



# **INVESTMENT, CONSUMPTION AND ECONOMIC GROWTH IN CAMEROON: AN AUTOREGRESSIVE VECTOR APPROACH**

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## **Abstract**

*This study highlights the correlation between investment, consumption and economic growth in Cameroon over the period 1993-2017. By disaggregating variables such as: investments, in public and private investment; consumer spending in public and private consumption; The evidence of the autoregressive vector approach leads us to the results according to which, there is a correlation between investment and consumption (public and private) on the one hand; and on the other hand, between economic growth and investments (public and private). The degree of correlation is a function of the number of lags and the direction of causality. Thus, an increase in investment by 1% leads to a decrease in public consumption by 0.1878%. A 1% increase in public consumption leads to a decrease in investment by 3.0231%. An increase in economic growth of 1% leads to a decrease in public investment of 3.1036%. A 1% increase in public investment leads to a 0.8847% increase in economic growth. It is important for the State of Cameroon to pursue its strategy of improving the business climate, promoting public and private partnership in order to promote investments.*

*Keywords: Investment, Consumption, Economic growth, Vector autoregression, Cameroon*

## **INTRODUCTION**

The Keynesian macroeconomic model states that consumption and investment play a very important role in the process of economic growth by stimulating aggregate spending. Thus, policy makers should put in place appropriate stimulus policies to encourage consumption and investment. At the same time, investment and consumption are cyclical components of demand,



which vary with business cycle conditions. For example, according to Keynes' model, consumption is volatile because changes in income lead to changes in consumption. The investment for its part varies inversely with the interest rate.

On the demand side, economists have identified the two keys to economic growth, namely monetary variables and exports. The literature goes further to show that investment is an important determinant of economic growth. There is controversy over the link between public investment and private investment. The existence of a possibility of crowding out and complementarity. But understanding the role of public and private investment in economic growth is crucial for policymakers to understand whether they play an important role in economic growth. This is to see to what extent to orient or strengthen the partnership between the public and private sector. Besides this first concern, it is clear that investment and consumption according to Keynes contribute to economic growth. And knowing that there are few studies translating the correlation between investment and consumption, knowing the scale of investment in public and private consumption will also allow these decision-makers to know if these levels of consumption are supported by the investment or not. This will allow them to make the right investment decision.

In the context of Cameroon, the promotion of economic growth is seen as one of the major challenges from independence to the present day. During this period the evolution of Cameroon's economic growth is cyclical. Indeed, we observe the period of strong expansion, recession and even economic crisis. But never mind, Cameroon is characterized by highlights, namely: from the beginning of the 1960s to the first half of the 1980s, there was positive economic growth; from 1985 to 1995, we observed a period of economic crisis with measures to end the crisis advocated by the Bretton Woods institutions; from 1995 to 2008, there are measures in the direction of debt relief and the fight against poverty that would have allowed the economy to return to the path of positive and inclusive economic growth; from 2008 to 2017, we can observe consolidated growth and despite the double oil and security shock, the country has experienced real resilience.

The economic growth during this period in Cameroon was influenced by several factors such as political and socioeconomic factors, or simply cyclical and structural factors. From 1960 until the first half of the 1980s, the five-year plans highlighted had a favorable impact on economic growth despite the oil shocks of the 1970s which led to a sharp turnaround in commodity prices. . Cameroon ranked among oil producing and exporting countries, which depended heavily on export raw materials such as cotton, cocoa, coffee; was the victim of a sharp deterioration in the terms of trade, hence the start of its economic or production difficulty in the early 1980s. In addition to this situation which disrupts the production systems set up

under the plans five years, we noted the weak demand for raw materials due to the crisis in developed countries and mainly France, where many of the country's products were destined. The stimulus policy put in place during this period, characterized by an expansionary budgetary policy and a restrictive fiscal policy, allowed the development of the rural world which was considered as the nurturing breast of urban centers. Public and private investment has undergone considerable changes with a strong impact on economic growth.

