

Ugwuoke, Okwudili W.; Ogbonna, Oliver E.; Freeman, Aye-Agele

Article

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Financial Inclusion and Poverty Reduction in Nigeria: The Role of Microfinance Institutions

Okwudili W. Ugwuoke^{1,2} Oliver E. Ogbonna³ and Aye-Agele Freeman¹

This study investigates the role of microfinance institutions as a vehicle for driving financial inclusion and alleviating poverty in Nigeria using the EFinA 2018 household survey data. The probit model, propensity score matching, and average treatment effect methods are applied for the analyses. The study finds that financial inclusion driven by access to, and usage of products/services provided by microfinance institutions reduces poverty. The study recommends among others the need for increased access to microfinance products/services and an integrated poverty reduction policies that identifies microfinance institutions as a critical enabler.

Keywords: Financial inclusion, microfinance institutions, poverty, propensity score matching.

JEL Classification: G32, I31, G21

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1. Introduction

The importance of efficient and effective financial sector in an economy is well documented in extant literature. There is evidence of a positive relationship between financial system development and poverty reduction via accelerated financial intermediation, effective allocation of resources, improved payment system, and increased access to credit (Cojocura, 2016; Babajide, 2020). Furthermore, existing studies have shown that financial inclusion is a *sine quo non* for the development of any economy. Therefore, the issues of financial access and utilization of financial products as well as services have become a global concern to the extent that five out of the seventeen (17) Sustainable Development Goals (SDGs) are geared towards achieving them (Nizam, 2020). However, there is consensus in the literature on the importance of efficient financial system, but a less studied strand pertains to the extent to which financial penetration or coverage (financial inclusion) affect poverty, especially from

¹Department of Economics, Federal University Lafia, Nasarawa State.

²Corresponding author's email: ugwuokemartins@yahoo.com

³Department of Economics, University of Nigeria, Nsukka, Enugu State, Nigeria

the perspective of microfinance institution strategy (Aribaba, 2020; Babajide, 2020). Therefore, the role of microfinance institutions as a major instrument of achieving financial inclusion aimed at reducing poverty in Nigeria has not been properly documented.

Financial inclusion has become an important subject of academic and policy discourse due to its effect on economic opportunities, moderating economic shocks and reducing poverty (Tuesta & Urbiola, 2018). When household lacks access to banking services, it limits their opportunities to engage in economic activities. This condition known as financial exclusion is a factor for slow economic growth, and in most cases responsible for different dimensions of poverty as well as sustained income inequalities (Bara *et al*, 2016). Therefore, financial inclusion is not only essential in ensuring inclusive growth but also fundamental to reducing poverty and income gap.

Despite the general agreement by scholars on the importance of financial inclusion, achieving wide financial coverage remains a daunting task with about 54 percent of global adults in 2015 lacking access to financial services, 73 percent of the global poor in 2017 being unbanked and 38 percent of global adults in 2018 having no access to bank accounts (Global Findex, 2018), while in sub-Saharan Africa, 22 percent of adult population in 2018 are unbanked (Babajide, 2020).

The situation is not different in Nigeria as 60 percent of adult population in 2014 are financially excluded with only 44 percent of adults in 2016 having accounts in the formal banking system (Global Findex, 2018). This is abysmally low in both absolute and relative terms when compared to 2014 world average of 50 percent (Enhancing Financial Innovation & Access (EFInA, 2018))

The launching of the microfinance institution policy framework in 2005 in Nigeria was a major effort towards achieving financial inclusion. It aimed at establishing five microfinance bank branches per one hundred thousand adults. This singular policy is a strategy orientated towards realizing the National Financial Inclusion goal of 80 percent inclusion by 2020 (EFInA, 2018). The fundamental objective of microfinance institution is to provide financial products to disadvantaged and financially excluded population (Hermes, *et al*, 2018). This is expected to lift the disadvantaged

population out of poverty via access to microcredit. However, in Nigeria, financial system development is still very low compared to the size of its economy (World Development Indicator, (WDI, 2020).

