

THE IMPACT OF MICROFINANCE ON FINANCIAL INCLUSION IN THE WAEMU'S  
COUNTRIES AND ITS IMPLICATIONS

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## ABSTRACT

This study aims to evaluate the impact of microfinance institutions on financial inclusion in developing countries, especially in Sub-Saharan Africa in the West African Economic Monetary Union. The objective is attained through time-fixed effects, clustered by countries. The estimation results revealed that microfinances have a positive impact on financial inclusion, which is statistically significant when using fixed-effects modelling with clustering by countries. When adding more controls, the interest rate is a determinant of inclusion but has a negative effect on it. The gross domestic product growth rate per year and the proportion of individuals living in rural areas also play a role. Investment in the development of microfinance is necessary to achieve inclusion. However, other driving forces should be used as well such as urbanisation, economic growth, to ensure everyone is included and benefit from it.

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## ABBREVIATIONS

BCEAO: Central Bank for the West African States

NGO: Non-Governmental Organization

MFI: Microfinance Institutions

WAEMU: West African Economic and Monetary Union

UNDP: United Nation for the development and

ADFB: African Development Bank

AFI: Alliance for Financial Inclusion

SFD: Systeme Financier Decentralise

WAMU: West African Monetary Union

## 1. Introduction

According to the World Health Organization, almost half of the population worldwide lives under extreme poverty. In other words, more than half of the population does not have access to clean water, electricity, food, an appropriate house, and education (World Health Organization, 2017). Consequently, this leads to problems for economies in transition or developing economies unable to reach their full potential or record economic growth or better GDP. It is one of the reasons why the United Nations developed the Millennium goals of development to reduce poverty. Canada (as well as other countries in the world) engaged to both the OECD goals and the United Nations Millennium goals to reduce poverty, increase health, and access to primary needs for the poorest of the population (Morduch & Haley, 2002).

Focusing on those objectives, various authors in economic development undertook studies and experiments in finding ways to reach those goals, thus reducing poverty. As a result, microfinance was born to provide poor households that do not have access to the traditional banking system, access to financial services through microfinance. “Microfinance is defined as a provider of financial services: loans, savings, insurance, or transfer services to low-income households” (Mecha 2017, p.17). They perceived microfinance as a provision of micro-credit to the poor, enabling them to develop income-generating activities, to take care of their expenditures, invest in health, or education. Microfinance provides short-term loan repayable microcredits in installment, ideal for start-ups or micro-entrepreneurs with few funds. The characteristics of micro-credit help the needs of developing countries whose population does not have access to credit or saving options. Thus, financial services can be drivers of development by allowing individuals to have sufficient funds to face any issues which may arise in their daily lives and a tool in the fight against poverty, especially in developing

countries (Demirgüç-Kunt et al., 2018). Previous studies find a positive effect of microfinance on poverty in Asia and Latin America, but Sub-Saharan Africa seems to be left behind (Bannerjee et al., 2015; Hermes, 2014; Nawaz, 2010; Samer et al., 2015). However, the results of the effect of microfinance on poverty seem mixed; some authors found that access to micro-credit helps in the reduction of poverty and inequality (Samer et al., 2015), while others find no real effects (Hermes, 2014; Nawaz, 2010).

Even though some progress has been made in the previous years in financial development, a recent estimation of global poverty by the World Bank indicates that about 736 million people, or 8.6% of the world population, lives in extreme poverty – a mere \$1.90 or less a day (World Bank, 2018a). Since the 1990s, following various programs on reducing poverty worldwide, about a quarter of the world has risen out of extreme poverty (World Bank, 2018a). Although these results are encouraging, a lot still needs to be done, mainly in developing countries where the number of people living in poverty is increasing year after year (Wadhwa, 2018). To reduce poverty through financial development, NGOs, international organizations have made financial development, especially financial inclusion the top priority of their agenda (World Bank, 2018b). They give special attention to policies that encourage the development of banking services as a major tool for financial inclusion by making more accessible access to deposits, credits, and payments services (World Bank, 2014).

A growing body of research reveals many potential development benefits from financial inclusion through microfinance (Adeola & Evans, 2017; Dacanay et al., 2011; Demirgüç-Kunt et al., 2018). However, the evidence is somewhat mixed, and the impact of microfinance somewhat overlooked or miss specified (Ghosh, 2013; Hudon et al., 2019; Lopez & Winkler, 2018). To evaluate this impact, the goal of this major research paper is to assess the impact of

microfinance on financial inclusion in the West Africa Economic Monetary Union (WAEMU), to see if there is a positive relationship between microfinance and financial inclusion. Many studies have examined financial inclusion, most of them are of countries in Asia and Latin America (Dacanay et al., 2011; Ghosh, 2013); few have looked at this issue in West Africa, in French-speaking countries (Chaibou, 2019).

The contribution of this work to the literature is to put light on the state of financial inclusion in the West African union and show what impact microfinance could have on financial inclusion in this part of the world. The specificity of this work is to focus on countries of the same regional union and use the index of financial inclusion developed by the WAEMU. In addition, it will provide recommendations to governments, NGOs, private organizations, and international credit institutions regarding financial inclusion and how to achieve it in West Africa. Financial inclusion is an important topic, primarily for developing economies in Sub-Saharan Africa. Well-documented literature and a strong research methodology on this subject can be a great help. It is precisely what our work intends to do. The objective of this paper is attained by giving an overview of the WAEMU'S peculiar banking system and its state of inclusion. Then, a literature review on financial inclusion and the impact of microfinance on financial inclusion. It then presents the research methodology and the data used in our study. Finally, provide some recommendations in conclusion.

## 2. State of financial inclusion in West Africa

### 2.1 Presentation of the WAEMU

WAEMU stands for West African Economic and Monetary Union. It is a regional

integration of markets, goods, and people in the West part of Africa. It is the sum of eight countries sharing the same currency, the Francs CFA, with two different languages, French and Portuguese. The eight countries are Cote d'Ivoire, Benin, Togo, Senegal, Mali, Guinee-Bissau, Niger, Burkina Faso (<http://www.uemoa.int/>). The WAEMU was founded in 1994 and headquartered in Ouagadougou, Burkina Faso. The union is made up of countries at different level of development and diverse economical, social, and demographic characteristics. The principal mission of the block is to promote integration between the eight countries, ensure competitiveness, and provide a space for a free market, free trade, and free services. The end goal is the convergence of the different economies to build a stronger union and negotiate better partnerships with the rest of the world (<http://www.uemoa.int/>).

