Original research article

Why Fiscal Policies are Pro-cyclical in Economic and Monetary Community of central Africa?

Abstract

The objective of this paper is to study empirically the cyclical behaviour of fiscal policies in CEMAC. According to the literature, fiscal policies are pro-cyclical in developing countries. Two main arguments are put forward: borrowing constraints during economic downturns; and irrational behaviour of governments, which do not save enough during booms because of political pressure groups. Over the period 1992 to 2012, using ordinary least and double least squares on panel data, our estimates show that fiscal policies are pro-cyclical in CEMAC and public investment spending is the most pro-cyclical. This is because their governments do not save enough when the terms of trade are favourable (boom periods), due to the fact that they rather take advantage of their access to external finance to increase public investment spending necessary for their development (rational behaviour).

Keywords

Keywords: Fiscal policy; pro-cyclicality; public investment expenditure; panel data.
JEL Code: E32 ; E62 ; H54 ; C23.

Abbreviations

CEMAC: Economic and Monetary Community of Central Africa;
IMF: International Monetary Fund;
OECD: Organisation for Economic Co-operation and Development;
WAEMU: West African Economic and Monetary.

1. INTRODUCTION

As part of multilateral surveillance of fiscal policies in CEMAC zone, governments of these countries adopted criteria in 2001, among which basic budget balance [1] must be positive or zero. According to IMF (2017), the latter has been pro-cyclical, favouring the growth of public debt in the zone. Thus, CEMAC governments have adopted a new criterion, in force since 2017, reference budget balance [2] must not exceed -1.5% of GDP.

According to Keynesian and neoclassical currents, fiscal policies should be counter-cyclical[3] in order to achieve stable economic growth and avoid high budget deficits. Understanding why fiscal policies are not counter-cyclical or rather pro-cyclical[4] is therefore very important.

Indeed, the literature on behaviour of fiscal policies in relation to business cycle in developing countries asserts pro-cyclicality, while it is counter-cyclical or acyclical in developed countries. It justifies this by two main arguments: the constraints on borrowing during recessions (Gavin and Perotti, [5]; Caballero and Krishnamurthy, [4]); and by the presence of political pressure groups that prevent sufficient savings during boom periods, i.e. political-institutional and socio-political factors (Tornell and Lane, [15]; Talvi and Végh, [14]; Woo, [16]; Alesina and al., [2]). This second argument underlines an irrational behaviour by governments: an increase in public consumption expenditure during boom periods.

However, during these boom periods, there would be insufficient savings to be made, as governments instead take advantage of access to external finance to increase public investment spending, borrowing and raising a good part of the revenues when activity is expanding. Indeed, net capital flows are pro-cyclical in low-income countries (including 10 franc zone countries in the sample studied) and channels suggested by authors are terms of trade fluctuations (Kaminski and al., [8]).

In developing countries where public infrastructure needs are enormous, public investment expenditure cannot be subject to the voracity effect of pressure groups, as it is usually spread over several years and is useful for long-term growth. Thus, during expansions it increases, and during recessions, in face of voracity of pressure groups, it may decrease more than other types of expenditure.

Lane [9] finds that only wages are affected by political pressure groups in OECD countries. Mpatswe and al. [10] also looks the cyclicality of components of public expenditure (public consumption and public investment). They find that public investment expenditure is the most pro-cyclical in CEMAC region and that political pressure variables (elections and quality of institutions) do not favour this behaviour.

[1] The difference between total revenue excluding grants and total public expenditure minus investment expenditure on external resources.
[2] Overall balance minus 20% of oil revenues and 80% of the difference between oil revenues and their average in relation to GDP over the last three years.
[3] This means that public spending increases during economic downturns and decreases during expansions.
[4] This means that public spending decreases during economic downturns and increases during expansions.

For countries in monetary union, cyclicality of components of public expenditure is also important, especially in setting a fiscal rule.

The objective of this paper is therefore to study empirically the pro-cyclical behaviour of fiscal policies in CEMAC zone. The originality of this work is to highlight a new argument that can justify the pro-cyclicality of fiscal policies in some developing countries. The rest of work is divided into four sections: methodology, results and interpretations, justification of pro-cyclicality of fiscal policies, and conclusion.

