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GROWTH EFFECT OF FISCAL POLICY IN DEPENDENT NATURAL RESOURCES COUNTRIES: CASE OF A MONETARY UNION

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ABSTRACT

This paper contributes to the understanding of the other neglected effects of fiscal policy by analyzing how it affects economic growth in developing countries over the period 1980–2014.The empirical evidence is based on a Pooled Mean Group approach. With the panel of dependent natural resources countries that all are members of a Central Africa Economic and Monetary Community (CEMAC), the results show that fiscal policy measured as budget deficit has a positive and significant effect on growth in the short-run while it has a negative and significant effect on economic growth in the long run. The results of a short-run country effect analysis show the effectiveness of fiscal policy in all the countries of the union with an important effect in Equatorial Guinea and the less effect in Cameroon. There for, it would be important for the governments of these countries to diversify their economy, increase the share of manufacturing exports in their total exports and finally rigorously manage their public spending.

Contribution/ Originality: This study contributes to the existing literature by exploring if the dependency in natural resources can influence the relationship between fiscal policy and economic growth. This study is one of very few studies which have investigated on the issue in the CEMAC using panel Autoregressive Distributed Lag (ARDL) regression.

1. INTRODUCTION

The budget deficit was mainly a tool of fiscal policy during the post-world war years. The application of Keynesian theory has long been advocated for boosting the economy even if the state budget is in deficit. This in order to revive the economy. Taken as an economic tool, the budget deficit made it possible, at best, to stimulate the economy and at worst to limit the effects of a recession, the multiplier effect proved its worth in the economic crises especially that of 1929. But the economic crisis 1980s, after the 1973 and 1979 oil shocks halted economic growth after that of the glorious Thirty. The implementation of Keynesian policies was no longer followed by positive effects. It is in this context of over-indebtedness and economic imbalances that some developing countries have had to adopt reforms based on structural adjustment programs under the supervision of the International Monetary Fund and the World Bank. These reforms intensified in sub-Saharan Africa and particularly in the Franc Zone from 1994 with the devaluation of the CFA franc against the French franc and the process of sub-regional integration. Economic life has also been subject to multiple and restrictive regulations. These orientations constituted a heavy

handicap for economic growth. The public sector has proven to be ineffective and has created heavy burdens on public finances. This failure of fiscal policy follows the predictions of liberal monetarist economists like (Congdon, 2011) who spoke of the crowding-out effect which manifests itself as: additional public expenditure financed by borrowing reduces the availability of internal savings and raises the interest rate, this results in a drop in private investors due to the high cost of loans; public spending is said to crowd out private investment. However, the private sector is the real engine of the economy in a "market economy". Thus, this foreclosure must have consequences on variables such as inflation and employment. Existing literatures have shown the effectiveness of fiscal policy Ocran (2009); Ubesie (2016); Ubi-abai and Bosco (2017); Ubi-abai and Ekere (2018) while others authors demonstrate the ineffective of fiscal policy Lwanga and Mawejje (2015) and Ugwuanyi and Ugwunta (2017). However, some studies have shown that the budget deficit when it is very large crowds out private investment, which in turn has a positive effect on economic growth; beyond this threshold, the economy enters a prohibited area characterizing imbalances (Nubukpo, 2007).

Despite the will of African countries in general and of CEMAC countries in particular to restore their major macroeconomic balances, notably the deficit in external accounts and the deterioration of public finances, the budget deficit still persists in these countries. The economy of the CEMAC zone is mainly dependent on natural resources, the prices of which are volatile on the international market. Their membership of the same monetary union constitutes the basis for this decision-making, in the context of budgetary convergence. In fact, the Solidarity and Growth Pact requires standards with regard to the management of public finances in the member countries of the union. In addition, in monetary unions, fiscal policy is the main instrument for responding to the various asymmetric shocks that can affect economies in the absence of fiscal federalism, to the extent that monetary policy is common to all countries.

