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# Estimating the impact of financial development on poverty in Cameroon using the autoregressive distributed deceleration (ARDL) model for the period (1981-2017)

Memperkirakan dampak pembangunan keuangan terhadap kemiskinan di Kamerun dengan menggunakan model perlambatan terdistribusi autoregresif (ARDL) untuk periode (1981-2017)

Asst. Prof. Dr. Yusra Salim Nayf, Yusrasalimnayf@gmail.com, (1)

College of Administration and Economics , Tikrit University, Iraq

Asst. Prof. Dr. Khattab Imran Saleh, Khattabimransaleh@gmail.com, (0)

College of Administration and Economics ,Tikrit University, Iraq

Asst. Prof. Dr. Mustafa ismaeel khaleel, Mustafaismaeelkhaleel@gmail.com, (0)

College of Administration and Economics , Tikrit University, Iraq

(1) Corresponding author

# **Abstract**

General Background: Financial development is often seen as a tool for poverty reduction. In Cameroon, its effectiveness remains debated. Specific Background: Despite reforms since the 1980s, poverty—especially in rural areas—persists amid uneven financial access. Knowledge Gap: Empirical evidence on how specific financial indicators affect poverty in Cameroon is limited. Aims: This study analyzes the impact of financial development on poverty using ARDL models for 1981–2017, with per capita consumption as a proxy for poverty. Results: Broad money supply positively affects consumption in both the short and long term, while private sector credit has a negative long-term effect. Inflation reduces consumption, and trade openness is statistically insignificant. Novelty: The study distinguishes between financial indicators, revealing that not all forms of financial development reduce poverty. Implications: Broader financial development must be complemented by inflation control, infrastructure improvements, and inclusive policies to reduce poverty effectively.

Highlight:

- Financial development, particularly broad money supply, significantly influences poverty reduction in both short and long terms.
- Inflation has a consistently negative effect on per capita consumption, highlighting its role in poverty dynamics.

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• Credit to the private sector does not effectively reduce poverty long-term without supportive infrastructure and policy conditions.

Keywords: Financial Development, Poverty, Cameroon, ARDL Model, Inflation

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# Introduction

Recent years have seen the development of a substantial body of research on the relationship between an economy's financial system and growth. Numerous studies have also been conducted on the connections between poverty alleviation, income distribution, and economic growth. A complicated web of interdependencies between financial development, economic growth, income inequality, and poverty reduction is made possible by the paucity of empirical research on the relationship between financial development and poverty reduction. This article's goal is to quantify the causal links between Cameroon's financial progress and poverty alleviation. The first section examines the theoretical connections between poverty alleviation and financial development as well as the ways in which financial development affects poverty, poverty and development. As for the second section, it reviewed the course of financial development in Cameroon and the stages that financial development went through in this country. In addition to that, this section also included a presentation of the reality of poverty in Cameroon. As for the third section, the experimental aspect was included to measure the impact of financial development on poverty for the period (1981- 2017) using a model Autoregressive Distribution Lag Bounds Test (ARDL) and presents the results of econometrics, and the last section presents a summary and conclusion of this research.

# Reviewing the literature on the relationship between financial development and poverty:-

Over the past few decades, reducing poverty through the growth of the financial sector has become increasingly important in emerging nations. In the literature on development economics, the theoretical examination of these problems has undergone several phases. According to the literature currently in publication, financial development can have two distinct effects on poverty: first, it can directly influence poverty by increasing the disadvantaged's access to financing; second, it can indirectly influence poverty, primarily through economic growth

#### A-The direct effects of financial development on poverty reduction :

The direct effects of financial development on poverty reduction are theoretical in developing countries in many ways.

**First:** By giving the poor better access to the credit market and financial services, sophisticated financial intermediaries can directly reduce poverty. However, developing nations face a number of market failures in the financial sector, including asymmetric information and exorbitant fixed costs for small credit borrowing Stiglitz and Weiss (1981) mention that these defects create the effect of harmful moral hazard in the underdeveloped financial market (45, 2016): Abdin), which generates financial deprivation, which is one of the main factors behind the persistence of poverty, as mentioned by Levine, who considered that the deficiencies of the financial market It is the cornerstone behind the continuation of the Poor dynasties. In perfect financial markets—that is, where perfect competition prevails—individuals have access to capital to fund education or business endeavors based solely on individual talent and initiative rather than parental wealth. In these theories ideal financial markets reward opportunity by devaluing paternal wealth. From this perspective, financial development may have a disproportionately positive impact on the poor.(Levine:2008,3-4).

