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The Empirical Analysis of Private Investment Behaviour on Growth Process in Cote d'Ivoire

DRAMA Bedi Guy Hervé[1]Ph.D.

Abstract

This study analyses and highlights the impact of private investment function on the process of economic growth in Côte d'Ivoire. Based on time series data from 1980 to 2016, a multiple linear regression model allowed us to assess the effect of private investment on the growth process using a two-stage cointegration method couple with error correction model. The empirical investigation results show that public investment, credit to the private sector, external debt link positively with private investment in long term. Moreover, real exchange rate and public investment, external debt and growth crowd in private investment in short run. These results also show that public investment plays an essential role in the function of private investment in the Ivorian economic growth process. The study therefore encourages government policy makers to continuously improve business environment for domestic private investment and creating other small and medium-sized enterprises to be globally expanded.

Key words: Private investment, Public investment, Growth, Cointegration, Error correction.

JEL Classification : E27, E70, F43

1. Introduction

In the 2000s, the political-military crisis further annoyed the fragility of the Ivorian economy. But following some political agreements for the reunification of the country, the normalization of the political situation (by creating a relatively peaceful political climate) has allowed the rehabilitation of public infrastructures as well as the gradual return of the confidence of the private sector. Although the post-election crisis of 2010 reduced overall investment and pushed investors back, Côte d'Ivoire has enjoyed remarkable economic success since 2012. It recorded a strong growth of 9.5% of DGP in 2015 driven by structural investments in growth-generating sectors. Among these structuring investments, private investment represents 10.7% of GDP in the growth process. In fact, the government has adopted two national development programmes (NDPs) for Ivorian economic growth. The first NDP was to invest in infrastructure (2012-2015) and the second in the period 2016-2020, which implies the structural transformation of Côte d'Ivoire into a middle-income economy by 2020 with a view to further reducing the poverty rate. In this context, it seems important to us to analyze the impact of private investment function on the growth process in Côte d'Ivoire.

In addition, the nature and intensity of the relationship between domestic investment and its determinants is also a warm topic for researchers particularly in countries with low economic growth. To return to the literature, there are various studies in this field. Montmartin, (2013) addressed the intensity of private R&D investment in OECD countries impact and complementarily of R&D financial support in a dynamic panel model over the period (1990-2007). He found that only indirect aid significantly influences the intensity of private R&D. In the case where there is a substitution effect between direct and indirect aid within a country, a certain complementarily appears between these internal measures and the measures put in place by other countries.

[1] Department of Economics, University Peleforo Gon of Korhogo. , Republic of Cote d'Ivoire,
E-mail: dramsiben.upgck@gmail.com

Kamgnia and Mama, (2001) worked on private investment function in Cameroon: a tightening of the financial constraint in an econometric model "of accelerator-credit rationing" as part of a two-stage error-correction model over the period (1969-1993). Their results have helped to clarify the relationships between private investment and some of its determinants. Their results also showed that external debt reduces the effects of private sector credit on private investment. In adding up, investment spending significantly affects private investment rather than the budget deficit but in a negative way. And the shocks on private investment observed in a given year are fully absorbed in a year. In 1986, Michel worked on the dynamics of capital accumulation in the presence of market constraints in a simple model to study the gap between the market constraint period and investment reduction decisions. And the second model is to see the influence of demand oscillations on optimal investment and the adjustment of supply to fluctuating demand. He found that market constraints increase the marginal value of capital and encourage firms to invest more. His study also showed that fluctuations have no specific effect only if demand always remains higher than the optimal unconstrained supply. But if supply and demand evolves according to the same trend, fluctuations in demand generate an endless succession of alternating regimes of excess supply and excess demand.

