

Political Budget Cycles: The Case of Gabon

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Abstract

This article analyzes the political-fiscal cycle in Gabon. In Africa, it seems that the analysis of the politico-fiscal cycle has not attracted much interest. This is particularly the case in Gabon, a small country of the Economic and Monetary Community of Central Africa (EMCCA). Unlike approaches based on the estimation of a single model linking the electoral cycle and a dimension of the state budget, we estimate four models each incorporating a different dimension of the state budget, namely: capital expenditures, total expenditures and the budget deficit. The estimation of a VAR Model (2) and three Error Correction Vector Models (ECVM) confirms the existence of an "opportunistic" politico-budgetary cycle in Gabon.

Keywords: political budget cycles, public expenditure composition

Classification JEL: D72; E62.

1. Introduction

Interest in politico-fiscal cycles, understood as the study of the links between political elections and fiscal policies, is gaining momentum thanks to the role given to institutional rules and constraints in the conduct of political economy. Indeed, this question is the subject of abundant theoretical and empirical developments in recent decades.

Concerning first the theoretical plan, the discussions crystallize around two main approaches: the so-called opportunist approach, initiated by Nordhaus (1975) and extended by Lindbeck (1976), who argues that re-election is the main motivation of decision-makers (Downs, 1957), on the one hand, the "partisan" approach of the politico-fiscal cycle, developed around the pioneering work of Hibbs (1976), which considers, for its part, that the influence of the electoral cycle on the budget depends on the ideological belonging of politicians (Sakurai and Menezes-Filho, 2011), on the other hand.

As for the empirical plan, several studies attempt to identify the political-budgetary cycle. This research is particularly abundant and varied in developed countries (Akhmedov and Zhuravskaya 2004, Milani 2007, Vergne 2009, Drazen and Eslava 2010).

In Africa, it seems that the analysis of the politico-fiscal cycle has not attracted much interest. This is particularly the case in Gabon, a small member country of the Economic and Monetary Community of Central Africa (EMCCA). The study of the politico-fiscal cycle is of interest for at least two reasons: firstly, Gabon's fiscal policy, which is the only instrument available to national authorities to achieve a goal of a full-employment internal balance, is governed by criteria of convergence and control of public finances.

Second, the political life of Gabon has undergone many changes. Indeed, after a period of political pluralism (1961-1968), marked by the organization of free elections, the country experienced a period of political life dominated by a single party (1968-1990) before the rehabilitation of democracy in 1990, the liberalization of political rights came from the East after the collapse of the Berlin Wall and spread to the African continent. Thus, since 1990 to date, Gabon's political life is punctuated by the organization, at the relatively regular deadline, of various presidential, legislative and municipal elections.

The present reflection is a contribution to the study of the politico-budgetary cycles in Gabon in that it estimates four dynamic models in order to determine the influence of the electoral periods on different dimensions of the State budget, namely the expenditures in capital, total expenditure, current expenditure and budget deficit. The rest of the study is organized as follows: Section 2 reviews the literature review. Section 3 presents the model of identification of the politico-fiscal cycle. Section 4 is devoted to empirical analysis. Finally, section 5 concludes.

2. The Literature Review

The theoretical literature on the politico-fiscal cycle distinguishes the opportunist approach, on the one hand, the partisan approach, on the other. The opportunistic approach of the politico-fiscal cycle can be broken down into two versions: the first considers that voters reward governments for favorable economic conditions before the electoral period, without taking into account past variations in the economy or post-election slowdowns future of these expansionist policies (Lewis-Beck, 1988). These adaptive expectations of voters allow an "inflation-unemployment" arbitration that reinforces the opportunistic behavior of political decision-makers. It thus appears that the variations in the state budget are mainly due to the desire of political decision makers to seek a future mandate. This idea is echoed by Tufte (1976) and Madsen (1980), when they show that policy makers are overly using state resources to increase the probability of staying in power, in line with voters preferences for a favorable situation of the economy. The second version of the opportunistic approach, highlighted by Rogoff and Silbert (1988), Rogoff (1990), suggests that voters make rational expectations (Rogoff, 1987). Under this assumption, no "inflation-unemployment" arbitrage is possible, either in the short term or in the long term. Voters perfectly anticipate economic policies and punish politicians manipulators of the state budget for electoral purposes. From this point of view, the competence of the political decision-maker is solely determined by his ability to pursue lean budget policies (Rogoff and Sibert 1988, Rogoff 1990), to promote growth without inflation (Persson and Tabellini, 1990) or to protect economy in the face of random shocks (Cukierman and Meltzer, 1990). For Rogoff and Sibert (1988), Rogoff (1990), the government can increase its probability of staying in power by proving that it can meet the needs of the citizen at a lower cost. In addition, Persson and Tabellini (1990) argue that even with rational voters, it is possible to manipulate inflation and growth during an election period. The partisan approach is also divided into two versions: the first version, developed by Hibbs (1977), is based on the adaptive expectations of voters and the dichotomous analysis of the ruling parties (Left and Right, Republicans and Democrats). For the author, policymakers pursue macroeconomic objectives according to their partisan preferences. The existence of partisan cycles is reflected in a change in public policy following the election. The second, more recent, version is built around the pioneering work of Alesina (1987 and 1988), which admits that with rational expectations, only surprise inflation affects yields, and the size of the cycle depends on the degree of electoral uncertainty.

The recent analyzes (Golten and Poterba, 1980; and Stein, 1982, Beauvallet, 2008) argue that, for a government, the macroeconomic variables (GDP, unemployment, inflation, etc.) are more complex to manipulate than budget variables. Which explains why political budget cycle are more frequent than political economy cycle. Regarding this last aspect, for Hagen (2006), Milani (2007), Streb and Torrens (2009), Vicente, Rios and Guillamon (2012), Ebeke and Olser (2013), Bonfatti and Forni (2017), the study of politico-budgetary cycles must be able to take into account the rules (fiscal and fiscal rules) and institutional constraints. Whether by opportunism or ideology,

On an empirical level, interested in the existence of politico-fiscal cycles in Russian municipalities, Akhmedov and Zhuravskaya (2004) study a panel of local political jurisdictions and show that municipalities increase public spending before and after elections. just after their reelections. Which causes a deficit during the election year. On the other hand, the authors do not provide evidence of changes in local taxation before or after the voting period, which confirms the existence of opportunistic political-budgetary cycles in these localities. In the case of the United States, Milani (2007) points out that the existence of partisan cycles in tax policies may differ depending on whether the President of the Union is Democrat or Republican. In this respect, it shows that the application of fiscal policy depends on the ideological lineage of the President of the Republic

For its part, Vergne (2009) studies the nature of public expenditures in relation to the election periods. To this end, he argues that public spending is moving towards more visible current spending, particularly wages and subsidies, and capital expenditures. In the same vein, Drazen and Eslava (2010) show that public spending increases before the elections, including the construction of roads, power stations and hydro. On the other hand, interest payments, retiree transfers and temporary worker payments fall during the election years.

In a study focusing on the case of Croatia, Mackic (2014) shows that the budget deficit and total expenditure decrease because of the institutional context which limits the manipulation of the budget at the local level. The results of Mackic (2014) lead to the rejection of the existence of an opportunistic cycle in Croatian municipalities. For the author indeed, to ensure the re-election of local elected representatives, municipalities circumvent the institutional constraint of the local budget by resorting to public borrowing and private companies that provide public services. More recently, Bonfatti and Forni (2017), in the case of Italy, show that the impact of the opportunistic cycle is higher on capital expenditures and increases during the election years, as well as two years before and after the elections.