From 1985 to 1995, economic growth experienced a negative trend with parallel public investment which had the enormous difficulty of ensuring its full function of production of goods and infrastructure. In the same vein, the drop in production, see the economic crisis has pushed Cameroon to develop restrictive measures, which inevitably led to a drop in consumption due to the inflation that has spread to the sphere. real. This is a time of economic hardship, because she had no plans for the non-implementation of the Sixth Plan or the appreciation of the dollar. Public investment has fallen due to multiple liquidations and closures of state-owned enterprises. In view of this alarming state, structural adjustment programs have been requested by the Cameroonian state from the IMF and the World Bank. The latter agreed with conditionalities such as: devaluing the FCFA to revive the country's competitiveness in the international sphere, liberalize the economy through multiple privatizations to refocus production in the hands of the private sector, likely to create and multiply wealth; promote an austerity policy which aimed to allow the Cameroonian State not to live beyond its means, this measure has led on the social level to reduce the salary by nearly 66%, to restart the payment university fees, drastically lowering public investment, etc. It is also important to note on the political level the advent of democracy, which did not shake Cameroon badly, which would have facilitated a different vision of economic policies.

From 1995 to 2008, Cameroon returned to positive economic growth influenced by the measures taken during the previous period. These measures being necessary but not sufficient, the process of the Heavily Indebted Poor Countries Initiative (HIPIC) is underway. Aimed at promoting growth and reducing poverty, this process started with the three-year plan (1997-2000), at the decision point in 2000, passing through admission to the IPPTE in 2003 and reaching the point of completion in April 2006. The day after the completion point, Cameroon, through this breath of fresh air, resumed a policy of stimulus which can be observed through the revaluation of wages and expansionary public spending. The fight against corruption through the anti-corruption commission and the National Governance Plan has restored confidence to the private sectors in the real sector of the economy despite the hunger crisis of 2008. It is nonetheless important to note that the action of the donors during this period went in the direction of reviving the private sector through national private investment and foreign direct,

improving the well-being of the population through their consumption expenditure. It is evident that public and private investment and consumption have in one way or another impacted the level of growth during this period.

During the period 2008-2017, Cameroon experienced positive economic growth until 2014. This is well explained from the evidence of DSCE, and the advent of program budgets. On the other hand, the double security and oil shock disrupted macroeconomic forecasts in terms of economic growth. Cameroon has demonstrated economic resilience because of its economic diversification. It is important to note that many indicators such as consumption, investment have experienced a downward trend and this has contributed to the decline in economic growth. The economic and financial reform program was undertaken by the CEMAC States, to put the economy back on the path of economic growth from 2018.

In view of the above, it is important to note that there are causal relationships between investment, consumption and economic growth. The evidence for the magnitude of the aggregate variables (investment and consumption) is worrying. This is why, after the stationarity test, the autoregressive vector approach is used to know the extent and direction of the correlation between growth, public and private consumption on a part and; on the other hand, between growth, public and private investment. In addition to the introduction, the article is structured as follows: literature review (2), methodology (3), results and interpretation (4) and finally the conclusion.

## LITERATURE REVIEW

### Review of the theoretical literature

Domar (1946) in the post-Keynesian growth model shows that investment exerts a dual influence on the economy (Muet, 1993) on both the demand and the supply side.

On the demand side, the change in investment determines via the Keynesian multiplier principle ( $\Delta I \rightarrow Y \rightarrow C$  and  $R$ ), the level of income and aggregate demand. The income effect associated with an increase in investment  $\Delta I$ , is equal to  $\Delta I [1 / (1-c)]$  that is to say  $\Delta I [1 / s]$  where  $s = (1-c)$  knowing that  $c$  and  $s$  represent the marginal propensities to consume and save, respectively. In addition to investment considered to be a determinant of economic growth, consumption and exportation cannot fall outside this logic according to economic theories.

On the supply side, investment increases production capacity. The capacity effect stipulates that the investment must generate a stimulation of productive capacity, via the accelerator mechanism. Investment increases production capacities in a proportion equal to  $1 / v$  where  $v$  is the capital coefficient and corresponds to the inverse of the average productivity of capital, i.e.  $v = K / Y$  (where  $K$  is the capital stock and  $Y$  production). This approach places

investment as one of the factors of economic growth. The specific cases of public and private investments have not been highlighted and this is the reason why we disaggregate investment to measure its contribution to economic growth, via other factors such as savings, debt, private investment etc.