In addition, excess supply is decreasing and supply tends to adjust to the fluctuating demand floor. In a two-regime model (Tobin's Q-accelerator), Epaulard, (1993) discusses the contribution of Tobin's Q to investment modeling in France. Thanks to the empirical relevance of Tobin's Q approach, she was able to describe the investment function of French companies. The results of his study showed that companies suffer adjusted costs on capital and returns are not necessarily constant on labor. Dje, (2007) analyses the determinants of FDI investment in developing countries: the findings for WAEMU in an econometric model of panel data over the period 1980-2002. These results show that economic openness, investment rate, public investment rate, and human capital are the determinants of FDI. And that it is interesting for WAEMU countries to adopt attraction policies based on its main factors in order to increase FDI in the area. Keho, (2011; 2012) discusses the role of institutional factors in financial and economic development in UEMOA countries in a panel data model over the period (1984-2005). He's research demonstrates that bureaucracy, control of corruption, democracy, respect for law and order and government stability are the most critical aspects of the institutional environment for financial sector development and growth in UEMOA. According to him, uncertainty leads banks to ration credit to private agents and to a preference for government securities that offer more collateral. This situation is reinforced by the deficit position of countries' public finances.

Morrissey and Manop, (2012) worked on the governance of private investment and foreign direct investment in developing countries through dynamic panel methods over the period (1996-2009). Their results suggest that FDI and private investment are high in countries with good governance, there is evidence of crowding out (FDI displaces domestic investment) and its extent is related to governance. According to these authors, the governance indicators that have the greatest influence on private investment are corruption and political instability. These authors found that political stability is the most important aspect of governance in terms of the relationship between FDI and domestic private investment. Carriou and François, (1997) analyzed continuing training in companies and its return on investment over the period (1987-1992). In their study they used three differents models of the cross-sectional production function: the Cobb-Douglass function; a model with delay, accumulation and obsolescence effect and a model with factor substitution effects and formation saturation. Their study showed that continuous training contributes to increasing the added value generated by the company. This is what attests to its introduction into the production functions of different types of models. Thus the results of these models make it possible to perceive continuing training as investment thanks to decreasing returns, complementarily with capital and substitutability with work. In 2016, Attefah and Dawud,(2016) analyzed using an OLS approach to model the determinants of private investment in Ghana in a multiple linear regression model. They found that private investment is explicitly determined by public investment, inflation, interest rates, exchange rates, openness, taxes, foreign debt, private sector credit and democracy.

Most of the variables in their study are significant and there is a disconnect between public and private investment in Ghana. Ajide and Olukemi, (2012) modeled the long-term determinants of national private investment in Nigeria using the ARDL method "developed by Pesaran et al; (2001) over the period (1970-2010). Their findings show that public investment, real GDP, real interest rates, exchange rates, private sector credit, terms of trade, external debt and reforms are the main long-term determinants of domestic private investment in Nigeria, while public investment, real GDP and terms of trade are statistically significant in the short term.

Tchouassi, (2014) analyses private capital and the investment climate for economic growth: empirical lessons based on the ARDL-related test technique to examine the relationship over the period (1960-2011). These results showed that in the short term there is a significant relationship between private capital, the investment climate and economic growth in Cameroon, Côte d'Ivoire, South Africa and Zambia and a long-term relationship between the variables. This implies that there is a long-term cointegration relationship between the variables in Cameroon, Côte d'Ivoire, South Africa and Zambia.

But the test of the ARDL specification and the proxies of multidimensional economic freedom suggest that the results obtained are not all significant. Tchouassi and Ngwen, (2014) study private and public investment in Africa: a cross-sectional time-series analysis using panel data for the period 1980-2010. In their analysis they did not find a complementary effect between private and public investment but rather a substitution effect between them. Their results also showed that public investment, gross domestic product, trade openness, external debt stocks are all significant with the exception of credit to the private sector and public investment negatively affects private investment.

Similarly, liberalization policies, state disengagement and macroeconomic performance in developing countries are dependent on renewed growth. For this purpose, the conditions for the success of effective policies in the growth process are numerous, but better promotion of private investment is needed, hence the dynamism of the private sector. According to the OECD, private investment is one of the most important factors in boosting a country's economic growth. In this context, it seems important for us to analyze the impact of private investment function on the growth process in Côte d'Ivoire. The question arises is: how could private investment in Côte d'Ivoire contribute to Ivorian economic growth? In other words, what are the factors that influence private investment in the Ivorian economy? The overall objective of this study is to analyze and highlight the impact of private investment function on the process of economic growth in Côte d'Ivoire. The rest of the paper is organized as follow. Section 2 explores the conceptual framework and the data sources, the methodology applied for the empirical investigation is explained in section 3, the section 4 deals with the results and interpretations, the section 5 finally conclude.

