Procyclical Fiscal Policy: Is OPEC an exception?

Aziz Arman[1]   Mahvash Moradi[2]

1. Department of Economics, Chamran University, Ahvaz, Iran
2. Ph.D. student, Department of Economics, Chamran University, Ahvaz, Iran

Abstract

International empirical evidence shows that fiscal policy in developing countries is largely procyclical, opposite to what is held by neo-classical and Keynesian theories and to the cyclical behavior of fiscal policy in G-7 countries. This paper examines the cyclicality of fiscal behavior in 12 developing countries of OPEC during 1990–2009. After testing fiscal measure - government expenditure - and correcting for reverse causality between non-oil output and fiscal variables, the results suggest that fiscal variable is strongly procyclical in the full sample. From the results, it can be interpreted that fiscal behavior is more procyclical when the bureaucracy quality, the constraints on the executive and political competition are low.

Keywords: Fiscal Policy, OPEC countries, government expenditure, GMM
JEL: E32, H30, E02, E62

1. Introduction

Over the last 10 years, a large and growing literature has argued that there is a fundamental difference between how fiscal policy is conducted in developing countries compared to industrial countries. While fiscal policy in industrial countries is either acyclical or countercyclical, fiscal policy in developing countries is, by and large, pro-cyclical. Gavin and Perotti (1997) were the first to call attention to the fact that fiscal policy in Latin America appeared to be pro-cyclical. Talvi and Végh (2005) then claimed that, far from being a Latin-American phenomenon, pro-cyclical fiscal policy seemed to be the rule in all of the developing world. In fact, in Talvi and Végh's (2005) study, the correlation between the cyclical component of government consumption and GDP is positive for each of the 36 developing countries in their sample (with an average of 0.53). In sharp contrast, the average correlation for G7 countries is zero. By now, a large number of authors have reached similar conclusions to the point that the pro-cyclicality of fiscal policy in developing countries has become part of the conventional wisdom.

Perhaps the more convincing evidence that this idea has indeed become conventional wisdom is the explosion of theoretical models trying to explain such a puzzle. In other words, why would developing countries pursue a pro-cyclical fiscal policy that might exacerbate the business cycle? An all too brief review of the literature reveals that explanations follow two main strands: (a) imperfections in international credit markets that prevent developing countries from borrowing in bad times (Gavin and Perotti (1997), Riascos and Végh (2003), Guerson (2003), Caballero and Krishnamurthy (2004), Mendoza and Oviedo (2006), and Susuki (2006)); and (b) political economy explanations typically based on the idea that good times encourage fiscal profligacy and/or rent-seeking activities: (Tornell and Lane (1998, 1999), Talvi and Végh (2005), Alesina and Tabellini (2005), and Ilzetzki (2007)).

But do we really know what we think we know? Put differently, is it really the case that government spending responds positively (in a causal sense) to the business cycle in developing countries? While a positive correlation between the cyclical component of government consumption and GDP certainly gives no indication of causality, the literature has implicitly assumed that the causality goes from the business cycle to fiscal policy. But is this a reasonable inference? No, according to the insightful comments of Roberto Rigobon on Kaminsky, Reinhart, and Végh (2004). In fact, Rigobon has argued that, if anything, the structure of shocks in developing and industrial countries is such that it is more likely that reverse causality explains the observed patterns in the data (i.e., fiscal policy is driving output). In a similar vein, the numerous papers that have purported to establish that fiscal policy is pro-cyclical by regressing some measure of fiscal policy on some measure of the business cycle- while controlling for other factors- have essentially ignored the problem of endogeneity. What if accounting for endogeneity were to make the pro-cyclical results disappear? This is precisely the argument made by Jaimovich and Panizza (2007) who claim that, once GDP has been suitably instrumented for, causality runs in the opposite direction (i.e., from fiscal policy to GDP). But, surprisingly enough, there is little systematic work in this area. This would seem to be a major shortcoming, given that if fiscal policy in developing countries is not really pro-cyclical, all the existing theory would be essentially irrelevant.

In addition to the obvious academic interest of this question, its relevance for public policy is hard to understate. In fact, the ability to transition from a pro-cyclical fiscal policy to an acyclical or countercyclical policy is viewed as a badge of macroeconomic honor in the developing world and as a sign that the country belongs to an exclusive club that relies on sound fiscal and monetary policies. If pro-cyclical fiscal policy just reflects reverse causality, then clearly this way of thinking would be completely unfounded.

The main purpose of this paper is thus to ask: Is fiscal policy really pro-cyclical in developing countries❓ How do we proceed? After discussing some empirical studies in Section 2, Section 3 develops model specification. Section 4 concludes.

