

## *Original Paper*

# Cyclicity of Public Spending Theoretical and Methodological Approach Case of Morocco

Otmane Erguigue<sup>1\*</sup>

<sup>1</sup> Mohamed V University -Morocco / Faculty of Legal, Economic and Social Sciences) Salé, Morocco

Research Team: Macroeconomics and Public Policy

\* Otmane Erguigue, Mohamed V University -Morocco / Faculty of Legal, Economic and Social Sciences) Salé, Morocco

Research Team: Macroeconomics and Public Policy

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### ***Abstract***

*This article is a contribution to the analysis of the impact of fiscal policy on economic activity in Morocco. It provides a concise overview of the literature on fiscal policy. Reviewing both theoretical and empirical literature, an abundant literature focuses on the effect of spending on output and other macroeconomic variables. Some studies find that an increase in public spending has little effect on output, while others find that an expansionary fiscal policy has a positive effect on the economy, thus supporting Keynesian ideas. Most studies use data from developed countries such as the USA, Japan and Europe, but developing countries seem to have received less attention.*

### ***Keywords***

*fiscal policy, public spending, Generalized Method of Moments (GMM)*

## **1. Introduction**

Fatas and Mihov (2001) argue that fiscal policy research can be divided into three categories: studies that focus on the impact of large reductions in the budget deficit; studies that analyze the stabilizing capacity of fiscal policy variables (i.e., research focuses on automatic fiscal stabilizers); and studies that examine the effect of discretionary fiscal policy on macroeconomic variables (for example, to investigate the effect of changes in public spending and taxation on output, as shown by Blanchard and Perotti, 2002).

An abundance of literature focuses on the effect of spending on output and other macroeconomic variables. Some studies find that an increase in public spending has little effect on output, while others

find that an expansionary fiscal policy has a positive effect on the economy, thus supporting Keynesian ideas. Most studies use data from developed countries such as the USA, Japan and Europe, but developing countries seem to have received less attention.

This article provides a concise overview of the literature on fiscal policy and the cyclicity of public spending. We analyze a summary of the results of estimating the reaction function of Moroccan public spending over the period 1980-2019 using the GMM technique.

## 2. Literature Review

It is no exaggeration to say that an implicit consensus has emerged in the literature that counter-cyclical policies are preferable to pro-cyclical responses. On the one hand, "theoretical work clearly suggests that countercyclical policy should mitigate the severity and duration of crises. For example, Altig et al. (2011) and Nakata (2013) show that optimal fiscal policy in a stochastic model with sticky prices is actually countercyclical. While the former takes monetary policy as given, the latter shows how countercyclical monetary and fiscal policies complement each other.

On the other hand, "empirical studies have also reached the same conclusion. A pro-cyclical fiscal policy is sub-optimal because it would exacerbate the business cycle (Ilzetzki & Vegh, 2008)—what Kaminsky, Reinhart and Vegh (2005) have called the 'when it rains, it pours' phenomenon. In their recent study, Vegh and Vuletin (2014) analyze in depth the case of Latin America from 1960 to 2010 and conclude that, when applied, counter-cyclical government measures have been effective in reducing the duration and intensity of recessions".

Similarly, they show that the pro-cyclical fiscal policy of some Eurozone countries prolonged the duration and intensity of the last global crisis.

Over the past 20 years, a growing body of literature has highlighted a fundamental difference between the way fiscal policy is conducted in developing and industrialized countries. Traditionally, while fiscal policy in industrialized countries is either cyclical or countercyclical, it is generally procyclical in developing countries. Gavin and Perotti (1997) opened the debate by concluding that, compared with OECD countries, fiscal policy in Latin America was volatile and procyclical.

A large number of authors have reached similar conclusions and extended them to other regions, to the point where this has become part of the conventional wisdom. For example, Frankel, Vegh and Vuletin (2013) illustrate this contrast by comparing 94 countries between 1960 and 2009: while over 90% of developing countries (67 out of 73) displayed pro-cyclical public spending, around 80% of industrialized countries (17 out of 21) displayed counter-cyclical public spending over this period. (17 out of 21) showed counter-cyclical public spending over this period.

