Incentive scheme and productivity in microfinance institutions in Benin

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Abstract:

This article aims to analyze the productive effects of financial and non-financial incentive in microfinance institutions in Benin. We estimate a Cobb-Douglas production function augmented by the Incentive Scheme on an unbalanced panel of 14 registered MFIs over the period 2007-2017. The findings of this study show that non-financial incentives positively impact the outreach whereas the financial incentives have a negative effect on outreach. They further suggest that a well-designed incentive scheme is a powerful tool to overcome free riding and other asymmetric information problems in a costly monitoring environment.

Key Words: Financial incentive, Non-Financial Incentive, Productivity, MFI, Benin
JEL Classification : C25 J41 Q14

1. Introduction

Investments in developing countries often depend on the forms of financial intermediation, which may depend on banks or microfinance institutions (MFIs). Therefore, looking for appropriate strategies to improve the productivity of those institutions is very urgent. Balkenhol and Hudon (2011) and Biancini et al (2017) argue that productivity and the efficiency of MFIs are key indicators that guide the decision of donors. In addition, MFIs target joint objectives. First, the social objective which aims at a large number of clients. This is because the financial performance of MFIs may be affected positively due to the quality of its borrowers (Honlonkou et al, 2006). Second, the objective of financial performance leads MFIs to be sustainable in order to keep on providing credit to the poorest (Shea, 2012).

However, microfinance institutions have experienced remarkable development in recent years in Benin, increasing their market share in bank deposit from 10.08% to 84.07% between 1993 and 2008 (Babatoundé, 2014) thereby inducing competition in the microfinance sector and creating productivity gains through innovation facilities (McIntosh et al, 2005; Armandariz and Morduch 2010; Balemba, 2015). Moreover, the number of registered MFIs and their recipients are constantly progressing as well as the turnover and their implications on financial intermediation, banking and monetary regulation in WAEMU (Lanha, 2006; BCEAO, 2015). In addition, the strong competition among microfinance institutions compels them to efficiently exploit their productive resources and operate at full capacity (McIntosh & Wydick, 2005; Armendariz and Morduch, 2007; Amuli et al, 2013; Etro and Cella, 2013; Mugaa, 2017). This requires each MFI to know its abilities and limitations and to have a thorough knowledge of its intermediation system. Furthermore, it is also important to identify the most productive resources and the possibility of improving the less productive ones. Labor is one of the most used resources in the production technology of MFIs (Balemba, 2015, Nurun et al, 2017). Its compensation determines the incentive to reveal the effort and hence the productivity of the employee and consequently the performance of the firm (Groves et al, 1994; Aubert et al, 2009; Accion, 2013; Ennasri & Willinger, 2014; Tian and Yang, 2014; 2014; Falola et al, 2014; Guiteras and Jack, 2017).

Literature points this problem as a profit sharing scheme, incentive scheme or performance based pay. This incentive scheme is important for multi-goals firms such as MFIs that target both financial and social objectives. It allows employees and clients to know the objectives settled by the MFI (Gutiérrez-Nieto et al, 2009; Battilana and Dorado, 2010; Accion, 2013). According to Biancini et al (2017), the incentive scheme is very important for MFIs to reach

the poorest. Indeed, incentives provide an extrinsic reward in terms of wage, and intrinsic rewards through the recognition of efforts and results (OECD, 2005). In addition, Kraft and Ugarkovic (2006) show that this incentive scheme is appropriate in well-organized firms where tasks are overlapped making difficult the quantification of individual contributions. For this purpose, the individual incentive system is no longer appropriate (Maltarich, et al, 2017). Overall, incentive compensation aims to ensure good governance, to induce innovation among employees and to have the employee interested in the financial situation of the firm by establishing a link between the employee and their compensation (Laske and Schroeder, 2016; Gibbs et al, 2017). Compensations is therefore a very dynamic human resources management practice. In the competitive environment, it is important to manage the compensation scheme well, because they act differently and determine the attitudes and the behaviors of employees. Moreover, they also affect the firms' performance through attraction and retention of employees in firms. Incentive scheme have therefore the primary aim to influence the employee's productivity and to design appropriate labor contract in MFIs. Consequently, incentives can take two forms namely: Non-financial incentives and financial incentives (Ekpudu and Okafor, 2012). Indeed, in a context of globalization, with permanent mobility of labor, some employees are attracted by the compensation inside or outside the microfinance sector. For instance, when employees in MFIs are treated like those in banking sector, they may become more productive and enhance the performance of the MFI (Besley and Ghatak, 2005; Obembe et al, 2016).

This paper is devoted to the productive effects of incentive scheme in MFIs and shows the role of capacity building on the productivity of employees and consequently on the performance of MFIs in Benin. The paper is organized as follows. The second section reviews the related literature followed by the methodology in section3. Section4 displays results and discussion. We end the paper with a concluding remark in the last section.

