Effects of Multilateral Surveillance Criteria on the Pro-cyclicality of Fiscal Policy in Economic and Monetary Community of Central Africa

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Original Research Article

ABSTRACT

The objective of this article is to study the effect of multilateral surveillance criteria on the cyclical behavior of fiscal policy in CEMAC. Using a linear regression model and estimated by fixed-effect ordinary double least squares on panel data from 1992 to 2012, we find that the surveillance criteria adopted in 2001 increased the pro-cyclicality of fiscal policy.

ABBREVIATIONS

CEMAC : *Economic and Monetary Community*
          of Central Africa
IMF   : *International Monetary Fund*
WDI   : *World Development Indicators*
IDS   : *International Debt Statistics*

WAEMU : *West African Economic and Monetary Union created in 1994, comprising eight countries: Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo.*

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1. INTRODUCTION

Following the example of the European Union in 1997, and in their process of deepening integration, the governments of the CEMAC countries [1] adopted in 2001 rules on budget deficits and debt levels[2] (multilateral surveillance criteria). These countries also wanted to avoid future budgetary slippages in terms of debt.

The literature on the behaviour of governments with respect to the business cycle in developing countries asserts pro-cyclicality, while it is counter-cyclical or acyclical in developed countries. It is justified by borrowing constraints during recessionary periods, [1,2], and by the presence of political pressure groups that prevent sufficient savings during booms, i.e. political-institutional and socio-political factors [3,4,5].

The existence of a fiscal balance rule may further reduce government spending during recessions, as the authorities seek to comply with the rule, [6]; or it may reduce savings during expansions, as the authorities limit themselves to strict compliance with the rule [7]. According to the IMF (2017), The basic fiscal balance criterion[3] has been pro-cyclical.

Guerguil, Mandon and Tapsoba [8] studying the flexibility of the rules, find that fiscal rules favourable to public investment expenditure reduce the pro-cyclicality of fiscal policies. Bova, Carcemac and Guerguil [9] find that fiscal rules have reduced the pro-cyclicality of fiscal policies in developing countries. Fatas and Mihov [10] also find that they have reduced the volatility of discretionary policies oriented towards policy objectives in the European Union. While for Egert [11], they encourage the pro-cyclicality of fiscal policies in the European Union. On the other hand, according to Gali and Perotti [9], it is difficult to say that these rules prevent fiscal policies from being counter-cyclical in the European Union.

Jeanneney and Tapsoba [12] find that the multilateral surveillance criteria introduced since 1995 create a pro-cyclicality bias in public spending during recession phases, which is stronger in WAEMU than in other African countries (including CEMAC). Similarly, Bikai [13] finds that the multilateral surveillance criteria introduced since 1995 have increased the pro-cyclicality of policy in CEMAC, and significantly during expansionary phases.

Finally, Gacko and Laffiteau [14] find that these monitoring criteria adopted in 2001, was pro-cyclical in CEMAC. The authors use the fiscal balance as an indicator of the pro-cyclicality of fiscal policy. However, public spending is the best indicator of the pro-cyclicality of fiscal policy [15].

The originality of this article is therefore a re-examination of the effect of multilateral surveillance criteria on the pro-cyclicality of fiscal policy in CEMAC.

2. METHODOLOGY

2.1. Data and Sources

The period of the study is from 1992 to 2012 for the six countries of CEMAC. The data comes on the one hand from the French Bank (franc zone reports from 1994 to 2013): total expenditure = wages + expenditures on goods and services + transfers and subsidies + capital expenditure or public investment (all in billions of CFA francs), and on the other hand from the World Bank: nominal GDP in billions of CFA francs and dollars (WDI), GDP deflator (2005=100, WDI), terms of trade (2005=100, datamarket.com), private sector credit to GDP (WDI) and external debt to GDP (IDS).

2.2 Model and Variables

Our model is based on Gali and Perotti [6]:

$$Dp_{i,t} = \beta + \mu * Dp_{i,t-1} + \alpha * GapGDP_{i,t-1} + \tau * \text{External debt}_{i,t-1} + \varepsilon_{i,t}$$

The variables in this model are defined as follows:

GapGDP represents the cycle of economic activity. It is the difference between the observed real GDP and its trend obtained from the Hodrick and Prescott filter [16] with a smoothing parameter of 100. As these countries do not

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[1] *CEMAC is the Economic and Monetary Community of Central African Countries created in 1994. It comprises six countries: Cameroon, Gabon, Equatorial Guinea, Central African Republic, Republic of Congo and Chad.*
[2] *The basic budget balance must be positive or zero, the total public debt to GDP ratio must be above 70%, the average annual inflation rate must not exceed 3%,*
[3] *The basic budget balance must be positive or zero (difference between total revenue excluding grants and total government expenditure minus capital expenditure on external resources, divided by GDP).*

have quarterly GDP data, annual data do not allow the different phases of the economic cycle to be captured [15];

Dp is the discretionary fiscal policy variable. It captures the willingness of governments to respond to a shock that deviates economic activity from its long-term trend. It is measured for each country by the residuals obtained from the regression without constant of the government spending in real terms over the economic cycle;

Dp (-1) is the one-period lagged series of discretionary government spending. It captures the degree of inertia of fiscal policy or their willingness to adjust their budget relative to initial conditions;

External debt (-1) represents total external debt in relation to GDP, lagged by one period. It captures their intention to reduce their external debt level regardless of the economic situation. Indeed, during the period under study, these countries were aiming to reduce their external debt (a large part of the total debt) through structural adjustment programs proposed by the International Monetary Fund (IMF) and the World Bank.