**Second:** The broken financial system leads to more income inequality in society, as it is in the face of the defects of the capital market, which greatly affects the distribution of wealth on the overall economic activity. In addition, These effects will also spread over time due to the indivisibility of human capital investment. Therefore, the initial distribution of wealth, or more precisely, the percentage of people who inherit sufficiently big amounts, has an impact on growth. They can invest in human capital because they are wealthy. Hence, economic growth will achieve uneven growth among individuals based on the amount of their investment in human capital, which depends in turn. The wealth they inherit from their parents.(GALOR&ZEIRA:1993,50-51)

**Third**: Financial intermediaries help the poor build up capital by pooling disparate savings and allowing the poor to borrow money from these accumulated savings to start small and medium-sized businesses in addition to earning interest, which ultimately reduces poverty by creating more job opportunities. This is why the developed financial sector not only offers credit facilities to the poor but also offers them opportunities for savings. This is because Keynes' (1937) theory of demand for money, which was rehabilitated by McKinnon (1973), assumed that financial intermediaries are beneficial to the poor even if they do not offer credit. Revenue Increase (Abdin: 2016, 46).

Fourth: It was found that financial development unevenly helps the poor. Greater financial development stimulates the incomes of the poor to grow faster than the growth of per capita gross domestic product, which reduces income inequality. The results of the study of Beck et al (2007) indicate that financial development helps the poorest fifth of the population after the impact of financing on aggregate growth. (Beck et al: 24, 2007). However, Greenwood and Yovanovitch (1989) argued that there is a nonlinear inverted U-shaped relationship between income inequality and financial sector development in early stages of development when exchange is highly unregulated and growth is slow. The financial system grows more inclusive, economic growth quickens, and the gap between rich and poor widens as income levels rise. When an economy reaches maturity, its financial structure is completely established, income distribution is steady, and its growth rate is higher than it was in its early phases, and income inequality

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among individuals decreases.(Greenwood & Jovanovic:1990,1100).

#### B- The indirect impact of financial development on poverty through economic growth:

Since many people think that economic growth lessens extreme poverty and that growth has an impact on poverty reduction through a variety of channels, economic growth is the primary way that the development of the financial sector helps poverty reduction.

First, economic growth can create jobs for the poor.

**Second:** Additionally, it was suggested that a rapid rate of growth may lessen the income gap between skilled and unskilled workers in the future, which would help the impoverished.

**Third:** High growth can lead to an increase in tax revenues, which enables the government to allocate more financial resources for social spending such as health, education and social protection and thus benefit the poor. The poor will also be able to invest more in human capital. **Fourth:** With the increase in the accumulation of capital and with high economic growth, more money will be made available to the poor for investment purposes, which will lead to an increase in their incomes (Zhuang et al. 2099, 10-11).

# Financial development and poverty in Cameroon:

#### a. Financial development path in Cameroon:

Under the auspices of monetary and regulatory policies intended to assist state-orchestrated growth objectives, Cameroon's financial industry grew during the post-independence era (1960-1985). Advocates of financial liberalization have referred to this state of affairs as "financial repression". The state owned all banks, and loans were made to industries that were thought to be significant. By 1987, because of the world economic crisis, demand and prices for Cameroon's main export declined.( Ngimanang & Ngouhouo: 137-138, 2016), Concurrently, the CFA franc's actual exchange rate increased significantly, the US dollar declined 40% vs the CFA franc, and terms of trade, including the drop in oil production, worsened 47%. All of this made it possible for the economy to plummet after two decades of prosperity. performance The decline in GDP was sudden and massive (from 8 to 5%) annually. Taken together, this situation revealed the fragile nature of an economy that appears to be well managed and resilient to external shocks. The Bretton Woods institutions attributed the problem to poverty and mismanagement of internal and external economic policies, and then suggested programs for structural transformation, which Cameroon implemented in 1987. As a result of the privatization and dismantling of many public institutions, these programs redefined the role of the state and enacted policies aimed at liberalizing the economy across the board. The crisis in the real sector also affected the financial sector, as the collapse of the real sector made companies unable to fulfill their financial obligations. This, along with other factors such as incompetence of managers, poor management techniques, competition from the informal financial sector, and state intervention led to Serious crises in the financial sector, and as a result many banks went bankrupt, and other banks became unavailable for liquidity due to their inability to face depositors' withdrawals. Some banks were dissolved and others were recapitalized as part of the structural adjustment programs, which reformed the financial system. The deregulation of financial markets in 1990 also brought about a shift in fiscal and monetary policy. The Central African Banking Commission (COBAC) was created as a new banking regulatory body. As a result, interest rates were liberalized, directed credit schemes were eliminated, banks were privatized, a money market was established, and the capital account was liberalized. Lastly, the Douala Stock Exchange (DSX), a stock exchange that is still in its infancy, was founded on December 1, 2001. The Douala Stock Exchange is a public limited company with a capital of (1.8 billion CFA francs, of which (63.7%) are owned by private commercial banks. It is believed that such an emerging financial system will provide better support for the economy, which is henceforth regulated by market forces. These reforms represented the end of the pent-up financial system and the beginning of a system based on classical market principles. With all the above-mentioned reforms, the economy regained the path of economic growth and the banking sector recovered. Its fluidity and safety( Johannes & et al, 2011, 368 - 369).