Despite efforts by successive governments and monetary authorities in Nigeria to improve financial inclusion through microfinance institutions, the country has not fared well when compared to other developing countries. For instance, after 62 years of independence, 17 years of establishing the microfinance policy framework and 10 years since the launch of the National Financial Inclusion Strategy, 36 percent of the adult population in 2020 are still financially excluded (WDI, 2021). Although, from 44 percent in 2016 to 36 percent in 2020, there seems to be an insignificant drop in financial exclusion, making the goal of reducing financially excluded adult population to 20 percent by 2020 unachievable, thus constituting a major concern to any intervention aimed at reducing poverty. In addition, Nigeria's low ranking of 48 out of 100 points in financial inclusion is a call for concern (Economic Policy and Research Institute, (EPRI, 2018)). Similarly, the high level of extreme poverty is worrisome as about 40 percent of the population live below poverty threshold (NBS, 2020). Despite the important role of financial inclusion in reducing poverty, the extent to which it is driven by a deliberate microfinance strategy to influence the poverty situation in Nigeria remains unclear.

Existing literature focus more on the benefits of financial inclusion (Campero & Kasier, 2013, Karlan *et al*, 2013). Other studies concentrate more on the role of financial services in mitigating risks with insurance (Collins, *et al*, 2016, World bank, 2018). Furthermore, while Ashraf, *et al*, (2010) and Dupas, *et al*, (2009) seem to concentrate on the role of financial inclusion on savings and consumption, Mbutor and Uba, (2013) focused on financial inclusion and effectiveness of monetary policy and Migap *et al*. (2015) and Babajide (2020) focused on threshold effect of financial inclusion. However, the shortcoming of these extant studies especially those conducted on Nigeria, is the measure of financial inclusion employed in their studies. They used aggregate measure such as individual with multiple accounts as well as foreigner that owns account but are not part of the Nigerian population; thus, overstating the level of financial inclusion in the country. Disaggregating these data by

ensuring that it captures only Nigerians and eliminates multiple accounts helps estimate the actual level of financial penetration, and how it has improved welfare of the low – income group in Nigeria. To address these, the study adopted access to/ and use of microfinance products or services as financial inclusion measure.

Thus, the study seeks to investigate the role of microfinance institutions as an instrument of financial inclusion in reducing poverty in Nigeria. The rest of the paper is structured into 4 Sections. Section 2 reviews relevant theoretical and empirical literature. Section 3 outlines the methodology. Section 4 presents and discusses the results. Section 5 provides the conclusion and policy implications.

2. Literature Review

2.1 Theoretical Literature

The two dominant theories on the subject are finance–growth hypothesis, and inclusion–growth theory. The finance–growth hypothesis propounded by Bagehot in 1873, states that an efficient financial system has growth - enhancing and poverty–reducing effect. The core of finance–growth hypothesis centers on the discourse of whether it is financial system deepening that leads to growth or growth leading to financial system deepening (Karimo & Ogbonna, 2017). Consequently, there are three strands of argument to the finance – growth hypothesis: supply – leading, the demand – leading and the hybrid argument. According to the supply – leading argument, the development of the financial system is a major determinant of economic growth via efficient allocation of resources, with direct effect on poverty reduction (Hurlin & Vent, 2008). On the contrary, the demand – leading hypothesis states that development in the financial system only responds to growth and not the other way around. Finally, the hybrid hypotheses posits that there is a bi - directional causality between financial system development and growth.

Thus, the finance – growth hypothesis forms the analytical framework of this study. This is because, the hypothesis helps to explain the interconnectedness of micro-finance institutions, financial inclusion, and poverty reduction (Nsiah *et al*, 2021). Therefore, financial deepening is seen as a driver of growth and poverty reduction. Finance–growth hypothesis sees poverty reduction as a part of the economic growth process, and this is categorized into two divides (Bara, *et al*, 2016). One divide, often

referred to as pure growth effect, measures the percentage change in poverty when income distribution remains constant while the other divide, usually referred to as inequality effect, measures change in poverty when inequality changes. Thus, the pro – poor growth can be expressed as:

$$\emptyset = \beta_g + \beta_1 \quad (1)$$

where β_g = pure growth effect that measures percentage change in poverty when the distribution of income does not change. This is always negative as positive growth reduces poverty with distribution remaining constant. β_1 = inequality effect that measures change in poverty when inequality changes in the absence of growth. This can be negative or positive depending on whether growth is associated with improving or worsening inequality.

The above scenario suggests that the degree of pro – poor growth is measured by an index expressed as

$$\Psi = \Pi_1 / \Pi_g \quad (2)$$

where Ψ is pro – poor growth index, Π_1 is inequality effect or total change in poverty, Π_g is pure growth process and Π / Π_g is the ratio of poverty elasticity, implying that when $\Psi > 1$ the growth is pro-poor, and when $\Psi < 0$ poverty is increased.

