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

Guy Noël Piam Simo

1 University of Dschang, Cameroon.

Author’s contribution

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

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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.

Keywords: Fiscal policy; pro-cyclicality; multilatéral surveillance criteria; CEMAC.

JEL code: E32, E62, H77.

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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*Corresponding author: Email: piampour@yahoo.fr,
1. INTRODUCTION

Following the example of the European Union in 1997, and in their process of deepening integration, the governments of the CEMAC countries adopted in 2001 rules on budget deficits and debt levels (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 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]:

\[ Dp_{t,t} = \beta + \mu \times Dp_{t,t-1} + \alpha \times GapGDP_{t,t-1} + \tau \times External \ debt_{t,t-1} + \epsilon_{t,t} \]

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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3 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.

\[
Dp_{it} = \beta + \delta \times Dev_{1994} + \mu \times Dp_{i,t-1} + \alpha \times GapGDP_{i,t} + \delta \times GapTOT_{i,t} + \omega \times Private\ credit_{i,t} + \tau \times External\ debt_{i,t-1} + \epsilon_{it}
\]

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

\[
Dp_{it} = \beta + \delta \times Dev_{1994} + \mu \times Dp_{i,t-1} + \alpha \times MS_{i,t} \times GapGDP_{i,t} + \delta \times GapTOT_{i,t} + \omega \times Private\ credit_{i,t} + \tau \times External\ debt_{i,t-1} + \epsilon_{it}
\]

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 \( \alpha \) is positive, 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 \( \epsilon_{i,t} \) contained in the error, \( \epsilon_{i,t} = v_{i,t} + \epsilon_{i,t} \). 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 $\mu$ 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 procyclical 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.

| Explanatory variables | 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*** | 0.019 | 0.84** |
|                       | (0.11) | (0.2) | (0.14) | (0.34) |
| MS*GapGDP             | 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.

REFERENCES

1. Gavin M, Perotti R. Fiscal policy in Latina America. NBER Macroeconomics Annual. 1997;12:11-72.
2. Caballero R, Krishnamurthy A. Fiscal policy and ﬁnancial depth. NBER Working Paper. 2004;10532:22.
3. Tornell A, Lane P. The voracity effect. The American Economic Review. 1999;89:22-46.
4. Woo J. Social polarization, ﬁscal instability, and growth. European Economic Review. 2005;49:1451-1477.
5. Alesina A, Campante F, Tabellini G. Why is Fiscal Policy often Pro-cyclical? Journal of the European Economics Association. 2008;6(5):1006-1036.
6. Gali J, Perotti R. Fiscal policy and monetary integration in Europe. Economic Policy. 2003;18(37):533-572.
7. Sorensen B, Yoshia O. Is state ﬁscal policy asymmetric over the business Cycle?. Economic Review. Third Quarter. 2001; 86:43-64.
8. Guerguil M, Mandon P, Tapsoba R. Flexible ﬁscal rule and countercyclical ﬁscal policy. Journal of Macroeconomics. 2017;45:308.
9. Bova E, Carcema N, Guerguil M. Fiscal rules and the procyclicality of ﬁscal policy in the developing world. IMF-World Bank Conference on Fiscal Policy, Equity and Long—Term Growth in Developing Countries, Washington, DC. 2013;April: 21.
10. Fatas A, Mihov I. On constraining ﬁscal policy discretion in EMU. Oxford Review of Economic Policy. 2003;19:112.
11. Égert B. Fiscal policy reaction to the cycle in the OECD: Pro or counter-cyclical? Cesifo Working Paper: Fiscal Policy, Macroeconomics and Growth. 2012; No.3777:18.
12. Jeanneneney GS, Tapsoba SJ. Procyclicality of ﬁscal policy and multilateral surveillance in African unions. CERDI, Studies and Documents. 2009;04:47.
13. Bikai J. Règles de surveillance multilatérales et pro-cyclicité de la politique budgétaire dans la zone CEMAC. Bank of Central African States (BEAC) Working Paper- BWP. 2015;07/15: 26. French.
14. Gacko I, Laﬀiteau E. Reforms criteria for convergence and cyclicality of budget policy in the french zone. Developing Worlds. 2017/3;No. 179:119-136.
15. Kaminsky G, Reinhart C, Vegh A. When it rains, it’s pours: Pro-cyclical capital ﬂows and macroeconomic policies. NBER Macroeconomics Annual. 2004;11-82.
16. Hodrick R, Prescott E. Postwar U.S. business cycles: An Empirical Investigation. Journal of Money, Credit, and Banking. 1997;29:16.
17. Roodman D. How to do xtabond2: An Introduction to “Difference” and “System” GMM in Stata. Stata Journal. 2009;9(1): 86-136.
18. Im K, Pesaran M, Shin Y. Testing for unit roots in heterogeneous panels. Journal of Econometrics. Journal of Econometrics. 2003;115(1):53-74.
19. Maddala G, Wu S. A comparative study of unit root tests with panel data and a new simple test. Oxford Bulletin of Economics and Statistics. 1999;special issue: 631-652.
20. Pesaran H. General diagnostic tests for cross section dependence in panels. Cesifo Working Paper. 2004;No. 1229: 42.
21. Pesaran H. A simple panel unit root test in the presence of cross-section dependence. Journal of Applied Econometrics. 2007;22: 265-312.
22. Staiger D, Stock J. Instrumental variable regressions with weak instruments. Econometrica. 1997;65:557-586.
### APPENDIX

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

| Explanatory variables | Dependent 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%.
Table 3. Expenditure Stationarity Test (dp)

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 gap |
| + Full sample statistics prior to testing. |

(A) Maddala and Wu (1999) Panel Unit Root test (MW)

| Specification without trend |
|----------------------------|
| Variable | lags | chi_eq | p-value |
| dp       | 0    | 12.254 | 0.425   |
| dp       | 1    | 6.380  | 0.896   |

| Specification with trend |
|--------------------------|
| Variable | lags | chi_eq | p-value |
| dp       | 0    | 16.273 | 0.179   |
| dp       | 1    | 11.822 | 0.452   |

(B) Pesaran (2007) Panel Unit Root test (CIPS)

| Specification without trend |
|-----------------------------|
| Variable | lags | 2t-bar | p-value | t-bar |
| dp       | 0    | -2.547  | 0.005   |   |
| dp       | 1    | -2.340  | 0.010   |   |

| Specification with trend |
|--------------------------|
| Variable | lags | 2t-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.

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