The Impact of Public Deficit on Private Savings: The Case of the Central African Economic and Monetary Community (CAEMC) countries

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Abstract

The major thrust of this paper is to investigate the impact of public deficits on private savings in countries belonging to the Central African Economic and Monetary Community (CAEMC). Their budget deficits are due to sharp fall in public revenues. Econometric estimation using a consumption function has led to the rejection of the ricardian assumption according to which the intertemporal profile of taxes does not affect the level of consumption owing to the low credibility linked to the State's debt commitments. It appears that the foundations of a decrease in public savings due to a fall in public revenues specific to CAEMC countries are counterbalanced by an increase in private savings.

Keywords: Private savings, Public deficit, Income, Consumption, Indebtness, CAEMC.

Introduction

Towards the middle of the 1970's, Central African States member of the Franc Zone were achieving a much lower level of saving than that of the rest of other countries of the franc zone. In fact, their domestic saving level relative to Gross Domestic Product (GDP) amounted to about 6.5% against 10.1% for the other Franc Zone African countries (DSCN, 2001; BEAC, 2003)[1]. This low saving rate is caused by a serious handicap for these countries which had to resort to significant external financial inflows to finance their investment. As a result, they become heavily indebted and the debt to GDP ratio of the entire CAEMC zone still remained superior to 75% in 2003 (World Bank, 2004). The Congo, Chad and the Central African Republic witnessed the highest indebtness rates of 119.0%, 135.8% and 168.0% respectively in year 2000. The other CAEMC zone countries had indebtness rates ranging from 75.0% to 86.9 % during the same year.

Table 1: Evolution of the rate of debt per GDP in some CAEMC countries during the period 1985-94

	1985	1986	1987	1988	1989	1990	1991	1992	1993*	1994*
CAM	33 ,90	31,00	31,50	37,70	46,30	53,20	59,30	60,00	65,80	107,0
RCA	49,20	48,70	59,40	59,20	58,20	50,20	62,20	61,50	73,20	101,8
RC	140,1	188,9	188,9	188,9	179,1	172,6	177,7	168,0	237,6	454,1

GAB	34,30	42,20	75,20	73,90	72,20	72,20	76,80	64,20	79,90	122,5
TCH	28,80	29,61	39,65	34,72	40,70	40,70	45,10	52,8	64,20	91,00

1995	1996	1997	1998	1999	2000
62,2	68,3	72,0	73,1	74,5	77,6
88,8	101,4	122,8	139,9	151,6	168,0
177,8	196,9	159,9	105,9	108,8	119,0
69,6	73,0	72,2	79,9	83,7	86,9
106,3	119,9	128,5	147,0	130,8	135,0

''For 1993 and 1994, the ratio corresponds to debt/GDP report''.

Sources : World Debt Tables 1992/ 2004 – Zone franc, Rapport annuel, 1996-2004.

The saving level still remaining non homogenous according the country considered, CAEMC countries[2] had an average saving rate high than that of the other Sub-Saharan African (ASS) countries (DSCN, 2001; BEAC, 2002)[3]. This better CAEMC wide performance, which did not however enable them to achieve the average domestic saving level of the other African countries taken as a whole (8.9% of GDP between 1993 and 2002), was obtained thanks to an appreciable level of public saving. CAEMC zone countries had an average saving rate close to 9% of public revenues against 2% for the other franc Zone countries and less than 5% for all African countries [4].

Table 2: Average Rate of Savings in some African countries zones (period from 1983 to 2002.

	Interior Saving in % of the GDP	Number of countries	Public saving in % of budgetaries recipes	Number of countries	Private saving in % of disposable private income	Number of countries
CAEMC countries	7,2	5,0	9,0	5,0	7,1	5,0
Others African out of CAEMC zone	5,6	10,0	2,0	9,0	9,2	9,0
Total of African	8,9	19,0	4,0	17,0	10,3	17,0

Sources : Synthèse des Statistiques DSCN (1983-2002), BEAC- BECEAO (1982-2003), World Tables (2002).

The high level of public saving of CAEMC zone countries was probably attributable to the common operating rules linked the countries member of the CAEMC and the "Banque des Etats de l'Afrique Centrale" (BEAC, 2002)[5]. Thus, the provision for a statutory limitation of Central Banks' advances to member States' Public treasuries has played an essential role [6]. The level of private saving of the other States of the CAEMC zone was on the other hand, similar on the average to that of the other Franc Zone African countries.