2. Conceptual Framework ,Model Specification and data sources

To conduct our study, we are interested in the work of Kamgnia and Mama, (2001). In 2001, their research "Private investment function in Cameroon: a tightening of financial constraint in a credit accelerator-rationing model", the authors specify that companies seek to maximize their profit, i.e. their net turnover in terms of wages and return on capital. In addition, they indicate that in the presence of a financial constraint, firms adjust their function according to the profits they generate. They are based on an updated profit model that we are trying to analyze:

$$\sum \frac{1}{(1+r)^t}\left[P_t Y_t - w_t L_t - p_t I_t\right] \quad (1)$$

With $K_t = (1-\delta)K_{t-1} + I_t \Rightarrow I_t = K_t - (1-\delta)K_{t-1}$ and

$$Y_t = F_t(K_t, L_t) \quad f_K^{'} > 0,\ f_L^{'} > 0,\ f_K^{''} < 0,\ f_L^{''} < 0 \quad (2)$$

If we incorporate Y_t and I_t in equation (1) we obtain (3) written as follow:

$$\sum \frac{1}{(1+r)^t}\left[P_t F_t(K_t, L_t) - w_t L_t - p_t(K_t - (1-\delta)K_{t-1})\right] \quad (3)$$

Where P_t is the production price, Y_t the production, L_t represents the labour level, I_t is the private investment, r is the interest rate supposed to be constant through time t, w_t is the labour cost, the equipment price is depicted by p_t and δ_t the annual depreciation of capital.

Either that defines the cost of using the capital and can be written as follows:

$$c_t = p_t\left[1 - \frac{1-\delta}{1-r}(1+p_t^a)\right] \text{ as } p_t^a \text{ is the anticipated price of the equipment.} \quad (4)$$

From the first order condition we have:

$$\frac{\partial \pi}{\partial K_t} = 0 \Rightarrow \frac{1}{(1+r)^t}\left[P_t f_K^{'} - c_t\right] = 0 \Rightarrow P_t f_K^{'} - c_t = 0 \Rightarrow P_t f_K^{'} = c_t \quad (5)$$

With $f_K^{'} = \frac{\Delta Y_t}{\Delta K_t}$ we obtain equation (6) bellow :

$$\frac{\Delta Y_t}{I_t} = c_t \Rightarrow I_t = \frac{\Delta Y_t}{\frac{c_t}{P_t}} \text{ with } \Delta K = I \quad (6)$$

By incorporating log we get equation (7):

$$LogI_t = \theta_0 + \theta_1 Log\Delta Y_t + \theta_2 Logc_t + \theta_3 LogP_t + \gamma_t \quad \text{with } \theta_2 < 0 \ ; \ \theta_3 < 0 \quad (7)$$

Starting from equation (7) we specify the model of our study as follows:

$$LogPRI_t = \theta_0 + \theta_1 LogPUBI_t + \theta_2 LogGDH_t + \theta_3 LogPCR_t + \theta_4 LogEXD_t + \theta_5 LogREX_t + \theta_6 LogPINS_t + \varepsilon_t \quad (8)$$

Where $LogPRI_t$ represents domestic private investment, $PUBI_t$ is public investment, the gross domestic product per capita is depicted by $LogGDH_t$, $LogPCR_t$ is the domestic private credit ,the external debt is illustrated by $LogEXD_t$, the real effective exchange rate is depicted by $LogREX_t$ and is the political stability $LogPINS_t$. The study variables to analyse the impact of private investment function on the growth process in Côte d'Ivoire were selected following the theoretical and empirical examination. The research also only concerns secondary data. These data from the study covering the period 1980-2016 from two different sources such as BCEAO and the World Bank (World Development Indicators). Domestic credit to the private sector as percentage of GDP, real effective exchange rate (REX) base 2010=100, stocks of external debt (EXD) as percentage of exports of goods, services and primary income in 2017 discounted and gross domestic product (GDP) per capita at constant price in 2016 discounted were obtained from the World Bank for the period 1980-2016. Private investment (PRI) and public investment (PUBI) were also obtained from BCEAO data over the same period 1980-2016. The dummy variable is constructed to see the years in which Côte d'Ivoire experienced political instability. During our study period we note 1 for year of political instability and 0 otherwise.