The organism in charge of the financing and monetary policy of the union is the BCEAO which stands for Central Bank of West African States. It focuses on issuing currency to the eight countries members of the union and is based in Dakar, Senegal, and was created in 1962 ([www.bceao.int](http://www.bceao.int)). The bank has different prerogatives regarding the monetary and financing policy of the union. Based on the BCEAO website ([www.bceao.int](http://www.bceao.int)), the principal duties of the central bank are the following: first, to implement and manage the monetary policy ensuring the liquidity levels of the economy leading to the stability of prices and the economic growth. Plus, to organize, regulate, and monitor the financial and banking sector ensuring stability, diversification, and the respect of local and international regulations. Second, it's the organism in charge of the formulation of financial inclusion strategies and policies ([www.bceao.int](http://www.bceao.int)).

## 2.2 WAEMU's financial intermediation ecosystem

In the WAEMU, there are two principal actors in the financial services industry:

commercial banks and microfinance called MFI (Microfinance Institutions). Commercial banks focus on the wealthiest part of the pyramid, people with high income, and companies with significant profits. They are present in the bigger cities of the countries. With most of the population living under \$1, we can see that commercial banks alone cannot help reaching the desired level of inclusion (Wadhwa, 2018). Conversely, MFI offers microcredits, savings, and deposits to the less fortunate and the micro-entrepreneurs, thus providing access to financial services to a broad range of the population (Commission Bancaire de l'Union Monetaire Ouest-Africaine, 2017). Most of the institutions in the network are international banks. "They control the market with 53.4% of the union's banking assets and cover 50.2% of the branch network, hold 52.3% of bank accounts and employ 54.0% of the workforce in the industry. While the sub-regional banks only have a 43.0% market share" (Commission Bancaire de l'Union Monetaire Ouest-Africaine, 2017, p.43). Consequently, interest rates associated with loans or credits are higher and out of the reach of low-income individuals.

The banking sector in the union is underdeveloped compared to some parts of Sub-Saharan Africa and the rest of the world, with a bank access rate of about 30% based on the BCEAO annual report (BCEAO, 2017). This rate underlines that more than 65% of the population does not have access to financial or banking services. Thus, financial inclusion is vital for governments and financial institutions in the WAEMU. In recent years as presented in table 1, the banking network expanded compared to the last decades. The table shows the number of banks and financial institutions per country, the market share, and the number of account holders. At the end of the 2017 fiscal year, the number of banking and financial institutions increased compared to December 2016. With 130 credit institutions in 2016, the number jumps to 138 in 2017. The number of counters and ATMs (Automatic Teller Machines / Automatic Bank Teller Machines) amounted

respectively to 2,594 and 3,217 units in 2017 against 2,542 and 3,010 units in 2016. (BCEAO, 2017). Regarding the financial intermediation sector, in 2017, the WAMU microfinance sector is in constant evolution. The creation of microfinance in this part of the world is subjected to specific laws, the Uniform Law regulating SFDs, its decree Application, and the BCEAO Application Instructions (Commission Bancaire de l'Union Monetaire Ouest-Africaine, 2017). This specific disposition ensures that these institutions' sole goal is to provide financial services, micro-credit to small-medium enterprises and individuals with lower income without access to commercial banks (Commission Bancaire de l'Union Monetaire Ouest-Africaine, 2017). As of December 31, 2017, the landscape of SFDs subject to the control of the Banking Commission of the WAMU is made up of sixty-two apex and unit funds and eighty-four affiliated base funds (Commission Bancaire de l'Union Monetaire Ouest-Africaine, 2017).

In the last few years, with the expansion of the microfinance sector, many branches emerged in different parts of the union. Table 2 presents the two types of microfinance institutions present in the regional integration and their market share at the end of 2017. The number of institutions active in the union is low compared to the size of the population. However, an increase in both the customers of microfinance as well as the number of providers was noticeable, from 12.7 million to 13.6 million and from 4156 in December to 4,853 in 2017. Besides, the financial intermediation activity also increased, with 12.7% in the number of deposits from 2016 to 2017 (BCEAO, 2017). These statistics showed the expansion of the numbers of individuals accessing banking and financial services in the union. Microfinance institutions are servicing the ones excluded from the formal banking system.

After giving a brief presentation of the institution and the banking system, we will give an overview of the state financial inclusion in the WAEMU.

### 2.3 Financial inclusion in the union

Many advancements have been made throughout the years regarding financial inclusion in the world. International institutions and governments worked closely to reduce the adult population's lack of access to essential financial services. The state of financial inclusion in 2017 revealed that even though progress has been made, 1.7 billion adults are still excluded from the formal banking system (Demirgüç-Kunt et al., 2018). Several observations are made, most of the unbanked people live in developing countries in Asia and Africa, developed economies are recording higher financial inclusion rates than developing ones. According to the report, "94 per cent of adults have an account in developed-countries while in developing countries only 63 per cent do" (Demirgüç-Kunt et al., 2018, p.2). With the highest population in the world, achieving financial inclusion is essential in this part of the world. Those observations stressed how urgent or crucial financial inclusion is for the world, especially for developing countries. The assessment of whether microfinance impacts financial inclusion can be of great help in reaching that objective.

In the same line, the BCEAO is engaged in providing financial services access to 75 per cent of its population by 2020. Therefore, the union recently developed a regional financial inclusion strategy to meet this goal (BCEAO, 2016). Financial inclusion is assessed with seven different indicators capturing access, usage, and quality of service. Two indices are used to capture access to financial services. They are the global demographic penetration rate of financial services, which computes the proximity of financial services to the population, and the geographic penetration rate of financial services, which assesses the number of branches and ATMs at a certain distance (BCEAO, 2018b). For usage, it is the Broad Banking Penetration Rate (BBPR) and Global Rate of Financial Services Utilization (GRFSU). They respectively measure the percentage of

adult people holding an account at a bank, postal service, National Savings Fund, national treasure, as well as at a microfinance institution, and the overall utilization of financial services (BCEAO, 2018b).

The overall financial inclusion is assessed by a synthetic indicator computed with the seven factors taken altogether in a weighted average. In 2018, the financial inclusion rate increased from 2016 to 2017 (BCEAO, 2018b). Regarding the demographic penetration rate of financial services, it increased by 12 points compared to 2016 to jump to 38. The geographic one recorded a higher increase of 23 points, from 47 POS (Point of Service) in 2017, it went to 70. The overall financial inclusion indicator increases by 0.04 points between 2016 and 2017. Taken per country, we can notice a disparity in the level of inclusion. The highest level of inclusion is recorded by Benin, followed by Senegal and Togo (BCEAO, 2018b). Niger and Guinea-Bissau occupy the bottom spot. The difference in the state of inclusion depicts heterogeneity between the different members of the organization. Those statistics demonstrated that the union are making effort to increase the level of inclusion for its adult population.