After oscillating for several years between 80 and 110 USD / barrel, the price of crude oil began to drop sharply in the second half of 2014. After a slight recovery in spring 2015 (60 USD / barrel in May), mainly due to the seasonal increase from American demand (the "driving season" from April to September, during which Americans use their cars massively to travel), the price started to fall again at the end of the summer. The West Texas Intermediate (WTI[1]) fell below 40 USD / barrel at the end of August 2015. It stood at 45 USD / barrel on September 9, 2015. In addition, the level of overall oil supply remains high, due to the increase significant production in the United States (from 6.8 million barrels per day (Mb / d) in 2006 to 11.6 Mb / d in 2014), mainly thanks to the exploitation of unconventional oil deposits (petroleum shale in particular). Canada presents a similar situation: production increased from 3.2 Mb / d in 2009 to 4.3 Mb / d in 2014, also thanks to unconventional oil (oil sands). Production has also remained higher than expected in countries like Iraq, Libya and Syria, despite their political instability. Finally, Saudi Arabia's deliberate strategy not to cut production to support prices also explains their collapse. While the country traditionally plays the role of "swing supplier", adjusting its production to maintain a certain balance between supply and demand in order to stabilize the price at a desired level (i.e between 80 and 100 USD / barrel for several years), Saudi Arabia has clearly opted for a strategy of maintaining its market share at the expense of the price. The first impact of the fall in the price of oil on the producing countries of Equatorial Africa concerns, logically, the fall in income from oil production. The extent of this decline and its effect on GDP, however, vary widely depending on the degree of dependence of national economies on oil activities and the income the state derives from it. However, with the exception of Cameroon, whose oil production is limited, the domestic market wider and the economy more diversified, the countries of the sub-region are extremely dependent on oil revenues, consequences of a poor diversification of the economy. If oil contributes 7.4% of Cameroon's GDP,

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[1]On the American market, the West Texas Intermediate (WTI) listed on the New York Mercantile Exchange (NYMEX, the commodity exchange of the financial center of New York) and whose price serves as a reference for fixing the price of crude is thus increased from 107 USD / barrel at the end of June 2014 to 45 USD / barrel in January 2015.

this rate raises to 85% for Equatorial Guinea, around 50% for Congo-Brazzaville, 69% for Chad, and barely less than 45% for Gabon (BEAC, 2014). With regard to the Central African Republic, mineral resources constitute the bulk of its natural resources, whose contribution to GDP hovers around 13.6% according to the IMF (2019).

Despite the measures (taken or announced) to limit public spending, all these countries record a significant widening of their twin deficits (budget and trade balance deficits). At the regional level (CEMAC), the budget deficit stood at 5.2% of GDP in 2014 (thus exceeding the 3% threshold as set by the convergence policies) and continued to deteriorate in 2015 and reach 6.8% of GDP, according to the IMF (2015). For its part, the current account deficit, which was 3.5% in 2014 and increased to 8.4% this year, due to both the decline in oil exports and the level of imports that remains high. This fiscal shock is all the more difficult to absorb as this increase in deficits occurs when all the countries - apart from the Congo and Chad which presented in 2013 a positive budgetary balance, the other countries were already in a situation of budgetary deficit before even the fall in oil prices: 3% for Gabon, 4% for Cameroon and 5% for Equatorial Guinea, 6.8% in the Central African Republic, for the year 2013.

The remainder of this paper is organized as follows: the second section is devoted to the review of the empirical literature, the third section is furnished by the econometric model, the data and definitions of the variables are presented in the section four, the section five is devoted to results and discussions and the section six concluded.

2. EMPIRICAL LITERATURE

The relationship between fiscal policy and real economic activity has been the subject of much controversy in the empirical literature. This review is mainly based on studies that have already been carried out in Africa. Dumon and Mesple-Somps (2000) analyze the impact of fiscal policy measured as government infrastructures on the competitiveness and the growth of the Senegalese economy. The use of a computable general equilibrium model shows that an increase in government spending on infrastructures leads to a better commercial performance and economic growth. In the West African Economic and Monetary Union countries, Nubukpo (2007) examines the effect of fiscal policy on the growth during the period 1965 to 2000. By using an error correction model, the author finds that the fiscal policy measured as government spending doesn't have a significant effect on economic growth in the majority of the economies of WAEMU while the government expenditure impact differs by country in the long-run. Going from his results, the author also advances the hypothesis according to which there is a non-linear relationship between the size of state (government spending) and economic growth. Mansouri (2008) studied the relationship between fiscal policy and economic growth within three North Africa countries (Morocco, Tunisia and Egypt). By using an error correction model, the empirical results showed that 1% increase in public spending raised the economic growth by 1.26% in Morocco during the period 1970-2002,1.15% in Tunisia during the period 1972-2002 and 0.56% in Egypt during the period 1975-2002. In the long-run, the results also indicated the existence of relationship between the two variables for all the three countries. This long-run relationship was also found by Iyeli and Azubuike (2013) on their investigation of the impact of fiscal policy variables on Nigeria's growth during 1970 to 2011. The positive impact of fiscal policy measured as fiscal deficit on economic growth was also found by Onwioduokit and Bassey (2013) in Gambia. Contrary to these results, the study of Lwanga and Mawejje (2015) shows that there exists no causal relationship between fiscal policy and macroeconomic fundamentals in Uganda.