Taking into account the rules (fiscal and / or fiscal) and institutional constraints, Rose (2006) argues that in the United States balanced fiscal rules help to curb political cycles in overall spending, taxes and deficits. In the presence of budgetary rules, the manipulation of the budget is considerably reduced during the election period. Similarly, according to Alt and Rose (2007), fiscal stability rules are associated with a smaller increase in spending as the election deadline approaches. This has the effect of reducing the public deficit. In Europe, Hagen (2006) provides evidence that the influence of electoral cycles on fiscal and fiscal policy instruments is reduced by the Maastricht Treaty between 1992 and 1998 in the municipalities of the countries of the European Union (EU) where no manipulation is observed. Garcia-Sanchez et al. (2011) have similar results since they argue that the handling of the debt in the run-up to the elections has decreased significantly since the introduction of the budget stability law. This view is also shared by Streb and Torrens (2009) who show that fiscal rules limit electoral cycles on debt.

While for Vicente, Rios and Guillamon (2012) the budget stability law avoids the influence of electoral cycles on debt, it does not, however, lessen the incentives of policy makers to manipulate the deficit, capital expenditure and current expenditure. . In the same vein, Grembi, Troiano and Nannicini (2011) show that the domestic stability pact reduces spending on average and improves fiscal discipline, although spending is higher during pre-electoral periods.

In developing countries, Sakurai and Menezes-Filho (2011) study the politico-fiscal cycle in "young democracies" where voters are less experienced. In addition, the authors note that the manipulation of fiscal policies is greater than in the old democracies. In this regard, they observe that Brazilian municipal deficits increase during the election years. Total and current expenditures are increasing and local revenues are decreasing. By limiting their analysis to the period 1989-2005, the authors also show that partisan ideology exerts a relatively strong influence on the performance of local public accounts. These results thus confirm the existence of partisan cycles in the management of municipal budgets. Expenditures, revenues and fiscal balance behave differently depending on the electoral cycle and the ideology of the party of mayors. In the same vein, Ebeke and Ölçer (2013) argue that several tax indicators are used to assess the extent of electoral cycles on the budget. For these authors, it is essential to break down the tax indicators to better understand the influence of electoral cycles on government policies. Drawing on low-income countries, Ebeke and Ölçer (2013) show that public consumption expenditure increases during the election year, with no significant decrease two years after the elections; while public investment, as a percentage of GDP, declines by almost 0.4 percentage points the year after the election. The authors' results thus confirm the influence of an opportunistic electoral cycle on the management of public expenditures.

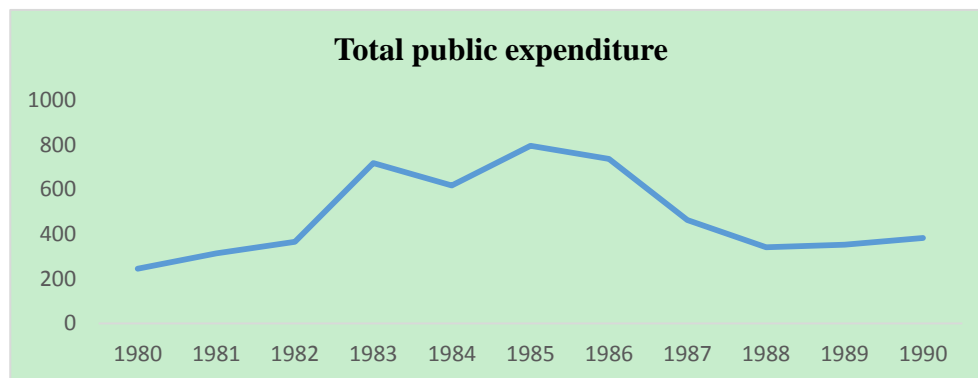
3. The Identification Model of the Politico-Budgetary Cycle

To identify the politico-fiscal cycle, we first analyze the evolution of public expenditure in relation to the election periods. We then perform an econometric application.

3.1 Evolution of Public Expenditures and Election Periods

The evolution of total public expenditure can be visualized on two graphs intersecting the different electoral periods that have punctuated the political life of Gabon since the early 1980s.

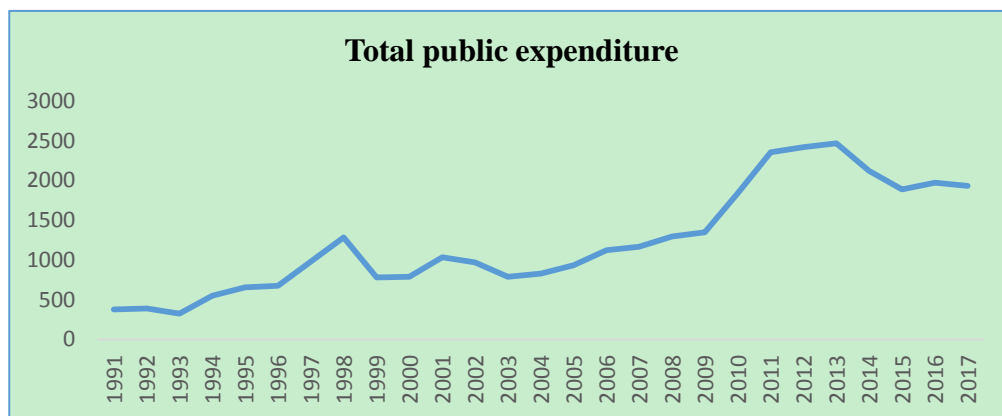
For this purpose, Graph 1 presents the evolution of total public expenditure before, during and after the presidential elections of the single party period (1983-1990).



Graph 1. Total public expenditure in the single party period

Graph 1 shows that total public expenditure increased in 1982, one year before the presidential elections. They peaked in 1983 during the election year, and ended up falling sharply the following year. The presidential elections of 1988 take place in a context of economic crisis following the collapse of the price of a barrel of oil (which goes from \$ 28 in December 1985 to \$ 10 from February 1986), accentuated by the depreciation of the French franc (to which the FCFA was attached at the time) in relation to the dollar. Thus, the fiscal policy implemented with the support of the International Monetary Fund leads to a significant reduction in public expenditures as early as the year 1987. For the 1988 financial year, there is a less significant decline in public expenditure, probably because of the organization of presidential elections.

Graph 2 shows the evolution of total public expenditure in different phases of the elections since the return to political pluralism to the present day.



Graph 2. Total public expenditure in the multiparty period

It can be seen from Graph 2 that during the 1993 presidential election, state spending, already slightly up since 1991, increased sharply from 1993 to 1994. In addition, the trend in public spending from 1996 to 1999, is characterized by three phases: between 1996 and the middle of 1997, there is an expansion of total public expenditure. From 1997 to the middle of 1998, stagnation of total public expenditure was recorded, which was followed by a significant decline after the second half of 1998. Likewise, the organization of the legislative elections the beginning of the 2000s highlights two phases in the evolution of public expenditure: from 2000 to 2001, there was a phase of expansion of total public expenditure which peaked in 2001, the year of parliamentary elections. Spending then dropped sharply between 2001 and 2002, after the electoral phase. In the mid-2000s, total public spending also increased from 2004, a year before the 2005 presidential elections. They continue to grow after the elections, reaching a peak in the parliamentary elections the following year. It is only after the election year in 2006 that spending will stagnate slightly until 2007. At the beginning of the decade 2010, the evolution of the public expenditure curve is marked by a trend towards high corresponding to a peak in the parliamentary elections held in 2011. In contrast, the year of the 2009 presidential elections is marked by a stagnation in the evolution of total public expenditure. Two main reasons can be mentioned in this regard: the wait-and-see context linked to the death of President Omar BONGO ONDIMBA, on the one hand, the anticipated organization of the presidential elections in August this year. Finally, after reaching a low in 2014, caused by the fall in the price of a barrel of oil, total public expenditure increased in 2015 to reach a peak in 2016, the year of the presidential elections. Subsequently, they gradually decrease until 2017.

In total, Graphs 1 and 2 show that total public spending tends to increase one year before elections (legislative or presidential) to peak during the election year. Then, they drop significantly after the elections. It also seems that the "electoral surprise" of 2009 (early presidential elections) does not give rise to an increase in total public expenditure.