### 3. Literature review

#### 3.1 Financial inclusion concepts and objectives

Before presenting the concept of financial inclusion, it is important to explain the concept of microfinance used in our study. Microfinance can have numerous definitions based on the aspect the authors want to emphasize and depending on the context of the study. Macchiavello (2018), in the European context, defined microfinance as “a provision of a wide range of financial services, particularly credit but also remittances and savings, to low-income or financially excluded people. It combines a business structure with social inspiration, often resorts to technological innovations

to lower costs” (para.1). In this context, microfinance is the sum of different services from credits to deposits, including insurances offered at an affordable cost to individuals excluded from the standard banking system (Macchiavello, 2018). Microfinance provides the same service as regulars banks, but at a lower cost.

On the opposite, Hermes (2014) sees microfinance as institutions providing financial services to the poorest part of the population by providing small loans or credits that can be reimbursed after a specific time, without any collateral. This definition targets individuals at the bottom of the pyramid and gives them access to loans according to their financial situation. In the same thought, Otero (1999, as cited in Urga & Shete, 2017) stated that microfinance is “the provision of financial services to low-income poor and very poor self-employed people” (p.6). Regarding the context of developing countries of our study, those last definitions will be considered when discussing microfinance.

Financial inclusion is a challenging and complex concept so that organizations, NGOs, and governments could not come to a common definition. Many definitions of financial inclusion are available in the literature based on the objective targeted by this inclusion. Overall, it is the access to financial and banking services for everyone. It is the case for the Corporate Finance Institute that defines inclusion as “the provision of equally available and affordable access to financial services for everyone, regardless of their level of income” (Corporate Finance Institute, 2021, para 1). In a simple definition, financial inclusion refers to the access and the provision of banking and financial services to the different parts of the population, whether poor or rich, living in urban or rural areas, at an affordable price. In other words, financial inclusion has the primary goal of facilitating access to financial services to people who usually are excluded from the formal banking sector (Corporate

Finance Institute, 2021). For the corporate institute, financial inclusion represents a tool for financial development.

Following the same line, Shaifali (2018) stated that “financial inclusion or inclusive finance is a phenomenon whereby effort is made to ensure that all households and businesses, regardless of levels of income, are able to effectively access and use appropriate financial services they need to improve their lives”. (p.83-84) This definition is in adequation with the one proposed by Klapper and Singer (2014), that focus on the access and affordability of services to the excluded of the regular banking system in a regulated environment that ensures appropriate use of funds and interests of the customers.

Besides this definition focusing on the financial aspect, another one links financial inclusion to social inclusion, meaning the access to banking services leads to improved users' lives. In this concept, access to banking and financial services is a means that allows lower-income individuals can get out of poverty, develop income-generating activities, and take care of their health and education (United Nations, 2006). Following this definition, Dube et al. (2014), mentioned that financial inclusion in the sense of access to financial services to everyone enables economic development, reduces poverty, and develops saving patterns in remote locations. Furthermore, the accepted definition by the Alliance for financial inclusion goes in the sense of social inclusion. For them, access to financial services encompasses improving the living condition of the beneficiaries (Alliance for Financial Inclusion, 2010). In the WAEMU, financial inclusion is closely linked to social inclusion, and it is a way for individuals to have access to better employment, education, and health (Direction Générale de la Stabilité et de l'Inclusion Financière, 2019). Therefore, it is the definition of financial inclusion considered in our study.

As seen above, we can draw the potential financial inclusion's objectives that are summarized in access, affordability, and availability of essential banking services. It also has some economic and social objectives, promoting economic development and reducing poverty among the poorest part of the population (Triki, & Faye, 2013). They pursued by saying that financial inclusion is the development tool that provides equity to all. Inclusive financial services allow for economic growth, financial development, reduction of poverty, and inequality reduction. Furthermore, they lead individuals and companies to be actors of development by developing consumption, saving habits and investment decisions (Triki & Faye, 2013). Similarly, Patwardhan et al. (2018) recognized that achieving financial inclusion is not the end-goal but rather a way to reduce poverty, increase development and reduce inequality. Therefore, achieving a financial system where the different segments of the population are included is a crucial step towards economic growth for countries in the WAEMU.

### 3.2 Impact of microfinance on financial inclusion

The goal of this part is to assess whether microfinance impacts inclusion or not and shows how. In the literature, various authors have talked about the impact of microfinance on financial inclusion. Macchiavello (2018), while reviewing the impact of microfinance on financial inclusion in Europe, she concluded that microfinance contributes to financial inclusion by offering access to financial services to all the population segments. Furthermore, she added that microfinance helps lowering financial exclusion and developing financial literacy by helping their clients assess credit requirements and develop good saving behaviours. Overall, microfinance favours inclusion and enables the empowerment of their clients through adequate training in money management and personal finances (Macchiavello, 2018).

For Schreiner and Colombet (2001), microfinance is an alternative to regular banks for those who cannot afford higher interest rates for micro-credit and important collateral. In that way, microfinance can be a significant step in financial inclusion since it allows the poorest part of the population to access financial services. In that same line of thought, Littlefield (2003, as cited in Kaberia, 2016) revealed that MFIs are essential tools in achieving inclusion for many reasons. They provide micro-credit to the less fortunate part of the population without asking for collateral at the opposite of commercial banks, making it a requirement before getting a loan. Also, MFIs are closer to those excluded from the formal banking system, whereas commercial banks are solely in the urban area. Consequently, microfinance institutions contribute to financial inclusion by the services offered and the proximity of their locations, satisfying the financial inclusion' objectives (Littlefield, 2003, as cited in Kaberia, 2016).

An example of this impact is presented in the study of Dacanay et al. (2011), examining the relationship between microfinance and financial inclusion in a set of developing countries. Their work found that microfinance has a positive impact on financial inclusion and this effect is statistically significant. Using Sarma (2008) financial inclusion index, they were able to show that microfinance positively impacts financial inclusion in developing countries. In other words, access to microfinance services can be an accelerator of inclusion. Following the same line, Chaibou (2019), with fixed-effect modelling, found out that there is a positive and statistically significant relationship between financial services access through microfinance and inclusion. He used a financial inclusion index computed by himself based on the work of Sarma (2008) and accounting for the level of development of the different countries of the union. Moreover, he found that interest rate can be a determinant of financial inclusion as well. This study was specific to the countries in

Western Africa with a focus on Niger. Those two examples demonstrated that microfinance could, at a certain level, be a driver of inclusion.