2. Literature Review

In the last decade, an important part of literature associated with fiscal policy has been addressing the issue of cyclicality. Several factors hamper the ability of developing countries to adopt optimal stabilization policies. These factors can be classified in two groups. The first corresponds to factors associated to the integration (access) to domestic and international financial markets. The main idea is that the limited access to domestic or external funds may hinder the ability of government to pursue expansionary fiscal policies in bad times. The second group of factors is associated to theories where the institutional framework plays a key role. Within this group, one standard of the theory suggests that countries pursuing poor fiscal policies also have weak institutions.

2.1 Structural determinants

Gavin and Perotti (1997) argue that governments in developing countries are unable to run countercyclical fiscal policies due to the rigorous credit constraints that avoid them from borrowing during downturns. Additionally, these governments are constrained to repay their debt, which, in consequence, forced them to adopt procyclical fiscal policy.

Kaminsky, *et al.,* (2004) and Alesina and Tabellini (2005) give evidence that capital inflows to developing countries are procyclical meaning that countries tend to borrow in good times and repay in bad times. This procyclical access to international capital markets forced developing countries to adopt procyclical fiscal policies. To avoid the limited access to international capital markets, in bad times, government adopts fiscal adjustment. If investors raise doubts on the ability of governments to implement required adjustment, creditworthiness would weaken and further financing would disappear.

Caballero and Krishnamurthy (2004) invoke the limited financial depth to explain procyclical fiscal policy in developing countries. Accordingly, when economy faces financial constraint to borrow, increasing government spending may crowd out private investment and, hence, may be contractionary. Caballero and Krishnamurthy (2004) point out that the contractionary effects of expansionary fiscal policies can be exacerbated if these policies lead to a deterioration of the quality of country's assets.

Aguiar, *et al.,* (2005) provide explanations about the observed procyclicality of fiscal policies in emerging markets and present another mechanism through which fiscal policy amplifies the business cycle. Their explanation relies on two features of emerging markets: limited access to financial markets and limited commitment to fiscal policy. They present a small open economy model with capital where a government maximizes the utility of a working population that has no access to financial markets and is subject to endowment shocks. The government's insurance motive generates procyclical taxes on capital income. If the government lacks commitment, its fiscal policy can be distortionary. Hence, the government has stronger incentives to tax capital in the future if the economy is in recession, thus reducing capital investment, amplifying and extending the downturn.

2.2 Institutional and Political determinants

Tornell and lane (1999) introduce the notion of "voracity effect" to explain the overspending of transitory increases in fiscal revenues. A positive shock to income leads to more than proportional increase in public spending, even if the shock is expected to be temporary. This, in turn, is the consequence of weak institution framework and the presence of multiple powerful groups in fiscal process.

Woo (2009) emphasizes the role of social polarization to understand procyclical fiscal stances in a number of countries. When there is polarization of social preferences over public choices, the incentives become greater for policymakers to implement their preferred policies. This individual rationality may threaten efficiency for the economy. According to the author, such incentives may become particularly stronger during boom periods, since increased revenues or new resources make their preferred policies seem easier to implement, thus producing procyclical fiscal policies.

Talvi and Végh (2005) argue that the variability of tax bases in developing countries can explain procyclicality in these countries. They developed an optimal fiscal policy model including a political distortion, which makes it costly to run budget surpluses due to the pressures that abandon fiscal resources created to increase public spending. Given this political distortion, a government that faces large fluctuations in the tax bases will choose to worse taxes in good times to dissuaded spending pressures. Given this political distortion, the best way to avoid a high growth in expenditure is to lower tax rates. This procyclical behavior is a second-best response to that political distortion.

Alesina and Tabellini (2005) try to explain why countries follow seemingly sub optimal procyclical

fiscal policies that add to macroeconomic instability. To answer this question they adopt a political approach as Talvi and Végh (2005) and focus on diving political distortions. In this paper voters face corrupt government that can appropriate part of tax revenues to finance unproductive public consumption. When voters realize that a positive income shock has affected the economy, they manifest an immediate welfare like tax cuts or increases in productive government spending and transfers. This political distortion leads to excessive accumulation of government debt and procyclical fiscal policy during both boom and recession and should be more prevalent in countries where political corruption is prevalent and the government is responsible to the voters. Alesina and Tabellini (2005) criticize the relevance of credit constrain argument (Gavin and Perotti (1997), Kaminski, Reinhart and Végh (2004), Riascos and Végh (2003)) and explain that political distortion may drive government to attempt an unsustainable level of debt corresponding to what they can repay and therefore at the limit of what borrowers can lend. Consequently, credit constrain is a direct consequence of the political agency problem and implies that fiscal policy should be procyclical only in recession.