#### b. Poverty in Cameroon

Like the majority of sub-Saharan African nations, Cameroon had a string of setbacks that caused its economic structure to collapse. GDP by 2.5 percent), however this hasn't always been the case since the 1960s. These oscillations can be differentiated by significant economic policy booms or by external international shocks. Cameroon has had economic crises since the middle of the 1980s, primarily as a result of falling global agricultural and other commodity prices, which have reduced income. Additionally, major sectors like infrastructure, health, and education were neglected in the context of cutting public spending as required by the donor community. This was reflected in the majority of macroeconomic indicators, as they all saw a decline in their values and an attempt to In September 1988, the Cameroonian government implemented the Structural Adjustment Program, which was backed by the World Bank and the International Monetary Fund, in an effort to escape this terrible economic condition. The goal of this spending-cutting initiative was to address the inadequate financial situation. The failure of this program culminated in the devaluation of the CFA franc in 1994, which included both spending cuts and expenditure shifting components. Currency devaluation has been bearing fruit since 1996 with significant

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improvement in macroeconomic policies implemented by the reform-minded government. Difficulties in resolving poverty issues prompted the government to adopt a medium-term economic and financial program that ran from July 1997 to June 2000. As a result, in October 2000, Cameroon became a member of the Heavily Indebted Poor Countries (HIPC) Initiative. Cameroon has since created both a preliminary and final strategy plan. The goal of poverty reduction is to fight poverty, and the level of poverty decreased from 53.3% in 1996 to 40.2% in 2001 as a result of these efforts. Conversely, from 2001 to 2007, The economy did not perform similarly, which led to poverty remaining almost constant during the period. Between 1996 and 2001, the poverty rate declined by (13.1%), depth by (5.1%), and severity by (2%). In 2007, the prevalence of poverty reached (39.9%), its depth (12.3%), and its severity (5%), (Epo:2010,3-4). The evolution of the numerical indicator of poverty at the national poverty line (% of the population) can be presented in Table (1).

The numerical index of poverty at the national poverty line (% of population) in Cameroon.

| the years   | 1996 | 2001 | 2007 | 2014 |
|---|------|------|------|------|
| The numerical index of poverty at the national poverty line (% of population) |      | 40.0 | 39.9 | 37.5 |

Table 1.

Source: World Bank data

https://data.albankal.dawli.org/indicator/SI.POV.NAHC?view=chart.

We note that the poverty rate decreased a lot between 1996 and 2001 by about (13%), but the decline became slower after that, as the poverty rate decreased between 2001 and 2007 by about (1%), while during the period from 2007-2014 the decline reached about (2.4%) %) Just. An analysis of income distribution in Cameroon using Cameroon household survey data demonstrates that there is a significant divide between the urban and rural populations as well as between the impoverished and the non-poor. She adds that between 1996 and 2001, inequality did not significantly decrease. (Tah: 2016, 110).

