

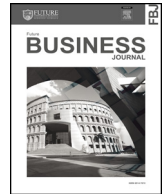
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The effects of oil shocks on government expenditures and government revenues nexus in Nigeria (with exogeneity restrictions)

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ABSTRACT

The study employed data from 1981 to 2014 to investigate the effects of oil shocks (price and revenue) on the dynamic relationship between government revenues and government expenditures in Nigeria and how it transmits effects on major macroeconomic variables using structural VAR (SVAR) on key variables, and also employed unrestricted VAR and Vector Error Correction (VEC) Models on expanded number of variables. The results of SVAR show that oil price shocks could not predict the variation in government expenditure in the short-run, while the predictive power of oil revenue shocks is very strong both in the short-run and in the long-run. The VAR and VECM also substantiate the results of SVAR and provide further insight which shows that short-run fiscal synchronization hypothesis is evidenced between the oil revenues and total government expenditures, while spend-tax hypothesis exists in the long-run between total expenditures and total revenues. It is also evidenced that oil shocks highly affect policy variables in the short-run and transfer the effects on the other macroeconomic variables in the long run. Thus, the study suggests expedient government actions to redirect the economy from oil revenue dependency towards diversifications along other less volatile sources of revenues so as to prevent long-run transmission of effects of oil shocks on broader macroeconomic variables.

Introduction

The oil rich developing economies are hard hit recently by the burst of the crude oil price bubble at the international market. This has created agitation on how the countries who are key players would respond economically to the shocks in the short and long-run. Nigeria is one of the countries heavily affected by the sharp decline in the revenue vis-à-vis the fall in the price of crude oil. It is recalled that, over the years, oil revenues are the main source of financing government expenditures and for importation of products to the country. Specifically, on average, 75% of government revenues come from oil export (Nweze and Edame, 2016). As such, the budget is usually affected by sudden negative or positive shocks to the oil prices. For instance, in about 20 months, the oil price has dropped rapidly from as high as about 130 dollars per barrel to as low as 28 dollars in the earlier months of 2016.

The crisis has drained the Nigeria's excess crude account (ECA), which ought to serve as a buffer and countercyclical reserve against any unexpected shocks. The country is nowhere to be found within the World Bank's minimum reserve requirements. Unfortunately, Nigeria is an import dependent economy, depending heavily on the foreign exchange through the crude oil export to finance its enormous importation. This has created serious dip in the foreign reserves, which now stands as the time of this study at \$27.14bn (Business News, 2016). The persistent crisis is perceived to continue impacting negatively on all macroeconomic indicators

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of an emerging economy like Nigeria.

Given these, Nigeria has lost track in meeting spending commitments in many areas, it has put upward pressures on government borrowing (both local and foreign) as the government seeks to fund additional deficit positions. Could it be that, the effect would depend on how prolonged the current downtrend persists, bearing in mind that the country's ability to withstand shocks is fizzling out as the ECA dries up. The revenue trap accounts for heavy borrowing plan to finance 2016 budget of the government. An imminent danger is a ripple effect that can stifle economic growth; given the heavy reliance of the economy on Government spending to stimulate growth. In short, the effect could be heavier on all the macroeconomic indicators, including exchange rate, interest rates, and inflation among others. This study is a step ahead in examining the roles of oil shocks (price and revenue) on the nature of interaction between government revenue and expenditure, having potential to guide in the nature of recommendable strategies for policy review and the crisis amelioration.

There are four possible relationships as entrenched in the literature between revenue and expenditure (Yinusa and Adedokun, 2017). The first is tax-spend hypothesis which assumed revenue as the determinant of expenditure where it exists. In this circumstance, deficit could be easily avoided by stimulating government revenue. The second possibility is the spend-tax hypothesis, which places expenditure as the determinant of revenue. This can be scary if proper policy is not devised because it has potential to escalate the level of deficit in the economy, while the payment is shifted on the future tax payers. In such scenario, recession could be aggravated through the investors' speculation on the possible tax increase in the future, thus drives away investment. However, if the third scenario which is fiscal synchronization is valid, the duo of revenue and expenditure determine each other and the government has better chances of choosing among the various policy thrust to manage the crises. But if there exist no fiscal synchronization otherwise referred as fiscal separations, it implies the revenue and expenditure decisions are made independently. This could be dangerous for the economy as deficit escalates if expenditure rises faster than revenue.