3.2 Presentation of the Model

We build on Mackic's (2013) dynamic model, which aims to verify the existence of the politico-fiscal cycle in municipalities. In this respect, the equation of the model is formulated as follows:

$$Y_t = \mu + \gamma Y_{t-1} + \beta_1 X_{1,t} + \beta_2 X_{2,t} + \dots + \beta_k X_{k,t} + \epsilon_t \quad [1]$$

For $t = 1, 2, \dots, T$

With:

- Y_t , the dependent variable ;
- Y_{t-1} , the delayed dependent variable ;
- $X_{k,t}$; the k independent variables ;
- $\beta_1 \dots \beta_k$, the parameters of the exogenous variables;
- ϵ_t , le the error term.

Like Mackic (2013), we retain four (4) specifications of equation [1] according to the four (4) dependent variables that represent the different dimensions of public expenditure, namely current expenditures, in capital (Rogoff, 1990, Vergne, 2006, Ehrhart, 2012), total expenditures (Nordhaus, 1975, Tufte, 1978, Rogoff and Sibert, 1988), and the budget deficit (Nordhaus, 1975, Tufte, 1978, Rogoff and Sibert, 1988).). Four exogenous variables are also selected, including an "election" interest variable and three control variables: real GDP per capita (Dubois, 2006), the inflation rate (Dubois, 2006) and the real interest rate. (Mackic, 2014)

By integrating the exogenous variables in the model [1], we obtain the following relation:

$$Y_t = \mu + \gamma Y_{t-1} + \beta_1 ele_t + \beta_2 inf_t + \beta_3 pib_t + \beta_4 tir_t + \epsilon_t \quad [2]$$

For $t = 1, 2, \dots, T$

With:

- Y_t , the dependent budget variable;
- Y_{t-1} , the delayed dependent variable ;
- ele_t , election period ;
- inf_t , rate of inflation ;
- pib_t , Gross Domestic Product ;
- tir_t , real interest rate of banks;
- ϵ_t , the error term.

We estimate the following four models:

$$dc_t = \mu + \gamma dc_{t-1} + \beta_1 ele_t + \beta_2 inf_t + \beta_3 pib_t + \beta_4 tir_t + \epsilon_t \quad [\text{Model 1}]$$

$$inv_t = \mu + \gamma inv_{t-1} + \beta_1 ele_t + \beta_2 inf_t + \beta_3 pib_t + \beta_4 tir_t + \epsilon_t \quad [\text{Model 2}]$$

$$dt_t = \mu + \gamma dt_{t-1} + \beta_1 ele_t + \beta_2 inf_t + \beta_3 pib_t + \beta_4 tir_t + \epsilon_t \quad [\text{Model 3}]$$

$$def_t = \mu + \gamma def_{t-1} + \beta_1 ele_t + \beta_2 inf_t + \beta_3 pib_t + \beta_4 tir_t + \epsilon_t \quad [\text{Model 4}]$$

For $t = 1, 2, \dots, T$

With:

- dc_t , current expenditure;
- inv_t , capital expenditure;
- dt_t , total expenses;
- def_t , budget deficit;
- ele_t , election period;
- inf_t , rate of inflation;
- pib_t , Gross Domestic Product;
- tir_t , real interest rate of banks;
- ϵ_t , the error term.

We consider that if politicians adopt opportunistic behavior, the following phenomena could be verified in the facts: i) expenditures are up in the year of the election or the year before; (ii) expenditures increase faster in the year of the

election or the year before than in other years; (iii) expenditures during these two years are decreasing at a lower rate than in previous years.

On the other hand, if they engage in partisan behavior such that they attempt to manipulate public policy instruments after the election has passed, the following observations could be made: (i) spending increases in the following year election; (ii) spending increases faster in the year after the election than in other years; (iii) post election expenses decrease at a lower rate than other years.

4. Empirical Analysis

The data used come from the Scoreboard of the Gabonese economy over the period 1980-2017 (38 years). These are public capital expenditures (inv_t), total expenditures (dt_t), current (dc_t), budget deficit (def_t), inflation rate (inf_t), gross domestic product (pib_t), and rate of real interest (tir_t). For the sake of the harmonization of quantities, all these variables have been linearized by the natural logarithm (\ln). In addition, trends in the different dimensions of public spending are determined using the Hodrik and Prescott (HP) filter. The "election" is the variable of interest relative to the study of the politico-budgetary cycles. In most cases, the variable "election" (ele_t) is studied and broken down into three phases, namely a pre-electoral phase, an electoral phase and a post-election phase. This variable takes the value 0 or 1 in each case depending on whether or not it is the study period. Thus, we will consider this decomposition of the variable election to remain in the logic of the electoral cycle of Mackic (2013).

To analyze the effects of the elections on the budget of the Gabonese State, we resort to the developments of vector models with error correction. The estimation of dynamic models is done by the method of Johansen (1988), using the software Eviews8.

Two tests of stationarity are performed on the variables (level or differences). The Dickey-Fuller Augmented (ADF) test which considers the absence of a structural break under the alternative hypothesis and that of Phillips-Perron (Pperron), built on the assumption of a trend break with a known date. The results of said tests can be viewed in Table 1 below.

Table 1. Stationarity tests ADF et Pperron

variables	ADF Test		Pperron Test	
	Level	First Difference	Level	First Difference
	Pvalue	Pvalue	Pvalue	Pvalue
c_dc_t	0.0006 (none)	---	0.0005 (none)	---
c_inv_t	0.0001 (none)	---	0.0058 (none)	---
c_dt_t	0.0008 (none)	---	0.0035 (none)	---
c_def_t	0.0000 (none)	---	0.0000 (none)	---
ele_t	0.0000 (c)	---	0.0000 (none)	---
inf_t	0.0001 (none)	---	0.0002 (none)	---
pib_t	0.9885 (none)	0.0000 (none)	0.9885 (none)	0.0000 (none)
tir_t	0.0026 (c & t)	---	0.0029 (c & t)	---

Note: the variable is stationary when the Pvalue is less than 0.01 (at the 1% threshold), 0.05 (at the 5% threshold) and 0.10 (at the 10% threshold). The terms (c & t), (c) and (none) respectively mean "with constant and trend", "with constant" and "without constant or trend".

Table 1 shows that the budget deficit, government spending (total, current, capital), elections, inflation rate and real interest rate are level. Only GDP is stationary in first difference at the 1% threshold. As not all series are level-integrated, it is possible to test the existence of at least one cointegration relationship between these variables for different models.

In order to determine the optimal delay number, we estimate Vector Auto Regressive (VAR) vector models for different delays. Bonfatti and Forni (2017) state that fiscal policy cycles do not exceed a two-year period before and

after the election period. For this, we consider a delay between 0 and 2. The optimal delay obtained for each model is that which minimizes the Akaike criterion and the Likelihood Ratio, as can be seen in Table 2.

Table 2. Optimal delay

Models	Model 1	Model 2	Model 3	Model 4
LR	2	2	2	2
AIC	2	2	1	2

Note: The table values represent the delay number that minimizes the Akaike information criteria (AIC) and the likelihood ratio (LR).

According to Table 2, the estimation of the different models concludes that the delay which minimizes the criteria of akaike and of the likelihood ratio is of the order 2.

We perform the Johansen (1988) cointegration test on level variables using the trace and likelihood ratio (VR) test. The results are shown in Table 3 below.

Table 3. Johansen cointegration test

Models	Model 1	Model 2	Model 3	Model 4
Trace	2	3	2	3
RV	2	3	2	3

Note: The values represent the number of cointegration relationships, according to the criteria of trace and maximum likelihood

The results of these tests confirm the hypothesis that there is at least one cointegration relationship between the variables. In this respect, we first estimate an error-corrected vector model (ECVM) with a cointegration equation and 2 delays, which allows us to distinguish between long-term and short-run effects. However, the estimation of the model [1] in the form of an ECVM presents problems of autocorrelation of the residues, which led us to estimate it in the form of a VAR (2), with stationary variables. Table 4 below presents the results of the four models.