Table (2) shows that the rural poverty gap as a percentage, although it decreased after 2001, increased in 2007 compared to 2001, and the gap increased in 2014 and reached (22.9%). It is also shown that the rural poverty gap It is greater than in urban areas.

| the years  | 1996 | 2001 | 2007 | 2014 |
|--|------|------|------|------|
| Poverty gap at the poverty line in rural areas (%) |      | 17.3 | 17.5 | 22.9 |
| Poverty gap at urban poverty line (%)              | 14.7 | 4.3  | 2.8  | 1.8  |

**Table 2.** Poverty gap at the poverty line in rural areas(%)

Source: World Bank data

https://data.albankal.dawli.org/indicator/SI.POV.NAHC?view=chart.

Food accounts for about 56% of a rural household's income. Generally speaking, families spend 5.4% of their annual budget on education and 7.6% on health. This type of spending means that the poor cannot break the cycle of poverty in which they live by investing in health and education in order to form human capital. It is able to get them out of the circle of poverty, and here appears the role of developed financial markets, which can finance investment in education and health and help families to increase their investment in the accumulation of human capital. The World Bank believes that poverty results from several causes, including widespread corruption, mismanagement, poor judicial system, spread of diseases, armed conflicts, heavy debt burden, low investment, and mismanagement of human and material resources, which tend to plague African countries with poverty and inequality in general and Cameroon in particular (Tah:2016, 111).

#### **Standard Side:**

#### a. Description of the form and approved data:

This study used the Autoregressive Distribution Lag Bounds Test (ARDL) applied by Pesaran and Shin (1999) and developed by (Pesaran et al, 2001).

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This is to determine the standard relationship between financial development and poverty in the study of the case of the Cameroonian economy for the period (1981-2017).

This study adopted a multiple linear regression method that uses two variables that express financial development, which are X1 and X2, while the other two variables, which are X3 and X4, are control variables. Therefore, we define a model in this study in the form of Dali using the selected variables:-

Y = F(X1, X2, X3, X4)

The equation is expressed in linear form:-

LnY= Bo + B1 X1 + B2 X2 + B3 X3 + B4X4+ U .....(1)

Whereas:

LnY = natural logarithm of per capita final expenditure of household consumption (constant 2010 US dollars) The choice of this variable to express poverty was based on previous studies such as (Odhiambo, 2009; Khan et al. 2012; Aye 2013; Uddin et al. Chemli, 2014: Kheir, 2018).)

X1 = which expresses the domestic credit provided to the private sector (% of GDP).

X2 = which expresses the broad money supply (% of GDP).

X3 = Inflation, GDP deflator (annual%).

X4 = Trade (% of GDP), which expresses trade openness.

.BO,B1,B2,B3) represents the parameters)

U = represents the limit of error.

As the two variables (X1, X2) reflect the financial development in this study, while (X3, X4) represent the control variables.

#### b. The unit root test:

The unit wall test aims to examine the properties of the time series. Despite the multiplicity of unit wall tests, we will use the Phillips-Perron Test. Appendix (1) explains the results of this test. We note that the dependent variable (LnY) Unstable at the level, and this appears through the calculated (t) value, which was less than the tabular (t) value, which means that the series contains the root of the unit, and this appeared in both cases, the case of the fixed limit and the case of the fixed limit and the same words for the variables ((X1, X2, X4, as all of them are unstable fixed limit and the case of the fixed limit and the direction, and with the exception of the variable (X3), it appeared stable according to the test results in both cases, the fixed limit and the fixed limit, since the calculated (t) value was greater than the tabular (t) value, the results of the mixed stability test of the variables permit the adoption of the ARDL model methodology) It was stated by Pesaran and others 2001 with the need for the maximum degree of stability of the variable to be achieved at the first difference (Pesaran & et al: 2001, 315).

#### c. Cointegration Test Using Limits Method:

The results of the statistical calculation (F) for the ARDL limits test are displayed in Appendix (2). The values for F () are higher than the upper limit of the critical values in the model and the critical values derived from the tables suggested by Pesaran et al. (2001) when the significant levels are 1%, 5%, and 10%. The results of this model support the rejection of the null hypothesis at significant levels 1%, 5%, and 10%, and from it confirm the existence of a long-term equilibrium relationship between poverty, represented by per capita final consumption expenditures for households, and the independent variables in Cameroon.

#### ${f d}.$ The model in the long run :

Following confirmation of a co-integration link between the poverty variable and the chosen independent variables, the ARDL model's framework was used to measure the long-term relationship. Getting the long-term parameter estimations is part of this step, as indicated in Appendix (3) While others came the opposite of what previous studies indicate, some of them are moral and others are not.