At the beginning of the 1980's, public revenues of CAEMC zone States witnessed a sharp fall in terms of ratio to GDP, the public levies of these States dropped from 17.7 % in 1982-85 to 13.1% in 1993-96 (Gankou, 1996). This trend did not experience any major change. This fall in public levies was specific to CAEMC zone countries since the other African countries maintained their public levies at around 19% of GDP. The fall in public resources in the CAEMC zone is basically attributable to a contraction of the tax base subsequent to increasing tax evasion, and the fact that the economics of the zone were increasingly becoming informal as a result of the serious economic crisis which struck these countries in the mid-80's and lasted for a decade until the CFA franc devaluation in 1994.

Moreover, public arrears accumulation also contributed significantly as a considerable obstacle to tax collection (Mengue Me Engouang, 2001).

In order to avoid a considerable worsening of deficits (or budgetary imbalances) the CAEMC zone States were unable to mobilize their off-debt service current public expenditures (Cockburn, 1995)[8]. The fall in current receipts therefore gave rise to a sharp downturn in public saving. Given the increasing difficulties involved in mobilizing external financial inflows during the 1988-1997 period and initial importance of public saving in CAEMC zone States, the fall in public saving became a major concern since it tended to call into question the capacity of States to invest for their future development.

However, according to the equivalence assumption of Ricardo (1971)[9] as restated by Barro (1974)[10], aggregate saving capacity could remain unchanged since taxpayers would increase their private savings in order to finance the future debt service burden created by budget deficit. Some empirical studies (Aschauer, 1985; Felstein, 1998; Seater, 1993) underline the assumption of a partial compensation of a fall in public savings by a rise in private savings.

Other authors (Graham, 1993; Cox and Jappelli, 1990; Hayashi, 1985; Baxter and King, 1983; Kormendi, 1983) highlight a concomitant fall in both public and private savings. These observations call into question the relevance of the link between public deficits and private savings in CAEMC countries. Our concern is therefore to find an answer to the following crucial question: how do public deficits caused by a fall in public levies impact on private savings in the context of CAEMC countries?

The overall objective of the present analysis is therefore to assess in the case of CAEMC countries, the impacts on private savings of public budget deficits maintained at a high level owing to the specific phenomenon of a downturn in public resources. In other words, this study attemps to capture the relationships between public deficits and private savings. This research/study is carried out using the ricardian equivalence assumption by supposing that the representative agent of the private sector works out his intertemporal consumption planning by maximizing his utility subject to a budget constraint and that States can resort to external borrowing. Given these hypotheses and the related literature, the 2OLS method permit us to estimate a private consumption function incorporating the low credibility attached to the commitments of the States. However, it is useful to underline the fact that public deficit stimulates private consumption and is largely attributable to a fall public levies in the long-term. In general, the public debt becomes perfectly substitutable to taxes, and public securities do not constitute net wealth.

The rest of study revolves around three main points. Section 2 describes the model linking public deficits with private savings, section 3 presents the results of econometric estimation of the model using the time-series data of CAEMC zone countries, and Section 4 concludes the study.

Description of the Model: Public Deficits-Private Savings

The relationships between public deficit 12 and private savings can be highlighted with an explanatory model by making the following assumptions: the representative agent of the private sector works out his intertemporal planning of consumption in an infinite economic horizon by maximizing his utility function subject to his budget constraint. Owing to rules presently in force in the CAEMC zone which put ceilings on the amount outstanding of financial commitments of the State vis-à-vis the banking system, we assume that the State does not call on the monetary financing of the deficit, while the weakness of domestic financial markets does not enable the State to mobilize a significant domestic direct financing. Moreover, public arrears may be considered as a form of domestic borrowing corresponding to forced saving. Finally, the States may subscribe or have recourse to foreign borrowing. The State thus has the following budget constraint:

$$X_t = (1+i_d)X_{t-1} - (R_t - D_t) \tag{1}$$

Where X_t represents the debt outstanding, i_d the interest rate on the public debt which, by assumption, is equal to the public discount rate, R_t public revenues, and D_t, primary public expenditures off-debt service.

The State may increase its debt outstanding when primary public expenditures and interest payments on the debt exceed public receipts. However, in the absence of restrictions on recourse to borrowing, the State could infinitely increase its expenditures and increasingly get into debt to reimburse interests on the debt. The so-called "non ponzi" condition permits to avoid explosive indebtness strategies. It prevents the debt from growing more rapidly than the interest rate. We have:

$$\lim \frac{E_t X_t}{(1+i_d)^t} = 0 \ lorsque \ t \to \infty, \tag{2}$$

Where E_t is the conditional mathematical operator of information at time t.