We also add variables in this model that can express financial constraints during recessionary periods:

Private credit represents total credit to the private sector as a proportion of nominal GDP. It is a measure of financial deepening, the weakness of which can limit fiscal authority spending during recessions [2];

GapTOT represents fluctuations in the terms of trade. It is the difference between the terms of trade and its trend calculated from the Hodrick and Prescott filter with a smoothing parameter of 100, and captures the effects of external price fluctuations on government revenues, and thus expenditures. It also captures external financial constraints during recessionary periods. Net capital flows are pro-cyclical in income countries and the suggested channels are terms-of-trade fluctuations [2];

Dev1994 is the indicator variable for the devaluation of the CFA franc in 1994. It captures a common behavior linked to the devaluation, taking the value "1" for each

country in the year of devaluation, and "0" elsewhere.

$$Dp_{i,t} = \beta + \partial * Dev_{i,1994} + \mu * Dp_{i,t-1} + \alpha \\ * GapGDP_{i,t} + \delta * GapTOT_{i,t} + \omega \\ * Private\ credit_{i,t} \\ + \tau * \text{External debt}_{i,t-1} + \varepsilon_{i,t} \ (1)$$

In order to study the effect of multilateral surveillance criteria on the pro-cyclicality of discretionary fiscal policy, we therefore use crosswords:

$$Dp_{i,t} = \beta + \partial * Dev_{i,1994} + \mu * Dp_{i,t-1} + \alpha * \\ MS_{i,t} * GapGDP_{i,t} + \delta * GapTOT_{i,t} + \omega * \\ Private\ credit_{i,t} + \tau * \text{External debt}_{i,t-1} + \varepsilon_{i,t} \ (2)$$

Where MS is the indicator variable for the adoption of multilateral surveillance criteria, it takes the value "1" for each country from 2002 onwards, i.e. after the year of adoption of these criteria in CEMAC and "0" elsewhere.

If the coefficient α The previously positive outcome then increases the criteria for multilateral surveillance, which encourages pro-cyclicality in fiscal policy. But if it is lowered, then these criteria rather reduce the pro-cyclicality of fiscal policy.

2.3 Technical Estimation

for estimating the coefficients of these models, ordinary least square and double least squares fixed effects are used.

Indeed, if the variable $Dp_{i,t}$ is stationary ($-1 < \mu < 1$) then its delayed series is not correlated with the idiosyncratic error, but probably with the fixed error. The endogeneity problem is due to the unobservable fixed effect v_i contained in the error, $\varepsilon_{i,t} = v_i + \epsilon_{i,t}$. This fixed effect can be correlated with the explanatory variables in the model. To solve this problem, the fixed-effect ordinary least squares (OLS) method is used. In order to take into account problems of endogeneity between the business cycle and public spending, the coefficients are also estimated by the instrumental variable method (double least squares). We can't use the generalized method of moments (difference and system GMM estimators) because it is efficient and valid when the model does not include temporal dummy variables, the number of countries is high and greater than the study period, [17], 43).

Moreover, the coefficient μ represents the degree of inertia of the budgetary variable, it is due to the time lag in implementing a new budgetary policy. This parameter is positive and less than unity. It thus expresses the existence of a long-term budget balance constraint, implying a gradual return to equilibrium (stationary variable). The budgetary authorities are therefore constrained by the initial conditions.

Due to the characteristics of the study sample, size (6) and number of years (21), the first generation stationarity tests of Im, Pesaran and Shin [18] and Maddala and Wu [19] are appropriate. Indeed, the authors offer a panel stationarity test for small sample sizes, with N (number of individuals) and T (number of years) fixed. Then, we will perform the Pesaran inter-individual dependency test [20]. If so, we will perform the Pesaran stationarity test [21] in the presence of a dependency between individuals. The result is that the expenditure series is stationary at a 1% risk.

3. RESULTS AND DISCUSSION

The first-stage estimate shows that the one-period lagged series of the cyclical component of economic activity is correlated with it, and is not a weak instrument. The F-test statistic is above the norm (10) according to the rule of Staiger and Stock [22], (557) (see appendix).

The table below summarizes the results found in Table 1.