Studies on the relationships between the revenue and expenditure is well documented in literature, but more is required in the economies where crude oil and associated shocks are major challenges. Dizaji (2014) gave special attention to studying the impact of oil shock in the relationship between expenditure and income in Iran, where he brought country specific variables into the relationship. The study revealed that, a proper understanding of the relationship between expenditure and revenue is sensitive to roles of critical macroeconomic variables that are much relevant in each economy. Like Dizaji (2014), this study focuses specifically on Nigeria fiscal dynamics, as it responds to the shocks that are associate with crude oil prices and revenues. But unlike the previous study, the oil shocks appear to have transmitted stronger effects on government total revenues and expenditures through oil revenue, foreign exchange, foreign reserve, inflation and interest rate in case of Nigeria. Table 1 present the overview of the changes as reflected concurrently in the key variables.

As shown in Table 1, oil price changes transmit effects on oil revenues and foreign reserves. The differences in the prices and revenues in some cases are compensated or aggravated by changes in the exchange rate and volume of oil produced.

The roles of the variables were much appreciated in early 2015 when economic recess was formerly declared in the country. Foreign exchange of Naira became difficult to manage vis-à-vis the heavily depleted foreign reserve. Consequently, the import dependent economy could not revert from the free flow of rising inflation which was consequential on the high cost of import. In its entirety, the economy still finds it difficult to devise way-out of the recess. Meanwhile, it is expected that the policy direction of the government could be better enlightened through proper understanding of the relationship between its expenditure and revenue, given the roles of key macroeconomic variables in the relationships. The main purpose of this study is to examine how oil price shocks influence Nigeria oil revenue and how shocks in oil revenue affect government expenditures and consequently, how the effects are transmitted to other macroeconomic variables.

The study employs three econometric techniques to avoid the limitations inherent in the use of single approach which tends to produce conflicting results over the same time horizon. For instance, a reliable result must be consistent and valid when subjected to robustness check which is provided by alternative techniques. Structural VAR is employed on three key variables; oil price, oil revenue and total government expenditures. This provides initial understanding of the dynamic interaction and how shocks to oil (price and revenue) affect government expenditure. By building structures into the interaction in this case corrects for theoretical waivers that are associated with unrestricted vector autoregressive (VAR) models. In other words, by the structural imposition, it is easier to align the estimation procedures with theory. The second model accommodate more variables that are relevant to understanding how revenues and expenditures transfer the effects of oil shocks to other macroeconomic variables. Dual econometric procedures and variable mix allowed in this study correct for the dichotomy and sensitivities of previous studies to numbers of variables and econometric techniques.

Literature review

Many approaches were adopted in the literature on the analysis of revenue expenditure nexus, but the most prominent ones examined it within the framework of tax-spend and fiscal synchronization frameworks. Diversities are inherent in the studies depending on each country, time horizon and methodology adopted. In general, all the possible scenarios are well documented. Theoretically, tax-spending hypothesis supports unidirectional causality which runs from revenues to expenditures. It was originally promoted by Buchanan and Wagner (1977). In their opinion, taxes encourage growth in government expenditure. Meanwhile, tax-spend hypothesis was motivated by Peacock and Wiseman (1979), they argued for unidirectional causality running from government expenditures to government revenues. Fiscal synchronization is the case of bidirectional causality which indicate concurrent rise in the revenue and expenditure. Baghestani and McNown (1994) argues for fiscal separation in which government expenditure and revenues are independently determined by long run economic growth.

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