

# **Fiscal Policy and Growth**

## *An Application to Sub Saharan Economies*

**Marcel Aloy, Blanca Moreno-Dodson, and  
Gilles Nancy**

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Fiscal Policy and Growth:  
*An Application to Sub Saharan Economies*

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# Contents

## **Introduction 1**

### **Section I. Fiscal Policy and Growth: an Overview 2**

*I.1 Public Financing Patterns and Economic Growth. 2*

*I.2 Fiscal Policy, Growth and Poverty 3*

### **Section II. An Application to Benin, Burkina Faso and Senegal 5**

*II.1. The Macroeconomic Framework 5*

*II.2. Numerical Simulations 7*

## **Conclusions 9**

## **References: 10**

## **Endnotes 12**



## Introduction

In the early 1960s, the developing countries in Sub-Saharan Africa committed to government interventionist policies. The failure of those policies led in the 1990s to economic and institutional reforms that were inspired by a narrower concept of the role of the state, mainly aiming at *ensuring property rights, controlling the monetary base, raising taxes, and providing basic education, health and infrastructure public services*. Despite these general orientations, the weight of the public sector is still very heavy in most Sub-Saharan countries, which affects the design and implementation of fiscal policies.

In this respect, a comparison regarding the role of the state and fiscal policy in other developing countries with similar levels of income in other regions, such as East and South Asia, would not be entirely appropriate because of the weaknesses of African states. In particular, Governments of Sub-Saharan African countries face serious difficulties implementing fiscal policy because of the persistence of the following elements:

- Unfair income distribution and higher proportion of the population affected by extreme poverty;
- Vulnerability to external shocks of all kinds (natural disasters, world prices of exported goods, dependency towards foreign assistance, etc.);
- Several market failures because of information imperfection, prevalence of monopolistic practices and different kinds of negative externalities;
- Lack of appropriate incentives for private sector operations in terms of competitive advantages, regulatory framework and judicial system;
- Governmental and institutional inefficiencies resulting from several rigidities, as well as credibility and governance problems.

In the last two decades, Sub-Saharan African countries have implemented macroeconomic policies in the context of structural adjustment programs. Meanwhile, monetary policies of the countries presented in this paper have become the responsibility of the regional central bank (BCEAO). In this respect, the fixed exchange rate regime has been maintained following the devaluation of the CFA Franc in 1994. The nominal anchorage to the French Franc and later on to the Euro has created favorable conditions for implementing inflation targeting policies.

Unfortunately, the necessary coordination of fiscal policies that a monetary union requires to ensure price and exchange rate stability has not been the main priority of Sub-Saharan governments. Budget deficits and difficulties to set up an effective tax policy, due to, among other things, the prominent share of poor in the population and a large informal sector, have led to high indebtedness levels. Low levels of debt-reducing savings available for investment have also decreased the perspectives of growth.

This paper focuses on two main issues related to the conduct of fiscal policy in Sub-Saharan African countries:

- Firstly, we analyze the trade-off among different public financing policies and their impact on growth, from both theoretical and empirical perspectives.

- Secondly, we suggest a simple macroeconomic framework to assess the influence of fiscal policy on growth, with an application to Burkina Faso, Benin and Senegal.

## Section I. Fiscal Policy and Growth: an Overview

Public expenditure financing is mainly carried out through tax receipts, monetary creation and public debt<sup>1</sup>. These different forms of financing are not neutral<sup>2</sup> vis-à-vis economic growth.

### *1.1 Public Financing Patterns and Economic Growth.*

**Financing through taxes** may have an impact, on welfare and/or on growth, mainly if taxes are distortionary. This impact will depend on the differences in tax rates among different goods (domestic goods versus imported goods; consumer goods versus intermediate or investment goods; essential goods versus luxury goods) and different incomes (income from labor versus income from capital). The neo-classical models have considered for long **that fiscal policy was neutral vis-à-vis long-term growth rates** but that it might have an impact on the steady state per capita income levels.