Table 4. Short term relationships

Mod ès	Model 1	Model 2	Model 3	Model 4
Estimation Method	VAR (2)	ECMV	ECMV	ECMV
D(ele_{t-1})	4.63581	87.1763*	323.247*	324.3042*
D(ele_{t-2})	1.51677	60.0211*	200.601*	175.1240*
FR	-	-0.669*	-0.51123*	-0.92662*
R-squared	0.17410	0.805687	0.695350	0.63660
F-statistic	0.50593	8.669605	5.477899	4.2043

Note: FR is the Recall Force (Error Correction Coefficient). F-statistic represents the Fischer statistic. When the coefficient is preceded by (*) then it is significant at the 1% threshold.

The results in Table 4 show that the models [2], [3] and [4] have negative and significant return forces (FR) at the 1% threshold, with R-squared coefficients greater than 50 %. With regard to the model [1], the coefficient of determination (R-squared) is 17.41% and the coefficients associated with the elections are not significant.

After estimating the models, it is now necessary to carry out a set of post-estimation tests: the autocorrelation test (LM-test) and the test of heteroscedasticity (White test) of the residues. The good quality of the ECVM estimation

results requires that the residuals of the estimated models are not autocorrelated. The selected test is LM test whose null hypothesis is the absence of autocorrelation of the residues.

Table 5. Autocorrelation of residues (LM-stat)

Models	Model 1	Model 2	Model 3	Model 4
Lags 1	0.0000	0.7539	0.7049	0.2007
Lag 2	0.0000	0.0425	0.4354	0.6839

Note: The values in the table are the pvalue. When the coefficient is preceded by (*) then the Lag is significant at the 1% threshold.

The results in Table 5 show that the pvalue of models [2], [3] and [4] are greater than 0.01. The null hypothesis cannot be rejected at the 1% threshold. The residues of these models are not autocorrelated. On the other hand, the model [1] presenting a problem of autocorrelation of the residues, it will not be the object of interpretation.

The hypothesis of homoscedasticity requires that the variance of the residuals be constant for each observation. The test retained is that of White whose null hypothesis is the homoscedasticity of the residues.

Table 6. Heteroscedasticity of residues (White test)

Models	Model 1	Model 2	Model 3	Model 4
Chi – sq	268.4846	313.431	325.727	324.686
df	270	330	330	330
pvalue	0.5146	0.7357	0.5561	0.5722

Note: When the coefficient is preceded by (*) then it is significant at the 1% threshold.

The results in Table 6 show that the probabilities of rejection of the null hypothesis are all greater than 1%. The null hypothesis cannot be rejected. There is homoscedasticity of the residues.

The validation of the ECVI and the VAR requires that they be stable. This stability appears when all these roots are inside the circle of diameter 1. According to the graphs in appendix 2, all the roots of VAR (2) and ECVI are inside the circle, therefore they are stable.

Moreover, the coefficients obtained from the models [2], [3] and [4] support the hypothesis according to which the pre-electoral period corresponds to a phase of increase of public expenditures of the State. In other words, the politico-fiscal cycle is of the "opportunistic" type. Indeed, two years before the election year, the elections ($D(ele_{t-2})$) have a positive effect on total public expenditure (200,601), capital expenditure (60,021) and the budget deficit (175.1240). This influence increases as we get closer to the election year. One year before the election year ($D(ele_{t-1})$), the influence of elections is even higher on total spending (323.24), capital expenditure (87.176) and the budget deficit. (324.30). In this, our results support the work of Bonfatti and Forni (2017), who point out that the impact of the "opportunistic" cycle is particularly high for capital expenditure and manifests itself two years before the elections.

In Gabon, the approach of the elections represents the period during which one generally observes the launching by the State of various projects (constructions of roads, hospitals, etc.). In the same way, it is noted that the regulation by the Government of the internal debt to the companies procuring public contracts is often carried out with the approach of the elections. Finally, municipal budgets, the level of endowments, grants, donations and the circulation of money are also increasing as elections approach (presidential or legislative). However, the increase in public spending during election periods is not accompanied by increased tax revenues, as the government avoids raising taxes by electioneering opportunism, which aggravates the budget deficit. In this respect, our results converge with those of Sakurai and Menezes-Filho (2011) who argue that in "young democracies", where voters are less experienced and manipulation of fiscal policies is greater, public deficits increase during election years.

5. Conclusion

In this article, we study the links between the cycle of fiscal policy and the elections in Gabon from Error Vector Models (ECVI) and a second-order VAR. After estimating four dynamic models, our results validate the hypothesis

of the existence of an "opportunistic" politico-budgetary cycle in Gabon. In fact, over the period 1983-2016, Gabonese policy makers repeatedly use the country's public resources excessively to increase their probability of staying in power, convinced that voters have a clear preference for a favorable economic situation. In other words, the variations in the state budget, which are regularly observed two years or even a year before the election year, are explained by the desire of the political decision-makers to ask each time a new mandate to the electors and stay in power.

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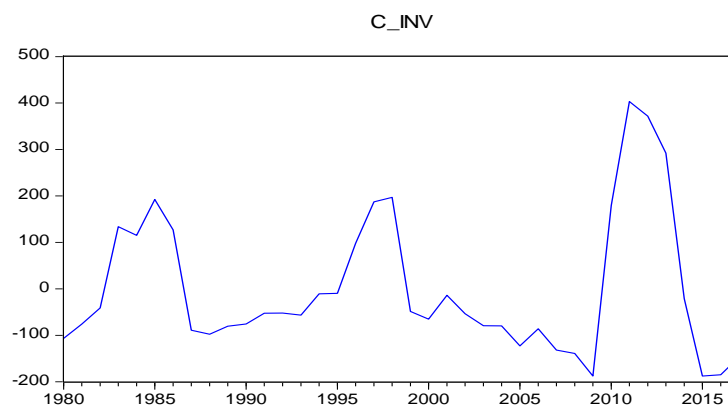
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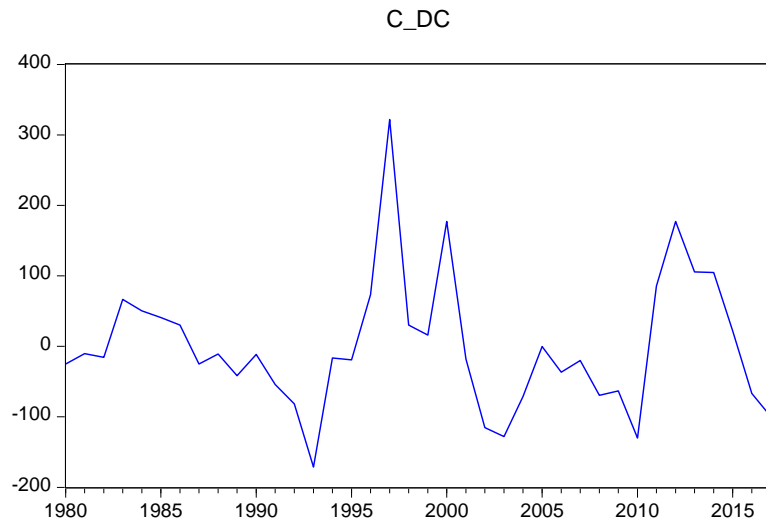
Appendices