From the neoclassical model, Solow (1956) attributes the origin of per capita growth to the amount of technical capital invested (machinery, equipment, software, infrastructure). When per capita investment exceeds the amount of existing per capita capital depreciation, each worker has better equipment and can produce more. However, when capital per capita is increased, production increases, but not proportionately (this is the principle of diminishing returns).

The neoclassical model goes beyond the simple framework of physical goods to include human capital in all its forms: level of education, experience, health (Lucas, 1988). If the economy tends towards a stable equilibrium ratio between human capital and physical capital, this ratio may initially deviate from its long-term value. The magnitude of this gap will affect how quickly the per capita product approaches its equilibrium level. Therefore, Solow's model, which adds investment in human capital to investment in technical capital, both explains the convergence of certain countries and the inequalities between poor and rich countries. Convergence stems from the efforts of countries to invest in human and technical capital, thus catching up.

Mankiw et al. (1992); proposed to integrate the evolution of the quality of the workforce into the Solow model in order to better reflect the course of economic growth. This is justified by the fact that we can increase human capital by investing in the education system, in the health system, etc. Their analysis starts from the thesis that the accumulation of physical capital is not enough (in Solow's model) to explain the disparity in economic performance. Endogenous growth theories are therefore based on the idea that economic activity needs imperfect competition and public intervention. Thus, the production function of the economy is a Cobb-Douglas and is written:  $Y = K^a H^b (AL)^{1-a-b}$  with  $a > 0$ ,  $b > 0$ ,  $a + b < 1$ .  $H$  represents the stock human capital,  $L$  denotes the number of workers and  $K$  denotes the capital stock. Its intensive form is  $y = k^a h^b$  with  $y = Y / AL$ ,  $k = K / AL$  and  $h = H / AL$ . Its linear form gives  $\text{Log } y = a \text{Log } k + b \text{Log } h$

Knowing that the State intervenes from public investments in the socio-economic field (water, electricity, education, health, infrastructure, etc.), the following increased growth model should be tested:  $Y = K^a K_{pu}^b (AL)^{1-a-b}$  or  $Y = f(K_{pu}, K_{pr})$  With  $K_{pu}$  the public capital which is approximated by the gross fixed capital formation (GFCF) of the public sector and  $K_{pr}$  the private capital approximated by the GFCF from the private sector.

It follows from the above that investment is a determining factor of economic growth. Keynes' theory following the global supply and aggregate demand approach in a closed economy gives us the following relationship:  $Y = C + I + G$  with aggregate supply =  $Y$  and aggregate demand =  $C + I + G$ . This identity shows us that the contribution of consumption to economic growth or production is also important and will also be called the multiplier effect. So if the theory of endogenous growth situates investment and government intervention as a factor of growth, consumption cannot be marginalized from this logic through the multiplier effect that this could have. The revival of consumption could have two transmission channels in an economy, namely: an increase or stimulus to consumption which directly impacts production under the multiplier effect and a stimulation of consumption which will pass through investment to reach the production under the name of the relation "accelerator-multiplier effect".

It is ultimately important to note that all these theories make analyzes in a global way. While it is true that consumption and investment influence economic growth, these theories fail in that they do not take into account the sectoral aspects of all these variables such as energy consumption, public and private consumption, public and private investment etc. Our analysis is based on the analysis of disaggregated investment and consumption in relation to economic growth in the specific case of Cameroon.

### **Review of the empirical literature**

There is controversy surrounding the correlation between investment and economic growth on the one hand and consumption and economic growth on the other. Without ignoring the existing one between public investment and private investment, this section is about reviewing the studies that have already been carried out, in order to better position ourselves to guide our own. Thus, the first part focuses on the correlation between investment and economic growth, the second on the correlation between consumption and economic growth and the third part synthesizes the possibilities of the global correlations between all these variables.