3. Empirical specification and results

The following empirical model specification, which is widely used in the literature (Gavin and Perotti (1997), Alesina and Tabellini (2005) and Lledo, *et al.,* (2009)) has been chosen.

$$\Delta(log(Fiscal_t)) = \alpha + \beta\Delta(log(non\text{-}oil\ GDP_{it})) + \theta\Delta(log(TOT_{it})) + \delta\Delta(log(Fiscal_{it\text{-}1})) + \delta Z_{it} + \eta_i + e_{it}$$
(1)

where Fiscal represents a fiscal variable. The independent variables on the right-hand side are non-oil GDP, an index of the country's terms of trade, TOT, the lagged fiscal variable, a set of other control variables as Z, fiscal shocks as e_{it} and η_i as an unobserved, country fixed effect. The i and t denote the country and the time period, respectively. Equation (1) is a fiscal reaction function where fiscal policy responds to contemporaneous output changes, terms of trade, the lagged fiscal variable, other control variables, and fiscal shocks (e_{it}). The terms of trade variable is important for developing countries in general but especially for OPEC, as their fiscal balances and economies are highly prone to terms of trade shocks, which usually originate from outside the domestic economy. Each individual country does not have control over the oil price; thus, including TOT provides a control for external shocks to the economy. Furthermore, the shocks to the fiscal balance or policy decisions in the previous year may have lasting effects on the following period, so the lagged dependent variable is included in the specification to allow for long-term mean reversion in fiscal behavior. The cyclicality of fiscal policy is determined by gauging the sign and the size of coefficient β, which measures the elasticity of the fiscal variable with respect to output growth. When fiscal policy is pro-cyclical, a positive β for most of the fiscal measures, except for the non-oil primary balance, is expected. Government expenditure, consumption, revenues, and investment should move in the same direction as output. If output increases during booms, the fiscal variables also increase, while the opposite happens in recessions. An estimated β value above 1 implies a more-than-proportionate response of the fiscal variable to output fluctuations.

The key explanatory variable is the growth of real GDP, excluding the oil sector (non-oil GDP). Non-oil GDP is more relevant to assess the status of economic conditions and the use of the labor factor, as the oil sector is typically an enclave sector, highly capital intensive with limited spillovers to the rest of the economy. Similarly, Barnett and Ossowski (2002), among others, argue that non-oil measures are more reliable variables of fiscal policy in OPCs than the overall balance, since oil revenue originates from abroad and non-oil variables are largely under the control of the authorities. The fiscal measurement used as dependent variables is real total general government expenditure.

As indicators of institutional quality and political structure, several variables from the *International Country Risk Guide* database are used: bureaucracy quality, and law and order. In addition, the composite index of institutional quality will be included, representing all of these. Furthermore, for political structure, variables such as political competition, democracy, constraints on the decision-making authority, and checks and balances from the Polity IV Project data set will be added.

In this linear panel framework, pooled OLS and dynamic fixed-effect estimations assume strict exogeneity of explanatory variables; however, this does not hold for this specification, and they produce biased and inconsistent estimators. Similarly, the instrumental variable estimates are also biased, and the precision of the instrumental variable estimates is lower than that of the OLS estimates. In the presence of weak instruments, the loss of precision will be severe, and the instrumental variable estimates may be no improvement over the OLS (Baum, 2007). However, all sources of endogeneity bias can be addressed by using GMM estimators (Arellano and Bond, 1991), as is commonly used in the literature.

In the first step of our analysis, it is crucial to ascertain the integrational properties of the data series. In a panel data model, when the presence of a unit root in a model is admitted, one may obtain apparently significant relationships from unrelated variables. This phenomenon is called the spurious regression problem. In order to test the data stationary and the order of integration of variables, we apply two conventional unit root tests, Im *et al.,* (2003) and levin *el al.,* (2002) (hear after IPS and LLC). These tests are widely known and

understood, so we refrain from repeating the methodology here. The results in table 1 indicate that there is no presence of unit root. The IPS and LLC tests reject the null hypothesis of a unit root, showing that all variables used in the study are stationary at level.