However, among the authors interested in analyzing the effect of fiscal policy on economic growth, whether those who used the fiscal deficit or public spending to capture fiscal policy in Africa, none of them have thought to explore this relationship in countries dependent on natural resources and which all belong to the same monetary union. This paper aims to fill this literature gap by exploring this relationship in the countries of Central Africa Economic and Monetary Community which have these characteristics.

3. MODEL AND ECONOMETRIC ISSUES

To analyze the effect of fiscal policy on economic growth, this study use the neoclassical augmented growth model developed by Mankiw, Romer, and Weil (1992). Taking into account the variable of interest (budget deficit) and the heterogeneity of the coefficients and other control variables, the model can be expressed as follows:

$$Y_{it} = \alpha_i + \lambda_i Y_{it-1} + \sum_{p=1}^{k} \beta_{pi} X_{it}^p + \gamma_{1i} \, Budef_{it} + \varepsilon_{it} \quad (1)$$

Where Y_{it} is GDP for country i at time t, X is the vector of control variables, including investment, external debt, terms of trade, trade and inflation. ε_{it} is an error term, and α_i reflects country-specific effects.

The transformation of Equation 1 as an error correction equation gives:

$$\Delta Y_{it} = \varphi_i \left(Y_{it} - \theta_{0i} - \sum_{p=1}^{k} \theta_{pi} X_{it-1}^p - \delta_{1i} \, Budef_{it-1} \right) - \sum_{p=1}^{k} \beta_{pi} \Delta X_{it}^p - \gamma_{1i} - \Delta Budef_{it} + \varepsilon_{it} \quad (2)$$

With $\theta_{0i} = \frac{\alpha_i}{1-\lambda_i}$, $\theta_{pi} = \frac{\beta_{pi}}{1-\lambda_i}$, $\delta_{1i} = \frac{\gamma_{1i}}{1-\lambda_i}$, $\varphi_i = -(1-\lambda_i)$

Where θ_{0i} is introduced for country-specific effects, ε_{it} represents the term of error, θ_{pi} and δ_{1i} capture the dynamic of long-run effects, while β_{pi} and γ_{1i} capture the short-run dynamics. Finally, φ_i represents adjustment speed toward the long-run state; this should be negative and significant to confirm the long-run relationship budget deficit and economic growth.

According to Pesaran, Shin, and Smith (1999) and Jouini (2015) to estimate dynamic heterogeneous panels by considering long-run equilibrium relations, the Pooled Mean Group (PMG) approach is appropriated, contrary to the other techniques that purge any potential long-run linkage among variables such as the dynamic panel GMM method. The PMG method has the advantage to allow identical long-run coefficients without assuming homogeneous short-run parameters. By doing so, the PMG method differs from techniques, such as the Mean Group (MG) developed by Pesaran and Smith (1995) that estimate a regression for each group and then calculate the coefficient means (Evans, 1997; Lee, Pesaran, & Smith, 1996). Despite the fact that the MG long-run estimators are consistent, they are inefficient if coefficient homogeneity holds. Under these conditions, the PMG method is useful since it provides consistent and efficient long-run when the parameter homogeneity holds. Thus, the PMG estimation approach is preferable to the MG method since it provides estimates that are less sensitive to outlier estimates. We address endogeneity concerns by augmenting the PMG estimator with lags of regressors and dependent variables to minimize the resultant bias and ensure that regression residuals are serially uncorrelated.