Thus, in his *constant savings rate growth model*, Solow [1956] found that the introduction of a proportional tax rate on income leads to – under a balanced public budget hypothesis – an increase (reduction) of the steady state per capita income if the government invests a higher (lower) fraction of its income compared to that invested by private agents. Taxation may thus reduce per capita income should the state use tax revenues for consumption rather than for productive investment.

The conclusions are quite close in the Cass-Ramsey<sup>3</sup> type of *optimal growth model*: generally, fiscal policy (especially if the budget is maintained in equilibrium and if the labor supply is fixed) does not change the steady-state growth rate, which remains subject to exogenous factors. The search for an optimal tax structure from the welfare perspective, initiated by Ramsey in 1927 has led to an abundant literature<sup>4</sup>.

A similar ambiguity in the results relates **to the effects of monetary policy and precisely of the monetary financing of the budget deficit** in growth models<sup>5</sup>. Basically, a direct effect between seignorage and inflation is currently admitted, the growth rate and the level of the money supply being generally neutral on real aggregates. However, this source of financing has limits beyond which the economy could be affected by a balance of payments crisis and speculative attacks on the exchange rate.

**Public debt financing** also has an impact on growth given its eviction effects: all things being equal, the increase in the public deficit financed through debt may materialize itself through a reduction in private investment and/or a deterioration of the current external account. However, the scope of these eviction effects is itself dependent upon the public deficit effect on the savings behavior of the private sector<sup>6</sup>.

An excessive recourse to **domestic debt** may increase the domestic interest rates and lead to an explosive debt dynamics. In this context, an interest rate control policy would simply lead to a credit-rationing situation and to a private investment eviction. This effect would not occur only if the private savings increased by the same amount than the debt issued, in anticipation of future taxes that the government will introduce to finance the interest and reimburse the principal. If such were the case, the domestic debt and the taxes would have an identical effect, thus leading to the Ricardian equivalence. However, most of the empirical

studies do not support the strict Ricardian equivalence in developing countries. A reduction of 1% of the GNP financed through internal borrowing increases private savings by 0.4% to 0.6% of the GNP<sup>7</sup>.

On the other hand, too much **external indebtedness** may trigger a debt crisis. First of all, resorting to non-concessional external financing leads to a debt build up that should be serviced and the principal reimbursed. This leads to vulnerability to exchange rate and world interest rates fluctuations whose impact will be more severe the higher the short-term debt component is. Moreover, the external debt increases the availability of external reserves, which can induce an exchange rate appreciation that negatively affects exports and encourage imports. Generally, the constraints of the indebtedness policy of the state are analyzed within the theoretical framework of the debt sustainability<sup>8</sup>. The government is subject, as all the other agents, to an inter-temporal constraint that can be stated as follows: the present value of the future primary budget surpluses should be equal to the current value of the debt. This sustainability condition will necessary be met if the growth rate of the debt is lower than the interest rates. In that case, the stability of the debt/GDP ratio is guaranteed.

### *1.2 Fiscal Policy, Growth and Poverty*

**The Endogenous Growth Analyses**, Lucas [1988], emphasize the importance of the human capital accumulation and therefore of education policy in the growth process. On the basis of this contribution, there is consensus on the idea that a minimum threshold of human capital should exist (or be introduced) in order to initiate a virtuous process of sustained growth. This idea has been additionally supported by the stylized facts covered by Barro [1991].

The reason why education policy cannot be left to the market relies on the idea that these policies may create social externalities - for instance political stability and/or the reduction of poverty as a public "bad" - externalities that will be beneficial to the community but that no individual alone will be interested in funding. A second argument in favor of public intervention is related to the existence of market imperfections: the poor will not be able to finance their human capital needs if the financial market is imperfect.

To come back to the impact of fiscal policy on the poverty reduction objective, one may consider two channels.