Appendice 1. Graphical representation of the cycles

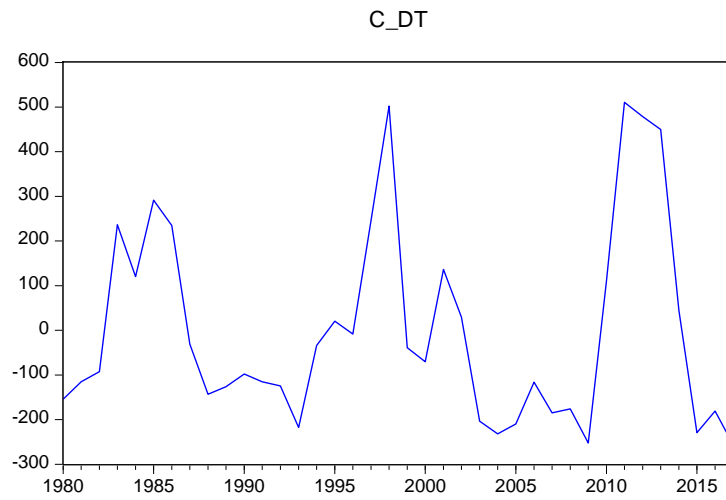
1. Capital Expenditure



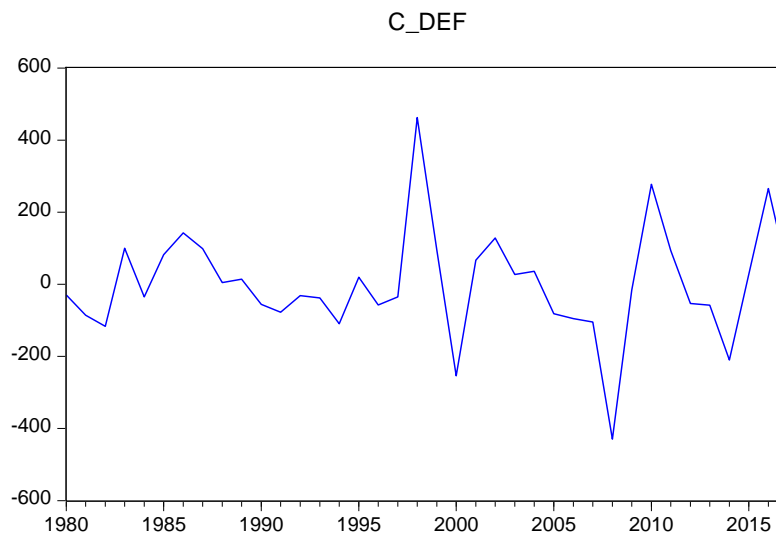
2. Current expenditure



3. Total expenditure



4. Budget deficit



Appendice 2. MVCE

1. Capital Expenditure

✓ **Estimation**

Vector Error Correction Estimates

Date: 03/06/19 Time: 08:14

Sample (adjusted): 1983 2017

Included observations: 35 after adjustments

Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1				
C_INV(-1)	1.000000				
ELE(-1)	214.4631 (99.0633) [2.16491]				
INF(-1)	-15.60874 (4.25557) [-3.66784]				
TIR(-1)	-0.287401 (2.67246) [-0.10754]				
PIB(-1)	-0.014623 (0.01070) [-1.36658]				
C	34.23243				

Error Correction:	D(C_INV)	D(ELE)	D(INF)	D(TIR)	D(PIB)
CointEq1	-0.669153 (0.10127) [-6.60757]	-0.001403 (0.00091) [-1.54750]	0.021487 (0.01371) [1.56706]	-0.039544 (0.02402) [-1.64603]	-0.457786 (0.81524) [-0.56154]
D(C_INV(-1))	0.771222 (0.13350) [5.77684]	0.000626 (0.00120) [0.52356]	-0.013039 (0.01808) [-0.72138]	0.063338 (0.03167) [1.99995]	1.631326 (1.07471) [1.51793]
D(C_INV(-2))	0.658122 (0.18714) [3.51665]	-0.000644 (0.00168) [-0.38446]	-0.012654 (0.02534) [-0.49942]	0.006980 (0.04439) [0.15722]	1.887238 (1.50653) [1.25271]
D(ELE(-1))	87.17635 (23.1493) [3.76584]	-0.674005 (0.20727) [-3.25189]	0.821315 (3.13429) [0.26204]	-5.644669 (5.49154) [-1.02788]	178.2411 (186.353) [0.95647]
D(ELE(-2))	60.02111 (20.4379) [2.93675]	-0.391917 (0.18299) [-2.14174]	2.034124 (2.76719) [0.73509]	-4.054602 (4.84835) [-0.83628]	216.3332 (164.527) [1.31488]
D(INF(-1))	-10.21162	-0.026972	-0.036872	-0.380719	-16.35108

	(1.65327)	(0.01480)	(0.22384)	(0.39219)	(13.3089)
	[-6.17664]	[-1.82216]	[-0.16472]	[-0.97074]	[-1.22858]
D(INF(-2))	-7.614201	-0.009990	-0.306269	-0.683808	0.098773
	(1.86016)	(0.01665)	(0.25186)	(0.44127)	(14.9745)
	[-4.09330]	[-0.59982]	[-1.21605]	[-1.54962]	[0.00660]
D(TIR(-1))	-4.630301	-0.003793	-0.009856	-0.530177	-15.75684
	(0.98817)	(0.00885)	(0.13379)	(0.23442)	(7.95485)
	[-4.68573]	[-0.42874]	[-0.07367]	[-2.26168]	[-1.98078]
D(TIR(-2))	-5.050776	0.001502	-0.144120	-0.338204	-12.43307
	(1.10992)	(0.00994)	(0.15028)	(0.26330)	(8.93496)
	[-4.55057]	[0.15117]	[-0.95902]	[-1.28448]	[-1.39151]
D(PIB(-1))	-0.104415	0.000140	-0.000608	-0.002825	-0.417710
	(0.03009)	(0.00027)	(0.00407)	(0.00714)	(0.24224)
	[-3.46990]	[0.51822]	[-0.14915]	[-0.39578]	[-1.72437]
D(PIB(-2))	-0.032591	-4.05E-05	-0.000714	0.007727	-0.384945
	(0.03047)	(0.00027)	(0.00413)	(0.00723)	(0.24530)
	[-1.06952]	[-0.14851]	[-0.17296]	[1.06896]	[-1.56925]
C	20.48844	-0.011326	-0.344791	-1.775397	375.2670
	(14.7319)	(0.13190)	(1.99462)	(3.49475)	(118.593)
	[1.39075]	[-0.08587]	[-0.17286]	[-0.50802]	[3.16433]
R-squared	0.805687	0.608049	0.426301	0.473194	0.326472
Adj. R-squared	0.712755	0.420595	0.151923	0.221243	0.004350
Sum sq. resids	97786.97	7.839014	1792.605	5502.939	6336965.
S.E. equation	65.20435	0.583804	8.828327	15.46797	524.9002
F-statistic	8.669605	3.243713	1.553698	1.878121	1.013504
Log likelihood	-188.5288	-23.47874	-118.5442	-138.1724	-261.5277
Akaike AIC	11.45879	2.027356	7.459669	8.581281	15.63015
Schwarz SC	11.99205	2.560619	7.992931	9.114543	16.16342
Mean dependent	-3.015828	0.000000	-0.426451	-0.474857	211.2543
S.D. dependent	121.6606	0.766965	9.586513	17.52801	526.0456
Determinant resid covariance (dof adj.)		3.05E+12			
Determinant resid covariance		3.74E+11			
Log likelihood		-714.6278			
Akaike information criterion		44.55016			
Schwarz criterion		47.43866			

✓ **Autocorrelation test**

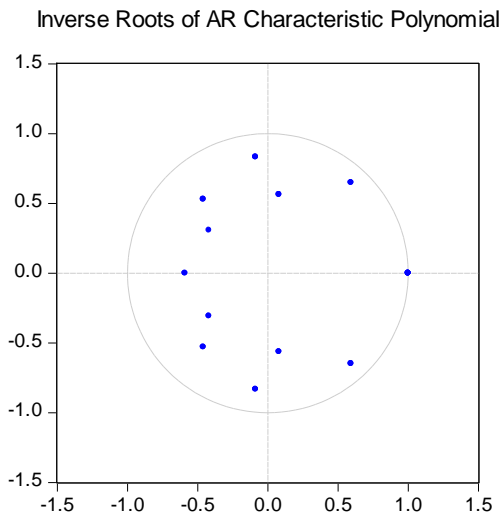
Lags	LM-Stat	Prob
1	19.86393	0.7539
2	38.37646	0.0425

✓ **Heterosc élasticity test**

Joint test:

Chi-sq	df	Prob.
313.4307	330	0.7357

✓ **Stability test**



2. Current Expenditure

✓ **Estimation**

Vector Error Correction Estimates
 Date: 03/06/19 Time: 08:20
 Sample (adjusted): 1983 2017
 Included observations: 35 after adjustments
 Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1
C_DC(-1)	1.000000
ELE(-1)	1193.021 (267.866) [4.45379]
INF(-1)	-48.52114 (13.4085) [-3.61869]
TIR(-1)	15.80953 (7.76856) [2.03507]
PIB(-1)	0.217975 (0.07222)

	[3.01800]				
@TREND(80)	-47.97566 (15.8461) [-3.02760]				
C	-233.4567				
Error Correction:	D(C_DC)	D(ELE)	D(INF)	D(TIR)	D(PIB)
CointEq1	-0.067519 (0.05308) [-1.27204]	-0.000725 (0.00030) [-2.43992]	0.006023 (0.00443) [1.35930]	-0.017267 (0.00820) [-2.10620]	0.099035 (0.32926) [0.30078]
D(C_DC(-1))	-0.388535 (0.23735) [-1.63696]	0.000708 (0.00133) [0.53305]	-0.039504 (0.01981) [-1.99369]	0.053908 (0.03666) [1.47050]	-0.271575 (1.47233) [-0.18445]
D(C_DC(-2))	-0.180711 (0.21342) [-0.84672]	0.002409 (0.00119) [2.01780]	-0.025947 (0.01782) [-1.45633]	0.019302 (0.03296) [0.58555]	-0.267554 (1.32390) [-0.20209]
D(ELE(-1))	84.15146 (46.4114) [1.81316]	-0.241689 (0.25966) [-0.93080]	-2.613469 (3.87446) [-0.67454]	6.230083 (7.16831) [0.86911]	78.54270 (287.897) [0.27282]
D(ELE(-2))	41.10828 (33.0885) [1.24237]	-0.221220 (0.18512) [-1.19501]	0.572383 (2.76226) [0.20722]	1.924704 (5.11057) [0.37661]	240.1634 (205.253) [1.17009]
D(INF(-1))	-4.326771 (2.44051) [-1.77290]	-0.035598 (0.01365) [-2.60722]	-0.087262 (0.20374) [-0.42831]	-0.387981 (0.37694) [-1.02929]	-5.238180 (15.1388) [-0.34601]
D(INF(-2))	0.007536 (2.78578) [0.00271]	-0.018964 (0.01559) [-1.21680]	-0.451897 (0.23256) [-1.94315]	-0.713013 (0.43027) [-1.65714]	9.487464 (17.2806) [0.54902]
D(TIR(-1))	-0.232315 (1.43691) [-0.16168]	-0.006125 (0.00804) [-0.76193]	-0.075556 (0.11995) [-0.62987]	-0.168728 (0.22193) [-0.76027]	-7.127724 (8.91334) [-0.79967]
D(TIR(-2))	1.665814 (1.24701) [1.33584]	-0.001682 (0.00698) [-0.24110]	-0.262111 (0.10410) [-2.51783]	-0.212049 (0.19260) [-1.10097]	-3.958158 (7.73541) [-0.51169]
D(PIB(-1))	0.115066 (0.03867) [2.97531]	8.55E-05 (0.00022) [0.39506]	0.000283 (0.00323) [0.08772]	0.002063 (0.00597) [0.34542]	-0.072626 (0.23990) [-0.30274]
D(PIB(-2))	0.011952 (0.04501) [0.26553]	-0.000257 (0.00025) [-1.01921]	0.002475 (0.00376) [0.65859]	0.003935 (0.00695) [0.56605]	-0.183782 (0.27921) [-0.65822]
C	-32.87787	0.026305	-1.174471	-2.275184	262.4218

	(22.3928)	(0.12528)	(1.86937)	(3.45859)	(138.906)
	[-1.46824]	[0.20997]	[-0.62827]	[-0.65784]	[1.88921]
R-squared	0.456553	0.686468	0.553175	0.542487	0.180663
Adj. R-squared	0.196644	0.536518	0.339477	0.323676	-0.211193
Sum sq. resids	200338.4	6.270646	1396.167	4779.116	7708824.
S.E. equation	93.32933	0.522146	7.791207	14.41484	578.9355
F-statistic	1.756586	4.577971	2.588576	2.479252	0.461044
Log likelihood	-201.0801	-19.57215	-114.1703	-135.7044	-264.9571
Akaike AIC	12.17601	1.804123	7.209729	8.440254	15.82612
Schwarz SC	12.70927	2.337385	7.742991	8.973516	16.35938
Mean dependent	-2.408855	0.000000	-0.426451	-0.474857	211.2543
S.D. dependent	104.1272	0.766965	9.586513	17.52801	526.0456
Determinant resid covariance (dof adj.)		1.92E+12			
Determinant resid covariance		2.36E+11			
Log likelihood		-706.5598			
Akaike information criterion		44.14627			
Schwarz criterion		47.07922			

✓ **Autocorrelation test**

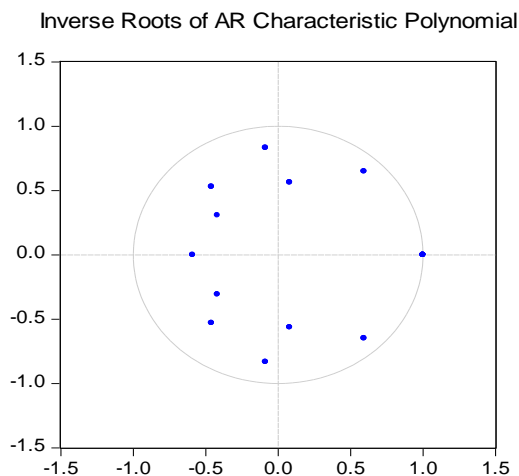
Lags	LM-Stat	Prob
1	19.86393	0.7539
2	38.37646	0.0425

✓ **Heteroscedasticity Test**

Joint test:

Chi-sq	df	Prob.
313.4307	330	0.7357

✓ **Stability test**



3. Total Expenditure

✓ Estimation

Vector Error Correction Estimates

Date: 03/06/19 Time: 18:33

Sample (adjusted): 1983 2017

Included observations: 35 after adjustments

Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1				
C_DT(-1)	1.000000				
ELE(-1)	1082.562 (215.278) [5.02866]				
INF(-1)	-36.40787 (6.14599) [-5.92384]				
TIR(-1)	-7.274879 (3.34409) [-2.17544]				
PIB(-1)	-0.040149 (0.01327) [-3.02472]				
Error Correction:	D(C_DT)	D(ELE)	D(INF)	D(TIR)	D(PIB)
CointEq1	-0.511230 (0.09913) [-5.15742]	-0.001031 (0.00033) [-3.10225]	0.010321 (0.00619) [1.66663]	-0.019793 (0.01072) [-1.84587]	-0.044008 (0.46912) [-0.09381]
D(C_DT(-1))	0.669991 (0.17685) [3.78839]	0.001089 (0.00059) [1.83713]	-0.021800 (0.01105) [-1.97320]	0.058609 (0.01913) [3.06361]	0.166435 (0.83698) [0.19885]
D(C_DT(-2))	0.581181 (0.21293) [2.72950]	-0.000932 (0.00071) [-1.30582]	-0.002241 (0.01330) [-0.16847]	0.002050 (0.02303) [0.08901]	0.382609 (1.00769) [0.37969]
D(ELE(-1))	323.2474 (77.8114) [4.15424]	-0.159776 (0.26085) [-0.61251]	-2.884349 (4.86097) [-0.59337]	1.616656 (8.41708) [0.19207]	209.2405 (368.249) [0.56820]
D(ELE(-2))	200.6015 (47.5126) [4.22207]	-0.092605 (0.15928) [-0.58140]	0.005724 (2.96817) [0.00193]	0.353738 (5.13957) [0.06883]	275.1741 (224.857) [1.22377]
D(INF(-1))	-13.89520 (3.54080) [-3.92432]	-0.042767 (0.01187) [-3.60288]	0.088234 (0.22120) [0.39889]	-0.689849 (0.38302) [-1.80109]	-11.14961 (16.7571) [-0.66537]