2. Literature review

Leibenstein (1957) argues that individual production is an increasing function of real wage. Therefore, a rise in wage increases the productivity as well as the direct cost of labor. Similarly, the efficiency wages model assumes that performance is not verifiable and no incentive contract is possible. The efficiency wage theory predicts that it may be beneficial for employers to increase wages beyond their competitive level in order to improve labor productivity (Cahuc and Zylberberg, 2001). In the same way, Akerlof (1982) proposed a sociological approach of efficiency wage based on gratification between employees and

employers. According to Akerlof, the employee's performance depends on the employer. One way for the employer to have the employee perform well is to offer wages higher than a reservation wage (Laffont and Martimort, 2002; Ennasri and Willinger, 2014; Falola et al, 2014). The effect of wage on the productivity depends on whether the compensation positively affects the worker's effort. In the context of wage stickiness where all employees with the same qualification are paid the same wage, the best way for employers to retain his employees and prevent them of shirking is to offer wages above the reservation wage. In addition, an incentive wage may prove to be a substitute for monitoring (Prescott, 1998; Bental and Demougin, 2006; Friebel et al, 2015). Incentive theory refers to methods and concepts of analyzing situations in which agents do not perfectly observe all the characteristics of their environment because information is asymmetric (Omollo, 2015). Indeed, the "principal/ agent" model is one of the most popular model used to analyze these situations. For that an incentive problem occurs since the gain of both the principal and the agent depends on the hidden information by the agent. The principal offers incentive contracts which might reveal his information to undertake good actions (Jaffee et Russell, 1976; Labie et al, 2009). Asymmetric information result then from the difference between what the employee knows about his productivity (Jaffee and Russell, 1976) and what the employer expects from the employee in terms of effort. Furthermore, the asymmetric information arises because the employee's effort is not perfectly observable (Mkhabela, 2018). It is therefore beneficial to correct some of the problems of asymmetric information and specifically moral hazard problem between the principal and the agent. That is the overall objective of the incentive scheme. Indeed, incentive is fundamental for MFIs that pursue several objectives such as profitability and outreach (Battilana and Dorado, 2010; Shea, 2012; Falola et al, 2014; Giné et al, 2017). In addition, incentive pay seek to relate the employee's performance to their compensation and then to relate the employer's interests to that of the employee (Clark et al, 2006). In other words, the employee works indirectly for themselves while working for the employer. Their objectives are therefore merged and the asymmetric information is reduced (Kian and Wan Yusoff, 2015). However, asymmetric information is considerably reduced by extrinsic motivation compensation such as wage, bonus and others forms of compensations which affect the employee productivity more than the intrinsic motivation (Gerhart and Fang, 2015; Nuru et al, 2017). Labie et al (2009) argues that incentive contracts lead the agent and particularly the credit officer to achieve the objective settled by the MFI. Similarly, Kraft and Ugarkovic (2006) show that incentive scheme is appropriate in well-organized firms where tasks are overlapping making difficult the measurement of individual performance. In the

same way, Nyberg et al (2018) pointed out that firms establish incentive scheme in order to have employees focus on profit maximization and cost minimization problem. Incentive scheme is an indicator for good governance and power balance in firms (Labie and Mersland, 2011). In this context, Englmaie et al, (2018) show that as extrinsic and financial incentive scheme, bonus systems affect significantly and positively employee's productivity in firms. They further note that this effect is more significant for collective incentives because it affects team work. However, employees do not no longer look for original solutions but rather the solution that may help them to achieve their goal rapidly. Delfgaauw et al, (2017) and Friebel et al. (2017) show that collective incentive that include both managers and employees are the most productive. In fact, investigating the productive effect of incentives based on collective performance in a German distribution chain, Friebel et al (2017) show that in spite of performance, collective performance-based incentives increase employee's productivity by about 3% as opposed to fixed pay. Delfgaauw et al, (2017) also show that collective incentives generally in terms of non-financial incentives and others forms of gratifications reduce favoritism in task assignment and favor group performance. Besides, Takahashi et al. (2016) note that the magnitude of the incentive effect depends on the task to be executed. Moreover, incentives enhance creation of ideas and drive employees to excel (Laske and Schroeder, 2016; Gibbs et al, 2017). On the other side, Milgrom and Roberts (1990) insist on the risk aversion of economic agent. With incentive contract, employees are compelled to bear some of the production risk which otherwise would have been entirely absorbed by the employer. In this way, we note that the employee will assume as much risk as in absence of incentive and is thereby subject to an additional risk pertained to the variability in productivity and consequently of their pay. Hart and Holmstrom (1987) point out that in the single case of fixed wage regardless of the employee's performance, the employment contract guarantees a fixed pay for the employee regardless of their productivity. As a result, the employee tends not to provide optimal effort. The opposite happens in the case of incentive contract. The incentive contract removes the invariability of the compensation and leads the employee to be performant. The effectiveness of the incentive contract rests on its ability to manage the tradeoff between the variability of the wage pertained to the incentive scheme and the response of the employee to this new variability. The incentive contract must therefore protect the employee against eventual risks pertaining their productivity and simultaneously provide them a return on their performance (PWC, 2017). That may have different effects on the production and labor. Kruse (1992) identifies three additional effects of incentives: they increase the labor effort; develop a qualified labor and generate a flow of information for an