2. METHODOLOGY

Before studying the behaviour of fiscal policies in relation to business cycle, we first carry out a descriptive analysis of fiscal and business variables.

2.1. Descriptive statistics

Table 1. Volatility of fiscal policies and economic activity in CEMAC

Variables	CEMAC		WAEMU	
	Average	Standard deviation	Average	Standard deviation
Total expenditures	6,96	5,70	5,59	4,66
Budgetary revenues	8,58	7,02	4,79	4,78
Primary balance	1,61	3,31	-0,79	1,19
GDP	36,21	26,26	29,41	25,73
Goods and services + others	2,41	2,03	2,01	1,91
Public Investment	2,80	3,93	1,88	1,44
Salaries	1,73	1,52	1,69	1,74

From the standard deviations of above variables (in billions of CFA francs and in real terms from 1992 to 2012), we observe that:

Fiscal and economic activity variables are more volatile in CEMAC zone than WAEMU zone. Fiscal policies would be more pro-cyclical in CEMAC zone than WAEMU zone if fiscal shocks were positively correlated with those of economic activity.

When we look at the composition of public expenditure, we see that public investment expenditure is the most volatile in CEMAC zone, while in WAEMU zone it is expenditure on goods and services plus transfers and subsidies.

2.2. Model and estimation technique

In order to study the behaviour of fiscal policies in relation to business cycle in CEMAC, we use a model inspired by Rigobon [11]:

$$Dp_{i,t} = \beta + \alpha * GDP_{i,t} + \varepsilon_{i,t}.$$

We add terms of trade and dummy variable linked to the devaluation of CFA franc in 1994:

$$Dp_{i,t} = \beta + \partial * Dev_{i,1994} + \alpha * GDP_{i,t} + \delta * TOT_{i,t} + \varepsilon_{i,t}$$

The coefficients of this model are estimated from fixed-effects Ordinary least squares (OLS) estimator and fixed effects instrumental variable (IV) estimator to correct for endogeneity problems and to observe whether the results differ (Jaimovich and Panizza, [7]). If α is positive then fiscal policies are pro-cyclical. But if α is negative, fiscal policies are counter-cyclical.

2.3. Variables

Fiscal variables and GDP are transformed into real terms by GDP deflator. We thus have:

Business cycle: it represented here by the observed real GDP. According to Aguiar and Gopinath (2004b), usual Hodrick and Prescott filter [6] would tend to equalise fluctuations in activity between groups of countries. For other indicators (growth rate and logarithm of GDP), it is difficult to find good instruments to resolve the endogeneity problem between business cycle and fiscal variable.

Fiscal variable: this is total public expenditure and its various components in real terms, the best indicator of pro-cyclicality of fiscal policies (Kaminski and al., [8]), Dp;
Indicator variable for the devaluation of the CFA franc in 1994, it captures a common behaviour linked to devaluation, it takes the value "1" for each country in the year of the 1994 devaluation and "0" elsewhere: Dev;
Terms of trade: TOT.

2.4. Data source and study period

The study period is from 1992 to 2012. Data come from the French Bank (Franc zone reports from 1994 to 2013): total expenditure = wages + expenditure on goods and services + transfers and subsidies + capital expenditure or public investment (all in billions of CFA francs), total revenue excluding grants (in billions of CFA francs), credit obtained from the IMF (in millions of dollars); and from the World Bank: nominal GDP in billions of CFA francs (WDI), GDP deflator (2005=100, WDI), terms of trade (2005=100, datamarket.com).

3. RESULTS AND INTERPRETATIONS

The estimation of first stage shows that lagged one-period series of real GDP is correlated with the latter, and is not a weak instrument for CEMAC and WAEMU countries. Indeed, it has a regression coefficient greater than unity, and significantly different from zeros; and the F-test statistic is above the norm (10) according to the Staiger and Stock [13] rule (see appendices).
The ordinary least squares (OLS) and double least squares (IV) fixed effects results are therefore reported in the tables below. To simplify the presentation of results, devaluation variable and constant are no longer mentioned in the tables related to the study of cyclicality of the components of public expenditure.