Similarly, Ilzetzki and Vegh (2008) found "that fiscal policy was indeed procyclical in developing countries, even after treating the endogeneity between public spending and GDP with several

econometric tools. At least for developing countries, this clearly shows that the ‘when it rains, it pours’ phenomenon is empirically relevant and should in fact be a major concern for public authorities”.

In fact, the ability to switch from a pro-cyclical to a counter-cyclical fiscal policy is seen as a sign of macroeconomic honor in developing countries, and a sign that the country belongs to an exclusive club based on sound economic policies.

This begs the question: why would policymakers in developing countries pursue a pro-cyclical fiscal policy? After all, such a policy cannot be optimal, as it will tend to reinforce the business cycle, exacerbate booms and deepen crises, with undesirable consequences such as higher unemployment. As summarized by Frankel, Vegh and Vuletin (2013), the most convincing explanations in the literature fall into two areas. The first relates to economic distortions, such as access to imperfect international credit markets and lack of financial depth (Caballero & Krishnamurthy, 2004, Gavin & Perotti, 1997). Lack of access to credit markets in times of crisis will naturally leave governments with no choice but to cut spending and raise taxes. The second reason relates to political constraints (Talvi & Vegh, 2005; Tornell & Lane, 1999).

Political pressure for additional spending in good times is difficult to resist, particularly when there may be a real need for additional government spending in critical social areas. Therefore, improving access to credit in difficult times, and designing rules and institutions to ensure that tax revenues are saved in good times so that they are available in bad times, would mitigate the undesirable consequences of pro-cyclical fiscal policy.

An interesting finding of the last decade is that, despite this suboptimal historical behavior, developing countries are experiencing a "shift" in terms of cyclical policies. Frankel, Vegh and Vuletin (2013) claim that around a third of developing countries have been able to "graduate" in the sense of overcoming the procyclicality problem and becoming countercyclical. Of the 73 developing countries studied, 26 showed countercyclical fiscal policy in 2000-2009, compared with 6 in 1960-1999.

Indeed, Didier, Hevia and Schmukler (2012) show in their study how emerging economies reacted to the latest global shock. The global crisis highlighted many emerging economies with greater fiscal space, improved national balance sheets and the credibility to pursue expansionary fiscal and monetary policies. As a result, they resumed their growth rates earlier and converged more rapidly towards their pre-crisis growth trends than in previous crises.