The transformation of Equation 2 is rewritten as follows:

$$\Delta Y_{it} = \varphi_i \left(Y_{it} - \theta_{0i} - \sum_{p=1}^{k} \breve{\theta}_{pi} X_{it-1}^p - \delta_{1i} \, Budef_{it-1} \right) - \sum_{p=1}^{k} \beta_{pi} \Delta X_{it}^p - \gamma_{1i} - \Delta Budef_{it} + \varepsilon_{it} \quad (3)$$

We conducted one stationary tests: the test of Im, Pesaran, and Shin (2003). These tests are a generalization of the Augmented Dickey–Fuller test (ADF). For cointegration, we applied the Kao (1999) and Pedroni (2004) tests.

4. DATA AND VARIABLES DEFINITION

This study uses annual data covering 1980 to 2014 taken all the six countries of CEMAC zone. The choice of the period of study is related to the availability of data on interest variables such as fiscal policy and economic growth. All the variables of this study are coming from World Bank (2016) except fiscal policy variable which are coming from UNITAD (2016). The dependent variable is economic growth, measured as the rate of the gross

domestic product (GDP). We also include a set of control variables that are commonly used in growth equations. The external debt variable (Exdebt) is measure as external debt as share of GDP. According to Fosu (1999) it is deleterious to economic growth. Due to the fact that investment (Inv) is viewed as a direct proxy of contribution to capital accumulation, as well as an indicator of efforts to develop basic economic infrastructure, it has been used in empirical studies. It is measure in this study as gross fixed capital formation. It has a positive and significant effect on economic growth (Barro, 1981; Levine & Renelt, 1992). According to trade openness variable, it is measure as the sum of exports and imports as a share of GDP (Trade). Some studies have found positive relationship between trade openness and economic growth (Jouini, 2015) while others have identified no association, or even negative relationship between the two variables (Musila & Yiheyis, 2015; Ulaşan, 2015). The terms of trade variable (Tot) is measure by the ratio of the price of exports to that of imports. According to the fiscal policy, it is appreciated in this work by the budget deficit (Budef). The budget deficit here is captured by the primary deficit which is the difference between public revenue and public expenditure, apart from servicing the external debt. According to Perotti (1998) the raise of deficit budget is beneficial to economic growth. The inflation (Inf) is measure by the consumer price index. According to Ngouhouo and Nkemgha (2018) inflation is deleterious to economic growth.

5. RESULTS AND DISCUSSION

This part begins with the results and interpretations of the preliminary tests, in particular the stationarity, homogeneity, specification and cointegration tests. Then, the estimation of the model by the Pooled Mean Group (PMG) method as well as the analysis of the effects of exogenous variables on growth (in panel and by country).

5.1. Results of Stationary Test

Table-1. Stationary test.

| Variables | IPS test with constant and trend | | | | Decision |
| | At level | | First difference | | |
	t-stat	P-value	t-stat	P-value	
Gdp	-6.96690	0.0000	-	-	I(0) ***
Budef	-3.94673	0.0000	-	-	I(0)***
Exdebt	1.90844	0.9718	-10.0164	0.0000	I(1)***
Inf	-1.04648	0.1477	-7.42169	0.0000	I(1) ***
Trade	-1.45206	0.0732	-	-	I(0) *
Inv	-3.08348	0.0010	-	-	I(0)* **
Tot	-1.08241	0.1395	-13.6563	0.0000	I(1)***

Note: *** and * Show that the variables are significant at 1% and 10% respectively.

With regard to the Table 1, it is clear that the P-values of the GDP, Budef, Trade and Inv variables are stationary (with constant and trend) at level. On the other hand, the Exdebt, Inf and Tot variables are not stationary at level but in the first difference. Since three of the seven variables are not stationary at level, there is a high risk of spurious regression. Thus, the cointegration tests of Pedroni (2004) and Kao (1999) are necessary in this case to see if our variables are cointegrated before proceeding to the model estimation.

5.2. Results of Homogeneity and Specification Test

Table-2. Homogeneity and specification tests.