3. The methodology applied for empirical investigation.

This point is devoted to the analysis of the different statistical properties related to stationary and cointegration of variables, in order to determine the appropriate method to estimate our model. Indeed, the first test to be performed is those of the stationary of the variables. If the latter reveals that all variables are stationary in level, then the Ordinary Least Square (OLS) method can be applied directly. However, if the variables are not stationary in level, cointegration theory will be used. In fact, this theory shows the existence of one or more long-term relationships between the variables to be studied. If there is no cointegration relationship between our variables, then the vector autoregressive (VAR) model will be used. Otherwise, an error-correction model (ECM) or a vector error-correction model (VECM) is considered as appropriate.

4. Empirical results and interpretations

4.1. Empirical results

First of all, we will conduct the stationary test. As we know, the stationary test is one of the most important steps in time series. Indeed, to work with time series, they must maintain a constant distribution (mathematical expectation and variance) over time. If the characteristics, i.e expectation and variance, are changed over time, this is called non-stationary series. In the case where the characteristics are invariant, we speak of stationary series. Several tests exist to account for the stationary or non-stationary nature of the variables. For our study, we adopt the test of Augmented Dickey Fuller, (1979) and Phillips Perron, (1988). The results are reported in chart 1 below.

Chart 1: **Unit root tests**

Variables	Level		First Difference		Order of Integation
	ADF		PP		
$LogPRI_t$	-0,214	-0,515	-4,952*	-5,019*	**I(1)**
	(-2,948)	(-2,948)	(-2,951)	(-2,951)	
$LogPUBI_t$	-0,177	-0,002	-5,084*	-5,095*	**I(1)**
	(-2,948)	(-2,948)	(-2,951)	(-2,951)	
$LogGDH_t$	-0,884	-1,118	-5,291*	-5,418*	**I(1)**
	(-2,948)	(-2,948)	(-2,951)	(-2,951)	
$LogPCR_t$	-1,387	-1,424	-2,355*	-4,848*	**I(1)**
	(-2,948)	(-2,948)	(-2,954)	(-2,951)	
$LogEXD_t$	-2,807	-2,886	-6,204*	-6.2559*	**I(1)**
	(-2,948)	(-2,948)	(-2,951)	(-2,951)	
$LogREX_t$	-0,025	-0,215	-5,392*	-5,426*	**I(1)**
	(-2,948)	(-2,948)	(-2,951)	(-2,951)	
$LogPINS_t$	-4,439*	-4,351*	-	-	**I(0)**
	(-2,948	(-2,948)			

Source: Computed by the author

The asterisks *, **, and *** denote statistical significance at 1%, 5%, and 10% levels, respectively. **I(0)** and **I(1)** indicate the order of integration at level and first difference respectively.

The table results show the presence of unit root in level i.e. non-stationary of the variables except for political instability which is stationary at level in both tests. By account the first difference shows a lack of unit root. This means that the variables are integrated in order I(1). Therefore, there is a long-term relationship between the variables, which leads us to perform the cointegration test of the variables.

Secondly, we will proceed with the cointegration test. Several tests are used to test the cointegration of variables. However, two main approaches are usually utilized. These are the approach of Johansen, (1998) and Engle and Granger, (1987). In our study, the approach used is that of Engle and Granger, (1987). Indeed, this approach is effective on integrated series of the same order, which leads us to assume that all our series are integrated of order (I). This Engle and Granger cointegration test is done in two steps. First, the first step will be to estimate the long-term relationship using the least ordinary squares (OLS). Then, the second step will consist in testing the stationary of the estimated residue. The regression on which this text is based is formulated as follows.

$$\Delta\hat{e}_t = \rho\hat{e}_{t-1} + \sum_{t=1}^{p}\eta\Delta\hat{e}_{t-1} + \psi_t \quad \text{with } \psi_t \text{ a white noise.} \qquad (9)$$

We test the null hypothesis $H_0 : \rho = 0$ again the alternative hypothesis $H_1 : \rho < 0$. If the residuals are stationary, we conclude that the series are cointegrated. In so doing, the first step consist to perform the linear multiple regression with the ordinary least square methodology by utilizing the model specify in equation (8) formulated above. The results are highlighted in the chart 2 bellow.