effective management in the firm. Even though that does not create problems in a single firm with only one employee, the incentive contract becomes complex in firms with many employees (McCormack et al, 2010) making it difficult to measure individual productivity (Alchian and Demsetz, 1972). In the case of team production, the total amount of production is not necessarily the summation of individual productions. This explains why the incentive contract is based on the collective production and it is not separable (Friebel et al. 2017; Delfgaauw et al, 2017). However, such measure of team performance creates the free-riding problem and indirectly that of firm size (Lazear, 1998; Nyberg, 2018; Englmaie et al, 2018). This is obvious in the case of medium and large size firms with more than fifty employees. Since incentives depend on team effort, the additional productive effort of a worker is inversely proportional to the firm's size. In a large firm, an employee may realize that their contribution to the team is minimal and then could be tempted not to work hard for the MFI. The expected effect of the free riding on the firm's performance will depend on the number of employees behaving like that. This effect may be positive and greater than it would have been without incentive but lesser than when all employees work in the same team (Bénabou and Tirole, 2004; Nyberg, 2018). According to Lazear (1998), free riding dilutes the effect of incentives. Conversely, Kandel and Lazear (1992) argue that firms where interaction and pressure among employees exists, partnership and incentives coexist, it is likely that the negative effect of free riding will be reduced. It will therefore be difficult to nod about the real effect of incentives in that context. The issue on the positive tradeoff between the various forms of incentives and the firm performance is almost unanimous in literature.

Most of the studies on this topic are on industrial firms and therefore there is a gap about the effects incentives might have on firms that provide service such as microfinance institutions. This because in microfinance sector, output is not easily quantifiable and the productive effect of incentive is not measurable even if it is a captivating task (Gramlich, 1976). Microfinance institution provide an experimental plot to assess the productive effect of incentive scheme since the labor factor is considerably used in the production process. In addition, MFIs provide an environment for both individual and team work in the monitoring process of borrowers. This may reduce free riding and enhance the effect of incentive when they are well designed and implemented (Kandel and Lazear, 1992; Accion, 2013).

3. Methodology

Empirical literature on the adoption of an incentive scheme is almost exclusively devoted to manufacturing firms and makes use of various econometric approaches. However, concerning

the productivity analysis of MFIs, there are plenty of studies. Table1 displays the outlines of some studies on MFIs' productivity as well as their econometric approaches. Indeed, based on large sample, some studies use the difference in difference matching approach to estimate the productive effect of incentive schemes. This approach constitutes a limitation for MFI sector because of data constraints. Other studies estimate that relationship by using the OLS method or 3LS on a panel of firms. However, the OLS method has been largely criticized because of the eventual correlation and endogeneity problems. Therefore, some authors propose to correct these issues by using for instance the two-step Heckman approach (Drolet et al, 1999). Finally, the Stochastic Frontier Analysis (SFA) and the Data Envelopment Analysis (DEA) are also used to estimate the efficiency and productivity of MFIs.

Table1: Some empirical studies on productivity analysis of MFIs

Authors	Data source	Methodology	Explanatory variables	Dependent variable
Fall et al (2018)	262 observations, 38 MFIs	Meta regression (DEA and SFA)	Inputs and outputs	Technical Efficiency average
Wijesiri et al (2015)	36 MFIs in Sri Lanka	DEA	Total Assets Number of loan officers Costs per borrower	Outstanding credit financial Revenue Number of active borrowers
Bassem (2014)	33 MFIs in the Middle East and North Africa	DEA-based Malmquist index	Number of employees operational expenditure	Indicator income for the poorest Interest income and commissions
Quayes (2012)	702 MFIs in 83 countries, Mix Market	OLS, logistic regression, 3MCO	Credit Amount; ratio of total expenditure, cost per borrower;	Average amount of credit to GDP; Percentage of women borrowers
Hermes et al (2011)	435 MFI Mixmarket	Stochastic Frontier Analysis	total costs	Ln (average amount of credit)
Bassem (2010)	42 MFI in 21 countries, Mixmarket	MCO	Total Assets of the MFI; age of the MFI; form of organization; mode of governance; regulation	Number of active borrowers; Average credit Amounts on GDP per capita
Gutiérrez-Nieto et al (2009)	89 MFIs, Mixmarket	DEA	Financial revenue; outstanding portfolio	Number of women credit recipients; dummy of poorest recipients
Jones and Kato (1995)	109 Japanese Firms	MCO	Total Assets as a proxy of capital; Number of employees	Added value