P-value	Decision
Prob > F = 0.0001	Accept H_1 ⟹ (heterogeneous panel)
Prob > F = 0.9164>5%	Accept H_0 ⟹ good specification of the model

The homogeneity test allowed us to accept the alternative hypothesis, which means that our panel is heterogeneous. The effects of fiscal policy are specific or individual to each country; all the more so since there is no common budgetary policy for all the countries of the sub-region. Each country defines its budgetary policy itself. On the other hand, the model is rather well specified because the second result allows us to accept the null hypothesis.

5.3. Résultats de Cointégration Tests

Table-3. Cointegration tests.

Pedroni test					Kao test		
Alternative hypothesis : common autoregressive coefficients (within dimension)							
Tests	*Statistics*	*P-value*	*Statistics*	*P-value*	*Test*	*t-stat*	*P-value*
Panel :							
Statistic v	-3.140541	0.9992	-3.386376	0.9996	*ADF*	-5.865139	0.0000
Statistic rho	0.126325	0.5503	-1.130493	0.1291			
Statistic PP	-13.84051	0.0000	-11.40382	0.0000			
Statistic ADF	-7.535204	0.0000	-8.086612	0.0000			
Alternative hypothesis : individuals autoregressive coefficients (between dimension)							
Group :	*Statistics*	*P-value*					
Statistic rho	-0.151590	0.4398					
Statistic PP	-15.77397	0.0000					
Statistic ADF	-8.292220	0.0000					
Number of observations :		210					

Table-4. Results of estimation growth model.

Variables	Model I	Model II
Long-run		
Budef	-0,187605***	-0,188968***
Tot	2,519786***	6,061755***
Inv	0,118264**	0,211806***
Inf	0,085695***	0,06224***
Trade	-	0,024619*
Exdebt	-	0,034591***
Short-run		
Cointeq01	-0,872886***	-0,977460***
D(Budef)	0,266290*	0,292041**
D(Budef(-1))	0,136651*	0,270617**
D(Tot)	-3,619329	-8,899964
D(Tot(-1))	1,273171	1,133099
D(Inv)	0,106767	0,118340
D(Inv(-1))	-0,024137	-0,144490
D(Inf)	0,012942	0,091152
D(Inf(-1))	-0,002007	-0,266521
D(Trade)	-	0,002022
D(Trade(-1))	-	-0,030404
D(Exdebt)	-	-0,147540
D(Exdebt(-1))	-	-0,10563*
C	-6,945116***	-15,86642***
Obs	198	198
Cross Section Short run equation		
Countries	Fiscal policy coefficient	ECM coefficient
CAMEROON	0.063427***	-0,4750***
CHAD	0.210854**	-1.4742***
GABON	0.092611**	-0.4292***
EQUATORIAL GUINEA	0.858827***	-0.9843***
CONGO	0.175156***	-1.2711***
CENTRAL AFRICAN REPUBLIC	0.351374	-1.2307***

Note: ***, ** and * Show that the variables are significant at 1%, 5% and 10% respectively.

We used two generations of cointegration tests: Pedroni (2004) and Kao (1999) tests. Four of the seven tests proposed by Pedroni suggest the presence of a cointegration relationship. As the homogeneity of the panel is unlikely, we prefer tests based on the within dimension, which leads us to conclude that there is cointegration between the growth rate of real GDP and its fundamentals. This conclusion is validated by the Kao test. It is now possible to estimate the parameters of the cointegration vector. To estimate these parameters, we previously determined the optimal lags of the model and from the information criterion of Akaike, we selected the ARDL model: ARDL(1, 2, 2, 2, 2, 2, 2). It should be recalled here that budgetary policy is individual or specific to each CEMAC government. We will first perform a panel analysis to assess the effects of fiscal policy in relation to the convergence criteria enshrined in the multilateral surveillance system in the CEMAC. Then, we will do a country by country analysis to take into account the real effects observed in the different countries.

Our results also show that the error correction term is significant and is equal to -0.977. This value corresponds to 9.77 years, meaning that the time required for a deviation of the real GDP growth rate from its equilibrium level to be absorbed is between 9 and 10 years. This suggests that it takes about 10 years for the effects of a fiscal policy shock in the CEMAC area to disappear completely and for the real GDP growth rate to return to its equilibrium level. It suggests that the return to balance is not immediate due, in particular, to the lack of convergence of the CEMAC countries. The results of Table 4 reveal that all the explanatory variables significantly influence the long-run dynamics of the economic growth rate in the CEMAC zone. However, only the budget deficit is significant in the short-run.