De Long and al.(1991), De Long et al. (1992), Mankiw et al. (1992) have shown that investment plays a very important role in economic activity. They reveal that the rate of capital formation in the form of capital equipment plays a very important role in the process of economic growth. Blomstrom et al (1996) reject the hypothesis of the contribution of investment to economic growth. Using the causality test in the sense of granger and sims they find that it is economic growth that drives investment and not the other way around.

Further study by De Long and al. (1993) in developing countries shows that investment drives economic growth. More specifically, rapid growth is found when investment is high; and low when the investment is low. For a small open economy, the investment - growth nexus is



important. Because, the high ratio of investment has a positive effect on economic growth. Thus, an increase in economic growth is likely to lead to a high investment ratio. Studies by Yu (1998), Kwan et al. (1999), and Jun (2003) in the case of china find that investment is the key determinant of its spectacular economic growth. The results confirm the view that China's economy is an investment-driven economy. Therefore, pragmatic policy should be implemented by encouraging private investors. However, Qin et al. (2006) show that growth in capital stock and investment does not drive output growth in the short and long term; which goes against the results found in the case of china, hence the rejection of the hypothesis of the link between investment and economic growth.

Some studies have been concerned with studying the contribution of foreign direct investment and domestic investment on economic growth. Using the ordinary least squares method and the fixed effect method, Adams (2009) finds that domestic investment is strongly correlated with economic growth in sub-Saharan Africa. This study reveals that FDI has a negative effect on domestic investment and subsequently a positive effect. In addition, the sign and magnitude of the current and lagged FDI coefficient suggests a net crowding out effect. Following the study by Ozkan et al. (2011), using the Engle-Granger, Co-integration and Error Correction Model (ECM) method, investment has a direct effect on economic growth and has a causal effect in the case of Turkey.

In the context of Cameroon, the most recent study is that of Ngouhouo et al. (2014) who examine the causality between investment, savings and economic growth. Starting from a multivariate approach, they show that the link between these three macroeconomic variables on both theoretical and empirical levels is not well known. The highlighted VAR model, to which the Granger causality test is applied, reveals that there is a unidirectional relationship between growth towards investment on the one hand, and from investment towards savings on the one hand somewhere else. Njimante et al (2017), in an approach of the estimation system between debt, domestic investment and economic growth, they show that domestic investment positively and significantly influences economic growth in Cameroon.

Regarding the link between consumption and economic growth, it is important to note that there is an important literature on this link. However, a good deal of literature is concerned with the consumption of energy (electricity) on economic growth. This is because electricity plays a vital role in the production and consumption of goods and services in an economy. For example, Ferguson et al (2000) find a strong correlation between the use of electricity and economic growth and development in a study of over 100 countries. However, this strong correlation does not imply a causal relationship between energy consumption and economic growth.

According to surveys conducted by Payne (2010), 31.15% support the hypothesis of neutrality, that is to say an absence of a causal relationship between electricity consumption and economic growth. 27.87% support the one-way hypothesis, that is, the causality that goes from economic growth to the consumption of electricity; 22.95% support the hypothesis of the link between energy consumption and economic growth and 18.03% support the hypothesis of feedback, ie a reciprocal relationship between energy consumption and economic growth.

Recent studies by Belke et al. (2011) examine the long-term relationship between energy consumption and real GDP. It appears that international development dominates the long-term relationship between energy consumption and real GDP. There is indeed a double causality, but the price of energy consumption is elastic. Unlike Gurgul and Lach (2011) who study the causal link between GDP and coal consumption in economic policy. He finds the hypothesis of neutrality. In Bangladesh, the recent study by, Ahamad and Islam (2011), reveals that in the short term there is a one-way relationship ranging from electricity consumption to GDP per capita. This study indicates that, an increase in electricity consumption affects economic activity in Bangladesh in the short term and in the long term there is a two-way causality from electricity consumption to growth and vice versa.

In the context of Cameroon, the most recent study is that of Molem et al. (2016) who examine the effect of energy use on economic growth. The method of generalized moments has been highlighted. The results show that there is a positive and significant relationship between energy consumption and economic growth. This leads the authors to conclude that energy consumption plays a very important role in the Cameroonian economy.

