

# The Impact of Fiscal Space on Economic Growth in Egypt

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## Abstract

*Fiscal space issue has been emerged with the development of the Millennium Development Goals. The main objective of this study is to examine the impact of fiscal space on economic growth in Egypt over the period from 1982 to 2015 using a vector autoregressive (VAR) model. The results of the empirical model confirmed that fiscal space has a positive impact on the growth rate in Egypt. This result has been verified by Granger causality test. It can be concluded that policy makers must focus on resource mobilization. Fiscal space resources must be mobilized carefully in order to avoid adverse impacts on the economy.*

**Keywords:** Fiscal Space; Economic Growth; Egypt; Fiscal policy.

## 1. Introduction

Although fiscal space is a new concept, it does not imply new unfamiliar fiscal policy framework. Countries are highly concerned with achieving the Millennium Development Goals (MDGs) and increasing economic growth. Policy makers face the problem of financing the achievement of these objectives. In another words, they are concerned with how to generate fiscal space. The introduction of the term fiscal space makes long term growth perceptions a more explicit concern in fiscal policy decision making. Countries might choose to relax economic constraint in order to raise fiscal space. Higher growth will affect the amount of tax revenues collected by the government which enlarge fiscal space in good times and vice versa if the economy witnessed lower growth rates. A government can enhance fiscal space by applying more effective tax and expenditure policy.

This paper is concerned with answering two main questions. First, does Egypt have a fiscal space? Second, to what extent fiscal space affects economic growth.

## 2. What is fiscal space?

The concept of “fiscal space” is still a new term, and there are various definitions that give emphasis to different aspects of the resource utilization.

Heller (2005a) defined fiscal space as a budgetary room which includes resources that can be used by the government for a desired objective without any expectation about the sustainability of the financial position of a government. Roy and Heuty (2005) defined fiscal space as particular actions that have been taken by policy makers in order to enhance domestic resource mobilization and reforms in order to ensure the effectiveness of these policy actions. They try to assess how existing policy actions may support mobilizing domestic resource towards pro-poor public investment.

Development Committee (2006) definition is mainly concerned with the short-term effects of an increase in public expenditure and its impact on the macroeconomic stability. Roy et.al (2007) defined fiscal space as a source of finance that is available to government through a number of policy actions for enriching resource mobilization, and ensuring the effectiveness of these policy actions, for a specified set of development objectives. Ghosh et al. (2013) defined fiscal space as the difference between debt boundary, beyond which debt would be unsustainable, and the present debt level.

### **3. *Alternative ways to create fiscal space***

Creating fiscal space means the availability of additional resources that can be used in a desirable government spending (or tax reduction). Fiscal space is used to enhance medium-term growth and finance this growth from future fiscal revenue. In fact, there are different channels through which a country can create or enlarge its fiscal space.

The first channel through which a government can increase or create fiscal space is tax revenue. A government can raise tax revenue through three different ways: broadening the tax base, rationalizing the rates, and improving tax administration. Governments can expand tax base by (a) bringing untaxed activities and more goods and services into the tax net; (b) simplifying the tax structure and reducing exemptions; and (c) strengthening administration. (IMF, 2015) With respect to tax structures, there is no optimal tax structure. For example, governments have to minimize exemptions and the number of rates, preferably to one non-zero rate; they have to eliminate export taxes; also they have to minimize exemptions and tax incentives.

Finally, governments have to improve tax administrations; success of reforms of tax administrations depends on the design of tax policy and administration capacity. If there is simple structure, administration, and enforcement are much easier, and the scope for corruption is minimized. (World Bank, 2012).

The second channel is to minimize or cancel lower priority expenditures. In order to reprioritize expenditure, governments should change subsidy programs, cutback spending on defense and internal security, and reduce foreign travel or embassy expenses. Reprioritizing expenditures will make additional resources available to be used for expenditures that are more desirable. (Heller, 2005a.)

The third channel to promote fiscal space is grants from external sources. If grants are sustained, this will reduce the uncertainty of being just a chance and creates the possibility for enlarging expenditure in the future. Unfortunately, grants are highly volatile, so that governments cannot depend on grants as a permanent source to create fiscal space. (Heller, 2005a) It has been argued that external grants and loans may decrease the incentives of doing efforts in mobilizing revenues and creating dependency and rent-seeking effects within government bureaucracies (Gupta et al, 2004; Heller, 2006).

The fourth channel for fiscal space creation is borrowing money either from domestic or external sources. Borrowing implies the need to repay; as a result, government spending must enhance future government revenues in order to be used to finance the repayment of the loan. Governments borrowing can be used to finance an overall fiscal deficit, rather than specific project or expenditure program. Domestic borrowing must be carefully managed, since it can increase government debt service obligations.

Finally, governments can print money in order to have more resources. This source offers only limited room for the creation of fiscal space as it should coincide with the monetary policy objectives otherwise it will cause inflation. (Heller, 2005a)

### **4. *Fiscal policy and economic growth in theory***

Economist's main objective is to raise the economic growth rate, as it helps to move towards a better standard of living for the population. If a government would like to increase economic growth, especially during recession, a government's priority will be given to create more employment and increase aggregate demand. According to Keynes, adjusting government spending and tax rates are the most effective ways to promote aggregate demand. Keynes opponents claim that taxes will distort the economy as it may reduce investment and labor supply and diminish growth. (Bunea-Bontas and Petre, 2008).

According to Keynes, a government must have sufficient fiscal space or access to debt markets in order to finance expansionary fiscal policies during recession. Increasing debt provides a fiscal space that emphasizes the effects of government spending on real GDP. This means that during recession, public expenditure financed by debt is a substitute for private expenditure. Therefore, governments can use borrowing (internal or external) or grants in order to stabilize the economy or stimulate growth. (Heller, 2005b).

Keynes's point of view has been challenged by classical economists, who believed that deficits potentially lead to crowding out effects. They asserted that if a government uses public debt to finance public expenditures; this can lead to economic recession, with capital leaving the country. (Spencer and Yohe, 1970).

Fiscal space is required for fiscal reforms that seek to increase growth. When governments increase spending on infrastructure, health or education, these can be financed through extra revenue or through reductions in spending. Also, these expenditures can be financed by borrowing where fiscal sustainability is not a concern. In order to achieve the desired growth level, fiscal space is required and resources should be made available in the least harmful way for growth; otherwise, economic growth will be affected negatively. (IMF, 2015).

### 5. Data:

This paper aims to examine the impact of fiscal space on economic growth in the Egyptian economy over the period from 1982 to 2015. A Vector Autoregressive (VAR) model will be used to examine this relationship. The data of government expenditure as a percentage of GDP, GDP growth rate, gross capital formation, inflation, debt as a percentage of GDP were collected from the world bank database. Fiscal space is calculated as debt to tax ratio. Debt and tax data were collected from the CAPMAS.

### 6. Model specification and estimation

The Vector Autoregressive (VAR) model has been used to estimate the effect of fiscal space shocks on economic growth in Egypt using annual data from 1982 to 2015. Before estimating the VAR model, a unit root test has to be conducted. If all variables are stationary, then there is no problem of spurious regression and the VAR model will be appropriate. (Aladejare, 2013).

#### 6.1 Determination of the Stationary of Data

Stationary means that the mean and the covariance of the variable are constant over time. The most commonly used unit root test is the Augmented Dickey Fuller test (ADF). The ADF test tests the null hypothesis of a unit root versus the alternative hypothesis of a stationary root. (Stock and Watson, 2007).

**Table 1: Augmented Dickey Fuller (ADF) Test Statistics**

Variables	Augmented Dickey Fuller (ADF)	
	At level	Prob.
Log GDPG	-3.123532	0.0348
Space	-2.622428	0.0990
Log db	-2.796343	0.0712
Log GCF	-3.381435	0.0718
Log G	-4.062641	0.0175
Log inf	-2.874759	0.0592

**Source:** Author's calculations.

The results of the ADF test for stationary, presented in Table 1, show that all the variables are stationary at level, which means that there is no unit root.

#### 6.2 Granger Causality Test

Granger causality test is used to examine the extent to which changes of past values of one variable lead to later variation of other variables, where all other variables stay unchanged. Granger causality test investigates the interaction of two variables together. The null hypothesis of this test states that x according to Granger does not cause y. (Ferreira, 2009).

**Table 2: Granger Causality Test**

Null Hypothesis:	Obs	F-Statistic	Prob.
LOG(GDPG) does not Granger Cause SPACE	28	0.96839	0.4788
SPACE does not Granger Cause LOG(GDPG)		3.16852	0.0327

**Source:** Author's calculations.

According to the results of the Granger causality test, we reject the null hypothesis with respect to the impact of space on economic growth and accept it with respect to the impact of growth on fiscal space. This means that fiscal space does cause economic growth.

**6.3 Vector Autoregressive Model (VAR):**

Since the unit root test showed that the variables are stationary at the level, then a Vector Autoregressive Model will be used. VAR models show that every endogenous variable in the system is a function of the lagged values of all the variables included in the system. All variables included in the VAR model are considered to be jointly endogenous. In addition, it reveals both endogenous and exogenous shocks. VAR models are quite easy to use in single country estimation. Each variable will be represented by an equation separately, which can be estimated by OLS.(Enders, 2004)

A VAR system can be expressed as follows.

$$\log(Y)_t = A_1\log(Y)_{t-1} + \dots + A_p\log(Y)_{t-p} + \varepsilon_t \tag{1}$$

Where:

$Y_{it}$  is a vector of endogenous variables at time t.  $A_i$  is the coefficient vector;  $i = 1, 2, \dots, p$ .