In light of the above studies, we consider a simple Cobb Douglas production model augmented by the Incentive scheme in this paper. We specifically follow Bhargava (1994), and Jones and Kato (1995) in their studies on firms in United Kingdom and Japan respectively. They provide an evidence on the productive effect of financial incentives in firms. We first conduct the Hausman test to check which of fixed effect model or random effect model is appropriate to this study. After the Hausman test, we estimate a random effect model with robust standard errors on an unbalanced panel of 14 MFIs in Benin. The Robust option allows to correct the hetereskedasticity and serial correlation issues. One of advantages of random effect model is that it allows to estimate the time invariant variables (Hausman and

Taylor, 1981). In addition, the random effect model is usually used to analyze the behavior and the performance of MFIs (Hartarska, 2005; Vanroose and D'Espallier, 2013; quoted by Hudon and Périlleux, 2015).

Model Specification

Assuming that the production technology used by the MFI is as Cobb Douglas form augmented by Incentive scheme (*IS*), the empirical model includes potential groups of variables and is presented as follows:

$$\boldsymbol{P_{it} = f[X, (FIS)_{it}, (NFIS)_{it}, \alpha_i, \alpha_t] + \varepsilon_{it}}$$

Where P_{it} represents the productivity of the MFI *i* at period *t* categorized in *breadth* and *depth* of the outreach and financial productivity in terms of Return on Asset (ROA) and Financial Revenue (FR). $(FIS)_{it}$ and $(NFIS)_{it}$ are respectively the dummy variables of Financial Incentive Scheme (FIS) and Non-Financial Incentive scheme (NFIS) taking 1 for presence of a form of incentive scheme and 0 otherwise. *X* is a matrix of explanatory variable such as *Total asset* as proxy of capital factor used by the MFI *i* at period *t; Age*, *Struc* represent respectively the age and the legal structure of the MFI. $\boldsymbol{\alpha_i}$ represents the MFI fixed specific effect, $\boldsymbol{\alpha_t}$ time specific effect and $\boldsymbol{\varepsilon_{it}}$ is the error term. Table A1 displays the empirical specification of each composante of social and financial productivity.

4. Data and Variables

4.1.Source

A sample of 14 registered MFIs in Benin over the period 2007-2017 is used in this study. Therefore, the size of our panel is 154 observations. These MFIs reflect well the overall MFIs in the microfinance sector in Benin. Selection of MFIs is based on the number of diamonds assigned by the Mixmarket to indicate the reliability and the availability of information pertaining to MFIs. As a matter of fact, all the MFIs of our sample have at least three diamonds reflecting the pertinence of our selection. Our data is drawn from three sources, namely: the "Mixmarket", the "Cellule de Surveillance des Structures de Financement Décentralisé (CSSFD)" and our own survey conducted in 2017 with the support of Consortium Alafia. We initially sent a short questionnaire by mail to 32 MFIs with a response rate of 53%. That is, only 17 MFIs provided the requested information on the human resource management practices. We then checked for MFIs that matched with Mixmarket criterion as

far as the number of diamonds is concerned. We therefore came out with 14 MFIs that constituted our sample at the end of the selection process.

4.2. Indicators of Productivity

Productivity is measured in microfinance sector through the social productivity (outreach) and the financial productivity (Return On asset or Financial Revenue) (Bassem, 2009; Schreiner, 2002). The most used indicators of social productivity of MFIs are the Breadth and the Depth of the outreach. The depth of the Outreach indicates the amount of credit on GDP per capita and shows how the MFI targets the most disadvantaged people. In a situation of complete information, the depth can be measured by aggregating the personal equity ratio of each borrower and tests whether the MFI actually provides credit to the poor regardless of their wealth. Since the information is not complete, some authors use the average volume of credit divided by the per capita GDP to approximate the depth of the outreach. A feeble depth indicates that the MFI has targeted the poorest (Cull et al, 2007; Kai, 2009; Hermes et al, 2011; Quayes, 2012). The Breadth of the outreach refers to the size of the clientele served by the MFI even if it entails non-poor clients. We proxy the breadth of the outreach by the logarithm of the number of active borrowers. The active borrower refers to the one that has an outstanding credit with the MFI. This indicator reported to the number of employees informs on the way the MFI adapts its methods and procedures for the sake of its activities. A feeble productivity as regard to this indicators does not mean that employees work less but indicates that procedures are inefficient (Microrate, 2003). As far as the financial productivity is concerned, we consider in this study the ROA and financial revenue that provide information on the sustainability of MFIs.