Another theory considered in the study is the inclusion-growth theory developed by Kakwani and Pernia (2000). The theory argues that growth should be pro-poor. That is, the growth that enables the poor to engage actively in and benefit from the growth process. Inclusive growth is the one that maximizes the Poverty Equivalent Growth Rate (PEGR) and emphasizes the inclusiveness of the poor population to help reduce poverty and inequality. The theory centers on growth that ensures that all the weaker sectors such as small-scale enterprises are nurtured and made to be at par with the developed sectors. As the economy grows, society is better organized and interconnected thereby enhancing inclusiveness.

2.2 Empirical Literature

The related can basically be divided into two strands. The first strand argues that lack of access to financial services such as access to loan/credit, security and option for mitigating risk associated with insurance leads to poverty and widening inequality gaps (Ashraf, *et al*, 2018; Mbutor & Uba, 2013; Campero & Kaiser, 2013; Karlan *et al.*, 2013). The other strand which focuses on the threshold effect of financial inclusion on poverty reduction argues that, beyond the threshold of 0.365, financial inclusion will lead to reduced poverty (Aribata, 2020; Omar & Inaba, 2020; Nizam, 2020; Asadullah & Savoia, 2018; Ajisafe & Ajide, 2014; Kama & Adigun, 2013).

Nsial, *et al* (2021) studied the threshold effect of financial inclusion on poverty in sub-Saharan Africa. Using threshold regression, the study found that beyond 0.37 threshold, financial inclusion as well as money supply reduces poverty. This finding is in tandem with the findings of Aribaba, *et al*, (2020) that financial inclusion schemes have significant effect on poverty reduction especially among the low – income in Nigeria. It also affirms the findings of Omar and Inaba (2020) that financial inclusion reduces poverty and enhances per capita income as well as standard of living via social investment schemes.

Also, while Migap *et al.*, (2015) revealed that the depth of financial inclusion was shallow in Nigeria and among most African and other emerging economies, Omojolaibi (2017) and Onaolapo (2015) found that financial inclusion tends to bridge the gap between the rich and the poor and reduce the prevalence of poverty in the Nigerian economy.

From the reviewed literature, most of empirical literature on the role of microfinance institutions in enhancing financial inclusion exist mainly at global levels with very few of these studies conducted on the Nigerian economy where most of the population live in rural areas and in extreme poverty. Also, few studies conducted in Nigeria such as Omojolaibi, (2017); Adeola and Evans, (2016); Migap *et al.*, (2015); Onaolapo, (2015); Ajisafe and Ajide, (2014) have obvious shortcoming in the measure of financial inclusion used (number of accounts per capita) which tends to capture individuals who have more than one account as well as foreigners who may not be part of the population under study but who own accounts. This is so because these existing

studies are predominantly time series. For this reason, this study attempts to bridge the gap in the literature by providing and contributing empirically to the availability of literature on the domestic level. First, this study utilized cross-sectional data that examined the individual characteristics of households and secondly, the study adopted the financial inclusion measure used in the CBN strategy on financial inclusion in Nigeria. Finally, previous studies tend to concentrate so much on the impact of microfinance services on financial inclusion, which is more anecdotal with little or no attention accorded to the impact on poverty reduction given that it is a key target of financial inclusion.

3. Data and Methodology

3.1 Data

The study uses the EFinA 2018 household survey data for Nigeria. This data source is found appropriate as it contained detailed information on financial inclusion and can be relied upon as credible source of data for policy analysis in Nigeria (Onyele and Onyekachi-Onyele, 2020). The variables of interest are indicators of financial inclusion such as savings, borrowing and payment patterns measured by extent of access to microfinance credit and usage of microfinance deposit, while poverty is measured in terms of per capita expenditure by the households. Expenditure per capita was used as a proxy for poverty and it is obtained by dividing the household income by the household size. This proxy is justified because the level of per capita expenditure enjoyed by the household is directly linked to its levels of welfare (Churchill *et al*, 2020). Also, to obtain the household asset, which is a proxy for wealth, the paper used multiple correspondence analysis to build household wealth index. Such correspondence include savings, investment, equity, shares, bond, interest, dividends, pension among others. This is expected to positively influence financial inclusion and negatively influence poverty.