Firstly, public expenditures patterns have a direct effect on poverty through the income redistribution (tax structure effect especially, and the impact of the different alternative forms of public expenditures on different social strata). Secondly they have a specific effect through economic *growth* for a given distribution structure.

Insofar as, on one hand, economic efficiency implies that the factors be remunerated depending on their productivity and, on the other hand, the level of human capital is often unequally distributed between individuals from the same country<sup>9</sup>, it is often considered – at least since John Rawls – that efficiency and fairness requirements should be the object of compromise<sup>10</sup>.

Thus the puzzle boils down to the following issue: what weights should be given to the fairness goal in such a compromise?

On one side, the richer having a higher savings rate compared to the poorest, an increase in inequalities promotes growth because of the induced increase of the overall savings.

On the other side, three arguments in favor of reducing income inequalities may be put forward:

- High-income inequality ensues political instability that impedes economic growth, according to Barro [1991].
- Positive impact of health and education is likely to create an incentive effect to improve labor productivity and savings, thus growth.
- Fairness contributes to increase growth by promoting accumulation of factors of production.

Consequently, a public finance policy in favor of reducing inequalities may have, subject to it being effective for the beneficiaries, a moderate or nil cost in terms of efficiency and a positive influence on economic growth, thus indirectly, on poverty.

It is difficult to assess the collective gain in welfare resulting from a poverty reduction. In this light, poverty may be considered as a public “bad” (Wane, 2001), that is a negative social externality: if society is on average adverse to poverty, it may be possible to suggest an optimal distribution structure.

Several empirical studies using econometrics in cross-section or panel data have demonstrated<sup>11</sup> a robust and positive link between poverty indicators (education level, infant mortality rate, life expectancy or aggregated human development indicator) and economic growth and/or levels of income. Given that a large number of empirical evidence<sup>12</sup> supports this hypothesis, one could assume that the growth policies can work in favor of the poor. In fact, the causality plays both ways. Poverty and inequality represent barriers to growth, for they lead to insufficient savings, a waste in potential human capital, and negative externalities such as social unrests and political instability.

If growth plays in favor of the reduction of poverty, then macroeconomic policies have an essential role in the growth process:

- to maintain or restore the main equilibriums (inflation, public deficits and external debt); and
- to favor private savings and physical and human capital investments

According to Levine and Renelt [1992] most of the explanatory variables put forward in the growth literature are econometrically weak, with the exception of two variables that are qualified as robust: the share of the investment in the GDP and the initial level of per capita income<sup>13</sup>.

Fisher [1993] shows that economic growth is negatively affected by inflation, public deficits and exchange market distortions. Taking the Levine and Renelt specification, Stanley Fisher [1993] suggested a causality between “good macroeconomic policy” and growth. The empirical results produced by Fisher indicate that, in particular, inflation and public deficits tend to reduce investment and productivity gains, reducing growth in turn.

## Section II. An Application to Benin, Burkina Faso and Senegal

### II.1. The Macroeconomic Framework

**The macro-economic framework** that has been set up for numerical simulation is based on a few hypotheses consistent with the reality of Sub-Saharan countries economies. They are small open economies with fixed exchange rates. Each country to be analyzed is a member of the WAEMU<sup>14</sup>. In terms of monetary policy, the regional currency (CFA Franc) is convertible into euro, which implies that the regional central bank controls money supply and respects as well a minimum coverage ratio of exchange reserves to monetary base (20%). Since the budgetary pact was adopted in 1999, governments of the sub region are committed to determine the budgetary balance and the amount of seigniorage by respecting a debt sustainability constraint;

We will further assume that there is no domestic public debt, which roughly corresponds to the situation of countries where a financial market does not exist: the government payment arrears to the domestic private sector are thus ignored.

The essential issue raised by this model is the effect of fiscal policy on growth when governments are committed to a debt sustainability constraint. Thus the main concern of the government fiscal policy is the trade off between investment expenditures and transfers.