The vector of endogenous variables is given by:

$$Y_t = [\text{GDPG, Space, DB, G, inf, GCF}] \tag{2}$$

Where:

GDPG is GDP growth rate; Inf is inflation rate; Space is fiscal space measured as the debt- tax ratio, where the higher the value of this ratio the lower the fiscal space available(Arizonan, et. Al, 2011 ;)DB is the ratio of debt to GDP; G is government expenditure as a percentage of GDP; and GCF is gross fixed formation as a percentage of GDP. For the estimation of the empirical VAR model, 1 lag was included based on the lag selection test.

**Table 3: Lag Order Selection Test**

Endogenous variables: LOG(GDPG) SPACE LOG(GCF) LOG(G) LOG(INF) LOG(DB)  
 Exogenous variables: C  
 Sample: 1982 2015

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-48.45756	NA	1.21e-06	3.403597	3.678423	3.494694
1	57.98739	166.3202*	1.55e-08*	-0.999212*	0.924567*	-0.361534*
2	84.78485	31.82199	3.55e-08	-0.424053	3.148678	0.760206

\* indicates lag order selected by the criterion

**Source: Author’s calculation**

Diagnostic tests were applied to ensure the validity of the results. Autocorrelation, hetroscedasticity, normality, and stability tests were conducted. The results of these tests confirm that the model does not suffer any autocorrelation, hetroscedasticity, normality, or stability problems. The results of these tests can be summarized in the following table:

**Table 4: Diagnostic tests for the VAR model**

Diagnostic Test	VAR Model	
	Test Statistic	P-value
<b>Residual Serial Correlation LM Test</b>	33.74634	0.5762
<b>Residual Heteroskedasticity Tests</b>	598.2883	0.1756
<b>Stability Test</b>	VAR satisfies the stability condition	No root lies outside the unit circle
<b>Normality Test</b>	36.53042	0.000003

**Source:** Researcher’s calculations.

**6.4 Interpretation of empirical results:**

The results of the empirical model should answer one main question which is “How economic growth will respond to a particular shock in fiscal space, inflation, government expenditures, debt, gross capital formation and to itself?

The results of the VAR model could be interpreted using an analytic tool which is impulse response functions (IRFs). These tools can help answering the question mentioned earlier. The results of the empirical model met plausible expected results, as economic growth responds positively in the first period following shocks to itself, gross capital formation, and fiscal space. It also shows that economic growth responds negatively to debt, inflation, government expenditure shocks.

