) panel data technique was employed. This statistical approach does not assume normal distribution or constant variance of error terms in a regression model. Furthermore, it allows for equal variances (heteroskedasticity) and autocorrelation. Hence, this technique is considered the most suitable for this study, leading to the proposition of the following model (Equation 1):

$$ROA_{it} = C + \beta_1 GDPG_{it} + \beta_2 UNP_{it} + \beta_3 \ln(POPR)_{it} + \beta_4 INF_{it} + \beta_5 \ln(TA)_{it} + \varepsilon_{it}$$

Where C is the constant, i denotes the number of MFIs, t represents the years, GDPG is GDP growth, UNP is unemployment, POPR is the rural population, INF is inflation, TA is total assets, and  $\varepsilon$  is the error term. It is important to note that the model represents both the population of the rural area and the total assets in their log form. The subsequent section will unveil the findings of the paper.

### 3. Findings and discussion

The following section presents the findings of the study, that are summarized in Table 2. The model is significant as it has an F-value of 8.15 that corresponds to a significant p-value lower than 5%. The model has an r-squared of 50.46%, which indicates that 50.46% of variations in the dependent variable is predicted by the GLS model.

**Tableau N°2: GLS panel regression results. Dependent variable: ROA**

Variable	Coefficient	t-Statistic	P-value
C	-9320.35***	-4.79	0.00
GDPG	0.16	0.63	0.53
UNP	2.93***	2.90	0.00
ln(POPR)	566.09***	4.80	0.00
INF	0.30	1.05	0.29
ln(TA)	-0.28	-0.31	0.76
*** significant under 1%, ** significant under 5%, and * significant under 10% GDPG is GDP growth, UNP is unemployment rate, POPR is the rural population, INF is inflation, and TA is total assets			

Results indicate that the GDPG has no statistically significant influence on MFIs' ROA as the resulted t-statistic for the coefficient has a high p-value (0.53). This confirms the first hypothesis of this study claiming that Moroccan GDP growth has no impact on the profitability of MFIs within the economy. Similarly, the inflation and the size of MFIs has no significant influence on the profitability of MFIs. This confirms the hypotheses H3 and H5 of the study.

The empirical analysis reveals a noteworthy positive impact of the unemployment rate on the ROA of Moroccan MFIs, confirming H4. This result suggests that higher levels of unemployment in the Moroccan context are associated with increased profitability for MFIs. One explanation for this phenomenon can be linked to the essential role that MFIs play in supporting the unemployed through supporting the creation of microenterprises.

Results also confirm H2, as any increase in the population of the rural area in Morocco positively influences the profitability of Moroccan MFIs. One explanation for this phenomenon could be the increased demand for financial services in these areas. It is also important to highlight that the increase in demand for these financial services is linked to the lack of established formal banking systems. Hence, MFIs can play a significant economic role in rural areas by supporting the needs of their population. This can lead to economic development, job creation, and entrepreneurship in these areas.

### **Conclusion**

This study investigates the relationship between various macroeconomic variables and the financial performance of Moroccan MFIs. More specifically, this contribution assesses the influences that GDP growth, unemployment, rural population, and inflation exhibit on the profitability of six Moroccan MFIs over the period from 1999 to 2019 using the generalized least squares regression technique.

Results provide valuable insights into the dynamics of the sector in Morocco while taking into consideration the macroeconomic context. First, the results indicate that there are no significant impacts of GDP growth and inflation on MFIs' profitability. However, they indicate that higher levels of unemployment within the economy positively and significantly influence the profitability of Moroccan MFIs. This suggests that Moroccan MFIs can have a crucial role in mitigating the adverse effects of unemployment by providing financial support to the poorest segment of the population, and by encouraging job creation through financing microenterprises. Additionally, this study highlights the significant and positive influence that the growth of rural population has on the profitability of Moroccan MFIs. In other words, any increase in the rural

population translates into a positive contribution to the profitability of these institutions, which might be explained by the limited access to conventional banking in these areas.

While this study contributes to the existing literature on how macroeconomic factors influence the financial success of MFIs in general, and Moroccan MFIs in particular, it also provides valuable insights to policy makers and practitioners in the microfinance sector. This contribution emphasizes the role that Moroccan MFIs can play in reducing the adverse effects of unemployment, and the role they can play in enhancing the development of rural areas.

Finally, it is important to highlight the limitations of this study. First, this contribution does not include all Moroccan MFIs because of data unavailability, which might not fully represent the entire sector. Second, this study adopts a quantitative approach and excludes the qualitative approach. For this reason, future studies could incorporate a qualitative method to provide deeper insights into the motivations and challenges faced by MFIs in Morocco. Lastly, the proposed model is not exhaustive in covering all macroeconomic factors that might have a direct or indirect influence on the profitability of Moroccan MFIs. Therefore, future contributions can investigate the influence of other macroeconomic variables on Moroccan MFIs such as the Heritage Index, Human Development Index, interest rates, and agricultural value added among many other understudied variables.

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