Table 1: Unit root test

Variables	IPS	LLC
fiscal	-3.68	-11.35
	(0.000)	(0.000)
non-oil GDP	-18.58	-18.47
	(0.000)	(0.000)
TOT	-6.35	-6.02
	(0.000)	(0.000)
bureaucracy quality	-4.73	-6.19
	(0.000)	(0.000)
law and order	-3.79	-6.66
	(0.000)	(0.000)
composite index of institutional quality	-5.90	-6.51
	(0.000)	(0.000)
political competition	-9.10	-6.00
	(0.000)	(0.000)
democracy	-4.67	-5.96
	(0.004)	(0.000)
constraints on the decision-making authority	-6.54	-8.57
	(0.002)	(0.000)
checks and balances	-7.64	-9.43
	(0.000)	(0.000)

Note: P values in parentheses
Source: Own elaboration

Various econometric approaches have been used to estimate the before mentioned function relying largely on cross-sectional (and more recently, panel) data by OLS or GLS. However, the possibility of existing endogeneity of variables in a model using macro variables should be bear in mind. In this case, two stage least squares (2SLS) or generalized method of moments (GMM) are suggested as remedy. GMM does not require complete knowledge of the distribution of the data and it ensures consistency and efficiency while dealing with heteroskedasticity and serial correlation. It undertakes the issue of persistence of fiscal variable performance over time by including lagged dependent variable in the regression, since, a simple panel analysis, either with fixed or random effects, is generally not sufficient to fully investigate the lag structures inherent in a macroeconomic variable. It also handled the potential bias that could be created by inclusion of dependent variable in the regression. The particular approach we adopt is based on the GMM estimators for panel data model and is due to Arellano and Bond (1991).

The Sargan test is designed to test the validity of the instruments, employed to estimate the model, by analyzing the sample analog of the moment conditions. It attempts to answer the question, given that a subset of instrumental variables is valid and exactly identifies the coefficients, are the extra instrumental variables valid? Failure to reject the null should be interpreted as favoring the specified model. Also, we apply Arellano–Bond test for serial correlation in the first-differenced errors. Table 2 presents the outcome. Based on the Sargan test, the null hypothesis of the validity of the instrumental variable cannot be rejected, i.e. the instrument passes the test and errors are independently distributed. The results for 1st and 2nd –order serial correlation report the fact that the assumption of serially uncorrelated errors is appropriate.

Table 2: GMM Estimation 1990-2009

Variables	Coefficient	Z	P>|Z|
Fiscal	0.336	59.65	0.000
non-oil GDP	0.785	13.47	0.000
TOT	0.0023	32.3	0.000
bureaucracy quality	-0.874	-8.36	0.000
law and order	0.000	5.26	0.000
composite index of institutional quality	-0.1215	-7.02	0.000
political competition	-0.547	-6.25	0.000
democracy	0.154	7.25	0.003
constraints on the decision-making authority	-0.145	-4.587	0.000
checks and balances	0.000	-5.578	0.009
Wald Chi2	586.06		
Sargan	60.78 (1.000)		
A(1)	-3.97 (0.0001)		
A(2)	1.001 (0.4658)		

Source: Own elaboration

*Sargan is asymptotically distributed as a Chi2 under the null of instrument validity, with p-value in parentheses.

**A1 and A2 are tests for first-order and second-order serial correlation in the first differenced residuals, asymptotically distributed as a Chi2 under the null of no serial correlation, with p-value in parentheses.

Finally, the estimation results for the sample, including the institutional and political control variables, are presented in Table 2. The estimated coefficient for fiscal variable for the sample is positive and statistically significant. Non-oil revenue growth is strongly procyclical, suggesting an increased tax collection as well as spillover effects of increased oil revenues. Among the political variables, bureaucracy quality, democracy, constraints on the decision-making authority (constraints on the executive), political competition, and checks and balances are significant. Except for democracy and checks and balances, the coefficients for the other variables are negative. From these results, it can be interpreted that fiscal behavior is more procyclical when the bureaucracy quality, the constraints on the executive and political competition are low. The coefficient for checks and balances is significant but very small. The coefficient for democracy is positive, indicating the higher the democracy variable, the higher is the expenditure, which partially supports the claim of Alesina and Tabellini (2005) that corrupt governments in democracies run procyclical fiscal policies.

4. Conclusion

International empirical evidence shows that fiscal policy in developing countries is largely procyclical, opposite to what is held by neo-classical and Keynesian theories and to the cyclical behavior of fiscal policy in G-7 countries. This paper analyzes the cyclicality of fiscal behavior thoroughly in 12 OPEC during 1990- 2009. By using GMM approach, we found support for the existence of procyclical fiscal policies in developing countries. We also added some political variables. The results show that bureaucracy quality, democracy, constraints on the decision-making authority (constraints on the executive), political competition, and checks and balances are significant. Except for democracy and checks and balances, the coefficients for the other variables are negative.