The private ( $Ip_t$ ) and the public ( $Ig_t$ ) investment are the main source of output growth (equation 1) through the marginal productivity of each kind of physical capital, denoted  $g$  and  $g_0$  :

$$(1) \quad Y_t - Y_{t-1} = g \cdot Ip_{t-1} + g_0 \cdot Ig_{t-1}$$

This assumption is broadly consistent with current theoretical analyses of growth process in developing countries, built on the so-called AK production function (see for instance Rebello, 1992).

The investment of the public sector ( $Ig_t$ ), at current prices ( $P_t$ ), is assumed to be proportional to the product of taxes levied by the government ( $T_t$ ):

$$(2) \quad P_t Ig_t = \gamma T_t$$

The private sector, physical investment (denoted  $P_t Ip_t$  at current price) is the sum of private saving on current income ( $S_t$ ) and change in domestic credit to the private sector ( $CR_t - CR_{t-1}$ ), minus the accumulation of other assets. In the absence of a financial market, cash balances ( $M_t$ ) are the only alternative assets to physical capital for the allocation of the private sector savings. Thus the accounting definition of private investment is the following:

$$(3) \quad P_t Ip_t = S_t + (CR_t - CR_{t-1}) - (M_t - M_{t-1})$$

In order to complete the analysis, on the one hand, we have to introduce a hypothesis concerning the household's propensity to save and, on the other hand, we must make explicit the difference between variation in domestic credit ( $CR_t - CR_{t-1}$ ) and variation in money ( $M_t - M_{t-1}$ ).

Concerning the formation of the private saving as a function of current income ( $S_t$ ), since most agents in developing countries are financially constrained, it is often assumed that current consumption (or saving) does not depend on human wealth (as it is the case in life

cycle models of consumption) but instead on current disposable income. Adding the two sources of savings (disposable income and transfers), we put forward the following expression for aggregate savings:

$$(4) \quad S_t = s_0(P_t Y_t - T_t) + s_1 G_t$$

This expression suggests that if the transfers are distributive toward the poor, the saving rates on income net of transfers ( $s_0$ ) will be greater than the saving rate on transfers ( $s_1$ ) since the poor are assumed to be endowed with a high propensity to consume.

The government transfers ( $G_t$ ) are a fixed proportion ( $\theta$ ) of the product of taxes levied by the government ( $T_t$ ):

$$(5) \quad G_t = \theta T_t$$

Let's turn now to the second part of the equation (3), namely the difference between the change in domestic credit and the change in money supply:  $(CR_t - CR_{t-1}) - (M_t - M_{t-1})$ .

The counterparts of money supply ( $M_t$ ) are external reserves ( $R_t$ ), domestic credit to the private sector ( $CR_t$ ) and money stock issuing by the government ( $MG_t$ ).

$$(6) \quad M_t = R_t + CR_t + MG_t$$

The balance of payment equilibrium defines the change in external reserves under a fixed exchange rate regime as follows:

$$(7) \quad R_t - R_{t-1} = XN_t + (D_t - D_{t-1}) - i^*(D_t - R_t)$$

The change in external reserves of the central bank ( $R_t - R_{t-1}$ ) is the sum of net exports at current prices ( $XN_t$ ) and the change in external public debt ( $D_t - D_{t-1}$ ) minus interest paid on public debt ( $D_t$ ) or received from external reserves ( $R_t$ ). We assume that the interest rate ( $i^*$ ) and net exports ( $XN_t$ ) are exogenous and that there are no capital movements other than those induced by the change in the public debt.