The budget constraint (1) and the '' non –ponzi''condition determine the intertemporal budget constraint (3) below, which says that the discounted sum of expected primary budget surpluses is sufficient to repay the public debt. We thus have the following equation:

$$X_t = \sum_{j=t+1}^{\infty} \frac{E_t(R_j - D_j)}{(1+i_d)^{j-t}} \tag{3}$$

The budget constraint of private agents is the following:

$$Z_t = (1 + i_p)Z_{t-1} - (Y_t - R_t - C_t) \qquad (4)$$

Where Z_t represents the private debt outstanding, i_p, the interest rate on the private debt outstanding which, by assumption, is equal to the private discount rate, Y_t, national income, and C_t, private consumption. Furthermore, the State also respects the so-called "non ponzi" condition which, combined with the budget constraint, enables to derive its intertemporal budget constraint as follows:

$$Z_t = \sum_{j=t+1}^{\infty} \frac{E_t(Y_j - R_j - C_j)}{(1 + i_p)^{j-t}} \qquad (5)$$

According to this condition, the debt augmented with the discounted sum of expected movements in consumption, must be equal to the discounted sum of disposable incomes.

The private agent knows the State's budget constraint (see equation (3)). He can integrate into his budget constraint (see equation 5), that of the State. We therefore have:

$$\sum_{j=t+1}^{\infty} \frac{E_t C_j}{(1 + i_p)^{j-t}} = (Z_t + X_t) + \sum_{j=t+1}^{\infty} \frac{E_t(Y_j - D_j)}{(i + i_p)^{j-t}} - \sum_{j=t+1}^{\infty} E_t(D_j - R_j)\left[\frac{1}{(1 + i_d)^{j-t}} - \frac{1}{(1 + i_p)^{j-t}}\right] \qquad (6)$$

According to equation (6), the discounted sum of expected consumption flows is equal to the wealth of private agents which is made up of three elements: the foreign debt $(Z_t + X_t)$ with a negative sign, national income net of public expenditures, and lastly, an element which is a function of expected primary deficits and the differential between the private and public discount rates.

If public expenditures (D_t) remain constant, and if taxes fall in time t, private agents will anticipate a reduction in primary future deficits for, to respect the intertemporal budget constraint of the State, the present fall in taxes must offset by their future increase. Thus, the wealth and consumption of private agents increase if the private interest rate is higher than that of the State.

In the case where the public and private interest rates are identical (i.e. $i_d = i_p = i$), and where the foreign debt and public expenditures remain unchanged, the intertemporal profile of taxes and the public debt do not impact on private consumption decisions: an increase in the public debt requires a future increase in taxes whose present value is equal to the current deficit. The ricardian equivalence principal (Chambas, 1995; Barro, 1974) is thus respected by the equation:

$$\sum_{j=t+1}^{\infty} \frac{E_t C_j}{(1+i)^{j-t}} = -Z_t - X_t + \sum_{j=t+1}^{\infty} \frac{E_t(R_t - D_t)}{(1+i)^{j-t}} \tag{7}$$

Which can also be written as:

$$\sum_{j=t+1}^{\infty} \frac{E_t C_j}{(1+i)^{j-t}} = \sum_{j=t+1}^{\infty} \frac{E_t(Y_j - D_j - iZ_t - iX_t)}{(1+i)^{j-t}} \tag{8}$$

This principle rest on the equality between the public and private discount rates. However, the method of financing public expenditures impact on the consumption of private agents whose life horizon unlike that of the State, is finite (Hubbard and Judd, 1986). In other words, according to Desquilbet and Villieu (1998), the present debt is nothing else but a future tax, and tax "reliefs" are tax "deferments".
For instance, on a perfect financial market with rational households, such a deferment should not have any consequence on consumption: if the present generation takes into account the welfare of its posterity (i.e. intergenerational altruism), in a dynastic perspective, it would increase its saving following a tax reduction so as to pass on to its descendants an inheritance enabling them to finance additional levies. If the State defers the burden of reimbursing the debt to future generations, and thus permit to the present generation to escape the tax increase and if, moreover, today's generation is indifferent to the welfare of future generations, its perceives wealth and hence its consumption would increase (Blanchard, 1985, 1996; Modigliani and Sterling, 1986; Chambas and Combes, 1995; Debelle, 1996; Desquilbert, 1997, and Allegret, 1998).

The existence of lump sum tax may also explain the rejection of Ricardian equivalence. Thus, if the State tax on the private sector's capital income, a change in that tax affects the relative price of present consumption against future consumption and may therefore change the level of private savings. For instance, when taxes are not in the lump sum form intergenerational altruism appears under many more varied forms than financial bequests in particular education expenditures.

