



The Effect of Private Investment on Public Expenditure in the CFA Franc Zone

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Authors' contributions

This work was carried out in collaboration between both authors. Author EBEN designed the study, managed the literature searches, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author LNN improved the statistical analysis and structured the study. Both authors read and approved the final manuscript.

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ABSTRACT

This paper investigates the effect of private investment on public expenditure in the CFA franc zone during the period 1980-2015. To attain this objective, the methodology adopted is the system Generalized Method of Moments (GMM). The result shows a positive and significant effect of private investment on public expenditure. This result thus justifies that private investment is an important source of increase in public expenditure. This result implies that public policies for improving private investment should be promoted: improving the business climate, improving the quality of institutions, ameliorate political environment, fight against terrorism ravaging part of Africa including Mali.

Keywords: Private investment; public expenditure; CFA franc zone¹; generalized method of moments.

¹ The countries of the CFA franc zone are: Cameroon, Central African Republic, Congo, Gabon, Equatorial Guinea, Chad, Benin, Burkina Faso, Ivory Coast, Guinea Bissau, Mali, Niger, Senegal, Togo and Comoros.

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1. INTRODUCTION

In many countries, public finances are the subject of debate. The constant increase in public indebtedness as well as the necessary budgetary discipline to contain it represent essential problems at the center of the current difficulties. Behind the question of deficits, arises that of the level of taxes and public spending [1]. If the evolution of public expenditure as a percentage of GDP has in fact been remarkable during the 20th century, it has relatively deteriorated for several decades now [2]. Thus, there is a need to increase productive public expenditure capable of improving the living conditions of the populations.

In fact, productive public spending falls within the framework of economic policy which refers to the set of decisions and measures taken by the government in order to achieve objectives either in the short and medium term (conjunctural policy), or in the long term (structural policy). Four main objectives have been identified since the work of Nicolas Kaldor (1971) and his « magic square » is well anchored in the literature on economy policy. This “magic square” is made up of: (i) economic growth which improves well-being through the development of national income; (ii) reducing unemployment through a better allocation of available factors of production; (iii) price stability through the fight against inflation; (iv) control of the external balance of goods, services, income and capital. The objective of the management of public finances, more particularly of public expenditure, is to participate actively in meeting many economic and social challenges: reduce

unemployment, accelerate economic growth, and ensure and strengthen social cohesion without causing inflationary pressure. Thus, the good management of public expenditure consists in seeking a better allocation of state resources, this is a major challenge for decision-makers. Since spending exceeds resources most of the time, this resulting deficit must be financed by private resources.

Indeed, the role of the private sector in the process of economic development is increasingly recognized. This sector invests in various fields. While public spending in certain sectors (for example the infrastructure sector) is beneficial for the development of private sector activities; the private sector through its investments generates significant revenues. In return, it can make available to the public sector significant resources that can enable it to increase the volume of productive public expenditure intended to improve the living conditions of the populations.

Work on this theme remains rare. Keho [3] conducts a study on Ivory Coast and finds a long-term relationship between revenue, public expenditure and GDP. Revenue and GDP have a positive effect on public spending. On the basis of these results, he concludes that the Ivorian authorities have followed a policy of “tax-and-spend”, that is, revenue mobilization preceded expenditure. OCDE [4], asserts that the resources made available to the public sector by the private sector lead to an increase in productive public spending. The private sector as well as the debt are important sources of public expenditure financing [5]. This same result was

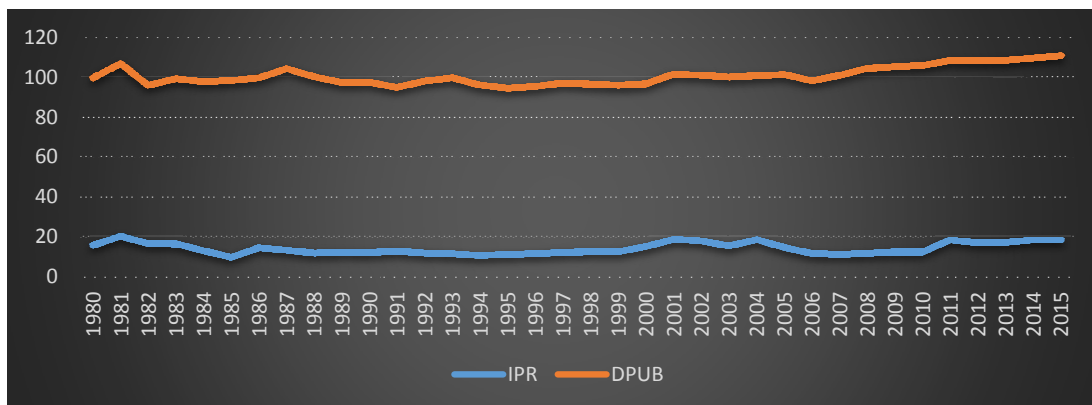


Fig. 1. Evolution of private investment and public spending in the franc zone over the period 1980-2015