Moreover, Matovu (2006, as cited in Kaberia, 2016) deduced from his study that access to financial services creates a virtuous cycle in which people usually excluded from the formal banking system are more inclined to use financial services for their daily activities. This inclusion enables them to develop income-generating activities, increase autonomy and reduce poverty, mainly for women. All of this is possible through the offer of microcredit to lower-income individuals without any collateral, allowing them to benefit from loans and longer repayments time (Matovu, 2006, as cited in Kaberia, 2016).

Even though the number of people living under 1\$ per day in the world has been decreasing, this is not entirely true everywhere. For instance, the share of poor in sub-Saharan Africa is about 30% of the population and is set to increase further in the following years (Wadhwa, 2018). With that high percentage of the population living in poverty, most do not have access to credit or saving options for their daily expenditures or businesses. Microfinance, in that case, can be the necessary option to help them reduce the burden of poverty by providing additional income. In that sense, microfinance is a tool in diversifying the household's income, a plus with the expenditures, and a relief in challenging times (Samer et al., 2015).

According to Hermes, the provision of loans or microcredits to the poorest part of the population accelerates investments opportunities they do not typically have due to the strict requirements to get a loan with commercial banks (Hermes, 2014). In addition, microfinance provides opportunities to all the population segments, by providing credit without collateral and

credit history, allowing them to participate in the economic development by developing income-generating activities.

Although we can see a positive impact of microfinance on financial inclusion in the above paragraph, it is not always the case. Other authors pointed out that microfinance does not necessarily lead to the inclusion of the unbanked. Even though various international organizations such as the World Bank, the UN, and the G-20 praised the positive impact of microfinance on financial inclusion, the results are not always perceptible. There is no accurate indicator to determine the tangible effects of microfinance in accessing financial services (Macchiavello, 2018). Consequently, it makes it difficult to quantify the impacts MFIs can have on inclusion. It is one of the toughest critiques against microfinance's impact on inclusion.

Another argument is the microfinance institutions' inefficacy to propose tailored services to their users' needs. For example, Agbenyo et al. (2019), while evaluating the impact of financial inclusion on agriculture, especially farmers in Ghana, mentioned that only the provision of financial services could not enable rural farmers to achieve financial inclusion. In other words, the access to microfinance services to individuals, when not adequate to their needs lead to their exclusion rather than inclusion. Therefore, to achieve inclusion, financial services institutions should develop products and services appropriate to their customer's needs and domains of activity, such as subventions and affordable interest rates. In the same line, Ka (2018, as cited in Dieme 2020), pointed out that issues related to financial inclusion in Senegal arise from the insufficient level of private investment, the absence of financial instruments to develop the important sectors of the economy, and the weakness of the financial system to respond to the needs of potential investors. The existence of microfinance, in that case, is not enough to drive inclusion; complementary policies are required.

Following the same line, Webster and Filder (1996, as cited in Mecha, 2017) stated that providing access to micro-credit is insufficient to help the excluded. Additionally, credit institutions should provide financial literacy training and other follow-up measures to ensure the good use of money. Combining financial training and access to financial services to everyone allows users to be actors of their lives rather than spectators. It enables them to deposit money, develop saving behaviors, benefit from insurances, and develop income-generating activities. It provides them with the financial freedom necessary to get out of poverty (Webster & Filder, 1996, as cited in Mecha, 2017).

Adeola and Evans (2017), in their evaluation of the impact of microfinance on inclusion in Nigeria, came to a similar conclusion. Following a panel data modelling, they concluded that there is a positive relationship between microfinance and inclusion. However, it is not statistically significant in the short run but become significant in the long run. Furthermore, their findings pinpointed that depending on the time and the context, the effect of microfinance can be different. Consequently, though there is a positive relationship, it may not always be significant.

In the review of the impact of microfinance on financial inclusion in India, Ghosh (2013) pointed out that the increased number of microfinances in India results in a rise of unhealthy competition, continuously looking for more profits. Moreover, encouraging individuals to take numerous loans with higher interest rates, MFIs, induces poor households into much more indebtedness than before joining microfinance. In other words, microfinance, in that case, leads more to financial exclusion rather than financial inclusion, leaving borrowers poorer than they were before (Ghosh, 2013). This evidence shows that the proliferation of microfinance does not always lead to an inclusive financial system.

In addition, McIntosh and Wydick (2005) posited that the crisis in the sector of microfinance in India generates losses of revenues from customers. As a result, users who usually borrow money from microfinance institutions could not invest in their education, health, or daily expenditures. Thus, microfinance from this perspective can harm financial inclusion. Therefore, the objective of microfinances to provide financial services to the poorest part of the population failed (McIntosh & Wydick, 2005). Furthermore, Bateman and Chang (2012) emphasized that in that case, microfinance does not reduce the level of poverty of individuals. On the opposite, it works as a barrier to economic development and access to affordable banking services, maintaining individuals in a poverty trap, excluded them from the banking system microfinance was supposed to provide.

Although additional research is needed, microfinance can partially advance financial and social inclusion and provide instruments to face financial difficulties better in some instances. The literature review showed that microfinance by targeting the poor is an enabler of financial inclusion and can have positive social outcomes even though usage and access to these services do not always guarantee the inclusion of their users. Complementary measures are needed to ensure that every part of the population is included.

#### 4. Data and Empirical approach

First, we start by presenting the sources and characteristics of the data used in our model and, in a second time, the empirical approach. The data used for this study are mainly drawn from the Central Bank of West African States (BCEAO) database and the World Development Indicators database of the World Bank. This study includes the eight WAEMU countries from 2009 to 2018. The choice of these countries is based on the fact that they share the same currency,

the CFA franc. In addition, the BCEAO collects monthly, quarterly, and annually periodic statistics from financial institutions (banks and MFIs) following the banking law and MFIs regulations (Commission Bancaire de l'Union Monetaire Ouest-Africaine, 2017). The ten-year time period, in this case, is relatively short, but it is due to the lack of data beyond this scope; it is the reason why we used panel data in our study.