D(INF(-2))	-20.34824 (4.06846) [-5.00146]	-0.011354 (0.01364) [-0.83250]	-0.286489 (0.25416) [-1.12719]	-0.828439 (0.44010) [-1.88240]	3.020648 (19.2543) [0.15688]
D(TIR(-1))	-8.795386 (2.26693) [-3.87987]	-0.011448 (0.00760) [-1.50635]	0.139822 (0.14162) [0.98732]	-0.819405 (0.24522) [-3.34150]	-9.198528 (10.7284) [-0.85740]
D(TIR(-2))	-12.18544 (2.50618) [-4.86217]	0.002111 (0.00840) [0.25120]	-0.119345 (0.15656) [-0.76228]	-0.470001 (0.27110) [-1.73368]	-4.949342 (11.8607) [-0.41729]
D(PIB(-1))	-0.058376 (0.05242) [-1.11362]	5.63E-05 (0.00018) [0.32019]	0.000999 (0.00327) [0.30498]	-0.006382 (0.00567) [-1.12550]	0.055493 (0.24808) [0.22369]
D(PIB(-2))	-0.011757 (0.04825) [-0.24366]	7.72E-05 (0.00016) [0.47697]	-0.001951 (0.00301) [-0.64736]	0.006054 (0.00522) [1.15980]	-0.059821 (0.22836) [-0.26196]
R-squared	0.695350	0.764005	0.475455	0.529547	0.000240
Adj. R-squared	0.568413	0.665674	0.256894	0.333524	-0.416326
Sum sq. resids	419975.4	4.719894	1639.016	4914.288	9406353.
S.E. equation	132.2837	0.443466	8.263917	14.30951	626.0442
F-statistic	5.477899	7.769720	2.175392	2.701462	0.000577
Log likelihood	-214.0334	-14.60052	-116.9767	-136.1925	-268.4399
Akaike AIC	12.85905	1.462887	7.312952	8.411003	15.96800
Schwarz SC	13.34788	1.951710	7.801775	8.899826	16.45682
Mean dependent	-4.691727	0.000000	-0.426451	-0.474857	211.2543
S.D. dependent	201.3595	0.766965	9.586513	17.52801	526.0456
Determinant resid covariance (dof adj.)		6.83E+12			
Determinant resid covariance		1.04E+12			
Log likelihood		-732.4657			
Akaike information criterion		45.28376			
Schwarz criterion		47.95007			

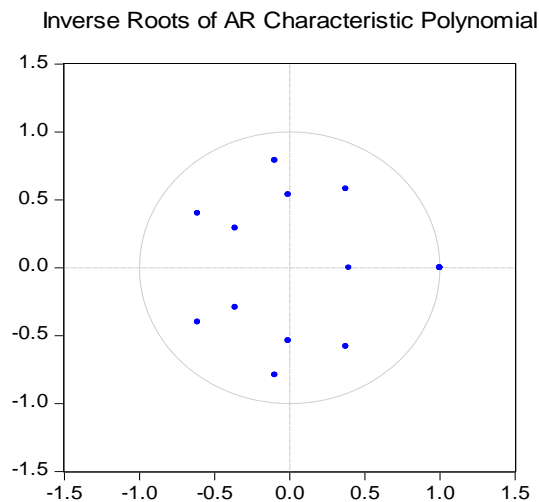
✓ Autocorrelation test

Lags	LM-Stat	Prob
1	20.77828	0.7049
2	25.48596	0.4354

✓ Heteroscedasticity test

Chi-sq	df	Prob.
325.7272	330	0.5561

✓ **Stability test**



4. Budget deficit

✓ **Estimation**

Vector Error Correction Estimates

Date: 03/06/19 Time: 18:58

Sample (adjusted): 1983 2017

Included observations: 35 after adjustments

Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1				
C_DEF(-1)	1.000000				
ELE(-1)	612.1722 (103.794) [5.89793]				
INF(-1)	-6.657411 (2.83085) [-2.35173]				
TIR(-1)	-9.704985 (1.50471) [-6.44975]				
PIB(-1)	-0.021018 (0.00493) [-4.26362]				
Error Correction:	D(C_DEF)	D(ELE)	D(INF)	D(TIR)	D(PIB)
CointEq1	-0.926619 (0.21956) [-4.22039]	-0.002537 (0.00064) [-3.93503]	-0.007088 (0.01336) [-0.53065]	0.015722 (0.02523) [0.62318]	-0.162184 (0.80198) [-0.20223]
D(C_DEF(-1))	0.504538 (0.26361)	0.002437 (0.00077)	-0.001267 (0.01604)	-0.011821 (0.03029)	2.244674 (0.96291)

	[1.91392]	[3.14838]	[-0.07899]	[-0.39024]	[2.33113]
D(C_DEF(-2))	0.278085 (0.28556) [0.97384]	5.36E-05 (0.00084) [0.06395]	0.021295 (0.01737) [1.22576]	-0.044768 (0.03281) [-1.36435]	0.869872 (1.04306) [0.83397]
D(ELE(-1))	342.3042 (96.5316) [3.54603]	0.190694 (0.28346) [0.67274]	6.146658 (5.87300) [1.04660]	-13.94547 (11.0924) [-1.25721]	5.265942 (352.603) [0.01493]
D(ELE(-2))	175.1240 (59.3437) [2.95101]	0.060887 (0.17426) [0.34941]	3.393304 (3.61048) [0.93985]	-4.778817 (6.81916) [-0.70079]	89.86704 (216.766) [0.41458]
D(INF(-1))	-0.298853 (3.18804) [-0.09374]	-0.029301 (0.00936) [-3.12997]	-0.153177 (0.19396) [-0.78973]	-0.036268 (0.36634) [-0.09900]	-16.30996 (11.6450) [-1.40059]
D(INF(-2))	-8.635528 (3.70074) [-2.33346]	-0.007122 (0.01087) [-0.65543]	-0.604266 (0.22515) [-2.68379]	-0.110045 (0.42525) [-0.25878]	-7.267810 (13.5178) [-0.53765]
D(TIR(-1))	-6.311393 (2.69191) [-2.34458]	-0.028505 (0.00790) [-3.60608]	-0.012778 (0.16378) [-0.07802]	-0.302814 (0.30933) [-0.97895]	-21.56424 (9.83281) [-2.19309]
D(TIR(-2))	-8.435166 (2.85176) [-2.95789]	-0.010260 (0.00837) [-1.22520]	-0.318910 (0.17350) [-1.83809]	-0.019284 (0.32769) [-0.05885]	-12.24013 (10.4167) [-1.17505]
D(PIB(-1))	-0.027392 (0.05814) [-0.47116]	0.000391 (0.00017) [2.29040]	-0.004621 (0.00354) [-1.30652]	0.006449 (0.00668) [0.96538]	0.156429 (0.21236) [0.73662]
D(PIB(-2))	0.141541 (0.06352) [2.22815]	-0.000120 (0.00019) [-0.64106]	0.001835 (0.00386) [0.47484]	-0.002780 (0.00730) [-0.38084]	0.221029 (0.23204) [0.95257]
R-squared	0.636600	0.784738	0.408516	0.368853	0.291940
Adj. R-squared	0.485183	0.695045	0.162065	0.105875	-0.003084
Sum sq. resids	499300.3	4.305246	1848.174	6592.869	6661861.
S.E. equation	144.2365	0.423539	8.775378	16.57416	526.8563
F-statistic	4.204290	8.749187	1.657594	1.402601	0.989545
Log likelihood	-217.0611	-12.99136	-119.0784	-141.3348	-262.4027
Akaike AIC	13.03206	1.370935	7.433054	8.704844	15.62301
Schwarz SC	13.52089	1.859758	7.921878	9.193668	16.11183
Mean dependent	4.170802	0.000000	-0.426451	-0.474857	211.2543
S.D. dependent	201.0245	0.766965	9.586513	17.52801	526.0456
Determinant resid covariance (dof adj.)		4.27E+12			
Determinant resid covariance		6.47E+11			
Log likelihood		-724.2383			
Akaike information criterion		44.81362			
Schwarz criterion		47.47993			