The estimation of coefficients by the instrumental variables method in the first column shows that discretionary or structural public spending is pro-cyclical in CEMAC. The coefficient of the lagged budget variable is positive and significant (less than 1), thus reflecting the persistence (irreversibility) of budget decisions over time. The coefficient related to fluctuations in the terms of trade is negative but not significant, as the fiscal authorities do not save enough during periods of favourable terms of trade. The coefficient related to private sector credit is positive but not significant, as authorities are subject to domestic financial constraints during recessionary periods. The coefficient linked to the level of external debt in the previous period is negative and significant, reflecting the fact that fiscal authorities, despite their previous level of debt, take into account the economic situation (economic recession). The value of the coefficient related to the cyclical component of economic activity increases and is significantly different from "0" when crossed with the indicator variable for the adoption of multilateral surveillance criteria. The coefficients of determination indicate that the variables broadly explain the different models. Multilateral surveillance criteria have thus increased the procyclicality of fiscal policy in CEMAC.

Table 1. Effects of multilateral surveillance criteria on the pro-cyclicality of fiscal policy in CEMAC

Explanatory variables	Dependent variables : Total Expenditures			
	All		The period	Effects of the rules
	OLS	IV	OLS	IV
Constant	2,40**	1,93*	2,60**	1,44
	(1,02)	(1,09)	(1,04)	(1,26)
Dev	-0,89	-0,71	-0,97	-0,80
	(1,04)	(1,10)	(1,05)	(1,21)
Dp (-1)	0,74***	0,76***	0,74***	0,81***
	(0,06)	(0,07)	(0,07)	(0,08)
Private credit	0,19	0,22	0,17	0,21
	(0,12)	(0,13)	(0,12)	(0,14)
External debt (-1)	-0,01	-0,01***	-0,01***	-0,01***
	(0,005)	(0,005)	(0,005)	(0,006)
GapTOT	-0,02	-0,02	-0,01	-0,03
	(0,02)	(0,01)	(0,02)	(0,02)
GapGDP	0,17	0,54***		
	(0,11)	(0,2)		
MS*GapGDP			0,019	0,84**
			(0,14)	(0,34)
R2	0,74	0,71	0,73	0,65

*Source: Author; (.) standard deviation; *, ** and *** risk significance 10%, 5% and 1%.*

4. CONCLUSION

The objective of this paper was to study the effect of multilateral surveillance criteria on the pro-cyclicality of fiscal policy in CEMAC.

Based on a model inspired by Gali and Perotti [6], when the business cycle variable is cross-tabulated with that of the adoption of multilateral surveillance criteria in 2001, using the instrumental variables method, the previously positive pro-cyclicality coefficient of discretionary public spending increases. These criteria have thus increased the pro-cyclicality of fiscal policy in CEMAC. This result corroborates that of Gacko and Laffiteau [14].

As a limitation of these estimates on the cyclical behavior of fiscal authorities, they do not take into account shocks that may lead to a common correlation or recession in this group of countries.

Finally, a study on the behavior of fiscal authorities according to the phases of the economic cycle is also needed, and above all, the effect of multilateral surveillance criteria on the behavior of fiscal authorities during expansionary phases, in order to identify whether there is a savings behavior for those countries that are financially constrained during recessionary phases.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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APPENDIX

Table 2. Estimates of the first stage of ordinary double least squares

	Dependent variables
Explanatory variables	**GapGDP**
Constant	1,26*
	(0,69)
Dev	-0,67
	(0,71)
dp(-1)	-0,05
	(0,04)
Externaldebt (-1)	-0,004
	(0,009)
Privatecredit	-0,09
	(0,08)
GapTOT	0,01
	(0,01)
GapGDP(-1)	0,55***
	(0,07)
F-test	10,95***
R2	0,37

*Source: Author; (.) standard deviation; *, ** and *** risk significance 10%, 5% and 1%.*

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Table 3. Expenditure Stationarity Test (dp)

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First and Second Generation Panel Unit Root Tests

Variables tested:          dp
Group variable:            code
Number of groups:          6
Total # of observations:   126+
Average # of observations: 21.00+
Panel is balanced and has gaps
+ Full sample statistics prior to testing.
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_____
(A) Maddala and Wu (1999) Panel Unit Root test (MW)
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	Specification without trend		
Variable	lags	chi_sq	p-value
dp	0	12.254	0.425
dp	1	6.380	0.896

	Specification with trend		
Variable	lags	chi_sq	p-value
dp	0	16.273	0.179
dp	1	11.922	0.452

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(B) Pesaran (2007) Panel Unit Root test (CIPS)
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	Specification without trend			
Variable	lags	Zt-bar	p-value	t-bar
dp	0	-2.547	0.005	.
dp	1	-2.340	0.010	.

	Specification with trend			
Variable	lags	Zt-bar	p-value	t-bar
dp	0	-1.480	0.069	.
dp	1	-1.155	0.124	.

```
Null for MW and CIPS tests: series is I(1).
MW test assumes cross-section independence.
CIPS test assumes cross-section dependence is in
    form of a single unobserved common factor.

-multipurt- uses Scott Merryman's -xtfisher- and
    Piotr Lewandowski's -pescadf-.
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