Table 2. Cyclicality of fiscal policies in CEMAC

Explanatory variables	Dependent variables			
	Expenditure (CEMAC)		Expenditure (WAEMU)	
	OLS	IV	OLS	IV
Constant	-4,26*** (0,88)	-5,17*** (0,90)	-1,77*** (0,53)	-2,18*** (0,55)
Dev	0,73 (1,09)	1,18 (1,11)	0,57 (0,38)	0,66 (0,37)
TOT	0,0001 (0,008)	-0,001 (0,009)	-0,002 (0,002)	-0,0008 (0,003)
GDP	0,308*** (0,02)	0,335*** (0,02)	0,258*** (0,01)	0,265*** (0,01)
R2	0,72	0,72	0,75	0,75

*, **and *** significance at 10%, 5% and 1% risk; (.) standard deviation.

According to instrumental variables method (IV), public spending is more pro-cyclical in CEMAC zone than WAEMU zone (table 2). The coefficient related to terms of trade fluctuations is negative and not significant in both unions. The countries of these two unions do not save sufficiently during periods of terms of trade boom (increase in commodity prices).

This result on the pro-cyclicality of fiscal policies in CEMAC corroborates those of Mpatswe and al. [10], Simo [12].

Table 3. Cyclicality of public expenditure components in CEMAC

Explanatory variables	Dependent variables :					
	Public investment		Salaries		Goods and services + transfers and subsidies	
	OLS	IV	OLS	IV	OLS	IV
TOT	0,015 (0,007)	0,013 (0,008)	-0,008*** (0,001)	-0,007*** (0,001)	-0,006** (0,003)	-0,007** (0,003)
GDP	0,191*** (0,01)	0,211*** (0,02)	0,026*** (0,004)	0,029*** (0,003)	0,091*** (0,007)	0,094*** (0,007)
R2	0,58	0,58	0,27	0,33	0,60	0,59

*, **and *** significance at 10%, 5% and 1% risk; (.) standard deviation.

In CEMAC zone, according to the instrumental variables method, estimates show that public investment is more pro-cyclical and explains more than half of the pro-cyclicality coefficient of total public expenditure (Table 3). The coefficient related to terms of trade fluctuations is negative and significant in the equations for wages and expenditure on goods and services plus transfers and subsidies, while it is positive and not significant in the public investment equation. Fiscal authorities do not save enough, as they increase public investment spending when the terms of trade are favourable (rising commodity prices). This behaviour become significant when taking into account the long reaction and implementation times of fiscal policies (see appendices, table 8).

Table 4. Cyclicality of public expenditure components in WAEMU

Explanatory variables	Dependent variables :					
	Public investment		Salaries		Goods and services + transfers and subsidies	
	OLS	IV	OLS	IV	OLS	IV
TOT	0,003 (0,001)	0,001 (0,002)	-0,0006 (0,001)	0,0001** (0,0009)	-0,002 (0,001)	-0,002 (0,001)
GDP	0,100*** (0,007)	0,092*** (0,008)	0,044*** (0,004)	0,054*** (0,003)	0,114*** (0,005)	0,118*** (0,006)
R2	0,52	0,49	0,38	0,55	0,72	0,73

*, **and *** significance at 10%, 5% and 1% risk; (.) standard deviation.

In WAEMU zone, the estimates show that spending on goods and services plus transfers and subsidies are more pro-cyclical (table 4). The coefficient related to terms of trade fluctuations is positive and significant in wages equation, positive and not significant investment expenditure equation, and negative and significant in expenditure on goods and services plus transfers and subsidies equation. Fiscal authorities do not save enough during boom periods, as they increase wages and public investment spending.

This result on the pro-cyclicality of public investment spending in CEMAC corroborates that of Mpatswe and al. [10]. But authors do not explain why public investment spending increases when terms of trade are favourable.

4. JUSTIFICATION OF PRO-CYCLICALITY OF FISCAL POLICIES IN CEMAC

4.1. Terms of trade fluctuations on budget balance

According to the neoclassical current, optimal fiscal policy is to smooth public spending in the face of shocks to the tax base (Barro, [3]). Thus, countries should save during boom periods (favourable terms of trade) in order to avoid cyclical deficits and to have counter-cyclical or rather less pro-cyclical fiscal policies.