4.3. Potential explanatory variables

Incentive scheme

Also known as profit sharing, the incentive scheme appears under various forms in MFIs. There are Financial Incentive Scheme (FIS) and Non-Financial incentive Scheme (NFIS). In addition, there exists different types of incentives such as individual incentive and collective incentive directly related to the incentive forms (Alchian et Demsetz, 1972; Al-Qudah, 2016). For instance, output bonus and other forms of gratification are popular indicators of individual performance in MFIs in Benin. There is for example the quarterly bonus related to the amount of outstanding portfolio of the credit officer. This portfolio is risky when more than 5% of

borrowers renege to their commitment vis-à-vis the payment of the credit. Incentives exist in MFIs at different level: there are incentive for staff and incentive for managers. Moreover, a combination of individual and collective incentives exists in some MFIs. In this study, we have binary information on the presence (absence) of each of those categories of incentive. Unfortunately, the observations on that issue is not large enough because the MFI considers as team work the aggregate output of its offices. However, the size of the sample and the quality of available information on the labor market characteristic in MFIs do not allow to dissociate individual and collective productive effects of individual and collective incentives. We therefore consider a binary approach in one hand of presence of financial or non-financial incentive in the MFI regardless to the frequency, the generosity, the compensation method and in other hand the MFIs without incentive scheme and do not practise any of the financial and non-financial incentives. Although, it is a strong assumption, incentives are considered in this study as equivalent from a MFI to another when they exist either as financial or non-financial form. Besides, we would have allowed two years lags so that the productive effect of incentives will be effective in MFIs. This because it is improbable that an introduction of an incentive scheme immediately enhances the productivity of the MFI. The response period may be reasonably more than one or two years. In addition, a new introduction of incentive scheme must consider the outcomes of its experimental phase. Finally, the adoption of incentive scheme is fundamental albeit its effect are not prompt as well as like others Human Resources Management Practices. Unfortunately, there is not enough information concerning performance indicators of Human Resources Management Practices in MFIs. For Wadhwani & Wall (1990), incentives schemes are adopted in well managed firms. Therefore, the coefficients related to incentives scheme dummy variables will inform on the quality of management of MFIs. Similarly, Conte & Svejnar (1990) argue that firms that adopt incentive scheme prove to be more efficient and their employees are more qualified than those from other conventional firms.

Total Asset

The total asset is a proxy for the capital and gives indication on the size of the MFI. Relevant information can be provided to determine the efforts supplied by employees and therefore the performance of the firm (Akben-Selcuk, 2016). Three main types of physical capital measures are used in the microfinance sector: Building, information technology (IT) and office equipment. The first two are the most important. We wanted to generate a measure of IT capital that can be defined as all equipment used for processing and exchanging electronic

information. The IT represents an important production factor for the financial sector. The main difficulty was to obtain a quantifiable measure of IT capital that accurately represents the technological capacity of firms especially in rural areas where some MFIs do not even use it. For MacIntosh & Shwartz (1995) the size of the firm in terms of the size of the asset can be used as proxy for capital. Indeed, using the asset as control variable will neutralize the possible gaps generated by the size of MFIs of our sample on the coefficients of other variables particularly the constant. The literature displays four measures of the size namely: The sales, log of the sales, total asset and log of the total asset. We therefore opt to the log of total asset instead of other measures in order to neutralize the size effect pertaining to it.

Number of employees

One of the most used measure of labor in the literature is the linear summation of all categories of employees such as executives, credit officers and others employees. Such a measure of labor supposes that there is an equal contribution of each category to the aggregate output even though it seems irrational. However, we consider that it is impossible to match each composante of the output to an exclusive group of worker that's why we consider the linear summation of all employees regardless their category. In addition, it was not possible to get information on compensation of each group of employee that would allow to weight the measures and estimate their productivity. In doing so, it would require to cancel prejudicially some part of our sample. Finally, some of MFIs such as CLCAM employ only one or two workers. It is then judicious to suppose that employees provide equivalent effort in those MFIs even though this way of doing limits the possibility of weighting we would have operated.

Age

The Age of the MFI is categorized as New, Young and Mature. The age is an important determinant of productivity and efficiency of MFIs. It appears as the age of MFI itself and the age of MFIs in the microfinance network. Indeed, Gonzalez (2008) found that the productive effect of age is very high during the first six years and varies between 2% and 8%. This effect decline as a result of the maturity. This reflects the ability of the MFI to build a solid basis of clientele the first years of its operations leading to a great efficiency. Likewise, the age of others MFIs in the sector of microfinance affects substantially the productivity of each MFI belonging to that sector. This because, there is a learning process among the nascent MFIs and the mature MFIs. For instance, the nascent MFIs belonging to "consortium Alafia" an

association of MFIs in Benin, enjoy the expertise of the most mature in that association. Besides, Mahinda & Meoli (2015) in their study on the productivity change of MFIs in Kenya, using Malmquist approach showed that mature MFIs are less productive than the young MFIs. That supports the fact that in getting old, the MFI losses its ability to cope new challenges and becomes less competitive.

Structure or legal status

It is a set of dummy variables that indicate the organizational form of MFIs in terms of Not for Profit Organization (NPO), cooperative (COOP) and Shareholder Firm (SHF) microfinance. Studies find cooperatives more productive and efficient than other form of MFIs (Mersland and Strøm, 2008; Nosa and Ose, 2010; Safarova, 2010; Fakhfakh et al, 2011).