Based on Baltagi (2005) book, panel data presents many advantages over time series and cross-section data. First, they consider individual heterogeneity, meaning individuals, objects, or companies in the panel may have characteristics that vary from one to another. Plus, panel data is suitable to examine dynamic change in a country, society, and company at the opposite of cross-sectional data, which are supposed static. In real life, most of the events observed, such as employment analysis, economic growth, and other economic and social events, evolve in the future. Panel data is the right tool to examine those effects (Batalgi, 2005). It is for these different reasons that we choose these data. Global FINDEX was supposed to be our source. However, due to the unavailability of many years of data regarding financial inclusion for countries in the WAEMU, we only use the BCEAO database and the World development indicator database.

The descriptive statistics of the variables used are presented in table 4. We have eight variables for ten years resulting in eighty observations. From the statistics, we can notice that the credit interest is relatively high in the WAEMU, with a mean of 8.5% and a standard deviation of 1.5%, showing a low variability in the union. This result translates the union's effort into harmonized monetary and financing policies that ensure a stable interest rate. However, the interest rate can go up to 11.66% in some countries, incredibly high for developing economies. The financial inclusion index is low in the union with a mean of 0.277, characteristics of developing countries especially the ones in Sub-Saharan Africa (Demirguc-Kunt et al., 2018). In other words,

the three-quarter of individuals in the WAEMU do not have access to essential financial services. The variable ISIS has high volatility between the different countries with a standard deviation of 11%, meaning that depending on the countries characteristics, the rate of financial inclusion can vary.

The inflation rate is stable within the union, with an average of 1.25%, translating the different policies ensuring a lower rate for all the countries and promoting the development of activities for both the private and public sectors. Besides that, the GDP annual growth varies across the union with an average of 5.1% growth per year, with high volatility. In some countries, the GDP growth can attain 10%, whereas, in other parts, it can be as low as -4.4%. Rural population is another characteristic of developing economies, as mentioned above. In the WAEMU, on average more than 62% of individuals live in rural areas. With banking institutions concentrated in urban areas, this statistic explained the low financial inclusion rate of the union, with more than half of the population excluded from the banking system. This fact explained the effort deployed by the BCEAO to develop the sector of microfinance in the WAEMU to provide financial services to everyone, whether in urban or rural areas. The following part focuses on the empirical approach used to evaluate the impact of microfinance on financial inclusion.

The formulation of the model follows the work of Okpara (2010); Adeola and Evans (2017); Chaibou (2019); and Senou et al. (2019) that evaluate the impact of microfinance on financial inclusion in Nigeria for Adeola and Evans, Chaibou, and Senou et al. in the WAEMU. The variables used in the model are based on the literature and the potential determinants of financial inclusion. The synthetic indicator of financial inclusion ISIS is the explained variables that identify financial inclusion. The primary variable of our research is SFDEvol, which represents the evolution of the sector of microfinance.

$$ISIS_{i,t} = \beta_0 + \beta_1 SFDEvol + \delta_2 TIN_{i,t} + \varepsilon_{i,t} \quad (1) \text{ where,}$$

ISIS is the level of financial inclusion; it is the composite indicator used to assess inclusion in the union. Based on the 2017 report on financial inclusion indicators, ISIS is the weighted average of the indicators of usage, the global demographic penetration rate of financial services, and the geographic penetration rate of financial services; availability, the Broad Banking Penetration Rate (BBPR) and Global Rate of Financial Services Utilization (GRFSU); and quality of financial services, the nominal rate of deposit, and the nominal rate of credit proposed by banks and MFIs (BCEAO 2018a). Following the study of Sarma (2008), the union developed a weighted average index based on the seven indicators presented above, using an endogenous method of a two-stage Principal Component Analysis nonparametric method to find the appropriate weight for each indicator developed by Camara and Tuesta, (2014).

SFDEvol refers to the evolution of the sector of microfinances. It is made of the number of clients, the number of deposits, and the credits offered by microfinance. The number of clients was used as a proxy based on Dacanay et al. (2011) study in the Philippines, exploring the impact of microfinance on financial inclusion. TIN is the nominal credit interest rate offered by the banks. Following the research of Adeola and Evans (2017), they found that interest is an important factor in assessing financial inclusion in developing countries, precisely Nigeria. Therefore, we used it as an explanatory variable in our model. When considering lending money, it is one of the essential variables in the decision. The higher the interest rate, the less likely customers will get a loan and the last term is the residual. The model is cluster by country to account for any heteroskedasticity issues that can arise from the data and to have robust standard error (Colin Cameron & Miller, 2015).

Other variables controls will be added to the initial model (1) based on evidence of the literature (Allen et al. (2016); Gebrehiwot & Makina (2015); Senou et al. (2019). Besides microfinance, many other macroeconomic indicators can impact financial inclusion in a country. Following studies in a similar context of developing economies, GDP, level of unemployment, inflation rate, and the part of the rural population in the total will be used as control variables. The gross domestic product (GDP) assessing the level of development of a country, is important in assessing the level of inclusion. Developed economies are recording higher level of inclusion compared to developing economies, meaning the stage of development is an important factor in that objective (Demirguc-Kunt et al., 2018). Next, the inflation rate is used because it is a deciding factor in financial intermediation. A higher inflation rate may discourage borrowers, but at the opposite, a lower one can stimulate lenders, it is the reason why we use this variable in our study.

Knowing the characteristics of developing economies, a huge part of the population lives in rural areas, and they are the ones excluded from the financial system (Allen et al., 2016). Thus, it is necessary to include this variable in assessing the impact of microfinance on financial inclusion. Unemployment is another variable retained for our research; the rationale behind this choice is to demonstrate how the employment status of individuals affects financial inclusion. With the unemployment rate higher than the rest of the world in Sub-Saharan Africa, this macroeconomic indicator is important in our analysis (Gebrehiwot & Makina, 2015). All the variables were obtained through the world development indicators of the World Bank. The new model is the following:

$$ISIS_{i,t} = \beta_0 + \beta_1 SFDEvol_{i,t} + \delta_2 \sum_1^n X_{i,t} + \varepsilon_{i,t} \quad (2)$$

X is the matrix of the controls variables with  $n=5$ , including the interest rate, the proportion of the rural population, the level of inflation, the gross domestic product, and the level of unemployment. The variables used in the model are presented in table 3 at the end of the paper.

