GOVERNMENT SPENDING AND NON-OIL ECONOMIC GROWTH IN THE UAE

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Abstract. The present paper studies empirically the relationship between government spending and non-oil economic growth in the UAE for the last four decades by using the vector autoregression (VAR) approach. The findings of the study suggest that the implementation of expansionary policy, through the intensification of current and development public expenditures, induces an increase in the non-oil economic growth during the subsequent periods of the government spending shock. Thus, the implementation of expansionary government spending stimulates the UAE economy, especially during recession periods. The study suggests that policymakers should concentrate their spending on the right projects, as well as on research and development. Moreover, they should channel their transfers and subsidies to the productive sectors, and they should ensure that higher productivity in public institutions is in conjunction with the rise in wages and salaries to achieve sustainable economic growth.

Keywords: Current Expenditures, Development Expenditures, Government Spending, Non-Oil Economic Growth, United Arab Emirates (UAE), Vector Autoregression (VAR).

JEL Classification: E60, E62, H50.

INTRODUCTION

Following the global financial crisis that started in the U.S. in 2008 and that was transmitted to the global markets, policymakers responded differently by implementing various expansionary policies. For instance, in September 2007, the Federal Reserve in the U.S. adopted a contractionary monetary policy through the reduction of funds rate. Furthermore, a fiscal stimulus policy was implemented to stimulate the economy by providing tax cuts and intensifying government spending.

Nevertheless, the impact of a fiscal stimulus on a country's economic growth is still widely debated.

On the one hand, pro-Keynesian economics suggest that an increase in government expenditures during recession periods has a positive impact on economic growth. Based on this supposition, the current budget deficit caused by the increase in government spending is compensated by higher demand and a higher level of investments.

On the other hand, neoclassical economists argue that a fiscal stimulus through government spending crowds out private investments. Higher demand induces a

higher inflation rate as well as higher long-term interest rates, which decrease real productivity and economic growth.

The present paper studies the impact of a fiscal stimulus through an increase in government spending on non-oil economic growth in the UAE during recession periods.

Government spending plays a crucial role in financing public and social services in the UAE. The total government expenditures increased by 135 percent between 1980 and 2016, ranging from 38,0410 million dirhams to 89,248 million dirhams in real terms (Fig. 1). The first substantial increase in government spending occurred between the years 2007 and 2009. The global financial crisis of 2008 caused a temporary recession in the UAE, which led to a decline in the growth rate of real non-oil GDP by 8.5 percent between 2008 and 2009. In response to this downturn, policymakers implemented an expansionary policy to stimulate the economy. Between 2007 and 2009, government spending increased by 115 percent from 47,337 to 101,546 million dirhams (Fig. 1).
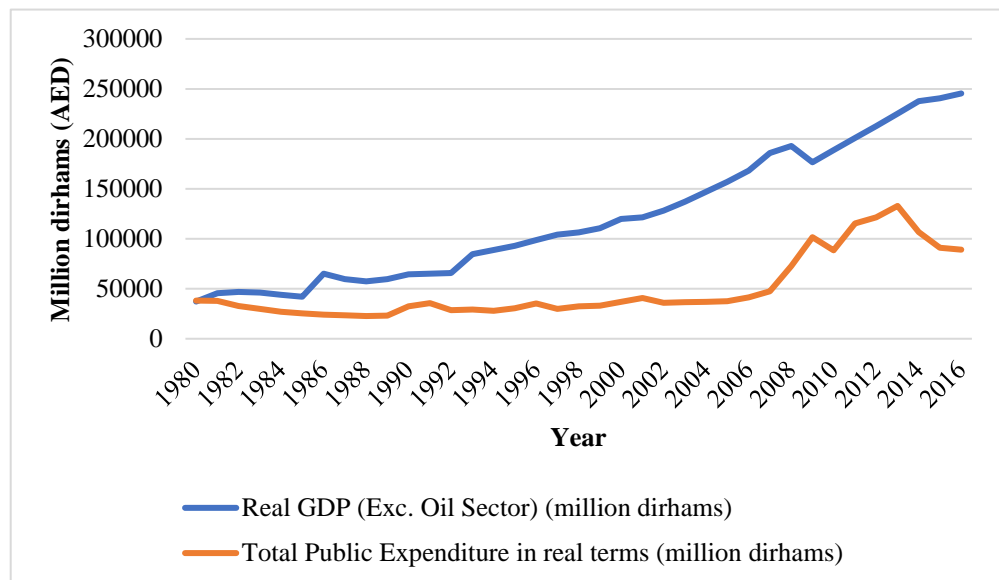