While there is a link between sector-specific consumption (electricity) and economic growth in the case of Cameroon, the relationship between aggregate consumption and economic growth is problematic. Starting from this limit, this study takes into account the role of aggregate household consumption (public and private) as well as that of investment (public and private) by looking for the dynamic relationship between these variables and economic growth.

An econometric study carried out by the Department of Economic and Financial Studies (1996) in Morocco between consumption and investment shows that the increase in consumption in 1974 was mainly driven by the increase in public investment. The entry into the structural adjustment phase, from the beginning of the 1980s, made it possible to reduce the public investment rate in favor of a higher private investment rate. A 1% drop in public investment would lead to a 0.4% drop in overall investment. This effect acts above all on private investment. A drop in public investment, which contributes to a reduction in the foreclosure effect, can offset the direct negative effect of this drop on overall investment (through the interest rate and the renewed confidence of operators).



Zulkefly et al (2012) conducted a study on the causality test between investment, consumption and economic growth in malaria. From a structural error correction model, it emerges on the one hand that investment and consumption positively and significantly influence short-term economic growth. In the long run this impact is not significant but rather a significant effect of economic growth on consumption and investment. This is to say that, on the demand side, the tax policy highlighted stimulates investment and consumption, hence their impact on economic activity. Thus a supply policy would be necessary to stimulate economic activity in the long term.

Ngouhou and Ntavoua (2017) in a study of the channels of transmission of the effects of public investments in CEMAC, reveal that investment disaggregated into public and private investment influences the economic growth of CEMAC. They do indeed find that the scale of private investment is greater than that of the public. Among the channels of transmission of the effect of public investment, we have private investment, export, human capital etc. They recommended further promoting the public and private sector partnership, prior to the emergence of the area in 2025. The method of generalized moments and generalized double least squares have been highlighted to achieve these results.

In view of the above, it is a question for us of considering consumption as a macroeconomic aggregate before disaggregating it into public and private consumption. This represents the first limitation of the previous works that we want to highlight. Then the investment will not know any disaggregation with regard to its contribution to public and private consumption, but it will be disaggregated into public and private investment when it comes to determining its contribution to economic growth. This is one of the limitations of most works that are content to study the causality between public and private investment or simply the contribution of one or the other type of investment on growth. This analysis will allow us to measure the extent or sensitivity of these different types of investment to economic growth. It is a question of verifying the disaggregated investment-economic growth hypothesis, this from a causality test in the sense of Granger or a test of cointegration. Before implementing the estimation technique, we will first proceed by analyzing stationarity to avoid spurious regressions, which is not observed in most empirical studies.

## **METHODOLOGY**

### **General framework of VAR modeling**

Faced with the shortcomings of Keynesian-inspired macroeconometric models, Sims (1980) proposes a multivariate model whose only restrictions are the choice of the variables selected and the number of lags integrated. The VAR representation is however based on the

assumption that the evolution of the economy can be well approximated by the description of the dynamic behavior of a vector of  $n$  variables linearly dependent on the past.

### Model specification

Since the work of Sims (1980), econometric techniques based on VAR models have undergone many developments. The VAR model used in this paper essentially models the dynamic relationships between on the one hand the investment (INV) and a group of variables (public consumption-CPU, private consumption-CPV) and on the other hand the GDP which characterizes the economic growth and public investment (IPU) and private investment (IPV). The initial formulation in the mathematical form of the model which can be written as follows:  $INV = f(CPU, CPV, INV(-i))$  and then  $PIB = f(IPU, IPV, CPU, CPV, PIB(-i))$ ,  $i$  being the number of lags retained in each model. The econometric models are in the following form:

$$INV_t = \beta_0 + \beta_1 CPU_{t-i} + \beta_2 CPV_{t-i} + \beta_3 INV_{t-i} + \varepsilon_t \quad (1)$$

$$PIB_t = \alpha_0 + \alpha_1 IPU_{t-i} + \alpha_2 IPV_{t-i} + \alpha_3 CPU_{t-i} + \alpha_4 CPV_{t-i} + \alpha_5 PIB_{t-i} + \mu_t \quad (2)$$