#### As it is clear from Appendix (3)

The variable of the credit ratio provided to the private sector (X1) is a variable that negatively affects poverty and at a significant level of 10%, and the effect appears in the long term, and this contradicts the expectations of economic theory, which states that increasing credit provided to the private sector would contribute to reducing

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rates Poverty, as it facilitates the access of limited-income groups to the financing necessary for the establishment of private projects. The effect of this variable in the long term came at a relatively weak moral level, which is 10%. Perhaps the reason for this is due to the fact that the mere existence of financing does not represent the only necessary condition for the poor to be able to establish projects However, economic growth requires preconditions such as the availability of infrastructure and the institutional environment needed to establish projects.

- As for the money supply variable in its broad sense (X2), it showed a positive effect in increasing per capita consumption, which means that this variable is positively associated in the long run with poverty reduction. The level of significance was very high at less than 1%, and this is consistent with the reality of this developing economy.
- The variable (X3), which expresses the inflation index, has shown a negative sign in per capita consumption, as inflation leads to damage to the poorest groups in society and leads to the erosion of the real value of their savings and the social transfers that take place. By the government, which weakens the purchasing power of the poorest groups and works to increase the inequality in the distribution of incomes, and the relationship was highly significant, at a level of more than 1%.
- -The only non-significant variable is (X4), which represents trade openness. As we know, the relationship between trade openness and poverty is a matter of controversy among economists, as it is not settled. Nevertheless, the sign of this variable was positive, meaning that trade openness is positively reflected in improving the level of consumption.

#### e. Short term model:

Shocks to any of the model's variables can cause short-term departures from long-term equilibrium, hence all short-term coefficients display dynamic adjustments of all variables to their long-term equilibrium. (Dritsakis, 2011; 16).

As for the short-term analysis, as shown in Appendix (4), we note that the variable X1 () in the short term showed a positive relationship with per capita consumption, meaning that an increase in domestic credit leads to a reduction in poverty, and this is at a very high significant level in the initial period (0). But the relationship becomes negative in the first and second period because of the shocks, now the value of the coefficient was small (0.007184) during the period (0). As for the money supply variable in its broad sense (X2), it showed a positive relationship with per capita consumption and poverty reduction, and this corresponds with long-term results. This component of financial development is of clear importance towards poverty reduction. Also, the inflation rate (X3) has maintained the same relationship in the short term, as it carried a negative sign, which means that fighting inflation is a priority in improving the purchasing power of limited groups, and this matches the results of the long-term analysis.

As for the trade openness variable (X4), it was statistically insignificant with per capita consumer expenditures, and there was no effect of trade openness on poverty reduction.

We note that the parameter of the error correction limit CointEq(-1)\* is equal to (-0.434977), and it is statistically significant with a negative sign, and this increases the accuracy and validity of the equilibrium relationship in the long run, and that the error correction mechanism is present in the model, and the error correction parameter measures the return speed To the equilibrium position in the long term and the speed of return to the equilibrium position is about 43.4%.

#### f. Diagnostic Tests:

**First**, the LM test and the serial correlation test We accept the null hypothesis, which claims that there is no serial correlation, because appendix (5) shows that the value of Prob. Chi-Square (2) is (0.4343), or greater than 0.05.

**Secondly,** the heterogeneity of variance test: - We perform the test The results are displayed in Appendix (6) and are based on the Breusch-Pagan-Godfrey test. We observe that the Prob. Chi-Square value is equal to (0.7326), which is greater than (0.05), indicating that the model According to the test hypotheses, it is not affected by the heterogeneity of variance issue.

#### : Third: Stability test of the model

In order to ensure that the data used in this study are free of any structural changes, one of the appropriate tests must be used, such as: the cumulative sum of the remainders (CUSUM) and the cumulative sum of the squares of the remainders (CUSUM of Squares). These two tests are among the most important tests in this field because they show two important things, namely, the presence of any structural change in the data, and the extent of stability and consistency of the long-term parameters with the parameters for the short term. According to numerous studies, these tests are always found in conjunction with the ARDL methodology. If the graphs of the CUSUM and CUSUM of Squares tests fall within the critical limits at the 5% level, as illustrated in figures (1) and (2), respectively, then the estimated coefficients for the error correction formula of the distributed time gap autoregressive model are structurally stable. We used the CUSUM and CUSUMSQ tests, which were suggested by Brown, Dublin, and Evans, in light of the majority of these investigations. (Adriush: 2013, 24).