Chart 2: Long run estimation

Dependent variable $LogPRI_t$			
Variables	**Coefficients**	**T-statistic**	**Prob**
$LogPUBI_t$	0.374*	3.315	0.003
$LogGDH_t$	0.444	1.095	0.283
$LogPCR_t$	-0.185***	-1.979	0.057
$LogEXD_t$	-0.372*	-3.067	0.005
$LogREX_t$	-1.904*	-3.979	0.001
$LogPINS_t$	-0.028	-0.406	0.688
Constant	12.472*	6.692	0.000

Source: Computed by the author. **Note:** $R^2 = 0.959$ mean that the model is well specified, the adjusted is $\bar{R}^2 = 0.949$. The asterisks *, ** and *** implies statistically significant at 1%, 5% and at 10% level respectively.

The residual series from this regression is recovered. For the estimated relationship to be cointegrating relationship, the residue from the regression must be stationary. Otherwise we have a fallacious regression. In the same order, the second step consists to perform the unit root test of the residuals. The results are summarized in the chart 4 bellow.

Chart 4: **Residual unit root test**

	ADF	**PP**
Statistics	-4.151	-4.059
Critical value at 5%	-3.633	-3.633

Source: Computed by the author

The statistics of the augmented Dickey-fuller and Phillips-Perron tests all report values below the critical values at 5%. We therefore deduce that the series of residues resulting from the static equation is stationary. Therefore, the series are cointegrated. It is also possible to estimate the error-correction model (ECM). After using the two-step method, we will introduce the error correction term (ECT_{t-1}) into the first difference model that was generated when estimating the long-term relationship. The results of the error-correction model are given in chart 5 below with $k = 1$.

Chart 5: **Short run model estimation**

Dependent variable	$DLogPR$; $k=1$		
	Coefficients	**T-Statistics**	**Prob.**
$DlogPUBI_t$	0,359*	2,730	0,013
$DlogGDH_t$	0,537	0,851	0,405
$DlogPCR_t$	0,499	1,309	0,206
$DlogEXD_t$	-0,002***	-1,959	0,095
$DlogREX_t$	-1,519**	-2,163	0,044
$DlogPINS_t$	-0,069	-0,985	0,337
$DlogPUBI_{t-1}$	0,269	1,306	0,207
$DlogGDH_{t-1}$	-0,078	-0,542	0,594
$DlogPCR_{t-1}$	-1,299***	-1,777	0,092
$DlogEXD_{t-1}$	-0,179	-0,435	0,669
$DlogREX_{t-1}$	-0,001	-0,139	0,891
$DlogPINS_{t-1}$	1,475	1,560	0,135
$DlogPUBI_{t-1}$	0,065	0,917	0,371
ECT_{t-1}	-0,799*	-2,996	0,007

Source: Computed by the author. **Note**: The asterisks *, ** and *** implies statistically significant at 1%, 5% and at 10% level respectively. k is lag value obtained by using the AIC and the BIC criterion. D is differentiated operator.

Our results show that the error-correction representation is therefore validated, since the coefficient associated with the return force, which is equal to -0.799, is negative and significant at the conventional level. This reflects that about 79.90% of the imbalance in period $t-1$ is corrected in t. The error-correction model is not reduced to a single equation. But here, we assume that it is reduced to a single equation because we formulate the hypothesis of low exogeneity of the explanatory variables Keho, (2011). It would then be interesting to test this hypothesis in the next step in order to perform the various classical tests (autocorrelation, heteroskedasticity, normality, stability, Ramsey test) on our model. The results of these various tests are illustrated in chart 6 and figure 1 below.

Chart 6: Diagnostic tests

Jarque Bera $F-statistic$	3.219 (0.896)
LM test $F-statistic$	2.123(0.139)
White test $F-statistic$	1.679(0.162)
Fisher $F-statistic$	111.594(0.000)