CAEMC's financial markets are not perfect [15] and these imperfections, which take on different forms, run countries some the assumptions underlying the Ricardian equivalence principle. For instance, during the 1984-1993 periods, private agents suffered under liquidity constant. This situation did not permit them to borrow in proportion to their permanent income. In this case, a rise in current disposable income consecutive to a fall in public levies could but entail an increase in consumption (Chambas et al., 1995). However, Ricardian equivalence rests on the assumption of perfect financial markets, and liquidity constraints and uncertainty significantly affect the consumption behaviour of private agents.

"Forced concessional credit" constitutes an other form of financial market imperfection in the CAEMC zone. The existences of a large differential between the costs of the State have been transformed into forced concessional credits in Cameroon (Talom, 1998). This was possible only because private agents

did not anticipate these arrears by including credits in the prices of the goods and services sold to the State.

The uncertain nature of anticipated income leads private agents to adopt behaviour relative to the fact that their discount rate is higher than the State's [16]. The impact of the instability of equivalent income is more important for private agents than for the State owing to the inadequate liquidity constraints private agents face. The absence of insurance policy mechanisms against the risks generated by the instability of private agents incomes increases the differential between discount rates. A fall in taxes may play the role of insurance in case disposable income rises spontaneously, insofar as it reduces uncertainly about disposable incomes (Abdramane and Kassim, 2003). It causes an increase in consumption by reducing precautionary saving. The wealth thus acquired increases since future taxes have a present value lower than the fall in taxes in the initial period.

The financial commitments entered into by CAEMC countries probably carried little credibility as far as private sector agents were concerned in the mid 80's. The level of commitments was such that debts forgiveness and defaults on payments seemed unavoidable. Then the accumulation of significant payments arrears since the decade of the 90's (and even nowadays) could not arouse private agents to save (these arrears were estimated 2989.7 billion CFAF in 2000 for CAEMC countries (Banque Mondiale, 2004). Finally, foreign financing was generally used to cover these arrears, this financing being mostly concessional and earmarked specifically for this purpose.

Overall, the key problem facing by CAEMC zone countries is the mobilization of public resources, and this seems to contribute to making it less credible to expect an increase in taxes in the near future (Chambas, 1995). However, only an empirical assessment may help clarify this situation.

Econometric Model Estimation

Based on the Ricardian equivalence principle which assumes the equality between the public and private discount rates, this model is estimated for CAEMC zone countries using pooled time-series data on relevant macro variables calculated in terms of simple averages respectively over the periods 1982-85, 1986-89, 1990-93 and 1997-2000. We first describe the estimation technique and then present the results.

The Technical Approach

The Ricardian equivalence assumption is verified where permanent consumption is solely a function of permanent national income net of aggregate public expenditures (including interest payments on foreign financial commitments). Permanent income[17]is understood here in Barro's (1983) sense as in equation (8) above, meaning that this aggregate is defined as the sum of the permanent disposable income of private agents (RD_t) and budgetary balance (S_t).

Interest payments, as in the right hand side (RHS) of equation (8), are solely derived from the initial foreign debt. Consequently, the approximation is all the more a period during which the debt varies little.

$$\sum_{j=t+1}^{\infty} \frac{E_t(Y_j - D_j - iZ_t - iX_t)}{(1+i)^{j-t}} = \sum_{j=t+1}^{\infty} \frac{E_t(Y_j - R_t - iZ_t)}{(1+i)^{j-t}} + \sum_{j=t+1}^{\infty} \frac{E_t(R_t - D_j - iX_t)}{(1+i)^{j-t}} \quad (9a)$$

Which can also be expressed as:

$$RP_t = RD_t + S_t \quad (9b)$$

The variables (pooled) are made comparable between the States transforming them into ratios of Gross Domestic Product (GDP). From equation (9b), the functional form to be estimated/ could be derived as fellows:

$$\frac{C_j}{Y_j} = a + b\frac{RP_j}{Y_j} + c\frac{S_j}{Y_j} + k_j \quad (10)$$

In this equation k_t is a white noise[18]. The budget balance, consumption, and incomes are simultaneously determined. The equation is estimated with the double Ordinary Least Squares (2OLS) or Two-Stage Least Squares (TSLS) method in order to reduce the bias simultaneously. If the Ricardian equivalence assumption is not rejected, we will have: b= 1 and c=0. On the other hand, if private agents are particularly sensitive to their permanent disposable income and do not behave according to the Ricardien equivalence principle, then we will have b=1 and b= - c.