Source: Author's construction from Excel

found by Giulia [6], Guajardo and Pagan [7], Sobhee [8] and Narayan [9] find that private investment influences public spending through taxes. Blanchard and Perotti [10] argue that private investment reacts negatively following a shock to public spending. Perotti [10] finds in five OECD countries that shocks on public spending do not influence private investments. Mihov and Fatas [11] find for the case of the United States that any increase in government consumption expenditure financed by a tax increase leads to a reduction in household consumption due to the decrease in their income. On the other hand, they find that a shock to overall public expenditure encourages private sector investments and promotes the level of employment. For Mountford and Uhlig [12], a shock of public spending crowds out private investment. Islam [13], Tang and Tuck Cheong [14] and Aregbeyen (2008), Chimobi [15] find that economic growth influences public spending. Institutions also play a crucial role. Good institutions must lead to good management of public finances [16]. Institutions also boost private investment.

The rest of the paper is structured as follows: the second section is devoted to the methodology and description of data, the third section to the results and discussions and the fourth section concludes the paper.

2. METHODOLOGY

2.1 Data

The data collected are quantitative, from secondary sources and come from the database of World Bank (World Development Indicators) and the Worldwide Governance Indicators (WGI). They are annual and cover a period of 36 years (1980-2015) for those from the World Bank database, and a period of 20 years (1996-2015) for those from Worldwide Governance Indicators. Our sample includes 15 developing countries including 6 from CEMAC, 8 from ECOWAS and Comoros. The descriptive statistic is presented in Table 1.

2.2 Econometric Specification and Estimation Method

In order to assess the impact of private investment on public expenditure in the CFA franc zone, we formulate our model following Keho [3]. This basic model is specified as follows:

2.2.1 Basic model

$$DPUB_{it} = \lambda_0 + \lambda_1 DPUB_{it-1} + \lambda_2 IPR_{it} + \lambda_3 CRO_{it} + \lambda_4 DETEX_{it} + \lambda_5 OPEN_{it} + \varepsilon_{it} \quad (1)$$

From this basic model, we derive two other models, one which integrates the variable "institution" and the other which integrates the cross variable "private investment*institution". These two models are as follows:

2.2.2 Model integrating the variable "institution"

$$DPUB_{it} = \lambda_0 + \lambda_1 DPUB_{it-1} + \lambda_2 IPR_{it} + \lambda_3 CRO_{it} + \lambda_4 DETEX_{it} + \lambda_5 OPEN_{it} + \lambda_6 INST_{it} + \varepsilon_{it} \quad (1.a)$$

2.2.3 Model integrating the cross variable "private investment*institution"

$$DPUB_{it} = \lambda_0 + \lambda_1 DPUB_{it-1} + \lambda_2 IPR_{it} + \lambda_3 CRO_{it} + \lambda_4 DETEX_{it} + \lambda_5 OPEN_{it} + \lambda_6 INST_{it} + \lambda_7 IPR * INST_{it} + \varepsilon_{it} \quad (1.b)$$

Where DPUB represents public expenditure. The variable of interest is private investment (IPR) with "i" the individual effect, "t" the time effect and ε_{it} the error term. The description of the control variables and the expected signs of the variables of our models are presented in Table 2.

We estimate our equations using the system Generalized Method of Moments (GMM) of Blundell and Bond [17]. This method is important because it has three main advantages: (i) it corrects the endogeneity problem that appears in the estimation in panel data; (ii) it takes into account the biases that appear due to the specific effect of each country; (iii) it allows the

Table 1. Descriptive statistics

Variables	Mean	Std. dev	Min	Max	Observations
CRO	1.1213	9.2154	-37.2849	142.0705	540
IPR	14.3557	12.2079	.2648	125.2134	540
DPUB	113.6092	38.8153	50.99	444.75	540
INST	11.2543	8.1632	3.4217	112.3	300
OPEN	3.97e+07	2.86e+08	-3.60e+08	3.65e+09	540
DETEX	20.0489	4.5403	0	23.6948	540

Source: Authors from stata

Table 2. Description of variables

Variables	Description	Expected signs and justifications
DPUB	Public expenditure. They are measured by public expenditure as a percentage of GDP.	
DPUB ₋₁	Lagged public expenditure.	+ (Elalaoui, 2018)
IPR	Private investment. It is measured by gross private fixed capital formation as a percentage of GDP.	+ [3]
CRO	Economic growth. It is measured by real GDP per capita.	+ [3]
DETEX	External debt. It is measured by external debt as a percentage of GDP.	- (pattillo, 2004)
OPEN	Openness. It is the ratio of exports plus imports to GDP.	+ [18]
INST	Institution. It is measured by government effectiveness.	+Foucault [16]
IPR*INST	It is the cross variable.	+Foucault [16]

Source: Authors from the literature review

formulation of dynamic models[19]. The GMM technique is declined in two versions: "difference GMM" and "system GMM". In the difference GMM estimator, the lagged levels of the endogenous variables are used as instruments (for exogenous variables, their first differences serve as their own instruments). The system GMM estimator employs simultaneously the equation in differences and the equation in levels by using lagged levels of the variables as instruments in the differenced equation and lagged differences of the variables as instruments in the level equation. Given sample-bias concerns associated with the difference GMM estimator, Bond et al. [20] have recommended that the system GMM estimator can dramatically improve efficiency and avoid the weak instruments problem in the first-difference GMM estimator. The robustness of the results obtained is based on two main tests: the absence of second order autocorrelation and the validation of the Sargan over identification test. This results in convergent and its coefficients are efficient [21]. Estimates are made using stata software. The results of the estimates are presented in the following section.