5-Results and discussions

Table2 displays the descriptive statistics of data used in this study. The sample is constituted by cooperatives (57.14%) followed by NPO (35.71%) and SHF (7.15 %). On average, the number of employees per MFI is approximately 32 although some of them employ only 2 workers for all their operations. Furthermore, despite the low productivity of some MFIs of the sample, it is significant to mention that in terms of performance of credit officers, the MFIs at plays in this study perform better in terms of the norms settled by the Central Bank of WAEMU (BCEAO). For instance, concerning the operations of credit, each credit officer manages approximately 245 active clients, which is greater than the 115 targeted by the Central Bank and the 152 by other regulatory institutions of the microfinance sector in Africa. Indeed, more than 30% of MFIs belonging to Consortium Alafia, an association of microfinance institutions, have a ratio of portfolio monitoring between 200 and 400 clients. However, the low value of the depth of the outreach (12433) indicates that MFIs actually target the disadvantaged people. In addition, it is worthwhile to add that the financial productivity in terms of financial revenue is approximately 30 million FCFA with a standard deviation of 752000 FCFA meaning the high variability of financial performance of MFIs. Reversely, in terms of profitability on asset, those MFIs are poorly performing.

Table2 : Descriptive statistics

Continuous Variables	Obs.	Mean	Std.dev	Min	Max
Breadth	*154*	*15967.59*	*23167.69*	*269*	*115556*
Depth	*140*	*12433.15*	*19027.3*	*0*	*78790.96*
ROA	*154*	*-0.0278*	*0.1389*	*-1.7596*	*0.3110*
Financial Revenue	*138*	*3.01 E+07*	*7.52 E+08*	*-3.35 E+09*	*2.21 E+09*
Total Asset	*154*	*8.82 E +9*	*1.40 E+10*	*2.63 E+7*	*6.47 E+10*
Number of employees	*154*	*131.2626*	*189.5423*	*2*	*902.7813*
Categorical Variables (frequency of« YES » in %)					
Incentive Scheme					
Financial Incentive Scheme	154	57.14			
Non-Financial Incentive Scheme	154	53.83			
Structures					
Cooperative	154	57.14			
NPO microfinance	154	35.71			
SHF microfinance	154	07.14			
Age of the MFI					
New	154	11.03			
Young	154	23.37			
Mature	154	67.53			

Source: Authors, 2018

As a matter of fact, the performance of MFIs depends fundamentally on the employed labor and its corollaries. In addition to the fixed wage that crucially affects the employee's effort, there is a stochastic component that affects more the employee's effort and then appears as a solution to free riding and asymmetric information issues in MFIs. Fifty seven percent of MFIs in the sample practice a financial incentive plan while fifty three percent, practice a non-financial incentive plan. This supports the importance of a simultaneous adoption of both the financial and non-financial incentive scheme in firms such as MFIs that mainly exploits labor to their financial operations. Therefore, a motivated employee is willing to provide considerable effort in order to achieve the assigned objectives for the sake of the performance of the MFI. In accordance with available data on microfinance sector, the data used in this study show that in MFIs that have clearly and effectually designed and implemented incentive scheme, staff productivity is greater than the one of MFIs without such an incentive scheme. Incentive scheme encourage employees in general and credit officers particularly to avoid adverse selections by distinguishing good borrowers from the bad ones and to limit outstanding payment risk in the MFI. However, the performance of MFIs through the productivity of employees does not only depend on incentive scheme. Indeed, field surveys show that practices such as the election of the best employee, the career plans, the endowment of equipment, the participation of employees in decision making and others forms of gratifications are as many non-financial motivations that affect employees and particularly credit officers in MFIs. Moreover, the literature reviews some intrinsic and extrinsic factors

that characterize the MFI and substantially affect its performance. We retained in this study the age of the MFI categorized as New, Young and Mature; the structure or the legal status in terms of mutual and cooperative (coop), NPO microfinance and share holding Firm (SHF) microfinance. Therefore, the statistics show that about 67.53% of MFIs are in maturity phase, 23.37% of MFIs are young and 11.03% of them are new. Fundamentally, a New MFI becomes young after five years and mature after ten years.

Regression results are presented in Table3. All diagnostic and validation tests pertaining to panel data estimation indicate that the random effect model is appropriate for this data. All the R square of models except that of ROA are more than 70% meaning that the explanatory variables explain the dependent variables well. They respectively explain the Breadth, the Depth, the ROA and the Financial Revenue model at 83.03%, 95.15%, 11.51% and 70.27%. The Breadth and the Depth are the social productivity indicators of the MFI and are respectively measured by the logarithm of the number of active borrowers and the logarithm of the amount of credit on the GDP per capita. We considered in this study the ROA and the financial Revenue as indicators of financial productivity. Moreover, giving the possibility of hetereskedasticity and serial correlation that often occur in cross section and time series data, we therefore estimated the models with robust option on the same explanatory variables. Results from robust estimations confirm those from the simple random effect estimations suggested by the Hausman test.