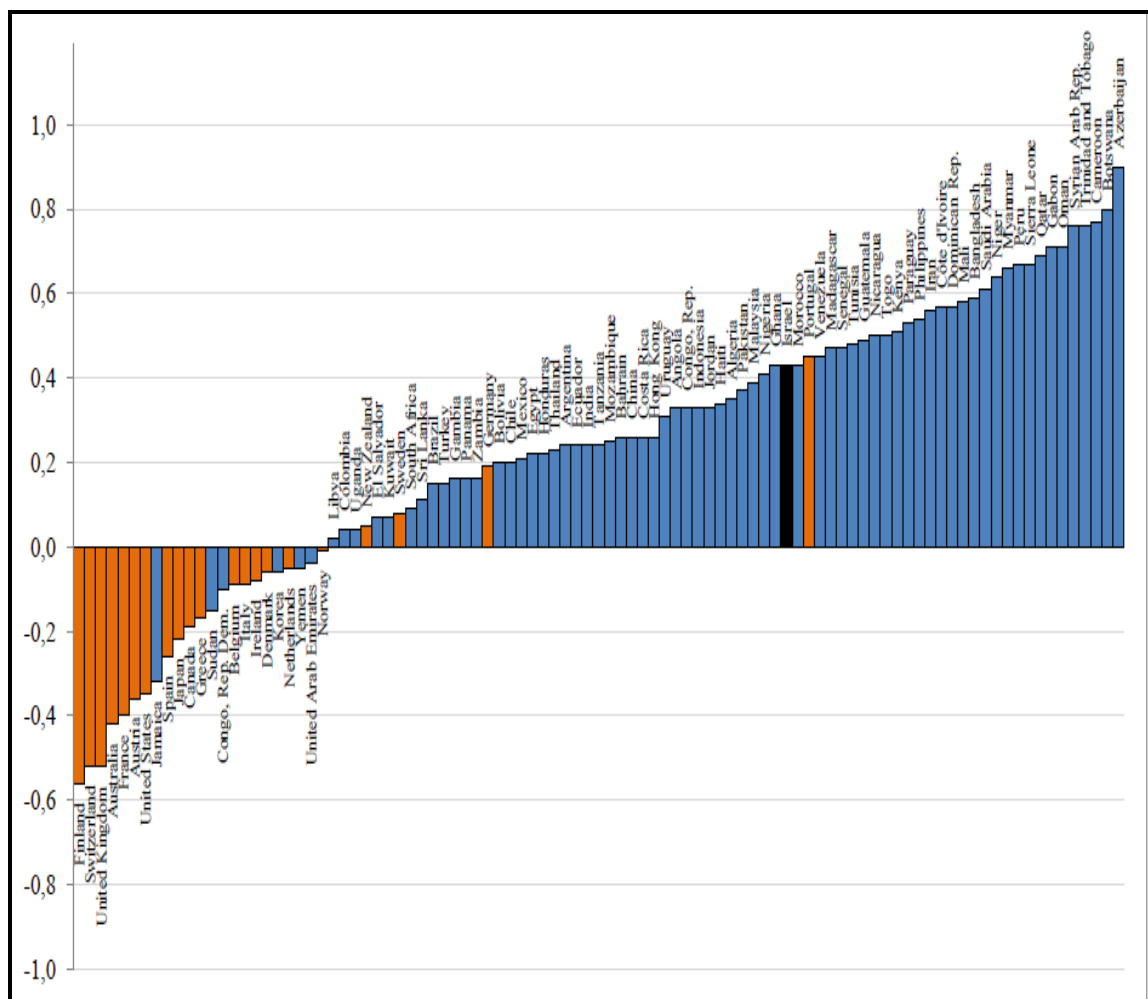
The resilience of emerging economies to the 2008 crisis could perhaps be attributed to a combination of stronger macroeconomic and financial policy frameworks and a move towards more secure national and international financial positions.

Similarly, Vegh and Vuletin (2014) concluded that, unlike the crises of the 1990s—when emerging economies generally lacked the policy tools available to advanced economies to respond counter-cyclically to external shocks—many developing countries were able to implement

counter-cyclical monetary and fiscal policies, which effectively helped reduce the duration and intensity of the latest crises in Latin America.

Figure 1 reproduces the aforementioned international comparison by Frankel, Vegh and Vuletin (2014) and clearly illustrates the contrast between industrial and developing countries (represented by orange and blue bars respectively) with regard to the cyclical nature of public spending.

Figure 1 shows the correlation between the cyclical components of real public spending (corrected by the GDP deflator) and real GDP for the period 1960-2009, where a positive (negative) correlation indicates procyclical (countercyclical) public spending. Cyclical components were estimated using the Hodrick-Prescott filter.



**Figure 1. International Comparison of the Cyclical Nature of Public Spending between 1960 and 2009**

Source: Vegh et Vuletin (2014)

### 3. Methodological Approach

We proceed with our analysis through a simplified fiscal policy specification:

$$\Delta \log(\text{DPUB})_t = \alpha + \alpha_2 \Delta \log(\text{GDP})_t + \alpha_3 \Delta \log(\text{DPUB})_{t-1} + \varepsilon_t$$

The dependent variable is real public expenditure,  $\Delta \log(\text{DPUB})$ , and the main independent variable is the logarithm of Moroccan real output,  $\Delta \log(\text{GDP})$ .