Fig. 1. Government expenditures and non-oil GDP in the UAE during the period 1980–2016 (real values in a million dirhams) (Central Bank of the UAE Publications, Federal Competitiveness and Statistics Authority).

The aim of this paper is to test the efficiency of the implementation of a fiscal stimulus through government spending in the UAE during recession periods.

In the present research, government expenditures are decomposed between current and development expenditures to test the impact of a shock to each spending category on non-oil economic growth.

Although several studies have addressed the relationship between government spending decomposition and economic growth in some countries (Alshahrani and Alsadiq (2014), Aschauer (1989)), the results of these studies differ based on the methodology used and the country applied to.

Moreover, none of these studies tested this relationship in the UAE case. In fact, each spending category developed differently in the UAE for the last four decades. While current public expenditures increased by 244.0 percent during the period 1980–2016, from 25,203 million dirhams to 86,741 million dirhams in real terms, development expenditures increased only by 6.21 percent, from 7610 million dirhams to 8083 million dirhams in real terms, during the same period (Fig. 2). However, following the adoption of a fiscal stimulus policy during the period 2007–2009, current expenditures and development expenditures rose by 56 percent and 136 percent, respectively (Fig. 2).

Thus, the present paper fills the gap by differentiating between the effects of current government expenditure shocks and investment expenditure shocks on non-oil economic growth in the UAE.
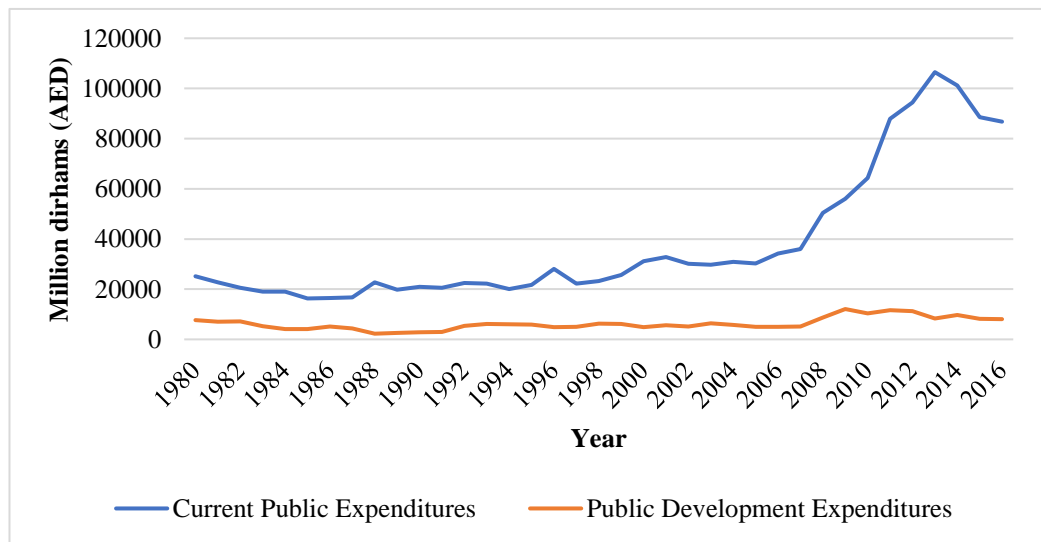

Fig. 2. Current and development expenditures in the UAE during the period 1980–2016 (real values in a million dirhams) (Central Bank of the UAE Publications, Federal Competitiveness and Statistics Authority).