Indeed, the following table (5) confirms this argument. The regression coefficient of primary budget balance against terms of trade fluctuations is positive and significant in both WAEMU and CEMAC zones. CEMAC governments are more affected by the deterioration of the terms of trade.

Table 5. Cyclical budget deficits in CEMAC

Primary budget balance (CEMAC)	
TOT	4,34*** (0,81)
F-test	26,05***
Primary budget balance (WAEMU)	
TOT	0,52* (0,27)
F-test	3,54*

*, **and *** significance at 10%, 5% and 1% risk; (.) standard deviation.

4.2. Financial constraints associated with fluctuations in the terms of trade

The table (6) below represents regressions of IMF credit against terms of trade (1) and against business cycle (2).

They show that in two monetary unions, when economic activity is expanding, credit obtained from the IMF increases and during periods of recession this credit decreases. Fiscal authorities are therefore financially constrained externally when economic activity is in recession. This argument was highlighted by Gavin and Perotti [5] in their study of Latin American countries.

In particular in CEMAC zone, when terms of trade are favourable (rising commodity prices), credit from abroad (IMF) increases and decreases during periods of deterioration (falling commodity prices). This second argument confirms the suggestion by Kaminski and al. [8] that pro-cyclicality of net capital flows in these countries is driven by terms of trade fluctuations. CEMAC governments therefore increase spending (public investment) during periods of favourable terms of trade, borrowing and taking a good share of revenues when activity is expanding.

In CEMAC, it is therefore not the pressure groups that explain low savings during periods of favourable terms of trade. But the fact that fiscal authorities take advantage of their access to international capital market to increase public investment spending necessary for long-term growth.

Table 6. External financial constraints in CEMAC

IMF credit (WAEMU)		
Explanatory variables	(1)	(2)
TOT	0,32 (0,33)	
GDP		3,72*** (1,31)
F-test	0,93	8,08***
IMF credit (CEMAC)		
Explanatory variables	(1)	(2)
TOT	0,44** (0,20)	
GDP		1,57*** (0,46)
F-test	4,77**	11,64***

*, **and *** significance at 10%, 5% and 1% risk; (.) standard deviation.

5. CONCLUSION

The objective of this paper was to study empirically the pro-cyclical behaviour of fiscal policies in CEMAC zone.

According to the literature, fiscal policies are pro-cyclical in developing countries because they are financially constrained during recessions; and do not save enough during booms because of political lobbies (irrational behaviour).

Our estimates for period 1992 to 2012 show that fiscal policies in this area are pro-cyclical and public investment spending is the most pro-cyclical. This is because governments are more affected by the deterioration of terms of trade; and they do not save enough when terms of trade are favourable, due to the fact that they take advantage of their access to external financing to increase public investment spending necessary for their development (rational behaviour)..

The new criterion linked to reference budget balance would be counter-cyclical, as it obliges the CEMAC fiscal authorities to save at least 20% of oil revenues per year. However, unlike the previous criterion which allowed public investment expenditure from external resources, it would lead to a decline in such expenditure.

AUTHOR CONTRIBUTION

The sole author Guy Noël PIAM SIMO designed, analysed, interpreted and prepared and prepared the manuscript.

COMPETING INTEREST:

Author has declared that no competing interests exist.