Estimation using cross-section pooled time-series of the set of all CAEMC zone countries has several advantages over estimation by single country:
- Flows between expenditures and deficits are less correlated between CAEMC zone countries than within a single State;
- It is possible to measure permanent variables by retaining their averages calculated every few years over the time-series data of the study period, as proxies of their true values.
- To restrict estimation to CAEMC zone countries only permits to particularly avoid the problems involved in analyzing the heterogeneity of institutions or the behaviour of international time-series. These States are certainly structurally different[19] and have sustained a number of different exogenous shocks due the specificities of their foreign trade. But, as Chambas and Combes (1995) put it in their study of CAEMC zone countries: "The worsening of budget is mainly due to a decline in public levies: residual heterogeneity is controlled by the fixed effects methods".

In this analysis, we do not test Euler's equation[20]. This equation is derived from the first order condition of the optimization model, which equalizes private consumption intertemporal marginal utilities. Moreover, testing the implications of this equation would amount to evaluating the relevance of the assumption according to which changes in private consumption are unpredictable, considering the interest rate (Hall,

1978, Aschauer, 1985). A derived specification of Euler's equation is therefore not tested because of the difficulty involved in estimating a dynamic model on pooled series, and also because the rejection of this equation may be due to phenomena unrelated to Ricardian equivalence [21]. This position does not mean that the estimated consumption function is of the Keynesian type, for the explanatory variables retained are not income and the deficit, but rather permanent income and deficit (Reid, 1985; Graham, 1993; and Berhein, 1987).

Disposable income is estimated using Gross National Product (GNP) from which public levies are subtracted, and the latter include both tax and non tax revenue.
One of the major difficulties we met was to evaluate outputs and consumption in kind. The evaluation of the flows of the informal sector, which are simultaneously in the monetary and non monetary forms, is equally difficult to establish. Public finance data is not completely homogenous [22]. The systems of recording economic aggregates data into the accounts differ according to countries [23]. The data we adopted seemed to be the most logical since they are the results of comparisons and combinations against various aggregates. They are also questionable. Private consumption is defined as the market price value of all goods and services or received in kind by individuals and institutions on a non profit basis. The budgetary balance here does not take grants into account[24].

Two important economic hypotheses are tested. The first test is performed using the student's test on the parameter (c=0), and the second with Wald's restriction test on (b=1 and b= -c).

The quality of the equation is appreciated by the Breusch and Godfrey 25 autocorrelation test of lags, which finds the presence of first order autocorrelation.
The fixed effects test evaluates the overall explanatory power of dummy variables by State. The White test detects the violation of the homoscedasticity. Chow's test determines an eventual temporal heterogeneity. The Ramsey test spots a poor specification of the model, notably, the omission of variables or an abnormal functional form. It is carried out by regressing the explained variable on explanatory variables and the powers of the explained variable previously estimated. Finally, the normality test of residues is carried out by the Jarque-Bera statistic.

The Results of the Study
The instrumental variables used in econometric estimation are the following: share of agricultural value-added, cover rate, population density on lands, urbanization rate, the log of population, and demographic dependence rate. The econometric estimation of equation (10) gives (Table 1):

Table1 : Estimation results

$$\frac{C_j}{Y} = 0.93 \ \frac{RP_j}{Y_j} - 1.2 \ \frac{S_j}{Y_j} - 4.18 CAM + 5.78 RCA \ -5.77 \ RC \ -19.5 \ GAB + 15.9 TCH + 0.96$$

       (2.09)**   (2.99)***   (1.06)   (1.1)   (1.09)   (5.3)***   (1.99)**   (0.02)

$\overline{R}^2 = 0.94$

Fixed effects : F= 9, 61***

LM : F = 0, 46

White : F = 0.76

Chow 1986- 2000 : F = 2, 67

Chow 1983 -1986, 1987-1991, 1997- 2000 : F = 0, 62

Ramsey : F = 1, 67

Jarque-Bera: Khi deux = 1, 29

Restriction b = 1 (Wald) : Khi deux = 0,05

Restriction b = c (Wald) : Khi deux = 0,16.

Student't- statistics have been realized on the different coefficients.

*** Significant at the 1% level; ** significant at the 5% level.

The model's explanatory power is high. The equation satisfies econometric tests. The Chow test does not detect any temporal specification. The equation was estimated by adding to explanatory variables, additional variables such as foreign saving and a monetization rate using M1. With this end in view, foreign saving may impact on domestic saving if it is rationed, since domestic savers must consider the rationing constraint in their intertemporal optimization planning (Fry, 1978); Chambas and Combes, 1995). Despite the absence of public deficit monetary financing in CAEMC zone countries, the monetization rate can probably be significant insofar as money is a component of the wealth of private economic agents, and because it facilitates the maintenance of the consumption level in case there occurs a transitory fall in income in an economic space where financial markets are quite imperfect (Hebbel Schmidt, Webb and Corsetti, 1992; Artus, 1997). Money could then impact positively on consumption. These results could be consecutive to a poor approximation of the second member of equation (8). Thus, this equation was estimated once more by replacing the conventional budget deficit (balance) by the primary budget deficit and the debt rate at the beginning of the period. These results are presented in Appendix 2. The economic hypothesis tests are not affected. The initial debt rate coefficient is insignificant.