Source: Computed by the author

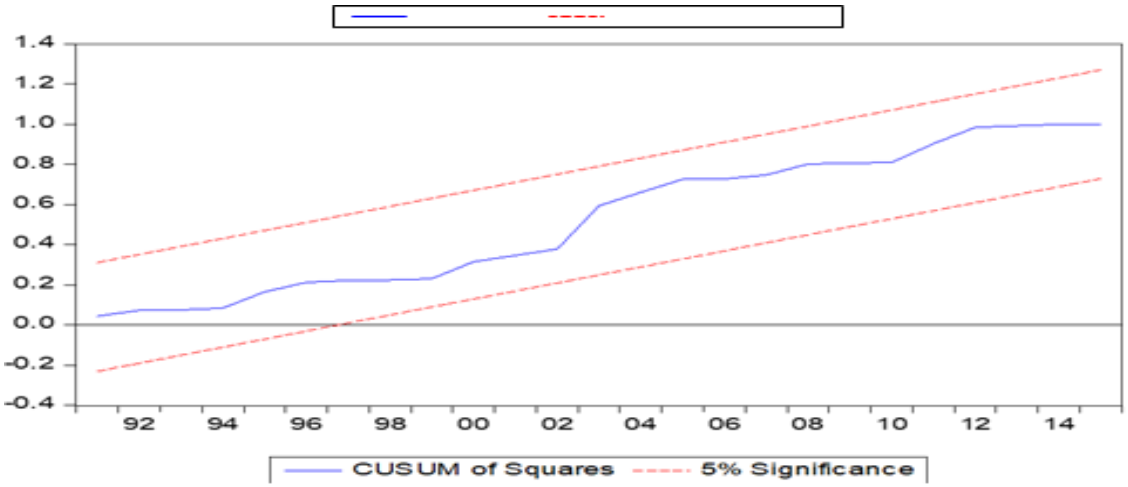

Figure 1: **Plot of cumulated sum squarre.**

Our model also passed the Jarque and Bera, (1987) test for normality without any serious pain. The computed Breusch–Godfrey Lagrange multiplier LM statistic shows no evidence of serial correlation and heteroscedasticity (White test). The coefficient of determination is quite acceptable with significant Fisher Statistic. In the regression analysis, the stability of coefficients is considered to be essential for policy purposes. In order to verify the stability of our models coefficients, we performed the CUSUM square Brown et al. (1975) to test the parameters stability of the regress model. Figure 1 above displays the cumulative sum of residuals plot. We have applied CUSMUS of Square tests and recursive coefficients to check the stability of the domestic private investment function. The overall model appears stable and correctly specified given the CUSMUS of Squares test statistics not exceed the bounds of the 5 per cent level of significance. So we strongly conclude that long run relationships exist between domestic private investment and its determinants in long run.

4.2. Empirical results interpretations

In the long-term affiliation, the regression shows us that the coefficient of determination is 0.959 and the adjusted coefficient of determination is 0.949 (chart 2). This reflects that about 94.9% of the variation in private investment is explained by our study variables and that about 95.9% of the variation in private investment is taken into account by the factors mentioned so our model is exhaustive. In addition, the model is statistically and globally significant with a Fisher statistic of 111.594 and a probability of 0.000. This means that private investment is strongly explained by public investment, GDP, private sector credit, external debt, the real exchange rate and political instability. However, the coefficient of the constant is positive, large and statistically significant at the 1% level because the 1% increase in exogenous variables will increase private investment by 12.472% on average. These studies results are consistent with the results of Attefah and Dawud, (2016) conducted for Ghana where if the exogenous variable (s) increase by 1%, private investment, on average, would increase by about 6.39%.

Our results from the long-term relationship show that public investment, private sector credit, external debt and the real exchange rate are statistically significant at the 1% and 10% level. Indeed, Public investment compared to private investment has a positive and statistically significant coefficient at the 1% level. This shows that there is a ripple effect between public and private investment in Côte d'Ivoire, hence the positive impact. This result reflects that a 1% increase in public investment will increase private investment by 37.4%.

It does not mix with empirical studies by Kamgnia and Mama, (2001) in Cameroon; Attefah and Dawud, (2016) in Ghana and Ajide and Olukemi, (2012) in Nigeria, which showed that public investment crowded out private investment in their studies, which is not the case in our frame. Then, credit to the private sector is negatively significant at the 10% level. This reflects that 1% increase in credit to the private sector will reduce private investment by 18.5%. Hence, the negative coefficient shows that the supply of credit to the private sector has a negative impact on private investment that is incompatible with economic theory. This result is still consistent with those obtained by Attefah and Dawud, (2016) in Ghana and by Tchouassi and Ngwen, (2014) in Africa, but in contrast to studies conducted by Ajide and Olukemi (2012) in Nigeria and Kamgnia and Mama, (2001) in Cameroon which concluded that credit to the private sector has a positive impact on private investment. Furthermore, the external debt ratio is negative and statistically significant at the 1% level.