$i$  varies from 1 to 3 for model (1) and from 1 to 4 for model (2);  $t$  being the annual observations. The econometric specification is that of a VAR model as developed by Johansen (1991). The idea behind cointegrating models is that in the long run, if two or more variables move together, then a linear combination of these variables could be stable around a fixed mean. If there is a long term relationship between these variables, then the disturbance follows a stationary process. It is therefore important before the estimation, to first evaluate the stationarity of each variable of the model (the ADF- Augmented Dickey-Fuller test) and to proceed secondly to the cointegration test (the Johansen test). . The Johansen test is used when the variables considered are integrated in a different order. While the Angle and Granger Cointegration Test is only used when the variables have the same order of integration, the Johansen test respects the constraint.

### Estimation technique

The Johansen cointegration test is considered to be a tool for verifying the existence of a cointegration relationship between integrated variables. For the first model, the result of the test presented in the appendix shows that there is no cointegrating relationship between investment and consumption expenditure. On the other hand for model 2, we can already conclude that there is no cointegration relation in the sense of Granger because the series do not have the same order of integration. Therefore, we cannot build an error correction vector model (VECM). The autoregressive vector model (VAR) is the most suitable for our study.

Determining the optimal delay number is necessary to perform the VAR model. To do this, two information criteria were used [AKAIKE (AIC), Schwarz (SC)]. Knowing that the Selection Principle is to keep the number of delays which corresponds to the one which minimizes the two selection criteria. In our study, the results presented in the appendix allow us to retain the delay number 4 for the first model, ie we will estimate an autoregressive model of order four VAR (4). On the other hand, for the second model, we retain the number of delay 3, that is to say that we will estimate an autoregressive model of order three VAR (3).

The data used for the analysis of the VAR model come from the National Institute of Statistics of Cameroon (INS). Secondary data in a longitudinal sectional study from 1993 to 2015.

## RESULTS AND DISCUSSION

### Unit root test results

To determine the degree of stationarity or the order of integration of the model variables, we use the Augmented Dickey Fuller test (ADF). The following table shows the unit root test results for all variables taken individua.

Table 1: Unit root test results

Variables	calculated t-student	t-student read	Order integration	Decision
<b>INV</b>	3.748	-2.660***	<b>I(0)</b>	Stationary
<b>CPU</b>	7.829	-2.660***	<b>I(0)</b>	Stationary
<b>CPV</b>	14.296	-2.660***	<b>I(0)</b>	Stationary
<b>PIB</b>	16.135	-2.660***	<b>I(0)</b>	Stationary
<b>IPU</b>	2.149	-1.950**	<b>I(1)</b>	Stationary
<b>IPV</b>	2.567	-1.950**	<b>I(0)</b>	Stationary

Note: Stationary at \*\*\* = 1% ; \*\* = 5% ; \* = 10%.

### Investment estimate results

The objective of autoregressive vector modeling is to describe the interdependencies between all of the variables. The results of this modeling allowed us to determine several relationships between the variables studied in model 1 and 2.

Table 2 presents the estimates of model 1 with investment, public and private consumption as explained variables. The explanatory variables of the model used explain the variables explained at 99%, which testifies to the goodness of the specification of said model. The table shows that there is a reciprocal influence between investment, public and

private consumption. Indeed, the investment delayed by one and four periods negatively influences the investment. Increasing investment four after by 1% results in decreasing current investment and private consumption. The 1% increase in investment results in a decrease in investment and private consumption of 0.3474% and 0.2378% respectively. Public consumption delayed for a period has a significant and positive influence on investment but negatively on private consumption. The 1% increase in public consumption results in all other things being equal to an increase in investment of 2.8247 and that same increase results in a decrease in private consumption of 1.2913. Public consumption delayed by two periods influences significantly and negatively on investment but positively on private consumption. The 1% increase in public consumption results in all other things being a decrease in investment of 3.0231, and the same increase results in an increase in private consumption of 1.4414. Public consumption delayed by three periods significantly and negatively influences private consumption. An increase in this consumption of 1% leads to a decrease in private consumption of 2.4282%.