3.2 Model Specification

The finance-growth theoretical framework is employed to estimate the interconnectivity between access and use of microfinance institutions and poverty reduction. The main thrust of the theory is that having a sound financial system promotes economic growth and reduces poverty (Anderson *et al.*, 2012). To achieve the objective of

the study, the propensity score matching (PSM) approach was employed to partition households into treatment and control groups. The probit regression was used to determine the average treatment effect (ATE). The reason for adopting probit regression is because of its ability to handle zero versus positive outcomes. That is, it can handle truncated parameter count density that is either zero truncated Poisson (ZTP) or zero truncated negative binomials (ZTNB). The probit model is specified as:

$$\beta_i = \alpha_{1i} + \alpha_{2i} AMFP + \alpha_{3i} UMFP + \alpha_{4i} DT + \alpha_{5i} RM + \cup_i \quad (3)$$

where β_i is poverty proxied by per capita expenditure; *AMFP* denote access to microfinance products or services proxied by amount of bank credit; *UMFP* is usage of microfinance products or services proxied by amount of bank deposit; *DT* is distance to microfinance institution; *RM* denotes remittance; \cup is the error term, α is model coefficients and *i* refers to cross-section.

PSM is found appropriate as it enables researchers to predict the probability of treatment based on the observed covariates for treatment and control groups. Usually, a single index variable (Propensity score) is obtained based on the pre-treatment characteristics of the individuals and subsequently used to match individuals with similar characteristics. Although, there are arrays of matching methods for PSM such as nearest neighbor matching, Kernel matching, radius matching, and local linear regression matching.

For this study, Kernel matching was used. This is found most appropriate as it utilizes local averages of the treated group (banked households utilizing microfinance products or services), to construct counterfactual group (unbanked households not utilizing microfinance products or services). Also, a check to ascertain if the households are outside the common range of propensity (that is lacking common support) was carried out and those lacking common support were dropped from the estimation. Similarly, the balancing test using absolute value of the standardized difference of means of the linear index of propensity score and t-test of variability was used to ascertain the correctness of the PSM specification and to match the treated and control groups using financially excluded households as categorized by CBN (2012) and EfInA (2018).

Given the above, to estimate the effect of microfinance institutions/financial inclusion on poverty in Nigeria, the paper utilized propensity score matching with Kernel nearest neighbor matching and bootstrapped standard error. The Kernel nearest neighbor ensures that both the treatment and control groups have similarity in terms of the probability of being financially included via microfinance products/ services. According to this technique, the treatment and control groups that have similar means are assumed to have similar characteristics and the same probability of being financially included. Therefore, what accounts for welfare differential between the treatment and control groups is the extent of financial inclusion through microfinance institutions. This necessitates the use of average treatment effect on the treated (ATT). It is also, important to note that in the context of this paper, the numbers of treated and controls are the nearest neighbor matches. Thus, while the ATT measures the poverty effect, the t – statistics measures the extent of the statistical significance of such effect. An important assumption in this study with respect to matching is that the treatment group was not selected randomly since households select themselves into financially included or excluded groups.

3.3 Estimation Procedure

The paper estimated the average treatment effect of financial inclusion using propensity score matching approach. The first step in applying the propensity score matching approach is to employ the probit/logit model to estimate the factors that influence financial inclusion.

The second step in estimating propensity score matching is generating a single index variable called propensity score based on the pre – treatment characteristics of the household/individual. This was used to match similar individual. Third, based on the above, the paper specified two groups to estimate the effect of financial inclusion on household poverty. These two groups are financially included otherwise referred to as the treatment group denoted by F_1 and the other group called the financially excluded denoted by F_0 . Those that are financially included (treatment group) were used to match against those that are financially excluded (control group) based on the propensity score.

Forth, the average treatment effect (ATE) was estimated using propensity score as-

suming that the distribution of the baseline covariates is the same for both treatment and control groups for observations with the same propensity score. Finally, observations were checked to determine if they are outside the common range of propensity scores for both groups. That is to determine if the observations were lacking common support. Thus, observations lacking common support were dropped from the estimations.

4. Results and Discussion

4.1 Descriptive Statistics

Table 1 shows that while the control group has a per capita expenditure of ₦3,859.1, that of the treatment group is about ₦11,599.2. This finding implies that household expenditure of the treatment group is higher than that of the control group. Distance to microfinance institutions is about 9.3 Kilometers for the control group, while it is about 4 Kilometers for the treatment group. This implies that households whose residences are closer to a microfinance institution are more likely to be financially included.

Furthermore, while the mean and standard deviation of access to microfinance products/services for the treatment group is 1.52 and 0.53, that of the control group are 1.42 and 0.51, respectively. This suggests that the rate of financial inclusion in Nigeria is relatively low.