This means that a 1% increase in external debt leads to a 37.20% decrease in private investment. Here, the result obtained is consistent with the theoretical economy and empirical studies of Attefah and Dawud, (2016) for Ghana; Ajide and Olukemi, (2012) for Nigeria but differs from that of Tchouassi and Ngwen, (2014) in Africa. Thus, when external debt increases in relation to GDP, private investment contracts because investors fear that in the future they will be taxed more by the government on debt service has increased. This leads to macroeconomic instability that is detrimental to private investment and hinders private sector growth and development in developing countries. Then, the real exchange rate is negative and significant at the 1% level. This reflects that 1% exchange rate appreciation leads to a decrease in private investment 190.4%, i.e. the increase in costs on the world market reduces export revenues, resulting in a decrease in investment in the export sector. This result is not in agreement with that of Ajide and Olukemi, (2012) where the exchange rate coefficient is also positive and statistically significant at 10% which is due to the introduction of SAPs in the 1980s that led to the persistent depreciation of (NAIRAS)[2] and increased domestic private investment in Nigeria.

Indeed, short-term results show that some variables that were statistically significant in the long term are not significant in the short term; this is due to the lag effect of the variables. In the short term, public investment still keeps its positive sign at 1% significance level. This shows that public investment in Côte d'Ivoire plays a very important role in the development of private investment. In other words, private and public investments are positively linked (crowding in effect). To be more precise, the 1% increase in public investment leads to 35.9% increasing in private investment. The short-term result also shows that the external debt ratio is negative and statistically significant but at the 10% level. This reflects the negative link between private investment and external debt. Hence a 1% increase in external debt will reduce private investment by 00.2%. The same for the real exchange rate which shows a short-term negative sign at the 5% level. This means that when the exchange rate appreciates by 1%, private investment will fall by 151.9% as a result of the deterioration in the terms of trade. Then, it can be seen that the gross domestic product in the long term as well as in the short term is not significant.

The responses to our various hypotheses show that the factors underlying private investment in Côte d'Ivoire affect certain macroeconomic variables. Most of them are public investment, credit to the private sector, external debt and the long-term real exchange rate. But in the short term public investment, external debt, real exchange rate and lagging GDP. Although GDP is lagging, it affects private investment negatively. Secondly, the results of our estimates show us that in Côte d'Ivoire public investment promotes private investment in the process of economic growth through socio-economic infrastructure. In addition, credit to the private sector does not encourage private investment in the growth process. In order to promote investment in the growth process, the State must clean up the financial sector which plays an essential role in the private sector, hence the growth process. Second, private investment promotes a country's economic growth, insofar as its dependence on the outside world is not significant. This is in line with our results. In this paper, we analyze the function of private investment in Côte d'Ivoire using 1980-2016 time series data and two-stage cointegration model Engle and Granger (1987). These results show that factors that have a significant impact on private investment in Côte d'Ivoire include public investment, private sector credit, external debt and the long-term real exchange rate. And that in the short term public investment, external debt, the real exchange rate and GDP have a significant impact on private investment. Thus, these results show that public investment leads to private investment. These results also show that the variables that favor investment in the Ivorian economic growth process are investment public, external debt, and real exchange rate.

[2] Nigerian national currency.

5. Conclusion

At the end of our analysis, we conclude that the crises in Côte d'Ivoire have reduced these investments, particularly private investments. In recent years, the liberalization of the Ivorian economic has led to the development of major investment projects, in particular private investment, to achieve sustainable growth. Indeed, Côte d'Ivoire recorded strong GDP growth of 9.5% in 2015, driven by structural investments in growth-generating sectors. Among these structuring investments, private investment represents 10.7% of GDP in the Ivorian growth process. This leads us to analyze and highlight the impact of private investment function on the process of economic growth in Côte d'Ivoire. The results of our study show that factors that have a significant impact on private investment in Côte d'Ivoire include public investment, private sector credit, external debt and the long-term real exchange rate. And that in the short term public investment, external debt, the real exchange rate and GDP have a significant impact on private investment. Thus, these results show that public investment leads to private investment.