In many developing countries, like OPEC, fiscal policy is procyclical. Our explanation is that rational voters do not trust corrupt governments with resources. When voters realize that a positive income shock has hit the economy, they demand immediate benefits in the form of tax cuts or increases in productive government spending or transfers. They fear that otherwise the available extra resources would be "wasted" in rents. Faced with these procyclical demands by voters, governments do not accumulate reserves in good times, on the contrary they incur large debts.

OPCE face volatile and unpredictable oil revenues, a situation that makes fiscal management challenging. For this reason, it is imperative for them to formulate effective countercyclical fiscal policies by which they can smooth government expenditure, decouple it from the volatile oil revenues, and prevent boom-and-bust cycles. Breaking away from a procyclical fiscal policy will enable them to sustain long-term growth and keep the safety net that the poor need. Sound fiscal policies and discipline require strong institutions, a higher-level bureaucracy, and more transparency. Strong institutions and transparency would also help reduce the voracity effect, which, in turn, would facilitate the accumulation of financial assets and build up confidence among investors to raise funds when needed.

Reference

1. Aguiar, M., Amador, M., and Gopinath, G. (2005). "Efficient fiscal policy and amplification", NBER

Working Papers, 11490.

2. Alesina, A., and Tabellini, G. (2005). "Why is fiscal policy often procyclical?", NBER Working Papers, No. 11600.

3. Arellano, M., and Bond, B. (1991). "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", Review of Economic Studies, 58(2), 277–297.

4. Barnett, S. and Ossowski, R. (2002). "Operational aspects of fiscal policy in oil producing countries", IMF Working Papers, 02/177.

5. Baum, K. (2007). "Instrumental variables: Overview and advances", United Kingdom Stata Users Group Meetings, Stata Users Group.

6. Caballero, R.J. and Krishnamurthy, A. (2004). "Fiscal policy and financial depth", NBER Working Papers No. 10532.

7. Gavin, M., and Perotti, R. (1997). "Fiscal policy in Latin America", NBER Macroeconomics Annual, edited by Ben Bernanke and Julio Rotemberg. Cambridge, MA: MIT Press.

8. Guerson, A. (2003). "On the optimality of procyclical fiscal policy when governments are not credible", Ph.D. dissertation, George Washington University.

9. Ilzetzki, E. (2007). "Rent-seeking distortions and fiscal procyclicality", Mimeo (University of Maryland).

10. Im, K.S., Pesaran, M.H., and Shin, Y. (2003). "Testing for unit roots in heterogeneous panels", Journal of Econometrics, 115(1), 53-74.

11. Jaimovich, D., and Panizza, U. (2007). "Procyclicality or reverse causality?", RES Working Papers 4508, Inter-American Development Bank, Research Department.

12. Kaminsky, G., Reinhart, C., and Vegh, C. (2004). "When it rains it pours: Procyclical capital flows and macroeconomic policies", NBER Working Papers, No. 10780.

13. Levin, A., Lin, C.F., and Chu, C. (2002). "Unit root rests in panel data: Asymptotic and finite-sample properties", Journal of Econometrics, 108, 1-24.

14. Lledó, V., Yackovlev, I., and Gadenne, L. (2009). "Cyclical patterns of government expenditures in Sub-Saharan Africa: Facts and Factors", IMF Working Paper No. 274.

15. Mendoza, E.G., and Oviedo, M. (2006). "Fiscal policy and macroeconomic uncertainty in developing countries: The tale of the tormented insurer", Mimeo (University of Maryland and Iowa State University.

16. Riascos, A., and Végh, C.A. (2003). "Procyclical government spending in developing countries: The role of capital market imperfections", Mimeo (UCLA and Banco Republica, Colombia).

17. Rigobon, R. (2004). "When it rains, it pours: Procyclical capital flows and macroeconomic policies, Discussion, NBER Macroeconomics Annual, 19, 80–82.

18. Susuki, Y. (2006). "Fate for procyclical fiscal policy in emerging economies: Role and function of sovereign borrowing with default option", Mimeo (University of Michigan).

19. Talvi, E., and Vegh, C.A. (2005). "Tax base variability and procyclicality of fiscal policy", Journal of Development Economics, 78, 156-190.

20. Tornell, A., and Lane, P. (1998). "Are windfalls a curse? A non-representative agent model of the current account", Journal of International Economics, 44, 83-112.

21. Tornell, A., and Lane, P. (1999). "The voracity effect", American Economic Review, 89, 22-46.

22. Woo, J. (2009). "Why do more polarized countries run more procyclical fiscal policy", The Review of Economics and Statistics, 91(4), 850-870.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/   All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar