International Journal of Business and Society, Vol. 23 No. 1, 2022, 404-426

THE FISCAL MULTIPLIER AND ITS DETERMINANTS: AN ECONOMETRIC ANALYSIS FOR THE CASE OF JORDAN DURING THE PERIOD (1975-2017)

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ABSTRACT

This study aimed to analyze the impacts of government expenditure and the public revenues on economic growth via the estimation of the fiscal multipliers for the period of (1975-2017). Also, the study analyzed the value and effects of the determinants of this multiplier, namely the openness of trade, public debt, the exchange rate, and the size of automatic stabilizers. In order to achieve these purposes, the study used the descriptive approach and the Auto-Regressive Distribution Lag (ARDL) approach. the tests showed that the variables became stationary after taking the first difference, and the variables are co-integration. The results of the study showed that the value of the fiscal multiplier of the government expenditure in the short and long term is about (1.34 and 3.60) respectively, and if we added its determinants, the value of the multiplier is estimated (2.80 and 2.97) respectively. The fiscal multiplier for the public revenues was estimated (1.17 and 4.10) respectively in the short and long term, but in the case of adding its determinants, the multiplier value is estimated (0.80 and 3.97) respectively. Based on the findings, the study recommended the government to increase its capital expenditures, although at the expense of carrying additional debt at present, to provide higher economic growth and encourage and attract an environment for investments.

Keywords: Fiscal Multiplier, Economic Growth, Government Expenditure, Public Revenues, Auto-Regression Distribution Lag Model (ARDL).

Received: 3 October 2020
Accepted: 1 September 2021
https://doi.org/10.33736/ijbs.4622.2022

1. INTRODUCTION

The global financial crisis that started in 2008 led to rising concern in studying the economic role of government by official and private entities, institutions, and academic researchers, it has shed light on Keynesian thought in particular to find solutions to this crisis, as it has displayed many studies on the role of government in the economy and its impact on economic growth, unemployment, and inflation. In the same context, several studies have to address the fiscal

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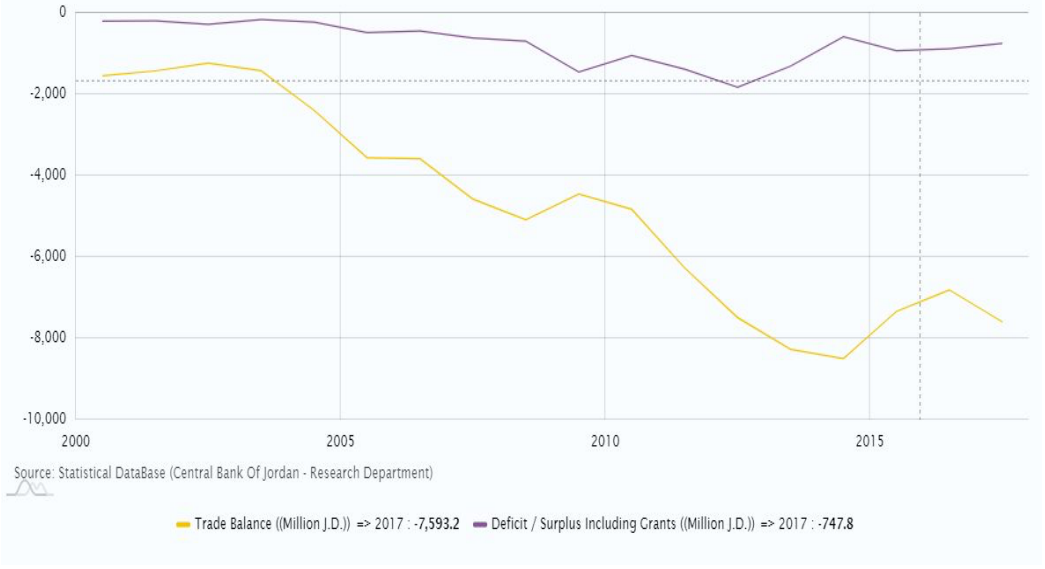
multiplier at the global levels, with many researchers interested in studying the role of the fiscal multiplier and its importance in the economy, the factors affecting this multiplier, as well as its importance in planning the economic policies of countries. Also, the countries seek out to determine the size of the fiscal multiplier and work to enhance the size of the multiplier, as it reflects, generally, the impact of fiscal policy on economic growth, and it can be used by decision-makers in drawing economic policies in the future, The-significant role of fiscal policy in increasing economic activity especially in developing countries such as Jordan, Which is described as a country that lacks maturity and efficiency in the private sector. Therefore, it becomes important for government intervention through fiscal policy components -expenditures and revenues- to achieve economic purposes, reaching a balanced level in the economy, and working to achieve sustainable economic development. Jordan suffers from chronic deficits in budget and trade, which affect several economic indicators: This twin deficit requires the use of a combination of economic policies, perhaps most notably: Fiscal policy, through the use of the components of fiscal policy to get maximum effect from government expenditure and revenue on economic growth. The problem with this study stems from the considerable variation in the estimation of the size of the fiscal multiplier and its determinants by scientific studies, which lies in the possibility of determining the impact of fiscal policy on economic growth and increasing the effectiveness of fiscal policy in the economy.

This study estimates the size of the fiscal multiplier in Jordan, reflecting the change in government expenditures or public revenue on the change of GDP, and analysis of its most important determinants that affect the size of this multiplier, using econometrics analysis. The remainder of this study is organized as follows: The next section reviews the relevant prior literature. The third section presents the empirical analysis framework of this section. The fourth sections descript the Econometric model and the collected data. The results of the empirical analysis are presented and discussed in the fifth section.

Figure 1: The budget and tread deficit in Jordan



2. LITERATURE REVIEW

Several studies have discussed the issue of fiscal multipliers, their importance, and the variables that affect it in general, and some studies have discussed the relationship between fiscal policy and economic performance. The various studies have been submitted on this topic to describe its impact on the economy from many different aspects because the subject of the fiscal multiplier is an important topic that shows the impact of effective fiscal policy on economic growth and these studies:

The study of Blanchard and Perotti (2002) aimed to demonstrate the effects of shocks on government spending and tax revenue on economic activity and GDP components in the United States, using the vector auto regression model (VAR). The researchers found a positive impact of shocks on government spending on output, while shocks on tax revenue have a negative impact on the economy, and the study concluded that the size of the multipliers of both government spending and tax revenues is low. Whereas the study of Auerbach and Gorodnichenko (2012) aimed to estimate the size of the fiscal multiplier in the countries of the Organization for Economic Cooperation and Development (OECD) by relying on the methodology of the structural self-regression vector model (SVAR) in estimating the size of the fiscal multiplier. The researchers concluded that the size of the fiscal multiplier is greater in the case of economic recession than in the case of economic expansion. The Alawin's study in (2011) aimed to estimate government expenditure multiplier in the short and long term as an indicator of the efficiency of fiscal policy, during the period (2004-2010). Particularly, the author used three complementary approaches: the Johansen Cointegration, the ECM, and the Granger Causality test. The results presented that there was a stable long-term relationship between economic growth and government expenditure. The long-term multiplier was estimated (2.5) which gives an indicator that the government multiplier is effective, and the fiscal policy is strong enough to stimulate the economy, while the short-run multiplier is (1.1) also the results show no effect for the global crisis on the size of the fiscal multiplier. The study of Ilzetzki et al. (2013) also aimed to know the effect of macroeconomics on the process of stimulating fiscal policy and showing the impact of government spending based on the main characteristics in some countries, such as the level of development, the exchange rate system, trade openness and the level of public debt, the quarterly data were used for government spending in 44 countries. Researchers concluded that output is affected by changing government consumption expenditures in developed countries more than in developing countries. Also, the fiscal multiplier is greater in countries that follow the fixed exchange rate system than countries with the flexible exchange rate, it has also been shown that the size of the fiscal multiplier in open economies is less than that in closed economies and the size of the fiscal multiplier in countries with high debt is negative. While, study of Sarangi et al. (2015) prepared by the Economic and Social Commission for Western Asia (ESCWA), aimed to assess the effectiveness of fiscal policy in Jordan and measure its impact on economic growth, poverty, and inequality, during the period between (1991-2013). The study used a fiscal multiplier to determine the effectiveness of the fiscal policy. The researchers found that the size of the multiplier in the case of current expenditures (2.5), the case of capital expenditures (0.9), and its size when taking total expenditures is about (1.2). The study showed that the highest size of the capital expenditure multiplier was about (5.8), it also showed that the maximum impact of the fiscal multiplier on the growth takes three years, so the role of investment is important in influencing growth, whilst the study of Reguzzi and Wegmueller (2015) aimed to demonstrate the impact of economic openness on the size of the fiscal multiplier

in Spain, examine three dimensions of economic openness: exchange rate flexibility, trade openness, and capital mobility. The impact of the fiscal multiplier was estimated in the short and long run. The New Keynesian model was applied in small-scale states, an open economy, and an effective role for monetary policy. The researchers found that there was a negative relationship between the fiscal multiplier and economic openness, also found that when the exchange rate was flexible, the value of the fiscal multiplier was reduced. However, Bose and Bhanumurthy (2015) conducted a study to set a framework for estimating the fiscal multiplier for the Indian economy in simulating structural macroeconomic models. However, the fiscal multiplier was estimated in the short term for each of the fiscal policy tools represented in expenditures and revenues. The study concluded that the size of the capital expenditure multiplier, the transfer payments multiplier, and the other current expenditure multiplier (2.45), (0.98) and (0.99) respectively, while the size of tax revenue multiplier is (-1), and estimates indicate a significant impact of the capital expenditure multiplier on GDP in the Indian economy, likewise Filipovski et al. (2016) study aimed to analyze the importance of the fiscal multiplier as a concept used in assessing the efficiency of fiscal policy, and to analysis fiscal multiplier in the Republic of Macedonia through the use of the auto-regression vector (VAR) model during the period 2000-2012. The study found that the fiscal multiplier was negative in this country; This means that increased public expenditure does not lead to an increase in economic activity through an increase in GDP, because owing small size of the Macedonian economy, the high degree of economic openness, the fixed exchange rate system and the high proportion of imports into the Macedonian economy and the Caldara and Kamps (2017) study aimed to demonstrate whether tax cuts and increased spending stimulates the economy, also aimed to determine the signal and size of the fiscal multiplier. It was found that the studies using the self-regression vector (SVAR) model reached different conclusions about the size of the multiplier, show analytically that this difference in views on the size of the fiscal multiplier reflects different assumptions about the fiscal rules associated with spending and tax policies in the macroeconomic, so the researchers reached using the SVAR model, that the increase in spending lead to stimulates output more than the tax cut process.

Note through previous studies that the topic of fiscal multiplier and its determinants has different aspects and used in the analysis of a wide range of statistical tools, also note that the studies that examined the Jordanian economy in this matter have not examined the various aspects of the fiscal multiplier but have been limited to linking it to economic growth. Consequently, it is expected that this study will contribute to clarify the importance of the fiscal multiplier and its role in the Jordanian economy in detail. Also, this study searched for the determinants of the fiscal multiplier in the Jordanian economy.

3. EMPIRICAL ANALYSIS FRAMEWORK

The idea of a multiplier came in the economic theory by economist Richard Kahn for the first time, who, in 1931, published an article entitled (The Relation of Home Investment to Unemployment) to study the relationship between domestic investment and unemployment. It concluded that the increase in investment leads to a greater increase in total employment in the economy. However, the idea of the multiplier was directly related to Keynesian economics, which studied the impact of investment on income, and concluded that the increase in investment leads to more increase in national income, and then Keynes used the concept of the multiplier to

justify the use of fiscal policy to stimulate the economy. The concept of a fiscal multiplier is clarified according to the following mechanism which is the government spending leads to an increase in aggregate demand, this government spending results in a series of incessant and time-consuming expenditures that continue for a period until the effect ends i.e., the direct and indirect effect of this spending ends. The output is affected at the end more than the rise in government spending.

The fiscal multiplier is defined as the change in fiscal policy instrument that may cause a change in output so that the fiscal policy tools are government spending or public revenue or one of its components. The spending (revenue) multiplier can be defined as measuring the impact of the change by one unit in government spending (or one unit of revenue) on change in GDP. The effect of the fiscal multiplier changes over time so that it can be taken in the same year, which is called the Impact Multiplier that measures the change in output to the change in any of the fiscal policy instruments in the same year, (ΔY_{to}/ $FI_{to}\Delta$), As the (Fiscal Instrument represents any tool of fiscal policy, as well, it is possible to measure the change of output in the future to the change in any of the fiscal policy instruments in the base year, which is called the multiplier in future, ($\Delta Y_{to+n}/\Delta$ FI_{to}), there is also a cumulative multiplier, the cumulative multiplier change in output to the cumulative change in one of the tools Fiscal policy through many years, $\sum_{i=1}^{n} \frac{\Delta Y_{to+i}}{\Delta FI_{to+i}}$, and the highest value of the fiscal multiplier can be measured by which is known the peak multiplier represents the biggest change in output after the change in one of the fiscal policy instruments,[Max_n (ΔY_{to+n}/ FI_{to})]. (Gnip, 2014).

The economic analysis contrasts between static analysis and dynamic analysis. Furthermore, in the context of this difference in the analysis, we find the two forms of fiscal multiplier (Dwivedi, 2005), which has been estimated in this study:

Static multiplier: defined as the direct change in the output of change in one of the instruments of fiscal policy, which means that there is no difference in time between a change in government expenditure and change in production (short-run multiplier).

Dynamic multiplier: defined as a change in output of a change in one of the instruments of fiscal policy indirectly, that means the output is a cumulative process by the time, through the attendance of time-lagged periods, The period of change in one of the instruments fiscal policy, and the period of change in the output, whether it is a year or more or half a year based on the data used in the study (long-run multiplier).

Determinants of the fiscal multipliers: It is clear from the literature review that many factors affect the fiscal multiplier, as a study issued by the International Monetary Fund in 2014 entitled "Fiscal Multipliers: Size, Determinants, and Use in Macroeconomic Projections" divided the determinants of the fiscal multiplier into two parts: Structural and temporary determinants. Structural characteristics are determinants that influence an economic response to fiscal shocks in normal times.

Trade Openness: The importance of trade openness is highlighted in which it shows the extent of the contribution of foreign trade; exports and imports, as an essential part of the country's GDP,

i.e., it shows the extent of the country's economic activity on the conditions prevailing in the import and export markets. Accordingly, if the trade openness is high, this indicates the country's dependence on the outside world, which makes its economy more vulnerable to the global economic crisis, thus making it in a state of dependence on the outside world. The trade openness of a country can be measured according to the total size of its exports and the size of its imports into the gross domestic product, as exports have a positive impact on the gross domestic product, while imports have a negative impact on the gross domestic product, and the economy is considered open to the outside world if the sum of exports and imports is equal or it exceeds (60%) of the gross domestic product, in the same context, many studies indicate that the fiscal multiplier is affected by the size of the trade openness, as the fiscal multiplier decreases as the imports increases against of exports, therefore increasing of trade openness, and the reason for the inverse relationship between the fiscal multiplier and the trade openness is that the process of increasing government spending in countries that are characterized by trade openness leads to an increase in the size of imports in them, which negatively affects government spending by leaking part of these spending outside in economic by importing goods and services, which reduces the size of the fiscal multiplier, which is known as leakage, and thus works to weaken the impact of government spending in the local economies (IMF, 2008; Ilzetzki et al., 2013; Barrell et al., 2012).

The Debt Level: The public debt is divided according to its source into internal debt and external debt. While the debt can be considered internal borrowing does not represent an increase in the total national wealth, in contrast, the external borrowing on a real increase in national wealth, any wealth from outside move to the inside, which increases the purchasing power of foreign currencies. Accordingly, internal borrowing represents a real burden on domestic investment and consumption counter to external borrowing. The danger is that the lender can overlap in political or economic affairs or social to the borrowing country. Studies indicate that the high size of the public debt of the country leads to a decrease in the fiscal multiplier in this country. The reason for this is that the process of increasing government spending has a negative impact on the private sector due to the method of financing these expenditures because the government funds the spending either by borrowing or increasing taxes, which could lead to the government competing with the private sector on borrowing, which is supposed to be directed towards investment and the increasing taxes leads to fewer profits and perhaps a loss to the private sector and discouraging the investment process. From this principle, the higher percentage of the public debt of the country leads to a decline in government spending on the economy, and thus lowers the fiscal multiplier (Kirchner et al., 2010; Ilzetzki et al., 2013).

The Exchange Rate Regime: the current global monetary system has seen some sort of exchange rate systems, specifically: the fixed exchange rate system and the flexible exchange rate system, and numerous exchange rates are included between them, a section of which approaches to be fixed and other exchange rates to be flexible exchange rates, and in the same context, the importance of coordination between the fiscal and monetary policies appears in the presence of different exchange rate systems, to employ this in achieving various macroeconomic goals, such as reducing the deficit in the trade balance and maintaining inflation rates, and other goals. Studies indicate that the exchange rate system followed significantly impacts the size of the fiscal multiplier. Studies have found that countries in which the exchange rate system is more flexible have a multiplier and the effectiveness of their fiscal policy is relatively low because the exchange rate affects the fiscal policy due to the continuous change in the exchange rate, which

in turn affects the size of exports and imports down. In countries where the exchange rate is fixed, the size of the fiscal multiplier is relatively high than countries that follow the flexible exchange rate system, due to avoiding fluctuations in exchange rates, which will lead to foreign trade stability at normal levels (Born et al., 2013; Ilzetzki et al., 2013).
The Size of Automatic Stabilizers: It is the factors that reduce fluctuations in output so operate by themselves without taking any government measures, and respond automatically to counter the recession or inflation, it is worth noting that stability automaticity in the economy can include parts of the public budget from the viewpoint of the Keynesian school, which can compensate the increase or decrease in aggregate demand by increasing taxes and reducing government spending in the case of inflation, and vice versa in the case of recession (Auerbach & Feenberg, 2000). Examples of these factors include income taxes, and government spending on social welfare, transfers, such as government support. Until the vision becomes clear in the state of recession in the economy, GDP tends to decrease stability factors automatically increase the government expenditures towards firms and individuals, which raises the demand for goods and services by individuals and firms and reduces cash flows from firms and individuals towards a government that is in the form of income, sales, taxes, social security, and retirement, which will reduce the incomes of firms and individuals, and thus will enable the keeping of investment and individuals spending at higher levels. In the case of recovery, the exact opposite happens, as automatic stabilization factors increase what the firms and individuals pay to the government, and consequently, the total demand decreases through spending on investment and consumption by firms and individuals. In these two cases, changes in the general budget are supposed to lead making a greater impact of expenditures on economic growth. Hence, the high size of the fiscal multiplier (Dolls et al., 2012) study shows an inverse relationship between the size of automatic stability and the fiscal multiplier, meaning that the greater the size of automatic stability, the lower fiscal multiplier.

Labor Market Rigidity: Studies have indicated a positive relationship between the more rigid labor market and the fiscal multiplier, the reason for this is because wages and salaries are inflexible or rigid, which is reflected in keeping consumption and savings levels constant. Therefore fiscal policy does not lead to a significant change in aggregate demand, which keeps the level of output stable, so the fiscal multiplier in the rigid labor market is greater than in the labor market flexibility (Cole & Ohanian, 2004).

Public Expenditure Management and Revenue Administration: There are a set of problems in this area, whether, at the level of public sector management or the level of efficiency in the use of resources and increasing productivity. Accordingly, the more difficulties in collecting taxes because of tax laws that are not proportional with the economic situation in the country, failure to control public spending and not to link it with different economic policies, expenditures become inefficient, among the indicators of this are: the low impact of fiscal policy with its components; spending and revenue on GDP, which reduces the size of the fiscal multiplier (Batini et al., 2014). The slowdown in spending between an individual's receipts of income and spending that income reduces the size of the multiplier in the short term. The same can apply to projects and plans approved by the government in its budget to stimulate economic activity and growth, since there are periods of multiple time delay permeate spending, beginning with the process of approval of these projects and plans, and then approved by the responsible party, and then prepare a plan implementation and distribution of the value of projects and plans on the different types of

government spending, and this leads to a negative impact on the value of the fiscal multiplier in the short term.