On the usage of microfinance products/services, the mean and standard deviation of the control group are 15.4 and 18.1, while those of the treatment group are 16.0 and 18.0. The implication of these findings is that there is infinitesimal difference between treatment and control groups in terms of access and usage of microfinance products/services.

To estimate the effect of financial inclusion via access to microfinance credit and usage of microfinance deposits on the poverty of households, the paper first estimated the Probit model to determine the microfinance institution's variables that matter for financial inclusion. The result of the Probit regression as attached in the appendix indicates that the quality of products/ services, access, and usage of microfinance products/services are the significant variables influencing financial inclusion.

Table 1: Descriptive statistics of variables of both control and treatment groups

Variables	Mean	Std. dev	Min	Max
Treatment group (Have or use microfinance account)				
Per capita expenditure as proxy for poverty	11.60	5.40	12.51	14.30
Access to microfinance products/services proxy by amount of bank credit	1.52	0.53	1.00	2.00
Usage of micro finance products/ services proxy by amount of bank deposit	42.40	16.00	18.00	92.00
Distance to Microfinance Institutions	3.90	21.70	1.00	9.60
Household Asset	-0.80	0.50	0	1
Remittance	0.20	0.40	0	1
Control group (Don't have or Use microfinance account)				
Per capita expenditure as proxy for poverty	3.90	2.61	3.60	12.51
Access to microfinance products/services proxy by amount of bank credit	1.42	0.51	1.00	2.00
Usage of micro finance products/ services proxy by amount of bank deposit	36.20	15.40	18.10	94.00
Distance to Microfinance Institutions	9.30	1.20	5.50	9.00
Household Asset	0.40	0.70	-5.00	0.90
Remittance	0.00	0.30	0	1

Note: The Treatment and Control groups have 12798 and 697 observations, respectively

Source: Authors' Computations based on EFinA Data, 2018

Next, propensity score matching is used to estimate the impact of microfinance institutions-based measure of financial inclusion on poverty using per capita expenditure as a poverty indicator. The results are presented in Table 2

Table 2: Result of ATE

ATT	Std error	t-statistics
4802.13	1230.80	3.28***

Note: The numbers of treated and controls refer to actual nearest neighbour matches; The number of Treatment and Control Group is 314 and 466, respectively; *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$

The result in Table 2 shows the estimate of the impact of microfinance institutions on poverty in Nigeria. In the absence of baseline data, the paper utilized kernel nearest neighbour matching method that brings together the treatment and control groups having similar mean with similar characteristics of being financially included. Therefore, what makes the difference in the welfare of the treatment group is the financial inclusion through microfinance institutions, hence the ATE on the Treated. In this

case, the ATT gives the poverty impact, but the t-value indicates the statistical significance. The result shows that microfinance institutions have a positive impact on the welfare of those households that are financially included, and such positive impact was significant at 5% level. The result shows that financial inclusion arising from the presence of microfinance institutions causes the financially included household to gain per capita expenditure of ₦4, 802.13. This result conforms with the findings of Aribata (2020), Omar and Inaba (2020), Nizam (2020), Asadullah and Savoia (2018), Ajisafe and Ajide (2014), Kama and Adigun (2013), Migap *et al.* (2015), and Omojolabi (2017) that there is a linkage between financial inclusion and poverty reduction.

5. Conclusion and Policy Implications

The drive towards universal financial inclusion is a force to reckon with globally. This necessitates the establishment of microfinance institutions as a way of enhancing access to/ and use of financial products/ services especially among the poor and vulnerable. Applying PSM to eFINA's household survey data of 2018, the paper finds that microfinance institutions could play financial inclusion roles, which can contribute to efforts at reducing poverty in Nigeria. Thus, the paper recommends the need for increased awareness on the use of/ and access to microfinance products/services. Also, the roles of microfinance institutions should be properly integrated into national poverty alleviation policies.

References

- Ajisafe, R. A., & Ajide, F. M. (2014). Bank competition and economic growth: Evidence from Nigeria. *Journal of Emerging Trends in Economics and Management Sciences*, 5(5), 419- 425
- Aribaba, F. O.(2020). Financial inclusion scheme and poverty alleviation in Nigeria (2004–2019). *Economica*, 16(4), 21- 36.
- Asadullah, M. N. & Savoia, A. (2018). Poverty reduction during 1990–2013: Did millennium development goals adoption and state capacity matter? *World Development*, 105, 70-82.
- Babajide, A. A (2020). Financial institutions concentration and financial inclusion penetration in Nigeria: A comparative analysis. *Journal of Contemporary African Studies*,

38(4), 610-626.