**Figure 1: Impulse Response Function of GDP Growth Rate**

Accumulated Response to Generalized One S.D. Innovations

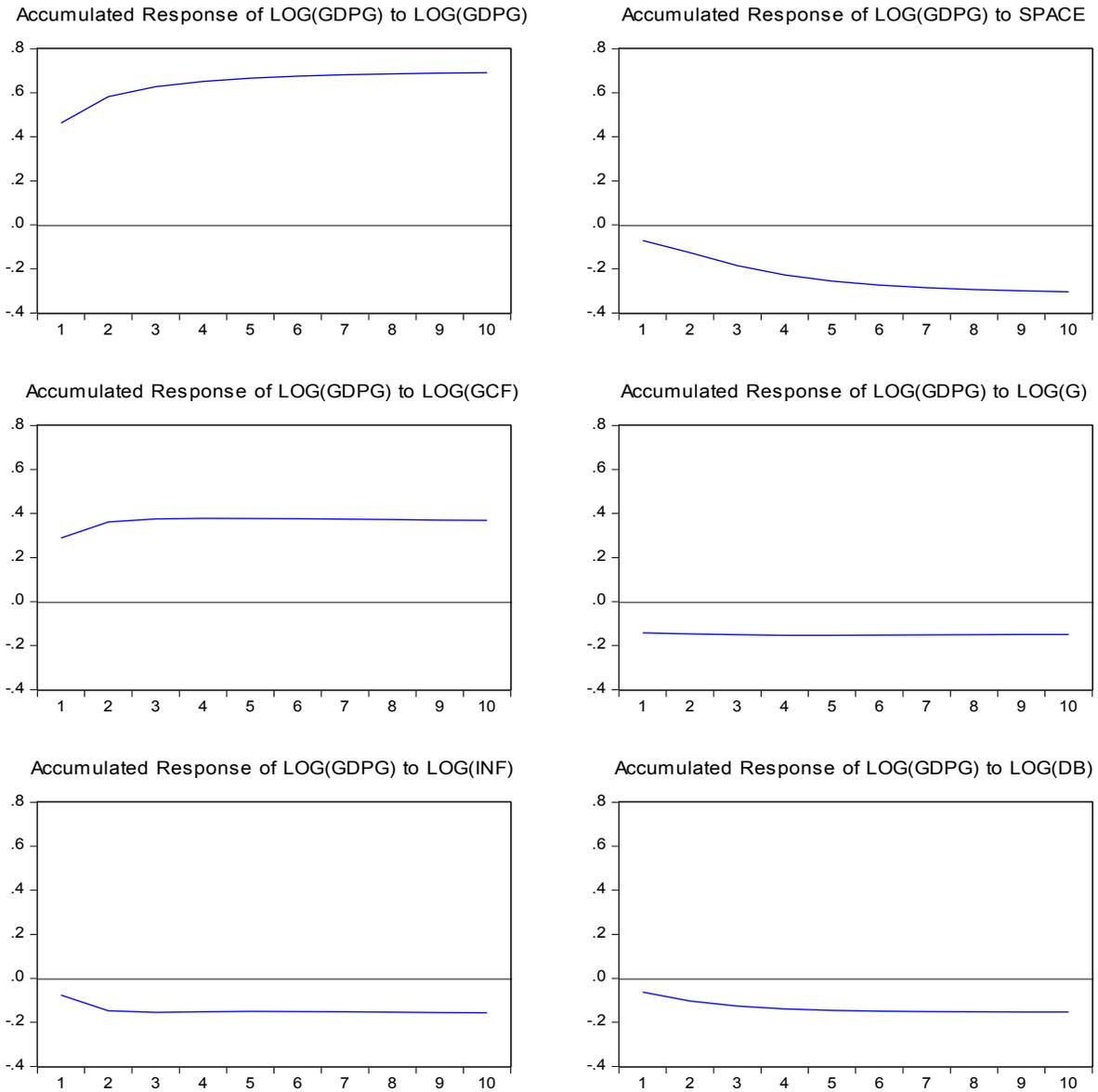


Figure 1 shows the responses of Egypt’s GDP growth rate fluctuations to the shocks in the variables in the model. Panel (a) shows that a shock in Egypt’s GDP growth rate has positive impact on itself for a prolonged period. Panel (b) shows that a shock in fiscal space has a positive impact on economic growth. The higher the value of fiscal space proxy, the lower the fiscal space, so it can be concluded that the higher the fiscal space, the higher the growth rate of the country. This increase in the rate of growth is increasing gradually over time. Panel (c) demonstrates that a shock in gross capital formation has positive impact on Egypt’s growth rate. It is noticed that the increase in the growth rate resulting from shock in gross capital formation, is fixed over time. Panel (d) demonstrates that the shock in government expenditure will have a negative fixed impact on Egypt’s GDP growth rate. This means that government expenditure has a crowding out effect which affects economic growth negatively.

Panel (e) shows that a shock in inflation rate will have negative impact on Egypt's GDP growth rate. Inflation leads to uncertainty about profitability of investment projects, as a result investments and economic growth will be lower. respect to panel (f), it shows that a shock in government debt will have negative impact in Egypt's GDP growth rate. Debt is considered to be a burden for next generations, which in turn reduces flow of income. In addition, it may drive up interest rates, as a result investments will decrease; it asserts crowding-out effect.

### 7. Conclusion and policy Recommendations

One of the most important issues arises with the development of the Millennium Development Goals, is the issue of fiscal space. Fiscal space is a method to locate resources in order to finance public goods. Fiscal space should be directed toward enhancing the growth potential of the country.

This study investigates the relationship between fiscal space and economic growth rate in Egypt. It uses a vector autoregressive (VAR) model to determine whether fiscal space has significant impact on Egypt's growth rate or not over the period from 1982 to 2015. The results are consistent with the economic theory, as Egypt's GDP growth rate responds positively in the first period following shocks to itself, fiscal space, and gross capital formation. It also shows that Egypt's GDP growth rate responds negatively to inflation rate, government expenditures, and government debt shocks.

From Granger causality test, it is found that fiscal space causes economic growth. As a result, policy makers should be concerned with fiscal space in order to increase economic growth. If the source of fiscal space resources is debt, then policy makers must ensure that the higher expenditure in the short run and in the long run can be financed from current and future revenues, otherwise it is going to be harmful for the economy and affect economic growth negatively.

Second, policy makers should identify whether the spending programs which are financed by fiscal space, will need more finance in the future or not. Fiscal space that has been created in the first year should be sustained in order to make sure of the creation of similar fiscal space in future years to cover these expenditures.

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