The main result is the rejection at the 1% significance level of the Ricardian equivalence assumption. It is remarkable, for it illustrates the fact that the public deficit stimulates private consumption. The coefficient of the budgetary balance is not significantly different to that of income net of public expenditures. Consumption is therefore a function of permanent disposable income and the propensity is not significantly different from 1. Similar result was previously obtained by Berhein (1998) from a sample of developing countries where he shows that permanent deficit increase private consumption. Desquilbet and Villieu (1998) tests data on Asian emerging countries. Their result is similar to that of the present

study: the State can increase domestic saving by increasing its own saving, that is by reducing the current budget deficit. A rise in private saving does not compensate for a fall of the same amount in public saving, as predicted by the Ricardian equivalence assumption. The implications of the Ricardian hypothesis are clear: in the absence of a change in the path of public spending, the tax multiplier (i.e. the response of the national product to a tax reduction) is null. For instance, each time relieves tax levies, households save more to offset unfavourable of taxes come on future generations, consumption does not change and fiscal policy is totally inefficient.

Since the 1980's, public deficits in CAEMC countries have been attributable to a fall in public receipts, despite the 1996 fiscal adjustment in the zone with the effective introduction of the value- added tax. This long-term evolution may lead private agents to think that the State will not immediately reverse this trend. Consequently they expect either a total failure in the repayment of the foreign public debt, a default on its payment or a restructuring of the debt at more or less concessional terms and conditions. The insignificance of the debt rate from the equation estimated in Appendix 2 tends to corroborate this hypothesis, thus indicating a trend that could last for a long time.

Conclusion

This paper has attempted to evaluate in the countries of the CAEMC, the impact on private saving of the budget deficits originating from a fall in public tax levies. To that end, the validity of the Ricardian equivalence principle has been tested. Since this assumption does not mainly integrate transitory deficits, the effects of permanent deficits on private saving were the only ones which have been analyzed.

A private consumption function was estimated using pooling time-series data on CAEMC zone countries. At the 1% level of significance level, the ricardian equivalence assumption according to which the intertemporel tax profile has no impact on the consumption level of private agents has been rejected. The long-term reduction of public tax levies in the CAEMC zone States has increased permanent disposable income, and hence consumption. National saving was considerably affected insofar as the fall in public saving was accompanied by a reduction in private saving. Private capital accumulation was maintained only by resorting to external resources which have become increasingly difficult to obtain from bilateral and multilateral investors (World Bank, IMF etc). Lasting budgetary deficit has led the State to drain a significant share of decreasing private savings. The fall in public resources has given rise to deficits in all the payment systems of the countries considered. Generally speaking, the weakness of saving has worsened the current account deficits of the balances of payments of CAEMC zone countries.

On the theoretical level, the results of this study run counter to:
- Keynesian models in which a reduction in public tax levies increases disposable income and exerts a multiplier effect on economic activity by reviving consumption. In these models, households do not consider the future taxes required to repay the public debt. Savings increases, but this is only an ex post increase generated by a rise in national income, and not an ex ante increase exactly equal to tax savings, as expounded by authors such as (Barro and Gordon (1983) ; Tabi and Atabongawung (2004); Rodriguez et al.(2004).

- Life cycle models with egoistic generations, in which the major concern centers on knowing whether the tax relief is temporary or "permanent" .i.e. a finite horizon only encompassing a generation. A temporary tax cut affects neither consumption nor saving, for it does not change household wealth.

- The rise in the public debt may therefore exert an opposite influence on investment by increasing real interest rates, since the demand for financing rises without affecting the supply of savings. A permanent tax cut, on the other hand, may have a positive impact on consumption. However, investment can not be crowded out as long as public expenditures do not increase, since transitory changes in taxes are exactly offset by opposite changes in private savings.

Notes

1. Statistics of the DSNC Cameroon, 1997-2002

2. Member countries of the Economic and Monetary Community of Central Africa (CAEMC) are: Cameroon (Cam), The Congo Republic (CR), Gabon (GAB), Republic of Center African (RCA), Republic of Chad (TCH), and Equatorial Guinea. In this study however, Equatorial Guinea, which joined the CAEMC zone in 1986 is excluded from the study.

3. More than 8% of GDP against nearly 5% of GDP are estimates from the DSCN (Direction de la Statistique et la de la Comptabilité Nationale) in 2001, and the BEAC (Banque des Etats de l'Afrique Centrale) in 2003.