From (6) and (7) the following expression for  $[(CR_t - CR_{t-1}) - (M_t - M_{t-1})]$  is obtained:

$$(8) \quad (CR_t - CR_{t-1}) - (M_t - M_{t-1}) = i^*(D_t - R_t) - XN_t - (D_t - D_{t-1}) - (MG_t - MG_{t-1})$$

Finally, to close the model, a debt sustainability constraint is introduced. The government tolerates the debt to change proportionally to the difference between the previous level of the debt ( $D_{t-1}$ ) and his objective of indebtedness as a percentage of GDP ( $\sigma$ ):

$$(9) \quad D_t - D_{t-1} = \rho(\sigma P_t Y_t - D_{t-1})$$

According to equation (9), if for instance the outstanding debt ( $D_{t-1}$ ) exceeds the ratio  $\sigma\%$  over the GDP, retained as long-run objective, the government will adjust his budget surplus in order to reduce his debt. In the long run, the government debt converges at a speed  $\rho$  toward a ratio around  $\sigma\%$  to GDP, which ensures the so called "debt sustainability".

Substituting (9) in (8), we have finally:

$$(10) \quad (CR_t - CR_{t-1}) - (M_t - M_{t-1}) = i^*(D_t - R_t) - XN_t - \rho(\sigma P_{t-1} Y_{t-1} - D_{t-1}) - (MG_t - MG_{t-1})$$

Thus the model can be solved with respect to the growth rate of output, substituting (2), (3), (4), (5) and (10) in equation 1.

Expressing the aggregates as percentage of GDP, the solution for the growth rate of output ( $gw_t$ ) is the following:

$$(11) \quad gw_t = g[s_0 + i^*(d_{t-1} - r_{t-1}) + \rho(d_{t-1} - \sigma) - \Delta mg_{t-1} - xn_{t-1}] + \tau_{t-1}[\gamma g_0 + g(\theta s_1 - s_0)]$$

with:

$$gw_t = (Y_t - Y_{t-1})/Y_{t-1}; d_t = D_t/P_t Y_t; r_t = R_t/P_t Y_t;$$

$$\Delta mg_t = (MG_t - MG_{t-1})/P_t Y_t; xn_t = XN_t/P_t Y_t; \tau_t = T_t/P_t Y_t$$

A long run solution for the output growth rate would be achieved when the public indebtedness ratio reaches his objective ( $d=\sigma$ ), with nil monetary financing of deficits ( $\Delta mg$ ) and the equilibrium of the current account ( $xn=0$ ). In this special case, the external reserves ratio ( $r$ ) should be equal to the public indebtedness ratio ( $d$ ) and the long run growth rate of output will be given by the following equation:

$$(12) \quad gw = g s_0 + \tau[\gamma g_0 + g(\theta s_1 - s_0)]$$

### II.2. Numerical Simulations

The proposition is to numerically simulate the theoretical average annual growth rate of the domestic production (equation 11) of Senegal, Benin and Burkina Faso according to different combinations of parameter values of the indebtedness policy ( $\sigma$  and  $\rho$ ), public expenditures structure ( $\gamma$  and  $\theta$ ) and government policy financing ( $\Delta mg$  and  $\tau$ ). The “structural parameters” ( $g_0, s_0, xn$ ) of countries considered have been computed using available historical data (1970-1997), and given initial condition on public debt and external reserves ( $d$  and  $r$ ). Notice that the values of propensity to save on transfers ( $s_1$ ) and interest rate on debt and external reserves ( $i^*$ ) are set arbitrarily.

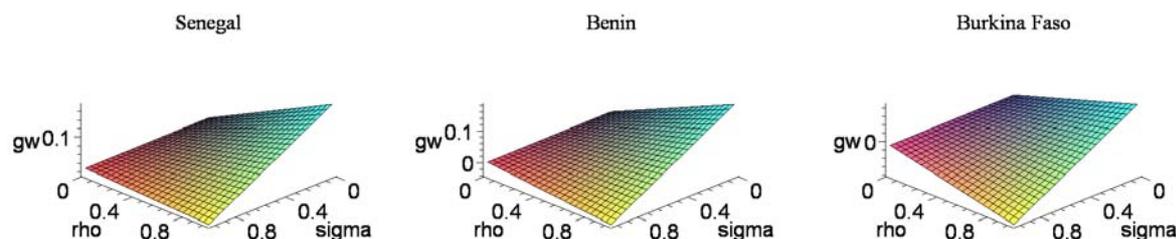
**Parameters Values**  
(average values over 1970-1997, otherwise indicated)