The introduction of the lagged fiscal variable makes it possible to take account of the inertia effect due to delays in implementing fiscal policies and spending induced by previous fiscal years.

Several indicators are used to measure fiscal policy (total public expenditure, tax revenue, tax rate, budget balance, cyclically-adjusted budget balance etc.), some of which have, however, been the subject of much criticism. In particular, tax revenues and the budget balance are considered to reflect the results of fiscal policy and are endogenously affected by the actions of policymakers (Kaminsky et al., 2004; Frankel et al., 2013).

Thus, according to this approach, a fiscal policy is said to be counter-cyclical if the fiscal authorities reduce budget spending or raise tax rates in expansionary phases. In recessionary phases, the opposite is true, with higher spending and lower tax rates.

“It should be noted that all fiscal variables are converted to constant prices using the GDP deflator, as we don’t want to eliminate any growth in public spending resulting in an increase in the relative price of public sector products (Lane, 2003)”.

For example, a possible fiscal policy response to cycles may be channeled through government wages. Our approach would take this into account, but this would not happen if we simply used government spending at constant prices.

### 4. Results

In order to resolve the problem of endogeneity between the current and lagged values of public spending, on the one hand, and between this dependent variable and GDP (the increase in output could be the result of a fiscal stimulus and be transmitted to the output gap), on the other hand, we use the estimation technique based on the Generalized Method of Moments (GMM). This technique produces estimates that are consistent both in the presence and absence of endogeneity in the explanatory variables.

Table 1 summarizes the results of estimating the reaction function of Moroccan public spending over the period 1980-2019 using the GMM technique.

**Table 1. Estimated Reaction Function for Public Spending**


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D V : DGGC

Method: GMM

Date: 04/06/2023 Time: 18:08

Sample (adjusted): 1980 2019

Included observations: 40 A J

Kernel: Bartlett, Bandwidth: Fixed (3), No prewhitening

Simultaneous weighting matrix & coefficient iteration

Convergence achieved after: 1 weight matrix, 2 total coef iterations

Instrument list: DGDP(-1) DGGC(-1)

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
DGDP	0.338225	0.081580	4.145948	0.0003
DGGC(-1)	-0.125219	0.191977	-0.652261	0.5192
C	0.036451	0.014374	2.535869	0.0167
R-squared	-0.694425	Mean dependent var		0.038557
Adjusted R-squared	-0.807386	S.D. dependent var		0.062844
S.E. of regression	0.084488	Sum squared resid		0.214144
Durbin-Watson stat	2.041819	J-statistic		3.34E-32

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*Source:* Eviews software output

The J-statistic probability is very close to 0 ( $3.34 \times 10^{-32} \approx 0.00$ ), demonstrating the robustness of the estimated function, while the Durbin-Watson coefficient is close to 2, justifying the use of instrumental variables attesting to the equation's correct identification.

The coefficient assigned to the real GDP variable is significant, positive with a probability close to 0. The positive sign attests to the pro-cyclical nature of public spending in Morocco, although the coefficient is not very strong. Similarly, the absence of an effect from the lagged fiscal variable cancels out the hypothesis of an inertia effect and thus an absence of future implications for spending in a given fiscal year. We then conclude that fiscal policy has been pro-cyclical over the period from 1980 to 2019.

An interesting question concerns the mechanism behind this character. What are the main obstacles to adopting a counter-cyclical fiscal policy? How will Morocco achieve even more pronounced counter-cyclical levels, similar to those of developed countries?

## 5. Conclusion

In conclusion, from a theoretical point of view, “there are controversies about the effects of fiscal policy. The effect of an expansionary fiscal policy on output can be positive, zero or negative: with an increase in public spending, output increases in Keynesian theory but remains unchanged in classical theory, while a decrease in public spending increases output in the German Expansionary Fiscal Contraction (EFC) view. Expansionary fiscal policy also affects crowding-out variables (e.g., interest rate or price increases resulting from expansionary fiscal policy in classical and Keynesian theories)”.

“Empirically, regardless of the method used, most studies have shown that an increase in total government spending has a positive effect on output, in line with Keynesian theory. The positive response of output to an increase in total public spending was found in most countries except Denmark and Ireland, where some studies showed a negative effect of a positive total government shock on output, in line with CBE opinion. However, while output reacted positively to an increase in total government spending, each type of expenditure had a different impact on output. For example, an increase in public consumption and public investment proved to have a positive effect on output, while an increase in public wages and public employment mainly had a negative effect on output”.

## References

- Aghion, P. (2007). Croissance Et Finance. *Revue De L'Ofce*, 102.
- Akboul, N., & Ragbi, B. (2015). Evaluation De L'Orientation Budgétaire Au Maroc. In *Politique Budgétaire Et Activité Economique Au Maroc, Ouvrage Collectif, Rabat (Maroc)*.
- Alesina, A., & Perotti, R. (1997). Fiscal Adjustments In Oecd Countries: Composition And Macroeconomic Effects. *International Monetary Fund Staff Papers*, 44(2), 210-248.
- Aschauer, D. A. (1985). Fiscal Policy and Aggregate Demand. *The American Economic Review*, 75(1), 117-127.
- Auerbach, A. J., & Gorodnichenko, Y. (2010). *Measuring the Output Responses to Fiscal Policy*. Nber Working Paper, No. 16311, National of Bureau of Economic Research.
- Baldacci, E., Clements, B., & Gupta, S. (2003), *Utiliser La Politique Budgétaire Pour Stimuler La Croissance, Finance Et Développement, Fmi* (pp. 28-31). Retrieved From <https://www.imf.org/external/Pubs/Ft/Fandd/Fre/2003/12/Pdf/Baldacci.Pdf>
- Barro, R. J. (1996). *Determinants of Economic Growth: A Cross Country Empirical Study*. Nber.
- Carstensen, K., Kamps, C., & Rother, J. (2005). *What Are The Effects Of Government Spending On Output?: Interaction With Monetary Policy, An Svar Approach*. Working Paper, Kiel Institute of World Economics.
- Caselli, F., Esquivel G., & Lefort, F. (1996). Reopening The Convergence Debate: A New Look At Cross-Country Growth Empirics. *Journal of Economic Growth*, (1), 363-389.

- Creel, J., Ducoudré, B., Mathieu, C. Et., & Sterdyniak, H. (2005). Doit-On Oublier La Politique Budgétaire: Une Analyse Critique De La Nouvelle Théorie Anti-Keynésienne Des Finances Publiques. *Revue De L'ofce*, 92, 43-97.
- Dahlby, B. (2003). *Restructuring the Canadian Tax Mix by Changing the Direct/Indirect Tax Mix in Tax Reform in Canada: Our Path to Greater Prosperity Edited By H. Grubel, Fraser Institute, Vancouver* (pp. 77-108).
- De Castro, F. (2003). Non-Keynesian Effects Of Public Expenditure in Spain. *Applied Economics Letters*, 10(10), 651-655.
- De Valerin, P. G. (2010). L'analyse De L'évolution De La Situation Internationale. *Revue Al Maliya*, 48.
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74, 427-431.
- Dolado, J. J., Jenkinson, T., & Sosvilla-Rivero, S. (1990). Cointegration and Unit Roots. *Journal of Economic Surveys*, 4(3), 249-273.
- Dungey, M., & Fry, R. (2007). *The Identification of Fiscal and Monetary Policy in a Structural Var*. Working Paper, No. 29-2007, Cama.
- Dungey, M., & Fry, R. (2009). The Identification of Fiscal and Monetary Policy in A Structural Var. *Economic Modelling*, 26(6), 1647-1160.
- Easterly, W., & Rebelo, S. (1993). Fiscal Policy and Economic Growth: An Empirical Investigation. *Journal of Monetary Economics*, 32, 417-458.
- Favero, C. (2001). *Applied Macroeconometrics*. Oxford: Oxford University Press.
- Favero, C., & Giavazzi, F. (2009). *How Large Are The Effects Of Tax Changes?* Working Paper, No. 15303, National Bureau of Economic Research.
- Furceri, D., & Mourougane, A., (2010). *The Effects of Fiscal Policy On Output: A Dsge Analysis*. In Oecd Economics Department Working Papers, No. 770, Oecd Publishing.
- Hall, R. E., & Jorgenson, D. W. (1967). Tax Policy and Investment Behavior. *American Economic Review*, 57, 391-414.
- Hansen, B. (1997). Inference in Tar Models. *Studies in Nonlinear Dynamics and Econometrics*, 2(1), 1-14.
- Heckman, J., Lochner L., & Taber, C. (1998). Tax Policy and Human Capital Formation. *American Economic Review*, 88, 293-297.
- Heming, R., Kell, M., & Mahfouz, S., (2002). *The Effectiveness Of Fiscal Policy In Simulating Of Economic Activity: A Review Of Literature*. In Imf Working Paper, N° Wp/02/208.
- Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. Macmillan, London.
- Mendoza, E. G., Milesi-Ferretti, G. M., & Asea, P. (1997). On The Ineffectiveness Of Tax Policy In Altering Long-Run Growth: Harberger's Super Neutrality Conjecture. *Journal of Public*