The paper is structured into four parts. Section 2 tackles the empirical studies that have investigated the relationship between government spending and economic growth. Section 3 presents the methodology used in the study. The results are discussed in Section 4, and finally, the conclusion is provided in Section 5.

1. LITERATURE REVIEW

Different methodologies have been used to test the relationship between public expenditures and economic growth. Findings vary by country, region, and the methodology adopted.

Moreover, studies that decomposed government expenditures found that different categories of government spending influence differently the productivity and the economic growth rate.

Amongst the studies that concluded a negative impact of a fiscal stimulus policy through government spending was the study conducted by Barro (1990). Using a cross-sectional study of 98 countries for the period 1960–1985, the author found that government consumption expenditures had a negative impact on investment and output growth.

Similarly, Heitger (2001) found that total government expenditures had a negative effect on economic growth. The author applied a generalized least squares regression analysis for 21 OECD countries for the period 1960–2000. Moreover, the author concluded that except for public investments and transfers, different categories of government expenditures had a negative impact on economic growth.

In addition, Strulik and Trimborn (2009) concluded that the implementation of a fiscal stimulus policy through a temporary increase in government spending reduced the aggregate output. The authors adopted a neoclassical growth model using the U.S. data. Their results showed that following a deep economic recession, a deficit spending programme would boost the economy during the first phase of the recovery. However, this policy would diminish the economic growth afterward even prior to the government stopping its spending.

In contrast, other studies found that government spending had a positive influence on economic growth. For instance, Aschauer (1989) found that a temporary increase in public investment expenditures, specifically an expansion of the infrastructure services (roads, highways, airports, water systems, etc.), led to an improvement in the productivity of the U.S. economy during the period 1949–1985. The author grounded his analysis on the Cobb-Douglas production form. Additionally, he found that the impact of the military government expenditures on the productivity movement was insignificant during the same period.

Likewise, a study conducted by Kelly (1997) among 73 developing and developed countries over the period 1970–1989, using OLS technique, suggested that public social expenditures, as well as public investment (mainly housing spending) had a positive influence on economic growth.

Furthermore, Elzetzki and Vegh (2008) analysed a dataset for 22 high-income countries and 27 developing countries, for the period 1960–2006 to test the impact of an increase in government spending on economic growth. The authors concluded that fiscal policy was procyclical in developing countries, where expansionary government consumption had a significant positive effect on the output in these countries.

Moreover, various studies analysed the effect of government spending on economic growth in the oil-exporting countries, especially in the GCC countries, where oil revenues constituted the primary source of public revenues for the last four decades.

Alshahrani and Alsadiq (2014) analysed the short-run and long-run relationships between government spending and economic growth in Saudi Arabia between 1969 and 2010, using VAR, cointegration and VECM techniques. The authors concluded that public investment, as well as government expenditures on education and healthcare had a positive influence on the economic growth in the short term. Moreover, capital expenditures and spending on healthcare had a positive impact on economic growth in the long run.

Finally, a study conducted on the UAE by Al-Mazrouei and Nejmeh (2012) concluded that government expenditures had a positive impact on GDP. The authors used three regression models for the period 1990–2009.

The present study differs from the above-mentioned studies through the use of VAR model to analyse the relationship dynamics between government expenditures and non-oil economic growth in the UAE. Furthermore, the study differentiates between the impact of current expenditures and investment expenditures on the non-oil economic growth in the UAE.

Data used in the research covers the period 1980–2016, which includes the recession period that occurred in the UAE in 2008, as well as the recovery that followed.

Therefore, the present study allows the author to conclude the efficiency of the implementation of expansionary government spending during recession periods in the UAE.

2. METHODS AND PROCEDURES

The relationship between government spending and non-oil economic growth in the UAE is estimated using annual time-series data for the period 1980–2016. Foreign Direct Investment (FDI) and Gross Fixed Capital Formation (GFCF) are included in our estimation since these variables have a significant impact on the non-oil economy in the UAE.

The yearly growth rate of non-oil real GDP is used as a representation of the non-oil economic activity. Current expenditures and development expenditures are represented as a percentage of non-oil real GDP. Similarly, FDI and GFCF are represented as a share of non-oil real GDP.

Time series data for the yearly growth rate of the non-oil real GDP, as well as data on GFCF, current expenditures as well as development expenditures, are collected from the Federal Competitiveness and Statistics Authority and the Central Bank of the UAE. Additionally, FDI data are obtained from the World Bank. All time-series data are deflated by the CPI index and expressed in real terms.

This study aims at examining the effect of current public expenditures and public development expenditures on the non-oil real economic growth in the UAE. Hence, government expenditures are decomposed between current expenditures and development expenditures.

The study uses the vector autoregression (VAR) model. The importance of this technique is its ability to isolate the causal impact of each category of government expenditures on non-oil economic growth. VAR model was applied by Perotti (2007) to test the effect of government spending shocks on private consumption, investment, and GDP in the U.S., Australia, Canada, and the United Kingdom. Similarly, Galí et al. (2007) estimated the response of GDP and consumption to government spending shocks by using VAR approach to the U.S. data over the period 1954–2003.

The growth rate of non-oil real GDP, current expenditures, development expenditures, FDI, and GFCF are included in the VAR equation.

The stationarity of all variables is a pre-condition required before applying the VAR model. Hence, Augmented Dickey-Fuller (ADF) unit root test is performed to test the existence of unit root for each of the data time series, and hence the stationarity of each variable.

The reduced form of VAR is estimated to analyse the impact of government spending shocks on non-oil economic growth:

$$Y_t = A(L)Y_{t-1} + U_t + v \,,$$

where

$Y_t = (y_{1t}, y_{2t}..., y_{nt})'$ is a vector of the endogenous variables; it includes current expenditures, development expenditures, GFCF, FDI, and the growth rate of non-oil real GDP,

$A(L)$ is a polynomial in the lag operator,

U_t is the vector of reduced-form residuals,

v is a vector of constants.

The impulse response function tool is used to test the response of non-oil economic growth to an impulse shock in current and development public expenditures in the UAE.

Cholesky decomposition is used in the identification of the impulse shocks. This method orthogonalizes the impulse response functions by decomposing the residuals and isolating shocks to one of the variables in the system. Thus, the response of a specific variable to an impulse shock to another variable tests the relationship dynamics between these variables, while all other variables are held constant.

When ordering the variables in the impulse response analysis, the first variable should have a potential immediate impact on all the other variables. Thus, the variables should be placed in the decreasing order of exogeneity. Consequently, government spending as an instrument of the fiscal policy should be placed first since it influences FDI, gross fixed capital investments, as well as the GDP growth rate. Blanchard and Perotti (2002) positioned tax and government spending variables first to study the impact of fiscal policy shocks on the economic activity in the U.S. during the period 1947–1997.

Therefore, the following order is used in the VAR model: development expenditures, current expenditures, FDI, GFCF, non-oil real GDP growth rate. The growth rate of non-oil real GDP contemporaneously depends on government spending, FDI, GFCF, and its own shock. GFCF contemporaneously reacts to government expenditures, FDI, and its own shocks. Additionally, FDI contemporaneously responds to current and development expenditures, as well as its own shock. Different methodologies have been used to test the relationship between public expenditures and economic growth. Findings vary by country, region, and the methodology adopted.

3. RESULTS

3.1. Unit Root Test

As mentioned earlier, the stationarity of each variable included in the VAR equation is tested using the ADF unit root test. The results presented in Table 1 show strong evidence that current expenditures, development expenditures, GFCF, as well as the growth rate of non-oil real GDP do not have a unit root. Thus, these variables are stationary at the level I(0), and the null hypothesis of the existence of unit roots can be rejected (Prob. < 5 %).

Table 1. Results of ADF Unit Root Test (at level specification)

Variables	Augmented Dickey-Fuller Unit Root Test (Level)	
	T-stats	Prob.
GDP	−3.442	0.017
Current Expenditures/non-oil GDP	−3.902	0.005
Development Expenditures/ non-oil GDP	−5.134	0.000
FDI/ non-oil GDP	−1.95	0.307
GFCF/ non-oil GDP	−4.715	0.001

However, FDI is non-stationary at level (Prob. > 5 %), and the null hypothesis of the existence of unit root is accepted. Nevertheless, when FDI is converted into the first difference, it becomes stationary I(1). This result is reported in Table 2. Therefore, the transformed FDI d(FDI) is used in the VAR model.

Table 2. Result of ADF Unit Root Test (first difference)

Variable	Augmented Dickey-Fuller Unit Root Test (First Difference)	
	T-stats	Prob.
FDI/ non-oil GDP	−5.504	0.000

Since all the variables are stationary at the level, and FDI is stationary when transformed into the first difference, VAR model is applied to examine if government spending is beneficial to the economic growth during recession periods.

3.2. Impulse Response Functions

An appropriate lag length is essential to estimate the relationship between the variables. Based on Table 3, lag length of 2 periods is the optimal lag and shall be used when running VAR.

Table 3. VAR Lag Order Selection Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−299.4041	NA	215520.3	26.46992	26.71677	26.53200
1	−232.8367	98.40404	6171.477	22.85536	24.33644	23.22785
2	−192.0884	42.51997*	2255.709*	21.48594*	24.20126*	22.16884*

  Note: *indicates lag order selected by criterion (each test at 5 % level). LR: sequential modified LR test statistic; FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion.

The responses of real economic growth to shocks in current and development expenditures are examined to test the efficiency of implementing a fiscal stimulus through the instrument of government spending during recessions. Cholesky decomposition is applied to isolate shocks to government spending.

The impulse response of real GDP growth rate to a government spending shock (μ) after one period is defined as $\partial GDP_{t+1} / \partial \mu_t$.

The accumulated response function of non-oil real economic growth in the subsequent periods is examined to capture the total effect of a current spending shock and development spending shock.

Figures 3 and 4 below present the accumulated response functions of non-oil real GDP growth following a shock to government development expenditures, and current government expenditures, respectively. Based on the accumulated responses, a shock to current expenditures or development expenditures has an immediate negative impact on the non-oil real economic growth in the UAE.
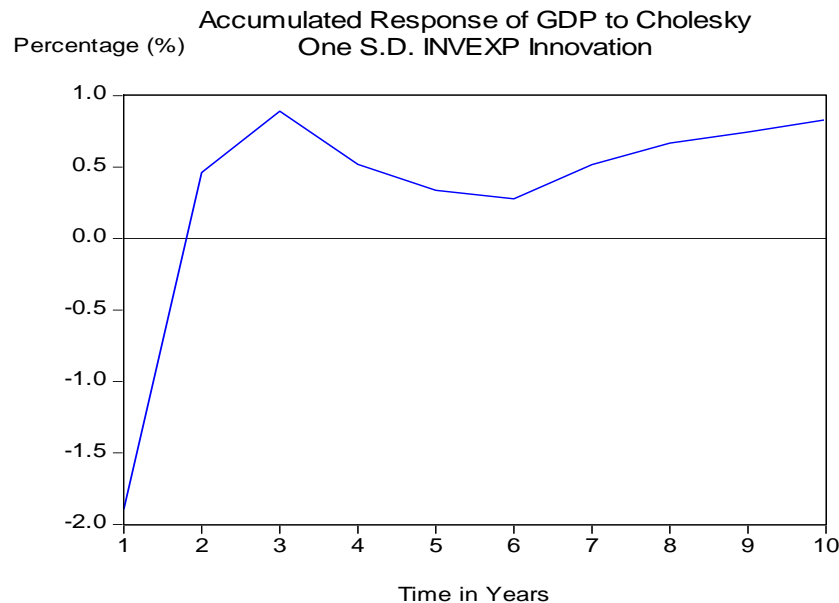

Fig. 3. Accumulated response of the growth rate of non-oil real GDP to development expenditure shock.

A shock to the development expenditures contemporaneously decreases the non-oil GDP ratio by 1.9 percent. However, after two years, the effect became positive and permanent. The sum of the accumulated responses reached 0.9 percent after three years and varied between 0.3 and 0.8 percent during the subsequent years.

On the other hand, the contemporaneous negative impact of a shock to the current expenditures on the non-oil economic growth is less significant. In fact, the non-oil GDP ratio decreases by 0.9 percent following a shock to current expenditures. This effect became positive and permanent after three years. The sum of the accumulated responses reached 1.1 percent after five years and 3.0 percent after eight years.
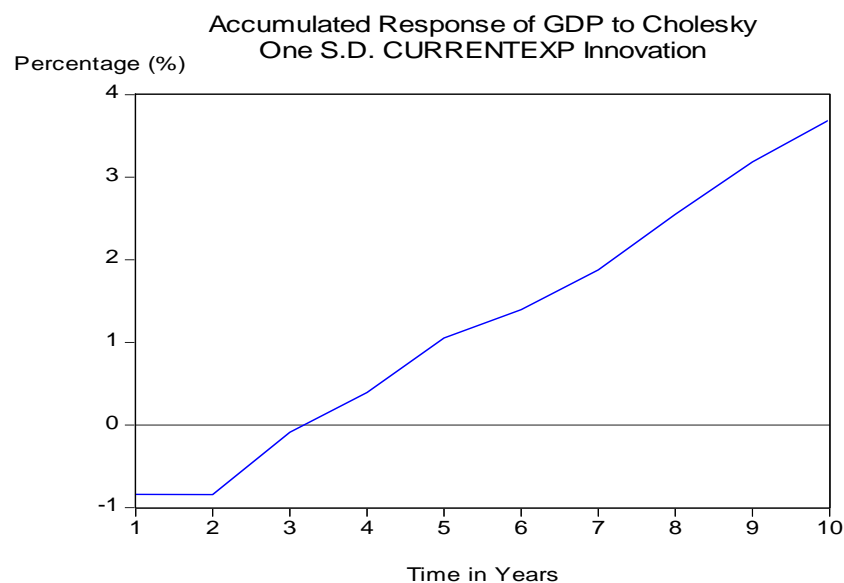

Fig. 4. Accumulated response of the growth rate of non-oil real GDP to current expenditure shock.

Thus, an increase in government spending has an immediate negative impact on the non-oil real economic growth. However, the positive effect of this fiscal stimulus tool occurred two years after the shock to development expenditures, and three years after the shock to current expenditures.

Therefore, the expansion of government expenditures during recession periods in the UAE stimulated the economy. However, because of a large decrease in real GDP during the recession, the economy needed time to recover. Hence, an increase in government expenditures during a deep recession was not able to offset the considerable reduction in private demand and private investments immediately. Nevertheless, in the subsequent periods, the non-oil real GDP increased permanently.

Furthermore, after five years, the positive effect of an increase in current expenditures on the non-oil economic growth became more significant than the positive impact of an increase in development expenditures. In fact, an increase in

current expenditures, especially a rise in wages and salaries induced an immediate increase in demand and investments. In addition, higher salaries and new jobs led to a further increase in demand, which intensified real GDP, and therefore real economic growth. Similarly, an expansion of government subsidies and purchases stimulated private investments and economic growth.

It can be concluded that after the implementation of an expansionary fiscal policy through an increase in government expenditures, the positive impact of this policy occurred after two to three years and persisted during the subsequent periods. In fact, the non-oil GDP in the UAE continued its rise even though the government reduced the total public expenditures by almost 33.0 percent between 2013 and 2016.

Therefore, when an economic recession hits the country, an increase in government spending boosts the aggregate demand and helps the economy recover. These findings confirm the positive association between government spending and economic growth that was found by other empirical studies, specifically those which examined this relation in the developing countries. However, as per the results of the accumulated impulse responses, the recovery phase does not occur immediately in the UAE.

In conclusion, both components of government spending are beneficial to the UAE economy. During recession periods, policymakers should increase development spending to ensure a quick economic recovery. The government's investments in the UAE are mainly channeled towards infrastructure services. However, policymakers should ensure that the fiscal injections induce a large sustainable positive impact on the country's economic growth. To achieve that, the government should invest in the right projects to raise productivity by crowding in private investments. In addition, the government should finance its development projects without taking on too much debt. In fact, when government spending is financed by borrowings, fiscal expansion has a negative effect on the economic growth in the long run. The debt burden increases the budget deficit, diminishes the government capability to spend in the long term, and crowds out private investments. Thus, policymakers should search for new sources of revenues to prevent borrowings and to compensate for the fall in oil revenues.

On the other hand, policymakers should focus on developing its soft infrastructure by providing a highly-skilled human capital able to create, innovate and adapt to new technologies. Although a large part of government expenditures is directed towards the education sector, the low-skilled human capital still constitutes a large part of the UAE workforce. A shift towards highly-skilled labour is required to fulfill the demand of workers in the private sector.

Furthermore, the government should ensure a high quality of life by developing the health sector. Thus, the federal budget should increase the share of its expenditures allocated to the healthcare sector. Moreover, policymakers need to focus on enhancing research and development expenditures, which play a vital role in the process of innovation and therefore increase business competitiveness and productivity.

Furthermore, based on the impulse response function results, an increase in current expenditures has a sustainable positive impact on the non-oil GDP growth

rate during the subsequent years of the government spending shock. Hence, the government should increase its current spending during recession periods to boost the aggregate demand, as well as increase the private investments, thus promoting the non-oil economic growth in the country.

CONCLUSION

The present study has investigated the dynamics of the relationship between government spending and non-oil economic growth in the UAE during the period 1980–2016. It has applied the vector autoregression (VAR) methodology to examine the dynamic response of non-oil GDP growth rate to the shocks in different categories of government spending. The results of the impulse response function tool indicate that current and development expenditures have an immediate negative impact on the non-oil economic growth in the UAE; this effect becomes positive and sustainable during the subsequent periods.

Thus, the implementation of an expansionary fiscal policy through an increase in both components of government spending is crucial during the recession phase to boost the economy.

The results of the research are in line with the Keynesian approach. Moreover, these findings assert the conclusions of Aschauer (1989) who found that an increase in public capital expenditures crowded in private investments, as well as the results of Elzetzki and Vegh (2008) who concluded that an increase in government current expenditures had a significant positive influence on economic growth.

However, to achieve sustainable economic growth in the UAE and prevent an increase in the country's budget deficit and the burden of debt, the following strategies should be taken into consideration. First, policymakers should channel their expenditures towards the right hard infrastructure projects that can attract local and foreign investments, and hence ensure future outcome and revenues to the country. Moreover, they should allocate more public expenditures towards the research and development to increase innovation and competitiveness in the private sector, which can increase the country's productivity, exports, and growth.

Furthermore, it is essential to increase the government's recurrent expenditures to stimulate the economy. Nevertheless, policymakers should ensure that an increase in the productivity of the workers in the public sector is in conjunction with the rise in their wages and salaries. In addition, subsidies and transfers should be channeled towards productive investments in different economic sectors to ensure an increase in the country's output, GDP, and economic growth.

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