4. See table 2, page 38

5. See report on BEAC references in 2002. BEAC is made up of CAEMC States.

6. This provision did not permit member States to have a massive access to monetary financing of budget deficits, but rather led them to implement a rigorous management of public finance. Greater macroeconomic stability, notably low inflation, the existence of a fixed exchange rate have also contributed to better management.

7. See works by Chambas and Combes, 1994; Servet, 19996, 1997. Servet shows that the development of financial relations in the informal sector is better explained by trust between operators, and that State intervention in this sector for eventual regulation arouses distrust.

8. See works of Cocburn (1995), and Cox and Joppelli (1990).

9. There exists no links between external and budget deficits as shown by Blanchard (1985) in his nested generational model. David Ricardo (1772-1823) explains budgetary deficit financing through indebtness does not affect demand, which being a question of "Today's tax" or "tomorrow's tax". In other works economic agents perfectly anticipate the future taxes directly linked to the increase in debt. For this reason, there exists no difference between today's borrowing (linked to the future taxes which will finance it) and tomorrow's taxes.

10. In 1974, Barro revisited "Ricardian equivalence assumption". In the context of a set precise assumptions (i.e. intergenerational altruism, perfect financial markets, lump sum taxes, and debts that do not increases faster than growth), public expenditure effects is totally independent of the mechanism according to which these expenditures are financed. Up to now, no consensus has been reached on public debt effects on the economy both from the points of views of theoretical developments or empirical results. (See the works of Wansup and Kim, 2003; Mathfield, 2003). Some authors find a link for present and future generations (Seater, 1993; Feldstein, 1982, 1998), and

others a relation linked to liquidity constraints at the level of families (See the works of Cox and Jappelli, 1990; King, 1993; Hayashi, 1985), and lastly those who take economic reasons into account (Aschauer, 1985; Felsteein, 1982).

11. See works by Chambas and Combes (1995).

12. In the context the pact of stability and growth (works by Carl et al., 2004), public deficits are the financing requirements of all administrations (central local and social security administrations). The public deficit encompasses the balance of receipts and expenditures of local governments and social Security. The budget deficit differs from the public deficit, because it does not encompass the receipts and expenditure balance of local governments and social security. It is equal to the State's financing requirement and manifests itself by the level of new borrowing the State must contract. The approved budgets may provide for a deficit and authorize the State to borrow up to this financing requirement (works of Greel and Sterdyniak, 1995).

13. For instance, the monetary rules concerning the amount of commitments of CAEMC States vis-à-vis the banking system and the money supply level relative to the evolution of economic activity. This has to do with the stringent provisions adopted by monetary authorities, which aim to prevent bank failures and to ensure the good management of financial markets, for instance.

14. The "non-ponzi" condition implies that the debt can not grow faster than the interest rate. In fact, the States would be well advised to satisfy this constraint. If a consumer runs into debt without limit at the on going interest rate, he may be tempted to commit himself to a sequence of debts (Ponzi Game): he may borrow 1 CFAF today to finance present consumption and get into debt again tomorrow to renew his debt and pay the interest. Since the debt is eventually never repaid, additional present consumption becomes free. On the other hand, the debt of the family increases indefinitely at the current rate. This type of aberrant situations must be eliminated from equilibrium paths: the debt must not asymptotically (See works by Yildizoglu, 2001, 2003).

15. Generally speaking, no financial market is perfect in practice. A financial market is mostly characterized by long-term capital investments and commitments in the form of stocks, bonds etc. these types of financial markets are almost inexistent in the CAEMC zone. Presently, the Cameroon Stock Exchange is yet to become truly operational. Some banks play the role of long-term capital. However, they are much more specialized in their classical role as regulators of the money market. Overall, the financial market in the zone is still embryonic.

16. To the instability of equivalent income, the consequences for private agents are more important than for the State because of the liquidity constraints they face continuously.

17. See works by Friedman (1957), Modigliani (1985).

18. The variance of the error term (constant and finite), which satisfies the usual homoscedasticity, conditions is equal to the square of standard deviations. In other words, the error margin mains unchanged throughout the period or it is identical at point of the sample.

19. Diversification as concerns population, per capita product, and geographic situation.

20. Differential equation. The satisfaction of conditions required by Euler-Lagrange equations, where f depends on private (agents permanent income, permanent budget balance, consumption) x, y, y', is a derived function. Euler's equation of motion for a rigid behaviour with fixed point as to its principal

axes. In other words, when a function with a certain degree of homogeneity, it can be decomposed into derivatives to obtain elasticities which can be interpreted. Aschauer (1985) proposes in these works, to discard the conventional method and insists on the direct use of Euler's equation, which permits to deduce derivatives from the first order conditions in order conditions in order to maximize consumer utility. The consumption function derived by Ashaurer is a homogenous function.