Table3: Random effect models estimations (robust)

	Social Productivity		Financial Productivity	
	Breadth	Depth	ROA	Financial revenue
Total Asset	0.243**	0.716***	0.0173	0.685***
	(0.100)	(0.102)	(0.0175)	(0.151)
Number of employees	0.734***	0.307***	-0.0174	0.106
	(0.112)	(0.111)	(0.0222)	(0.201)
Incentive scheme				
Financial Incentive	-0.744***	-0.0414	0.0656**	0.159
	(0.199)	(0.132)	(0.0323)	(0.340)
Non-Financial Incentive	0.862***	0.000232	-0.0294	0.0460
	(0.148)	(0.0633)	(0.0352)	(0.142)
Structures				
SHF microfinance (base category)				
COOP	1.094***	-0.683***	0.0752***	1.588***
	(0.266)	(0.117)	(0.0272)	(0.314)
NPO microfinance	1.141***	-0.355**	0.0506	1.898***
	(0.216)	(0.142)	(0.0318)	(0.203)
Age of the MFI				
New (Base category)				
Young	0.0377	-0.106	0.0917	-0.395
	(0.0867)	(0.102)	(0.0657)	(0.306)
Mature	-0.222**	-0.113	0.0963	0.0261
	(0.111)	(0.172)	(0.0805)	(0.447)
Constant	-0.531	-7.808***	-0.492	0.735
	(1.872)	(1.772)	(0.357)	(2.707)
Observations	154	140	154	105
Number of MFIs	14	14	14	14
R^2 Within	0.4030	0.6822	0.1149	0.3526
Between	0.8817	0.9968	0.1267	0.8242
Overall	0.8303	0.9515	0.1151	0.7027

(.) robust standard error ; *** p<0.01, ** p<0.05, * p<0.1

Source: Authors, 2018

The estimates results show that the breadth component of the outreach is more sensitive than the other three indicators to factors affecting the productivity of MFIs. In accordance with some empirical literatures (Oburu and Atambo, 2016; Locke, 2004; Rohn, 1993), results point out that incentive schemes either financial or non-financial significantly affect the productivity and therefore the performance of the MFI at 1% level. Indeed, the non-financial incentive scheme positively and significantly impacts the ROA but has a reverse effect on the Breadth of the outreach. Consequently, an adoption of non-financial incentive in terms of career plan, freedom in work, participation of employees in decisions making in the MFI and other forms of gratifications increase the Breadth component of the outreach of 86,2%. Similarly, an adoption of financial incentives in terms of bonus for instance increases the

ROA of 6.5%. However, financial incentives are indeed a powerful tool in boosting MFI's performance but are not without limitations in some cases. Therefore, results suggest that the number of active borrowers per employee declines by 74.4 % in response to an additional adoption of financial incentive in terms of increase of bonus. Though, this finding seems paradoxical, it confirms some theories on incentives that support an adverse effect of financial incentives on firms' performance. Indeed, some authors argue that a main adverse effect of incentives is that agents become themselves bonus pursuer. For instance, the establishment of an individual bonus divides the agents instead of rallying them. Further, it is difficult to assess the team's effect of an individual financial incentive. There are sometimes within a team, employees with different and often contradictory objectives. Moreover, some employees such as credit officers come out easily with risky borrowers to increase their individual production to the detriment of collective production (Oburu and Atambo, 2016, Delfgaauw et al, 2015; Friebel et al., 2017). Although the coefficient indicating the productive effect of non-financial incentives seems excessive, it is also consistent with some theories and confirm empirical results on that issue in MFIs (Tian & Yang, 2014; Oburu & Atambo, 2016; Delfgaauw et al, 2017; Friebel et al., 2017; Nyberg, 2018). For instance, Oburu and Atambo (2016) found that non-financial compensations are more productive than financial compensations in Wakenyapamoja, a microfinance institution in Kenya. Their also found that the participation of employees in decisions making , the well-designed career plans and appropriate working environments in MFIs are main factors motivating employees to appreciate their job and to give the best of themselves. Reversely, these results oppose those found by Ariely et al. (2007). Indeed, comparing the productive effects of monetary and non-monetary incentive, they found that monetary incentive are more productive than non-monetary incentive in private firms particularly in service offering companies. However, they also find that the effect is quite the opposite; that is the non- monetary incentive are more productive than monetary incentive in the case of public companies. Besides, many other variables affect the productivity of service offering companies such as MFIs. The results displays that variables such as total asset and the number of employees are positively related to social and financial indicators of productivity except the return on Asset (ROA). Indeed, the total asset of the MFI positively and significantly affect the productivity of the MFI at 1% level. This result confirm the study by Dumontier and Raffournier (1998) that argue that the total asset is one of best measures of firms size and prove to be a pertinent indicator of performance in the microfinance sector. Therefore, a one percent increase of the total asset significantly increases the breadth and the depth component of the outreach by respectively 24.3% and 71.6% and