When dealing with panel data, three options are possible: pooled OLS, Fixed-effects model, or Random-effect model. For a better choice regarding model specification, different steps are necessary. First, we used preliminary tests, such as unit root, Hausman, and testparm tests. Regarding the unit root test, due to the small sample size of our data,  $T=10$  and  $N=8$  the unit-roots tests available can lead to spurious results. Harris-Tsavalis(1999) suggested that the ht test results are useful for small size data and  $T$  fixed as long as  $N>25$ ; it is not the case of our model, so we cannot use this test. Besides them, another test that seems appropriate for small size samples, the Breitung test. Unlike the previous one with  $T$  fixed, this one has better power even with  $T=25$  and  $N=25$  (Breitung, 2001). In that case, our data are still smaller than the one proposed by this one.

In addition, Batalgi (2005), said that: “For small  $T$ , panel unit root tests have low power and there is the potential risk of concluding that the whole panel is nonstationary even when there is a large proportion of stationary series in the panel” (p.247). He explained how using unit roots tests for a small sample size like  $T=10$  might be inconclusive. For all these reasons cited above, a unit root test in our case is not required due to the small sizes of the sample, eight countries and ten years, so the unit root test will not be performed.

With that in mind, the second step in our modelling consists of the estimations of both fixed-effects model and random-effect, then compare the results and decide whether fixed-effects or random-effects model is appropriate. The fisher test helps assess whether a pooled OLS is preferred over a fixed-effects model. The result showed an F-test of 26.00 and the  $\text{prob}>F$

significant at .01 level, which concludes to the rejection of the null hypothesis of the absence of individual fixed-effect. This result confirms the choice of the fixed effects model in our study.

According to the Hausman test performed, we recorded a  $\text{prob} > \chi^2 = 0.000$  and the critical value  $\chi^2 = 29.19$ , with a probability of 0.000. We reject the null hypothesis at the .01 significance level, and the adequate model is the fixed effects. Based on this result, our model is a time-fixed effect model estimating the impact of microfinance on financial inclusion. Other studies used the same model looking at the impact of microfinances on financial inclusion (Chaibou, 2019). The testparm presents an F statistic of 5.71 and  $\text{Prob} > = 0.000$ ; the null hypothesis states that the years' dummies are zero for the ten years versus the hypothesis that they are different of zero. Based on the result of our test, we reject the null hypothesis at the .01 significance level so that time-fixed effects will be included in our model.

A Breusch and Pagan multiplier test was used to determine the suitable model between the pooled OLS and the random effects. The null hypothesis ruled in favour of the absence of random effects; thus, a regular OLS and the alternative is the presence of random effects. The  $\chi^2$  is equal to 25.31 with a  $\text{prob} > 1 = 0.000$ , which means that the appropriate model is the random effect, and we reject the null hypothesis, meaning the random-effects model is preferred over pooled OLS. After deciding between pooled OLS, random, and fixed effects, the Hausman test helped decide between random effects and fixed effects.

After the estimation of the model, various tests have been used to ensure the proper specification of the model. We start by testing for heteroskedasticity. The test used is the modified Wald test for groupwise heteroskedasticity. With a  $\text{prob} > \chi^2$  of 0.1145, we failed to reject the null hypothesis. In other words, the model is well specified and does not suffer from

heteroskedasticity. The second test performed is the Wooldridge testing for serial autocorrelation in a fixed-effect model. The null hypothesis is the absence of no first-order autocorrelation, and the alternative one is the presence of autocorrelation. With a  $\text{prob} > F = 0.1496$ , we failed to reject the null hypothesis; thus, there is no first-order autocorrelation.

The last check consists of assessing the linearity of the model to make sure the good specification of the model and the assumption of linearity. For this matter, a Pregibon link test was conducted in STATA in three different steps. The first one consists of regressing our model as specified in model (2), followed by predicting the fitted values. The second step is generating the fitted square values and regressing the model fixed effect with that variable. Lastly, test the significance of the estimation to assess the goodness of fit. The null hypothesis is the presence of a better specification of the model in the example of  $\text{sq\_fitted}$ . The alternative hypothesis is the correct specification of the model, the linear form. The  $\text{prob} > \chi^2 = 0.3966$  greater than 0.05 leads us to reject the null hypothesis; thus, our model is well specified. Based on the different tests, we can confidently say that time- fixed effects model with clustered countries is appropriate for our research.

The log formulation will be used in STATA to deal with any issues of non-normality of residues of the different variables, which might be an issue in linear modelling leading to spurious results or estimators, but also to ensure our model satisfies the linear model assumptions. Lastly, log transformations eliminate the effects of potential outliers, which can be problematic in the estimation (Wooldridge, 2006). The different models are:

$$\log \text{ISIS}_{i,t} = \beta_0 + \beta_1 \log \text{SFDEvol} + \delta_2 \log \text{TIN}_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$\log \text{ISIS}_{i,t} = \beta_0 + \beta_1 \log \text{SFDEvol} + \delta_2 \log \text{TIN}_{i,t} + i.\text{Years} + \varepsilon_{i,t} \quad (2)$$

$$\log ISIS_{i,t} = \beta_0 + \beta_1 \log SFDEvol + \delta_2 \log TIN_{i,t} + \alpha_1 \log GDPA + \alpha_2 \log Rpop + \varepsilon_{i,t} \quad (3)$$

$$\log ISIS_{i,t} = \beta_0 + \beta_1 \log SFDEvol + \delta_2 \log TIN_{i,t} + \alpha_1 \log GDPA + \alpha_2 \log Rpop + i.Years + \varepsilon_{i,t} \quad (4)$$

$$\log ISIS_{i,t} = \beta_0 + \beta_1 \log SFDEvol + \delta_2 \log TIN_{i,t} + \alpha_1 \log GDPA + \alpha_2 \log Rpop + \theta_1 \log Inflat + \theta_2 \log Unemp + i.Years + \varepsilon_{i,t} \quad (5)$$

Model (1) is fixed-effects without time-fixed effects; model (2) adds years dummies to the previous model. Model (3) adds more controls and no year dummies, and models (4) and (5) with time-fixed effects and clustered by countries and adding more controls to check for the robustness of the model. Model (5) is the one preferred for our analysis, followed by model (3) and (4).

Based on the work of Chaibou (2019), Allen et al. (2016), and Gebrehiwot & Makina (2015), we expect economic growth and the evolution of microfinance to have a positive impact on financial inclusion. The greater the number of microfinance institutions, the more people, gain access to financial services. In contrast, we expect the rate of unemployment, the interest rate on credit, the inflation rate, and the percentage of the people living in rural to have a negative sign, thus a negative impact on inclusion, following the study of Chaibou (2019), Dieme (2020), Senou et al. (2019). The more revenues individuals get, the more they will be willing to use financial services for their expenses; the increased number of microfinances institutions leads to better access to banking services. On the other hand, the more unemployed in a country, the fewer revenues they will get. In addition, inflation reduces the purchasing power of individuals, so with less purchasing, they will be less likely to request financial services. The percentage of the rural population in the overall population is an essential determinant of inclusion in developing countries (WAEMU countries in our case) because of the number of people living in rural areas (Allen et al.