3. RESULTS

The Sargan test which makes it possible to analyse the over-identification of the model and the validity of the instruments used for the estimation gives us the value of chi-2 equal to 6.02 with a p-value equal to 0.87. This p-value is greater than the significance level of 5%, which allows us to affirm that the model is over-identified and that all the instruments used for the estimation are valid. Arrelano and Bond's first and second order autocorrelation test gives us values of Z respectively equal to 0.40 and -1.45

with respective p-value of 0.67 and 0.23. These p-values are all greater than the significance level of 5%, which allows us to affirm that there is no autocorrelation of orders 1 and 2. The probability associated with the wald statistic ($\text{prob} > \chi^2$) is less than the threshold of 5%. This implies that the selected variables significantly explain the variations in the public finances in the franc zone. Table 3 shows the results of the effect of private investment on public finances in the franc zone.

Based on the results presented in Table 3, the following comments are made regarding the model variables:

Column (1) shows that the lagged variable (DPUB(-1)) has a positive but non-significant impact on the current year public expenditure. This result confirms our expectations. It corroborates that of Elalaoui (2018). The non-significance of this impact can be assigned to the fact that public expenditure is sometimes misguided.

Private investment (IPR) influences positively and significantly at 1% threshold public expenditure. This result corroborates our expectations as well as the theory. It is in line with those of Keho [3] and Marty [22]. Thus, all other things being equal, an increase in private investment by one unit results in an increase in public expenditure of 0.781 unit.

Openness influences negatively and significantly at 1% threshold public expenditure. This result is contrary to our expectations as well as to theory, it contradicts that of Siroen [18]. It could be justified by the fact that the countries of the CFA franc zone do not take sufficient advantage of

Table 3. Effect of private investment on public expenditure in CFA franc zone

Variables	(1) DPUB	(1.a) DPUB	(1.b) DPUB
DPUB ₍₋₁₎	0.031 (0.024)	0.812*** (0.0268)	0.620*** (0.159)
IPR	0.781*** (0.139)	0.0378 (0.0292)	-0.0590* (0.0327)
CRO	0.443 (0.187)	-0.000680 (0.000511)	-0.00186 (0.00118)
DETEX	-4.152*** (0.316)	0.00752** (0.00317)	0.0166*** (0.00438)
OPEN	-1.46e-08*** (5.13e-09)	-8.52e-11*** (0.012)	-1.03e-10*** (0.023)
INST		-0.0503** (0.0213)	0.0463 (0.0472)
IPR*INST			-0.00637*** (0.00198)
Constant	182.44 (8.044)	0.596*** (0.134)	1.543** (0.727)
Observations	504	300	300
Number of countries	15	15	15
Wald chi 2	528.04	3903.68	5836.22
prob> chi 2	0.000	0.0000	0.000
p-value test AR1	0.67	0.190	0.033
p-value test AR2	0.23	0.180	0.177
p-value Sargan test	0.87	1.000	1.000

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Source: Authors from stata

their openness to the outside world. The fact that they are open to the outside does not allow them to sufficiently drain the significant resources that can really help them to finance their public expenditure.

Economic growth (CRO) influences positively and significantly at 10% public expenditure. Thus, all other things being equal, an increase in economic growth by one unit cause the public expenditure to increase by 0,443 units. This result is in line with our expectations as well as the theory. It corroborates that of Keho [3].

External debt (DETEX) influences negatively and significantly at 1% public expenditure. This result corroborates our expectations as well as the theory. It is in line with that of Pattillo (2004). It can be justified by the fact that in most of developing countries like those of CFA franc zone, debt is not always used to finance productive public spending. Debts are most often contracted but without a real positive effect of the latter in the development process.

Institution and the cross variable public investment*institution influence negatively and significantly public expenditure. These results are contrary to our expectations. They are opposed to that of Foucault [16]. They can be explained

by the low quality of institutions in CFA franc zone.

4. CONCLUSION

In this study, we were concerned with evaluating the effect of private investment on public expenditure in CFA franc zone. To attain this objective, we used system Generalized Method of Moments (GMM). An empirical model inspired by Keho's work [3] on public expenditure was used. The results obtained show that private investment has a positive and significant influence on public expenditure in the CFA franc zone. It also emerges that economic growth is an important source of increased public expenditure. The institution itself has a negative influence on public expenditure.

This result implies that public policies for improving private investment should be promoted: improving the business climate, improving the quality of institutions, ameliorate political environment, fight against terrorism ravaging part of Africa including Mali.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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