|                     | $g_0, g_1$ | $s_0$ | $R^{(1)}$ | $d^{(1)}$ | $\Delta mg$ | $\gamma$ | $\theta$ | $\tau$ | $xn$   | $i^{*(2)}$ | $s_1^{(2)}$ |
|---------------------|------------|-------|-----------|-----------|-------------|----------|----------|--------|--------|------------|-------------|
| <b>Senegal</b>      | 0.168      | 0.125 | 0.015     | 0.899     | 0.076       | 0.189    | 1.037    | 0.208  | -0.061 | 0.04       | 0.01        |
| <b>Benin</b>        | 0.227      | 0.067 | 0.184     | 0.813     | 0           | 0.404    | 0.861    | 0.142  | -0.163 | 0.04       | 0.01        |
| <b>Burkina Faso</b> | 0.172      | 0.043 | 0.155     | 0.576     | 0           | 0.202    | 0.894    | 0.118  | -0.229 | 0.04       | 0.01        |

(1) Year 1997 (2) Determined arbitrarily Data source: World Bank, CD-ROM WDI

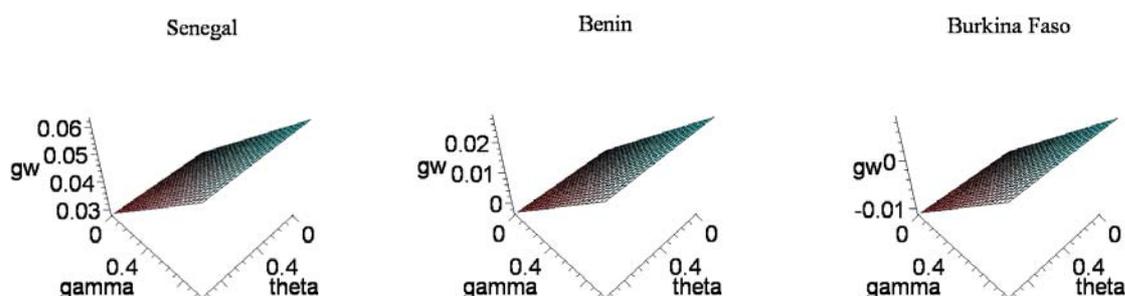
The first numerical simulation shows the impact of debt policy parameters, namely the speed of adjustment ( $\rho$ ) of public debt towards the indebtedness ratio, and the indebtedness ratio itself ( $\sigma$ ), on economic growth.

Figure 1 shows that the output growth rate increases when the level of indebtedness decreases, while the growth rate of output increases when the convergence speed increases provided that the indebtedness ratio fixed as objective is lower than the current one ( $\sigma < d$ ).



**Figure 1: Annual Average Growth Rate ( $gw$ ) and Debt Policy Parameters ( $\rho, \sigma$ )**

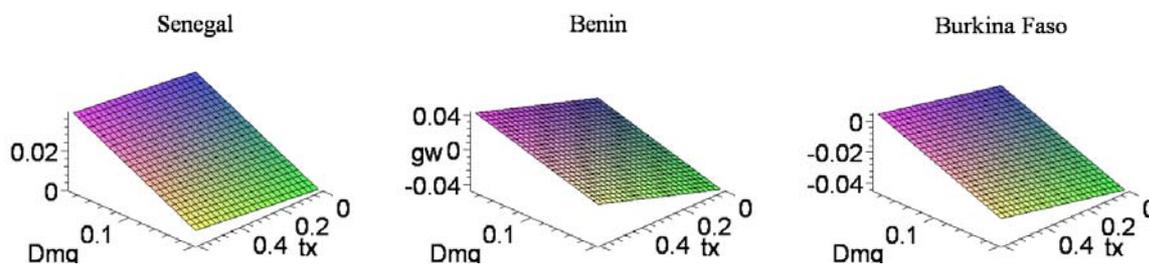
The second numerical simulation arbitrarily retains the values  $\sigma = 0.5$  and  $\rho = 0.1$ . It aims at measuring the impact of the government trade off between public investment ( $\gamma$ ) and transfers ( $\theta$ ) on economic growth. As expected, the higher the share dedicated to public investment  $\gamma$ , relatively to the redistribution  $\theta$ , the higher the growth rate. To attain a growth rate of 5%, the compromise between investments and redistribution, is around 80% for the investment and 20% in favor of redistribution.