(2016); Chaibou (2019). Therefore, we expect a negative sign from this variable based on those previous studies.

## 5. Results & Discussion

The results of the regressions are presented in Table 5. The first model without year dummies gives a result that we are not expecting, following other studies in the domain. The evolution of microfinance positively impacts the level of inclusion for countries in the union. Though not statistically significant, only the interest rate is statistically significant at the .01 level and negatively affects inclusion. If the interest is too high, people will be less likely to get credit, thus use financial services less and maybe find another way for their transactions. A 1% increase in the interest rate leads to a decrease of about 2.94% of financial inclusion; the interest rate negatively affects inclusion at a greater rate.

When adding year dummies, the signs of the different coefficients do not change. However, only the interest rate is significant at all significance levels; the one associated with microfinance increased but is still not statistically significant. A 1% increase in interest rate induces a decrease of 1.64% in financial inclusion. With fixed effects, better controls, and years dummies, microfinance has a positive impact on inclusion and significant at 0.1 level. The greater the number of microfinances, the greater financial inclusion is. A 1% increase leads to about 0.16% increase in the level of financial inclusion. The impact of the interest rate did not change with the new model, still negative and significant at 0.05 and 0.1. The GDP is significant at a 0.1 level and positively affects inclusion in model (4), an increase in economic growth can be a great tool to facilitate access to essential banking services. A 1% increase in economic growth leads to 0.044% of financial inclusion. On the other hand, the percentage of the rural population negatively affects

financial inclusion and is significant at the 0.05 and 0.1 levels. In model (3), a 1% increase in the number of people living in rural areas reduces leads the level of financial inclusion by about 4.6% per cent, all things equal. Model (5) is the one retained for interpretation.

The evolution of microfinance sector, the coefficient of this variable is only significant in model (5) at the 0.1 level. It positively affects financial inclusion in all the models specified, though significant only in the last one. These results demonstrate how microfinance can play a crucial role in reaching financial inclusion in the union. The impact of microfinance is non-negligible on financial inclusion when working with other factors such as interest rate, economic growth, and the urbanization of the rural population. Better control and significant investment in managing the sector of microfinances can offer many advantages. The same results were obtained in previous studies such as (Dacanay et al. 2011; Chaibou, 2019; Kaberia, 2016; Machiavello, 2018)

The interest rate associated with credit is the only variable significant in the different specifications of the model at all levels, 0.01, 0.05, and 0.1. It negatively affects access to banking services such as credit, but this effect decreases when adding more controls. This result is in adequation with the literature (Chaibou, 2019; Dacanay et al., 2011). Higher interest rates are more likely to discourage individuals looking to get a loan to find another way to get this fund. A good policy to encourage inclusion can be a reduction of the interest rate associated with micro-credits, loans for low-income individuals. Affordable interest rates coupled with access to microfinance could positively impact financial inclusion. In that sense, microfinance can be a driver of inclusion.

The gross domestic product growth rate is only significant in model (4) at the 0.1 level and positively affects financial inclusion. This result is expected in the sense that better-suited individuals are more likely to use financial services. The country's level of development is

associated with better access and usage of financial services. Because of this, there is a significant difference in the level of inclusion between developed countries and countries in development (Demirguc-Kunt et al., 2018). The impact of microfinance, when associated with a better level of development of a country, could lead to a more significant level of financial inclusion in the monetary union as portrayed in model (4).

The inflation rate is not significant in any model. However, it positively impacts financial inclusion, but its coefficient is close to 0. An increase in inflation causes more inclusion which is different from what we were expecting. It does not raise an issue since the coefficient is not significant. However, this result is in adequation with Senou et al. (2019) while assessing the impact of technology on financial inclusion in the WAEMU.

The percentage of the rural population negatively affects inclusion since one of the barriers to access to services is the distance between rural populations and branches. As expected, the percentage of the rural population is statistically significant at the 0.05 and 0.1 levels in model (3) and harms financial inclusion. The more people living in rural areas, the less likely they will have access to banks branches. This result is similar with the findings of Chaibou (2019) and Allen et al. (2016), who finds that the proportion of the rural population has a negative impact on financial inclusion. In that sense, microfinances can be used, especially to reach populations in remote locations, as we mentioned in the literature review. However, besides that, an investment in the urbanization of the rural areas is necessary to reach financial inclusion; policymakers should focus on that mission.

The level of unemployment is not statistically significant in any model. Though, it has a positive effect on financial inclusion, which is surprising because when people are unemployed,

they are less likely to have access to financial services as mentioned in the introduction. This result is in contradiction with the findings of Allen et al. (2016). Nevertheless, at the same time, the unemployed will be more inclined to contract a loan or a micro-credit to pay bills and others spending. All of this is possible by the services offered by microfinance institutions.

From these results, we noticed that the proliferation of microfinance can be a way to reach the objective of inclusion faster. However, to succeed in that mission, parallel investments must be made economically and socially: increase the level of development to achieve inclusive growth, control the level of credit interest rate, and invest in the urbanisation of rural areas. The ambiguous results of unemployment and inflation rate can be related to the quality and the size of the data. A better sample with a larger sample may help resolve these issues. For future research in that area, primary data should be preferred to resolve any issues related to the data. With better data in hand, results will be better and can be used to formulate better policies to achieve financial inclusion. These results are in adequation with the paper of Shetty (2008) regarding the impact of microfinance in inclusion in India, Dacanay et al. (2011) in the Philippines, Adeola and Evans (2017) in Nigeria, Kaberia (2016), and Chaibou (2019) in the WAEMU.

## 6. Conclusion

This paper aimed to evaluate or assess the impact microfinance on financial inclusion in the WAEMU'S countries in the Western part of Africa. The method consisted of using the fixed effects model with year dummies and clustered by country to assess this impact on the eight different countries of the union. Those estimations concluded that the proliferation of microfinance could be a source of financial inclusion in developing countries and West Africa particularly. When adding more controls, we noticed an improvement in the effect of microfinance on inclusion

which became significant at the 10% level. Moreover, GDP, credit interest rate, the percentage of the rural population, and the level of unemployment can have an impact on inclusion as well. However, the inflation rate and unemployment rate are not significant. This study evidenced that economic development can be an accelerator of inclusion. It is in adequation with the reality of developed countries where more than a third of the population have access to financial services (Demirgüç-Kunt et al., 2018). This result is similar to previous studies in Asia, Latin America, and other parts of Africa regarding financial inclusion.