Bagehot, W. (1873). *Lombard Street: A Description of the Money Market*, London, HS King & Company.

Bara, A., Mugano, G. & Le Roux, P. (2016). Financial development and economic growth in the Southern African Development Community (SADC). *Studies in Economics and Econometrics*, 40(3), 65-93.

Campero, A., & Kaiser, K. (2013). Access to credit: Awareness and use of formal and informal credit institutions Working Papers (No. 2013-07).

Enhancing Financial Innovation & Access (2018). Access to Financial Services in Nigeria 2018 Survey, Available at: <https://www.efina.org.ng/our-work/research/access>

Hermes, N., Lensink, R., & Meesters, A. (2018). Financial development and the efficiency of microfinance institutions. Edward Elgar Publishing, palmgrave company ltd.

Hurlin, C., & Venet, B. (2008). Financial development and growth: A re-examination using a panel Granger causality test. *Economica*, 14(6), 22-46.

Kakwani, N. & Pernia, E. M. (2000). What is pro-poor growth? *Asian Development Review*, 18(1), 1-16.

Kama, U. & Adigun, M. (2013). Financial inclusion in Nigeria: Issues and challenges. *Central Bank of Nigeria pub., Occasional Paper No.45*, 1-49

Karimo, T. M. & Ogbonna, O. E. (2017). Financial deepening and economic growth nexus in Nigeria: Supply-leading or demand-following? *Economies*, 5(2), 4-21.

Karlan, D., Osman, A., & Zinman, J. (2013). Follow the money: Methods for identifying consumption and investment responses to a liquidity shock (No. w19696). National Bureau of Economic Research.

Mbutor, M. O. & Uba, I. A. (2013). The Impact of Financial Inclusion on Monetary Policy in Nigeria. *Journal of Economics and International Finance*, 5(8), 318-326.

Migap, J. P., Okwanya, I., & Ojeka, G. (2015). Financial inclusion for inclusive growth: The Nigerian perspective. *International Journal of Information Technology and Business Management*, 37(1), 24-42.

Nizam, R. (2020). Financial inclusiveness and economic growth: New evidence using a threshold regression analysis. *Ekonomika istraživanja*, 33(1), 1465-1484.

- Nsiah, A. Y., Yusif, H., Tweneboah, G., Agyei, K., & Baidoo, S. T. (2021). The effect of financial inclusion on poverty reduction in Sub-Sahara Africa: Does threshold matter? *Cogent Social Sciences*, 7(1), 1903138.
- Onyele, K. O. & Onyekachi-Onyele, C. (2020). The effect of microfinance banks on poverty reduction in Nigeria. *Management Dynamics in the Knowledge Economy*, 8(3), 257-275.
- Omar, M. A. & Inaba, K. (2020). Does financial inclusion reduce poverty and income inequality in developing countries? A panel data analysis. *Journal of Economic Structures*, 9(1), 1–25.

Appendix I: Results of the Kernel Propensity Score Matching

Estimated Propensity Score				
	Percentile	Smallest		
1%	.0313916	.024809		
5%	.0467334	.0250969		
10%	.0766687	.0257488	Obs	1,489
25%	.1819307	.02582	Sum of Wgt.	1,489
50%	.4233848		Mean	.4507799
		Largest	Std. Dev.	.2976977
75%	.7062489	.9975355		
90%	.9044761	.9975624	Variance	.0886239
95%	.9553087	.9983152	Skewness	.278937
99%	.9896438	.9987654	Kurtosis	1.798864

Appendix II: Results of Blocks for Treated and Control groups

Inferior of block of p-score	Own and uses MFI account		Total
	0	1	
.024809	225	25	250
.2	70	30	100
.4	45	40	85
.6	18	43	61
.8	7	75	82

Appendix III: Results of the ATT

n. treat.	n. contr.	ATT	Std error	t-statistics
314	466	4802.13	1230.8	3.28

Appendix IV: Results from Probit model of the factors influencing financial inclusion

Microfinance access/ uses	Probit
Access to microfinance products/services proxy by amount of bank credit	0.0410 (0.13)
Usage of microfinance products/services proxy by amount of bank deposit	0.120*** (0.02)
Quality of products/ service delivery proxy by number of ATM	0.621*** (0.08)
Distance to microfinance institutions	-0.010 (0.01)
Household assets	-0.40*** (0.07)
Remittance	0.70*** (0.13)
Constant	-5.090*** (0.5)

Note: Standard error in () *** $p < 0.01$. ** $p < 0.05$ and * $p < 0.1$