These results also show that the variables that favor investment in the Ivorian economic growth process are public investment, external debt and the real exchange rate. However, the study makes recommendations and suggestions that include: (a) strengthening the financial sector, which plays an essential role in the private sector in order to promote growth; (b) continuously improving the business environment for domestic private investment and creating other small and medium-sized enterprises to expand globally; (c) controlling its trade balance to avoid external shocks caused by the uncertainty of foreign direct investment; and (d) strengthening its policies on the transformation of its production, thereby developing the industrial sector. While most of the key variables are significant in the long term as well as in the short term, it is important that government investment be more effective in order to achieve sustainable economic growth.

References

Ajide, K. B., & Olukemi, L. (2012). Modelling the long run determinants of domestic private investment in Nigeria. Canadian center of Science and Educations, 8(13).

Attefah, E. K., & Dawud, K. E. (2016, April). An OLS approach to modelling the determinants of private investment in Ghana. International journal of academic research in business and social science, 6(4).

Breusch. (1979). Testing for autocorrelation in dynamic linear models. Australian Economic Papers 17, 334-355.

Brown, a. D. (1975). Techniques for Testing the Constancy of Regression Relations Over Time,. Journal of the Royal Statistical Society, 37, 149-92.

Carriou, Y., & François Jeger. (1997, Mars). La formation continue dans les entreprises françaises et son retour sur l'investissement. Economie et Statistique(303), 45-58.

Dickey, F. (1979). Distribution of the Estimators for Autoregressive time series with Unit Roots. Journal of American Statistical Associations

Dunop. Dje, P. (2007, Septembre). Les déterminants des investissements IDE dans les pays de l'UEMOA. (DER/07/03).

Engel, -Granger, (1987). Cointegration and Error Correction: Presentation Estimation and Testing. Econometrica 55 149-149.

Godfrey, (1979) Testing against general autoregressive and moving average error models when the regressors include lagged dependent varibles. Econometrica 46, 1293-1302.

Epaulard, A. (1993). L'apport du Q de Tobin à la modélisation de l'investissement en France. Economie et prévision(109), 1-12.

Jarque-Bera. (1987). A test for normality of observations and . regression residuals, International Statistical Review, 55, 163–172.

Johansen, S. (1988). "Statistical Analysis of Cointegrating Vectors.". Journal of Economic Dynamics and Control, P. 231-54.

Kamgnia, B. D., & Mama, T. (2002, Mai). le comportement de l'investissement privé au Cameroun : un resserrement de la contrainte financière. Dakar: Working Paper Series (SISERA).

Keho, Y. (2011). Guide pratique d'introduction à l'économétrie sur eviews. Abidjan.

Keho, Y. (2012). Le rôle des facteurs institutionnels dans le développement financier et économique des pays de l'UEMOA. La revue économique et monétaire(12).

Montmartin, B. (2013). Intensité de l'investissement privé en R&D dans les pays de l'OCDE. Impact et complémentarité des aides financières à la R&D. Revue économique, Vol. 64(3), 541-550.

Morrissey, O., & Manop , U. D. (2012). Governance, private investment and foreign direct investment in developing countries. World development, 40(3), 437-445.

OCDE. (2002). L'investissement direct étranger au service du développement : Optimiser
les avantages et minimiser les côuts. Parris: Les éditions de L'OCDE, 2, rue André-Pascal, 75775 PARIS CEDEX 16.

Pesaran M.H., Shin Y. et Smith R.J. (2001), « Bounds Testing Approaches to the Analysis of Level Relationships », in Journal of Applied Econometrics, Vol.16, n°3, pp. 289- 326 (http://dx.doi.org/10.1002/jae.616).

Phillips–Perron. (1988). Testing for a Unit Root in Time Series Regression". Biometrika, 75, 335–346.

Tchouassi, G. (2014). Private capital and investment climate for economic growth: Empirical lessons based on ARDL bound test technique. European journal of substainable development, 3(2), 17-32.

Tchouassi, G., & Ngwen , N. (2014, April). Private and public investment in Africa: A time- series Cross-country analysis. International Journal of Economics and Finance, Vol.6(N°5)