21. This concerns a poor specification of the model or the stock of information, inadequacy between calendar time and psychological etc.

22. The methods of posting (i.e. entering into accounts) sometimes vary from country to country. For instance such is the case of heterogeneous integration of local governments and other related State bodies etc. the other data come from the national accounts data collection system. Public finance data were determined from a database constructed by Pinton (French Ministry of Cooperation and development), and the other data were drawn from world Bank Tables, the IMF and BEAC data sources. Data quality varies according to country and obviously depends on the data collection system of national accounts. However these data are more relevant for the whole zone. National data seemed less consistent to us.

23. Despite the coming into operation of the organization for the harmonization of business Laws (OHADA in French) since 1993, some CAEMC countries have yet to comply with the new laws and rules.

24. The balance is evaluated in terms of "commitment" and not a "cash basis for the simple reason that arrears are assimilated to borrowing from other agents.

25. This test makes use of the Lagrange multiplier.

Appendix 1:

Evolution of the rate of debt per GDP in some CAEMC countries during the period 1985-94

	1985	1986	1987	1988	1989	1990	1991	1992	1993*	1994*
CAM	33 ,90	31,00	31,50	37,70	46,30	53,20	59,30	60,00	65,80	107,0
RCA	49,20	48,70	59,40	59,20	58,20	50,20	62,20	61,50	73,20	101,8
RC	140,1	188,9	188,9	188,9	179,1	172,6	177,7	168,0	237,6	454,1
GAB	34,30	42,20	75,20	73,90	72,20	72,20	76,80	64,20	79,90	122,5
TCH	28,80	29,61	39,65	34,72	40,70	40,70	45,10	52,8	64,20	91,00

1995	1996	1997	1998	1999	2000
62,2	68,3	72,0	73,1	74,5	77,6
88,8	101,4	122,8	139,9	151,6	168,0
177,8	196,9	159,9	105,9	108,8	119,0
69,6	73,0	72,2	79,9	83,7	86,9
106,3	119,9	128,5	147,0	130,8	135,0

''For 1993 and 1994, the ratio corresponds to debt/GDP report''.

Sources : World Debt Tables 1992/ 2004 – Zone franc, Rapport annuel, 1996-2004.

Average Rate of Savings in some African countries zones (period from 1983 to 2002

	Interior Saving in % of the GDP	Number of countries	Public saving in % of budgetaries recipes	Number of countries	Private saving in % of disposable private income	Number of countries
CAEMC countries	7,2	5,0	9,0	5,0	7,1	5,0
Others African out of CAEMC zone	5,6	10,0	2,0	9,0	9,2	9,0
Total of African	8,9	19,0	4,0	17,0	10,3	17,0

Sources : Synthèse des Statistiques DSCN (1983-2002), BEAC- BECEAO (1982-2003), World Tables (2002).

Appendix 2

Estimation of the consumption functions with the primary budgetary balance and the initial debt rate

$$\frac{C_j}{Y} = 1.02 \ \frac{RDX_j}{Y_j} - \ 1.39 \ \frac{SP_j}{Y_j} - 0.03\frac{D_j}{Y_j} - 10.1\,CAM + 1.97\,RCA \ - 6.2 \ RC \ - 22.5\,GAB + 12.1\,TCH - \ 4.81$$

$(2.70)^{***} \qquad (3..11)^{***} \qquad (0.66) \qquad (1.60)^{**} \qquad (0.29) \qquad (0.98) \qquad (6.31) \qquad (1.28) \qquad (0.20)$

$\overline{R}^2 = 0,94$

Fixed effects : F= 9, 24[***]

LM : F = 0, 29

White : F = 1.52

Chow 1986- 2000 : F = 2, 30

Chow 1983 -1986, 1987-1991, 1997- 2000 : F = 0, 68

Ramsey : F = 1, 09

Jarque-Bera: Khi deux = 0.69

Restriction b = 1 (Wald) : Khi deux = 0,01

Restriction b = c (Wald) : Khi deux = 0,31.

Abbreviations

CAM: Cameroon

RCA: central African Republic

RC: Congo Republic

GAB: Gabon

TCH: Chad

CAEMC: Central African Economic and Monetary Community Countries

DSCN : Direction de la Statistique et de la Comptabilité Nationale (Statistics and National Accounting Direction)

OHADA : Organisation pour l'harmonisation en Afrique du droit des affaires (Harmonization Organization.for Business Law in Africa)

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