**Figure 2: Annual Average Growth Rate ( $gw$ ) and Public expenditures Patterns ( $\gamma, \theta$ )**

The third simulation retains the same arbitrary values for the indebtedness ratio and the speed of adjustment toward the debt ratio objective, but considers different values for monetary financing of deficits ( $\Delta mg$ ) and for the average tax rate ( $\tau$  or  $tx$  in Figure 3).

The simulation puts forward the role of the productivity of the public capital for a given value of the propensity to save on transfers. It seems rather significantly that the productivity effect is more important than the saving effect of groups, which benefit from redistribution.



**Figure 3: Annual Average Growth Rate ( $gw$ ) and Government Policy Financing ( $\Delta mg, \tau$ )**

## Conclusions

The stylized facts and the empirical studies clearly point out, even if the intensity of the link is different from one country to another, that there is a robust relationship between poverty and economic growth performance.

The least developed countries of Sub-Saharan Africa face significant difficulties in implementing state reforms and thus, in elaborating and implementing fiscal policies targeted toward growth and poverty reduction.

In this context, Governments should be aware of the low efficiency of fiscal policy to stimulate growth and reduce poverty. At the same time, they should not ignore that different expenditure financing modes are not neutral on inflation and the external accounts imbalances.

Numerical simulations implemented on three countries, Benin, Burkina Faso and Senegal, reinforce the idea that growth is negatively influenced by the level of debt, by its monetary financing and in some way by redistribution policy. To the contrary, the savings rate and capital productivity are the key elements of growth.

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## Endnotes

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<sup>1</sup> In practice, other forms of public expenditure financing, less conventional from the traditional fiscal deficit measures, exist and are very important in the African countries. Those include official grants, resources from privatizations and contingent liabilities. See Moreno-Dodson and Gonzalez-Paramo, World Bank Institute, forthcoming [2002].

<sup>2</sup> See Fisher and Easterly [1990] for a review.

<sup>3</sup> Barro and Sala-i-Martin [1995].

<sup>4</sup> See Chari and Kehoe [1999] and Erosa and Gervais [2001] for a review.

<sup>5</sup> The first monetary optimal growth model was provided by Sidrausky [1967].

<sup>6</sup> Under the Ricardian neutrality, the public deficit would be neutral on the external account and the investment.

<sup>7</sup> Loayza, Schmidt-Hebbel and Serven [2000], Lopez, Schmidt-Hebbel and Serven [2000].

<sup>8</sup> See for instance Cuddington [1996].

<sup>9</sup> Be it because of the natural effect of age distribution of the population.

<sup>10</sup> See for example Schwartz and Ter-Minassian [2000] for a recent review of the literature.

<sup>11</sup> See Cashin et alii [2000] for a review, and Moser et alii [2001] for an application to sub-Saharan African countries.

<sup>12</sup> This relationship is robust in the poor and rich countries, through the decades and the episodes of low and even negative growths.

<sup>13</sup> Nonetheless, Barro and Sala-i-Martin [1995, p.433 and the next] exhibits a less significant outcome for the investment rate. According to the authors, the relationship between growth and investment rates, when proven, would be explained by a reverse causation.

<sup>14</sup> West African Economic and Monetary Union