Table 2: Parameter estimates for model 1

<b>Vector autoregression</b>			
<b>Sample: 1993 à 2015.</b>			
<b>Variables</b>	<b>INV</b>	<b>CPU</b>	<b>CPV</b>
<b>INV (-1)</b>	0.5185(0.007)	-0.0289(0.493)	-0.1395(0.178)
<b>INV (-2)</b>	0.0785(0.739)	0.0629(0.220)	0.5216(0.000)
<b>INV (-3)</b>	-0.0761(0.666)	-0.2008(0.000)	0.0555(0.555)
<b>INV (-4)</b>	-0.3474(0.073)	-0.1878(0.000)	-0.2378(0.021)
<b>CPU (-1)</b>	2.8247(0.000)	0.1721(0.305)	-1.2913(0.002)
<b>CPU(-2)</b>	-3.0231(0.003)	0.1188(0.593)	1.4414(0.008)
<b>CPU (-3)</b>	0.6514(0.587)	-0.3395(0.193)	-2.4282(0.000)
<b>CPU (-4)</b>	0.6262(0.473)	0.9351(0.000)	2.5568(0.000)
<b>CPV (-1)</b>	0.9115(0.000)	0.0257(0.620)	0.6957(0.000)
<b>CPV (-2)</b>	-0.8460(0.008)	-0.0407(0.556)	0.0791(0.642)
<b>CPV (-3)</b>	0.4669(0.155)	0.0372(0.602)	0.0791(0.331)
<b>CPV (-4)</b>	-0.4309(0.152)	0.2295(0.000)	0.3555(0.027)
<b>C</b>	-413.6(0.114)	-446.8(0.000)	216.8(0.122)
<b>R<sup>2</sup></b>	0.9927	0.9988	0.9995

Significant: P-value is less than 10%

### Economic growth estimation results

The table shows that the different estimates explain at least 99% of the explained variables. The estimate of economic growth shows that the lagged GDP of all three periods positively influences current GDP. Transversely, growth significantly influences public investment (negatively) and private investment (positively). Indeed, when the GDP increases by 1%, public investment decreases 3.01036%. This can be explained by growth that does not release sufficient fiscal resources to allow the State to undertake investments. This increase of one unit leads to an increase in private investments of 1.2288 units which can be explained by new investors or the diversification of private investments. GDP growth has no significant effect on public and private consumption, which could be explained by activities that do not improve the living conditions of the population.

Delayed public investment of all late orders impacts current investment. Increasing the IPU by one unit results in an increase in GDP of 0.8847 units. Despite the reciprocal correlation, it is important to note that the orders of impact are different. This impact can be explained by the fact that the state budgets have been growing for some time with a percentage dedicated to significant investments. The evidence of program budgets also explains this positive impact. Public investment also has a significant effect on private investment which can be explained by the efforts of the state to promote good governance.

Delayed private investment of all orders of delays significantly influence current private investment. It significantly influences economic growth. In fact, increasing the IPV by one unit leads to an increase in economic growth of 0.6625 unit, all other things being equal. This is explained by the ease of business creation and especially in less than 48 hours in Cameroon. Despite the degree of impact and meaning, it is important to note that there is also a reciprocal relationship between economic growth and private investment. And compared to public investment, there is a negative impact of public investment. This shows that the public-private partnership is still not what is expected and that the state must further ensure that there is a perfect relationship of symbiosis between these investments. Note a reciprocal relationship between these two types of investment despite the direction and order of impact. The table shows a reciprocal relationship between CPU and GDP. Public consumption significantly influences growth, private and public investment of a different order. Private consumption also has an impact on all the other variables, namely GDP, IPU and IPV.