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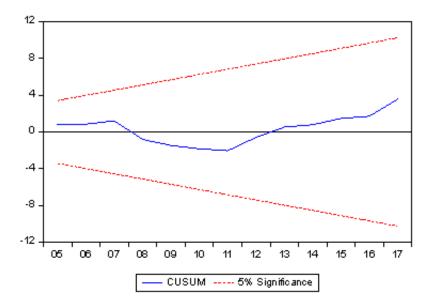


Figure 1. CUSUM test

Source: Figure prepared by the researcher using Eviwes8 software

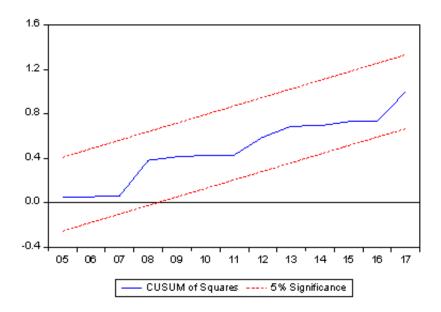


Figure 2. CUSUM OF Squares test

Source: Figure prepared by the researcher using Eviwes8 software

# **Conclusions and recommendations**

#### **First: Conclusions**

1-Cameroon has made great achievements in the field of liberalizing financial markets, especially after implementing economic stability and structural adjustment programs supported by the International Monetary Fund and the World Bank.

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- 2- Reviewing data on the prevalence of poverty in rural areas to a greater extent than in urban areas.
- 3- Cameroon's accession to the Heavily Indebted Poor Countries Agreement (HIPC) in October 2000 led to the adoption of a strategy to combat poverty. The results of this strategy appeared in the 2007 statistics, which revealed a clear decline in the number of poor people.
- 4- The long-term analysis showed that financial development helps in general to reduce poverty through the liquidity ratio variable (M3 / GDP) and at a very high level of significance, the same effect appeared in the analysis of the short-term relationship, while a positive effect did not appear for the variable The percentage of credit provided to the private sector in reducing poverty in the long term.
- 5- Maintaining a sound macroeconomic environment away from inflation can contribute to poverty reduction, and this is what appeared in the short and long-term analysis of the inflation variable, as it took a negative sign in its relationship with per capita consumption and at a very high moral level. It also means that aiming to keep inflation at a low level is crucial in combating the phenomenon of poverty.
- 6- Through the standard analysis, a significant effect of commercial openness did not appear in reducing poverty, either in the two terms, and perhaps the reason for this is due to the fact that Cameroon relies on the export of raw materials, and therefore the fluctuations in the prices of these materials is an external variable that cannot be controlled, and therefore the openness The current does not contribute clearly to poverty reduction policies.
- 7- We note that the error correction threshold parameter (CointEq (-1)) is equal to (-0.434977), which has a negative statistical significance sign, and this increases the accuracy and validity of the equilibrium relationship in the long run, and that the error correction mechanism is present in the model and The error correction parameter measures the speed of return to the equilibrium position in the long term, and the speed of return to the equilibrium position is about (43.4%).

### **Second: Recommendations**

- 1- Work to diversify the economy and reduce dependence on agriculture and mining in order to sustain public revenues to finance public spending on social aspects.
- 2- The provision of sufficient financing generated from within the national economy distances the country from dependence on loans and conditions of international financial institutions.
- 3- Keeping inflation at low levels is an important factor in ensuring an improvement in the standard of living for the poor and low-income groups.
- 4- The provision of credit is a necessary but not sufficient condition to enable individuals to establish private projects, as it is necessary to strengthen the infrastructure of roads, electricity and communications, as well as the importance of combating corruption, all of which are important factors to provide an appropriate investment environment.
- 5- It is necessary to encourage the establishment of financial institutions specialized in micro-lending, which is more compatible with the needs and capabilities of the poor than traditional institutions, and that these institutions give the poor in the countryside greater importance in financing their projects.
- 6- The role of financial development in combating the phenomenon of poverty requires further studies, especially at the micro level, in order to reach a clear assessment of its role and to know the procedures required to make the financial sector more friendly to the poor.

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