However, building an inclusive financial system cannot be possible by investments in microfinances only. Countries should invest in education, training program, and the development of adequate laws that ensure that every part of the population, youth, women, elders, can play an active role in the economic development of their countries and the continent. Every country on its own and the union should develop good practices and laws in that regard. Accessing financial services and adequate economic development is the key to the reduction of poverty. One thing to think about is the role the proliferation of the internet and mobile phone usage on the continent can play in financial inclusion.

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**Table 1-Banking institutions in activities in the WAEMU**

Countries	Number of institutions			Total Balance (millions FCFA)	Market share (*)	Counters (**)	GAB (***)	Number of accounts	Workforce
	Banks	FI	Total						
Benin	15	0	15	3 486 329	9.8%	201	313	1 313 741	2 855
Burkina	13	4	17	5 198 407	14.7%	293	431	1 832 403	3 155
Côte d'Ivoire	28	2	30	11 095 578	31.2%	709	1 004	3 277 292	8 699
Guinee- Bissau	5	0	5	245 921	0.7%	28	28	124 521	495
Mali	13	3	16	4 501 702	12.7%	489	472	1 586 998	3 466
Niger	12	1	13	1 572 520	4.4%	156	186	629 943	1 723
Senegal	24	3	27	6 788 590	19.1%	481	499	1 689 224	5 455
Togo	13	2	15	2 636 541	7.4%	227	284	1 037 714	2 406
WAMU	123	15	138	35 525 588	100%	2 594	3 217	11 491 836	28 254

*Source: WAEMU'S Banking commission secretary 2017 p.42*

**Table 2-Market share of microfinance institutions in WAEMU per country in 2017**

Countries	Institutions of microfinance concerned			Total balance (millions FCFA)	Market share (*)
	Ridge caps and unit boxes	Affiliated basic funds	Total		
Benin	11	7	18	175 044	10,5%
Burkina	9	17	26	297 923	17,8%
Côte d'Ivoire	9	10	19	334 185	20,0%
Guinée-Bissau	0	0	0	0	0,0%
Mali	6	3	9	136 447	8,2%
Niger	4	0	4	39 884	2,4%
Senegal	11	36	47	503 281	30,1%
Togo	9	10	19	184 140	11,0%
WAMU	59	83	142	1 670 904	100%

*Source: WAEMU'S Banking Commission Secretary 2017 p.60*

**Table 3-Explained and explanatory variables of the model**

Code	Signification	Sources
ISIS	The level of financial inclusion in the country	BCEAO Database
Infla	The inflation rate for the period	World Bank development indicators
GDPA	The Gross domestic product growth per year (annual rate)	World Bank development indicators
TINcredit	Nominal Interest rate on credit offered by the Banks	BCEAO Database
SDFEvol	The evolution of the sector of microfinance	BCEAO Database
Rpop	The rate of rural population	BCEAO Database
Unemp	The rate of unemployment	World Database indicators

**Table 4-Descriptive Statistics**

<b>Variables</b>		<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Observations</b>
<b>TINcredit</b>	overall	0.0856975	0.0150664	0.0567	0.1166	N = 80
	between		0.0135799	0.06277	0.10388	n = 8
	within		0.0079744	0.073148	0.1104975	T = 10
<b>ISIS</b>	overall	0.2774625	0.1129793	0.129	0.604	N = 80
	between		0.0713073	0.1664	0.3766	n = 8
	within		0.0908783	0.067863	0.5143625	T = 10
<b>Inflat</b>	overall	0.0125875	0.0164615	-0.028	0.067	N = 80
	between		0.0031197	0.007	0.0168	n = 8
	within		0.0161974	-0.02611	0.0656875	T = 10
<b>GDPA</b>	overall	5.099	2.55	-4.387	10.707	N = 80
	between		0.776	4.069	5.954	n = 8
	within		2.443	-5.242	9.876	T = 10
<b>Rpop</b>	overall	62.30322	10.36912	49.221	83.792	N = 80
	between		10.90536	51.18	83.7387	n = 8
	within		1.46299	58.73653	65.89253	T = 10
<b>Unemp</b>	overall	4.380125	2.616256	0.32	10.36	N = 80
	between		2.642381	0.772	8.311	n = 8
	within		0.8112076	2.599125	6.429125	T = 10
<b>SFDEvol</b>	overall	540335.9	331049.1	3375.667	1221112	N = 80
	between		320365.2	6431.736	992706.2	n = 8
	within		136572.7	-14414.1	814743.3	T = 10

**Table 5-The effect of microfinance on financial inclusion in the WAEMU using OLS panel fixed effects modelling**

	(1)	(2)	(3)	(4)	(5)
ISFDEvol	.055 (.052)	.072 (.063)	.064 (.049)	.073 (.054)	.164* (.075)
ITINcredit	-2.935*** (.176)	-1.639** (.562)	-1.865*** (.475)	-1.603** (.522)	-1.507** (.488)
2010.Years		.031 (.023)		.005 (.031)	.013 (.038)
2011.Years		.014 (.049)		-.035 (.069)	-.003 (.089)
2012.Years		.042 (.055)		-.032 (.088)	-.002 (.098)
2013.Years		.105 (.074)		.044 (.111)	.098 (.127)
2014.Years		.156 (.103)		.081 (.146)	.051 (.143)
2015.Years		.236 (.128)		.15 (.178)	.228 (.174)
2016.Years		.216 (.13)		.112 (.189)	.181 (.194)
2017.Years		.358** (.114)		.24 (.184)	.311 (.181)
2018.Years		.44** (.128)		.309 (.198)	.395* (.18)
lGDPA			.034 (.019)	.044* (.021)	.053 (.03)
lRpop			-4.592** (1.574)	-1.596 (1.299)	-.876 (1.081)
lInflat					.006 (.012)
lUnemp					.035 (.045)
_cons	-9.311*** (.644)	-6.479*** (1.586)	12.099 (7.682)	.172 (4.813)	-3.796 (4.171)
Observations	80	80	77	77	64
R-squared	.825	.905	.874	.914	.938
Years dummy	YES	YES	NO	NO	YES