Table 3: Parameter estimates for model 2

<b>Vector autoregression</b>					
<b>Sample: 1993 à 2015.</b>					
<b>Variables</b>	<b>PIB</b>	<b>IPU</b>	<b>IPV</b>	<b>CPU</b>	<b>CPV</b>
<b>PIB (-1)</b>	1.4794(0.000)	-0.2611(0.359)	-0.4676(0.167)	0.1571(0.163)	1.1225 (0.000)
<b>PIB (-2)</b>	1.0253 (0.022)	-3.1036(0.000)	1.2288(0.028)	0.1233(0.507)	-.2018(0.659)
<b>PIB (-3)</b>	1.2326 (0.016)	-0.6034(0.263)	-2.4721(0.000)	0.3768(0.078)	.4124(0.433)
<b>IPU (-1)</b>	0.8847 (0.001)	-1.3132(0.000)	0.9060(0.007)	0.1057(0.344)	0.5050(0.066)
<b>IPU (-2)</b>	0.2578 (0.306)	-1.2104(0.000)	1.7858(0.000)	-0.0526(0.616)	0.3042(0.239)
<b>IPU (-3)</b>	0.1555 (0.558)	-2.3308(0.000)	2.5724(0.000)	0.0497(0.653)	-0.1292(0.636)
<b>IPV (-1)</b>	0.6625 (0.000)	-0.8800(0.000)	0.9966(0.000)	0.0661(0.257)	0.1665(0.247)
<b>IPV (-2)</b>	0.6287 (0.002)	-0.3507(0.101)	-0.5974(0.019)	0.0208(0.806)	0.2110(0.312)
<b>IPV (-3)</b>	-0.3397 (0.054)	-0.2755(0.137)	0.4287(0.052)	-0.189(0.010)	-0.0635(0.725)
<b>CPU (-1)</b>	0.5231 (0.332)	-1.1337(0.046)	2.5331(0.000)	0.546(0.015)	-1.7552(0.002)
<b>CPU (-2)</b>	-4.7237 (0.000)	6.7734(0.000)	-6.9348(0.000)	-0.5521(0.180)	0.0941(0.926)
<b>CPU (-3)</b>	0.9971(0.216)	0.2666(0.753)	5.3296(0.000)	0.0639(0.849)	-0.1422(0.864)
<b>CPV (-1)</b>	-0.8682(0.063)	1.5588(0.002)	1.2285(0.036)	-0.2722(0.163)	-0.2029(0.673)
<b>CPV (-2)</b>	-1.9733(0.000)	1.9745(0.000)	-0.1896(0.746)	-0.33(0.089)	-0.6449(0.180)
<b>CPV (-3)</b>	-0.6124(0.173)	1.8634(0.000)	0.5687(0.312)	-0.038(0.835)	0.2514(0.586)
<b>C</b>	-1577.3(0.023)	943.9(0.197)	2886.9(0.001)	-640 (0.027)	-665.0(0.352)
<b>R<sup>2</sup></b>	0.9997	0.9627	0.9954	0.9984	0.9993

Note: P-value in parenthesis

## CONCLUSION

It was about studying the relationship between investment, consumption and economic growth. After having determined the orders of delays, we proceed to the Johansen tests because all the variables have the same maximum order of delays. It is 4 in the investment estimate and 3 in the economic growth estimate. After having disaggregated consumption into public and private consumption, the results show reciprocal correlations between these variables despite the fact of the differences through the direction of causality and even the order of delay. First, the investment delayed by one and three periods significantly influence the current investment. Then, investment influences public consumption at orders 3 and 4; and private consumption at order 2. On the other hand, public consumption influences investment for its part at order 1 and 2; the same for private consumption.

Regarding the investment estimate, the same scenarios can be observed. But what is important is to note that there is a reciprocal correlation between economic growth and investments (public and private) on the one hand, and on the other hand between public and private investments.



In view of these results, the influence varying from one order to another gives us to say that the State of Cameroon must further pursue its strategy of improving business climates and the promotion of public and private partnership in order to encourage in a common order, the influences or the reciprocal impacts noted above for a sustainable and inclusive growth favorable for the revival of national consumption. Also, it must rethink public and sectoral policies that include wealth and promote economic growth and employment. This study could be oriented by disaggregating public and private investments by sector of activity, to better see the contribution of each sector to economic growth.

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