REFERENCES

1. Aguiar, M and Gopinath, G. Emerging market business cycles: The cycle is the trend. NBER Paper. 2004b No. 10734.
2. Alesina, A, Campante, F and Tabellini, G. (2008) Why is Fiscal Policy often Procyclical?. Journal of the European Economics Association. 2008; 6(5): 1006-1036.
3. Barro, R. On the Determination of the public debt. Journal of Political Economy. 1979; (87). 940-971.
4. Gavin, M. And Perotti, R. Fiscal Policy in Latina America. NBER Macroeconomics Annual. 1997; (12): 11-72.
5. Caballero R, Krishnamurthy A. Fiscal policy and financial deph. NBER Working paper. 2004; 10532:22.
6. Hodrick, R and Prescott, E. Postwar U.S. Business Cycles: An Empirical Investigation, Journal of Money, Credit, and Banking. 1997; (29): 16.
7. Jaimovich D, Panizza U. Procyclicality or Reverse Causality?. IDB Working Paper. 2007; No. 501: 29.
8. Kaminsky, G, Reinhart, C and Vegh, A. When it Rains, it's Pours: Procyclical Capital Flows and Macroeconomic Policies. NBER Macroeconomic Annual. 2004:11-82.
9. Lane, P. The Cyclical Behavior of Fiscal Policy: Evidence from the OECD. Journal of Public Economies. 2003; (87): 2661-2675.
10. Mpatswe, K., Tapsoba, S, York, R. The Cyclicality of Fiscal Policies in the CEMAC Region. IMF Working paper.2011/11/205.
11. Rigobon, R. Comment on: When It Rains, It Pours' by Kaminsky, G. and al. (2004) In: Gretler, M. and Rogoff, editors, NBER Macroeconomics Annual. 2004; Cambridge, United States: MIT Press: 62-79.
12. Simo, G N P. Effects of Multilateral Surveillance Criteria on the Pro-Cyclicality of Fiscal Policy in Economic and Monetary Community of Central Africa. South Asian Journal of Social Studies and Economics. 2021; 9(3): 30-37.
13. Staiger, D and Stock, J. INSTRUMENTAL VARIABLES REGRESSIONS WITH WEAK INSTRUMENTS; Econometrica. 1997; (65): 557-586.
14. Talvi, E and Vegh, C. TAX BASE VARIABILITY AND PROCYCLICAL FISCAL POLICY, NBER Working paper. 2000; (7499): 37.
15. Tornell, A and Lane, P. The Voracity Effect. American Economic Review. 1999; (89): 22-46.
16. Woo, J. Social Polarization, Fiscal Instability, and Growth. European Economic Review. 2005; (49:6): 1451-1477.

APPENDICES

Table 7. First stage double ordinary least squares estimates

Explanatory variables	Dependent variables	
	GDP (CEMAC)	GDP (WAEMU)
Constant	0,28 (0,76)	0,17 (0,72)
Dev	-1,03 (0,93)	-0,47 (0,48)
TOT	0,01 (0,007)	0,002 (0,004)
GDP (-1)	1,009*** (0,01)	1,01*** (0,01)
F-test	1353,19***	1344,29***
R^2	0,99	0,99

*, **and *** significance at 10%, 5% and 1% risk; (.) standard deviation.

Table 8. Cyclicality of public expenditure components in CEMAC

Explanatory variables	Dependent variables :					
	Public investment		Salaries		Goods and services + transfers and subsidies	
	OLS	IV	OLS	IV	OLS	IV
TOT	0,015** (0,007)	0,014* (0,008)	-0,007*** (0,001)	-0,006*** (0,001)	-0,006** (0,003)	-0,006** (0,003)
GDP (-1)	0,213*** (0,01)	0,226*** (0,02)	0,030*** (0,003)	0,031*** (0,003)	0,095*** (0,007)	0,094*** (0,008)
R2	0,63	0,63	0,34	0,42	0,60	0,59

*, **and *** significance at 10%, 5% and 1% risk; (.) standard deviation.

Table 9. Cyclicality of public expenditure components in WAEMU

Explanatory variables	Dependent variables :					
	Public investment		Salaries		Goods and services + transfers and subsidies	
	OLS	IV	OLS	IV	OLS	IV
TOT	0,001 (0,001)	0,002 (0,002)	-0,0006 (0,001)	0,0001** (0,0009)	-0,002 (0,001)	-0,002 (0,001)
GDP (-1)	0,093*** (0,009)	0,083*** (0,01)	0,055*** (0,004)	0,069*** (0,003)	0,121*** (0,006)	0,128*** (0,007)
R2	0,40	0,36	0,52	0,70	0,69	0,69

*, **and *** significance at 10%, 5% and 1% risk; (.) standard deviation.

LIST OF COUNTRIES

- CEMAC: Cameroon, Gabon, Republic of Congo, Central African Republic, Chad, Equatorial Guinea.
- WAEMU: Togo, Senegal, Ivory Coast, Niger, Burkina Faso, Mali, Guinea Bissau, Benin.