- Economics*, 66(1), 99-126.
- Milesi-Ferretti, G. M., & Roubini, N. (1998). Growth Effects of Income and Consumption Taxes. *Journal Of Money, Credit And Banking*, 30(4), 721-744.
- Mohr, M., (2004). *On The Macroeconomic Impact of Fiscal Policy in Germany—Preliminary Results Of A Svar Approach*. In Banca D'italia, The Impact Of Fiscal Policy, Rome Bank Of Italy.
- Mountford, A., & Uhlig, H. (2009). What Are The Effects Of Fiscal Policy Shocks? *Journal Of Applied Econometrics*, 24(6), 960-992.
- Musgrave, R. (1959). *The Theory of Public Finance*. McGraw-Hill, New York.
- Perotti, R. (2004). *Estimating the Effects of Fiscal Policy in Oecd Countries*. In Igier Working Paper, 276.
- Sagou, M. (2006). *Les Politiques Macro-Économiques: Les Politiques Budgétaires Et Monétaires Du Maroc Depuis Cinquante Ans Et Perspectives Pour Les Vingt Prochaines Années*. Document De Travail.
- Solow, R. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal Of Economics* Lxx, 65-94.
- Solow, R. (2002). Peut-On Recourir À La Politique Budgétaire? Est-Ce Souhaitable? *Revue De L'ofce*, 83, 7-24.
- Tanimoune, N. A., Combes, J. L. Et., & Plane, P. (2008). La Politique Budgétaire Et Ses Effets De Seuil Sur L'activité En Union Economique Et Monétaire Ouest Africaine (Uemoa). *Economie & Prévision*, 5(186), 145-162.
- Van Den Bergh, J. C., & Van Der Straaten, J. (1997). *Economy and Ecosystems in Change: Analytical and Historical Approaches* (pp. 75-95). Edward Elgar Publishing Ltd.
- Vranceanu, R., & Besancenot, D. (2013). The Spending Multiplier In A Time Of Massive Public Debt: The Euro-Area Case. *Applied Economics Letters*, 20(8), 758-762.
- Wasserman, L. (2004). *All Of Statistics: A Concise Course In Statistical Inference*, Springer Texts In Statistics.
- Widmalm, F. (2001). Tax Structure And Growth: Are Some Taxes Better Than Others? *Public Choice*, 107(3/4), 199-219.
- Zandi, M. M. (2008). *Assessing the Macro Economic Impact of Fiscal Stimulus*. Moody's Economy.Com.