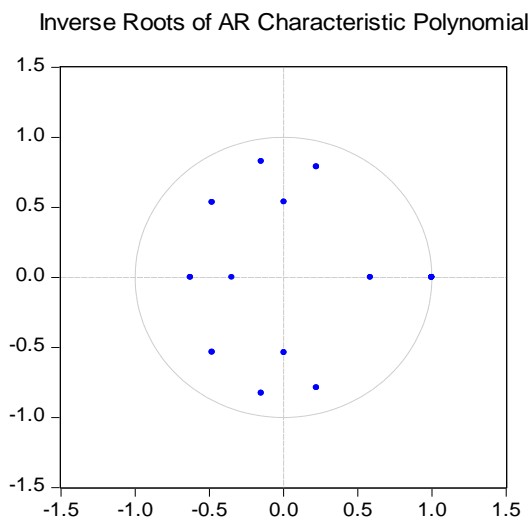
✓ **Autocorrelation test**

Lags	LM-Stat	Prob
1	30.65455	0.2007
2	21.15633	0.6839

✓ **Heteroscedasticity test**

Chi-sq	df	Prob.
324.6858	330	0.5722

✓ **Stability test**



Appendice 3: VAR Estimation

VAR (1): current expenditure

✓ **Estimation**

Bayesian VAR Estimates
 Date: 04/21/19 Time: 03:35
 Sample (adjusted): 1982 2017
 Included observations: 36 after adjustments
 Prior type: Litterman/Minnesota
 Initial residual covariance: Univariate AR
 Hyper-parameters: Mu: 0, L1: 0.1, L2: 0.99, L3: 1
 Standard errors in () & t-statistics in []

	C_DC	ELE	INF	DPIB	TIR
C_DC(-1)	0.125123 (0.08442) [1.48223]	4.47E-05 (0.00042) [0.10518]	-0.004573 (0.00719) [-0.63641]	-0.622461 (0.49530) [-1.25673]	0.013677 (0.01406) [0.97267]

ELE(-1)	4.448579 (16.7195) [0.26607]	-0.084513 (0.08540) [-0.98965]	0.920601 (1.43352) [0.64219]	57.02349 (98.8066) [0.57712]	-1.866793 (2.80499) [-0.66553]
INF(-1)	0.303642 (0.99623) [0.30479]	-0.001218 (0.00505) [-0.24109]	0.066568 (0.08605) [0.77356]	-1.267982 (5.88742) [-0.21537]	0.060141 (0.16714) [0.35982]
DPIB(-1)	0.016023 (0.01456) [1.10077]	5.15E-05 (7.4E-05) [0.69831]	0.000184 (0.00125) [0.14707]	-0.013022 (0.08667) [-0.15024]	0.000273 (0.00244) [0.11187]
TIR(-1)	-0.201917 (0.50922) [-0.39652]	-0.000669 (0.00258) [-0.25908]	-0.013113 (0.04366) [-0.30032]	-0.606569 (3.00944) [-0.20156]	0.117435 (0.08607) [1.36441]
C	-3.877344 (16.7390) [-0.23164]	0.328952 (0.08493) [3.87319]	2.764892 (1.43572) [1.92579]	204.2469 (98.9479) [2.06419]	5.189543 (2.80923) [1.84732]
R-squared	0.158937	0.074533	0.072948	0.103349	0.143392
Adj. R-squared	0.018760	-0.079712	-0.081561	-0.046093	0.000624
Sum sq. resids	279007.9	7.069542	1948.817	8443645.	7645.170
S.E. equation	96.43787	0.485439	8.059811	530.5232	15.96368
F-statistic	1.133831	0.483211	0.472126	0.691569	1.004369
Mean dependent	0.984195	0.305556	3.212414	208.6944	5.665804
S.D. dependent	97.35539	0.467177	7.749958	518.7037	15.96866

✓ **Autocorrelation test**

Lags	LM-Stat	Prob
1	53.97866	0.0007
2	58.34694	0.0002

VAR (2): current expenditure

✓ **Estimation**

Bayesian VAR Estimates
 Date: 04/21/19 Time: 03:18
 Sample (adjusted): 1983 2017
 Included observations: 35 after adjustments
 Prior type: Litterman/Minnesota
 Initial residual covariance: Univariate AR
 Hyper-parameters: Mu: 0, L1: 0.1, L2: 0.99, L3: 1
 Standard errors in () & t-statistics in []

	C_DC	ELE	INF	DPIB	TIR
C_DC(-1)	0.119781 (0.08528) [1.40454]	5.01E-05 (0.00041) [0.12165]	-0.004082 (0.00661) [-0.61720]	-0.582948 (0.49501) [-1.17765]	0.013279 (0.01424) [0.93249]
C_DC(-2)	0.005852	-4.46E-05	-0.001070	-0.128493	-0.001036

	(0.04801)	(0.00023)	(0.00372)	(0.27814)	(0.00800)
	[0.12189]	[-0.19298]	[-0.28804]	[-0.46197]	[-0.12943]
ELE(-1)	4.635813 (17.3898) [0.26658]	-0.091193 (0.08518) [-1.07064]	1.108611 (1.35865) [0.81596]	61.09119 (101.682) [0.60081]	-1.985759 (2.92510) [-0.67887]
ELE(-2)	1.516772 (9.77372) [0.15519]	-0.016728 (0.04797) [-0.34875]	0.146805 (0.76361) [0.19225]	21.02221 (57.1493) [0.36785]	0.226136 (1.64402) [0.13755]
INF(-1)	0.325677 (1.07564) [0.30277]	-0.001136 (0.00523) [-0.21715]	0.065214 (0.08465) [0.77042]	-1.465634 (6.28952) [-0.23303]	0.070890 (0.18094) [0.39179]
INF(-2)	0.352837 (0.60420) [0.58397]	0.000680 (0.00294) [0.23133]	-0.024652 (0.04764) [-0.51748]	0.010068 (3.53291) [0.00285]	0.022130 (0.10163) [0.21774]
DPIB(-1)	0.015922 (0.01478) [1.07731]	4.98E-05 (7.2E-05) [0.69370]	0.000189 (0.00115) [0.16348]	-0.016441 (0.08708) [-0.18880]	0.000208 (0.00249) [0.08355]
DPIB(-2)	-2.85E-05 (0.00816) [-0.00349]	-9.12E-06 (4.0E-05) [-0.22993]	2.80E-05 (0.00064) [0.04388]	-0.012843 (0.04817) [-0.26662]	1.55E-05 (0.00137) [0.01131]
TIR(-1)	-0.204688 (0.51202) [-0.39977]	-0.000709 (0.00249) [-0.28462]	-0.009975 (0.04000) [-0.24934]	-0.561393 (2.99394) [-0.18751]	0.111643 (0.08678) [1.28649]
TIR(-2)	0.024614 (0.28393) [0.08669]	0.000122 (0.00138) [0.08812]	0.000116 (0.02218) [0.00521]	0.288273 (1.66022) [0.17364]	0.015213 (0.04821) [0.31556]
C	-5.383844 (17.9020) [-0.30074]	0.344397 (0.08713) [3.95266]	2.349021 (1.39926) [1.67876]	201.5539 (104.709) [1.92489]	5.274495 (3.01256) [1.75084]
R-squared	0.174105	0.093097	0.098664	0.126589	0.152015
Adj. R-squared	-0.170018	-0.284779	-0.276893	-0.237332	-0.201312
Sum sq. resids	273745.2	6.840639	1726.461	8217586.	7490.059
S.E. equation	106.7991	0.533879	8.481502	585.1491	17.66595
F-statistic	0.505938	0.246369	0.262713	0.347848	0.430238
Mean dependent	1.455422	0.314286	2.827460	211.2543	5.936256
S.D. dependent	98.73505	0.471008	7.505774	526.0456	16.11792

✓ **Autocorrelation test**

Lags	LM-Stat	Prob
1	69.73856	0.0000
2	63.30596	0.0000