The budget deficit has a negative and significant impact on economic growth both in the short and long run in the CEMAC zone. Thus, an increase of one unit of bufget deficit causes a raising of 29.2% and a decrease of 18.89% in growth respectively in the short and long run. In the short run, the budget deficit positively affects growth because, according to Keynesian theory, the budget deficit is used for the purpose of stimulating and regulating economic activities through to the multiplier effect. Indeed, in the short run, the budget deficit is more intended to meet urgent needs such as the payment of civil servants' salaries, crises and natural disasters whereas in the long term, the budget deficit is rather oriented towards social projects such as education and health for example. This result is consistent with the work of Perotti (1998) who showed that an increase in the budget deficit can accelerate growth, especially when public debt is high and sustainable. In the long run, the deficit is detrimental to the growth of the CEMAC countries, perhaps because the latter have exceeded the 3% threshold as provided for in the criterion of multilateral surveillance or because these deficits have not been oriented towards profitable investments. This result is contrary to those of Iyeli and Azubuike (2013).

The terms of trade variable influences the level of long run real GDP growth rate. Indeed, a 1% increase in the terms of trade leads to an increase grwoth of 6.06%. This result is consistent with the work of Abdih and Tsangarides (2010) according to which most studies on the CFA zone attest that the terms of trade influence economic growth.

Trade openness has a positive and significant effect on economic growth. Thus, an increase in the opening rate of a unit leads to a raising in growth of 2.4%. This result is consistent with the theory of free trade that the growth generated by trade is due to the fact that it facilitates the diffusion of technology and knowledge through the importation of technological goods (Almeida & Fernandes, 2008).

The inflation rate has a positive and significant effect. Thus, an increase in this rate by one unit leads to an increase in growth of 6.22%. The work of Khan and Ssnhadji (2001) explains this result because, according to studies carried out by the latter, the threshold of inflation compatible with growth in developing countries fluctuates between 8 and 11%. With regard to the multilateral surveillance system, the average annual inflation rate of the CEMAC countries must not exceed 3%. This result is also compatible with the work of Gillman and Kejak (2002) who consider that low inflation has a positive effect on growth.

The investment is also positive and significant for growth. Thus, an increase in the investment of a unit leads to an increase in growth of 21.18%. This result is compatible with the work of Barro (1981) and Levine and Renelt (1992).

The external debt variable positively and negatively influences economic growth. The key idea for Keynesians is that debt does not create any burdens for current and future generations because of the investments it generates. From this approach, debt stimulates demand, the accelerating effect of an increase in investment leads to an increase in production. This result is compatible with the work of Sargent and Wallace (1981) which shows that a sustainable debt leads to a growth rate higher than that of the real interest rate of bonds. The positive effect would also be due to the rigor with which the main donors of the countries of the sub-region (International Monetary Funds and World Bank) control the various financings, which would only generate positive points on growth long run.

Finally,the short run analysis of the country effect shows effectiveness of fiscal policy in all the CEMAC countries. Among these countries, this effectiveness is most important in Equatorial Guinea (0.8588) and less important in Cameroon (0.063).

6. CONCLUSION

In this paper, it was question to verify whether the fact that a group of countries is dependent on natural resources and belongs to a monetary union significantly influences the relationship between fiscal policy and the economic growth of member countries of this union. Specifically, it was about appreciating the influence of fiscal policy on the economic growth of the CEMAC countries.

More robustly, the use of the PMG method confirms the existence of this perverse effect of the budget deficit on the growth of the countries of the CEMAC zone. With regard to the short-run analysis specific to each country, the fiscal policy understood from the angle of the deficit is effective in all the CEMAC countries and that it's more important in Equatorial Guinea and less important in Cameroon. The long run effects of fiscal policy in CEMAC follow the classical logic, while the effectiveness of short run fiscal policy specific to each country rather follows Keynesian logic. We therefore recommend that CEMAC member countries diversify their economies to mitigate the consequences of dependence. Then, they must increase the share of manufactured products on their total exports and finally, they must rigorously manage their public expenditure.

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