the financial revenue by 68.45%. Similarly, the labor plays an important role in the microfinance sector. The productivity of the MFI even the one of employees substantially depends on the number of employees because of the division of labor pertaining to the production in that sector. Our results indicate therefore a positive and significant impact of 73.35% and 30.7% of the number of employees on the breadth and the depth component of the outreach. Unfortunately, despite the positive coefficients related to the financial productivity indicators, we cannot interpret them due to their non-significance. These results can be explained by the fact that the financial performance of the MFI imposes to rationalize the operational and administrative costs in substituting labor by new technologies. However, some studies have evidenced the determinant role of organizational structure and age in the productivity of MFIs. Thus, the results show that the legal status of MFIs affect variously the social and financial productivity of MFIs. Although the literature indicates a strong relationship between the age and the performance of firms like MFIs, our results are silent on that issue in exception of the Breadth which negatively respond to the age of the MFI. The first categories of these variables are omitted in the result for the sake of comparison with respect to the base category. As result, being in the category of cooperative increases significantly by 109%, 7.52% and 158% the productive effect that a SHF microfinance would have on the Breadth, the depth and the financial revenue of the MFI. Therefore, the literature indicates that cooperatives and NPO microfinance are considered as compatible with social objectives of poverty alleviation via the magnitude of the Breadth because of their approaches based on group borrowers (Tortia, 2018). In contrary, the ROA of a cooperative is less than the one of SHF microfinance. Similarly, the breadth, the ROA and the financial revenue of the cooperatives increase significantly by 114.1%, 7.52% and 158.8% respectively compared to the SHF microfinance. This effect is approximatively -35.5% on the depth component of the outreach. Indeed, Perilleux (2012) indicates that cooperatives and NPO microfinance are more efficient than SHF microfinance because they set apart some of their profits to clients and employees instead of investing all the profits. All these findings support the relationship between the legal status and the productivity of the MFI. In addition, the coefficient related to mature in the variable age is -0.22 and is significant at 5% level. This confirms the fact that nascent MFIs requires times to make profit on their investments. However, in getting old, the MFI becomes more productive till its maturity phase where it starts declining because of the inability to cope new challenges in the market and the aggressive competition by other young MFIs.

Conclusion

This paper empirically analyzes the productive effect of incentive scheme in microfinance institutions based on an unbalanced panel of 14 registered MFIs over the period 2007-2017 in Benin. Estimated results of the random effect models suggested by the Hausman test show that the adoption of a well-designed incentive scheme either financial or non-financial affects significantly but diversely the employee's productivity and then the performance of the MFI. However, the findings also show that non-financial incentives are more productive than financial incentives. Although the effects of incentives on the financial productivity is confusing, it is worthwhile to mention that there is a narrow link between social productivity and financial productivity. Therefore, in targeting a large number of active clients, the employee indirectly contributes to the financial productivity of the MFI. Similarly, a financial performing MFI is able to easily achieve the social objective of serving a large number of poor. Moreover, a systematic adoption of an incentive scheme should strictly consider factors that do not lead to free riding in MFIs. This may specifically make the staff and the credit officers to increase their production and to contribute to a resolute performance of the MFI. However, collective based incentives are more productive than individual based incentives which lead employees to bonus seeking regardless to the overall performance of the MFI. Consequently, a well designed and implemented incentive scheme may significantly affect the productivity, the efficiency and the quality of operations made by MFIs. The design of the incentive scheme must then be transparent and target very clear objectives in order to have all the concerned employees understand its mechanism. It should not vary arbitrary on purpose of the managers and should be equitable and have feasible objectives. Last but the most important, the incentive scheme should reward the best employees such as credit officers and debt collectors in order to have other employees to mimic them and discourage free riding (Labie et al., 2009).

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Appendix

Table A1 : Empirical specification of models

Explanatory variables	*Constance*	*lnasset*	*lnstaff*	*RIF*	*RINF*	*Age*	*struc*
Dependent variables							
breadth	α_1	$\beta_{1,1}$	$\beta_{2,1}$	$\beta_{3,1}$	$\beta_{4,1}$	$\beta_{5,1}$	$\beta_{6,1}$
Depth	α_2	$\beta_{1,2}$	$\beta_{2,2}$	$\beta_{3,2}$	$\beta_{4,2}$	$\beta_{5,2}$	$\beta_{6,2}$
ROA	α_3	$\beta_{1,3}$	$\beta_{2,3}$	$\beta_{3,3}$	$\beta_{4,3}$	$\beta_{5,3}$	$\beta_{6,3}$
Finrev	α_2	$\beta_{1,4}$	$\beta_{2,4}$	$\beta_{3,4}$	$\beta_{4,4}$	$\beta_{5,4}$	$\beta_{6,4}$