Temporary Factors: The determinants that affect the response of the economy to fiscal shocks but make the size of the fiscal multiplier deviate from its levels and normal rates.

The State of The Business Cycle: The economic cycle is known as the fluctuation in the country's economic activity during the specified time, calculated through a rise or fall in real GDP (Hyman, 1996). Several studies have indicated that the fiscal multiplier in recessions greater than in expansion, and this can be explained that countries tend to follow an expansionary fiscal policy in the case of economic recession so that government spending is directed to the investment side as an attempt to stimulate economic activity, which leads to a greater fiscal multiplier than is economic in nature or expansion situations that the effectiveness of government spending and its impact on the economy is greater. Moreover, when an expansionary fiscal policy is taken in the case of expansion, government spending is less effective because the economy is in the full employment of resources. Thereby, increasing government spending, which works to increase aggregate demand, which leads to the crowding out of private demand because output has not changed, it leads to higher prices in the economy. On the other hand, following a contractionary fiscal policy in boom times by reducing government spending, especially on service sectors and/or increasing taxes, in addition to luxury goods and services, this restricts inflation, is then more effective than pursuing a contractionary fiscal policy in recession times. So, the size of the fiscal multiplier is greater when the fiscal policy used is more contractionary in booms than in recessions (Baum et al., 2012; Auerbach & Gorodnichenko, 2012).

Degree of Monetary Policy Accommodation to Fiscal Shocks: Studies show that expansionary monetary policy, by lowering interest rates, mitigates the impact of deflationary fiscal policy. The fiscal multiplier increases as the monetary policy followed is expansionary, and/or the interest rates are close to zero. The studies also indicated that the temporary increase in government spending- a fiscal shock - with interest rates near to zero, leads to an increase in the size of the fiscal multiplier much higher than spending at times naturally. This is due to when the fact that interest rates are low, demand for borrowing increases, whether for investment or consumption increase, Thus the impact of government spending is greater on an economy (Ercolani & e Azevedo, 2017; Erceg & Lindé, 2014; Woodford, 2011).

4. ECONOMETRIC MODEL AND DATA DESCRIPTION

4.1. The description of the econometric model

Based on what was described in the theoretical framework and literature review to achieve the objectives of this study, It relied on two models and indices applied to the case of Jordan, the first model, measures the size of the fiscal multiplier through the impact of expenditure and revenue on the gross domestic product, and the second model aims to measure the impact of determinants on the size of the fiscal multiplier, by determining the effect of trade openness, the public debt, the real exchange rate, and the automatic stability on the size of the fiscal multiplier and GDP in overall, based on studies (Ilzetzki et al., 2013; Riguzzi & Wegmueller, 2015), according to the following formula:

RGDP = F (RGE, RRE) ……..……. (1)
RGDP = F (RGE, RRE, OT, PD, RER, AS) ……... (2)
Whereas:
RGDP: real GDP.
RGE: Real government expenditure.
RRE: Real Public Revenue.
OT: Trade openness.
PD: Gross public debt as a percentage of GDP.
RER: the real exchange rate of Jordanian Dinar against the US Dollar.
AS: Automatic volume stabilization.

When taking real GDP, real government expenditure, and real public revenue in logarithmic form, the equation becomes as follows:

LRGDP = β0 + β1LRGE + β2LRRE + μ …… (3)

LRGDP = a0 + a1LRGE + a2LRRE + a3OT + a4PD + a5RER + a6AS +μ……..…… (4)

After performing the initial statistical tests, it becomes clear that the Autoregressive Distributed Lag (ARDL) method is the appropriate model that was used in this study.

Based on Pesaran (1997) and Pesaran et al. (2001), the ARDL model is formulated as follows:

$\Delta L(RGDP_t)$ =B0 +B1$\Delta L(RGDP_{t-1})$ +B2 $\Delta L(RGE)$ +B3 $\Delta L(RRE)$ -CointEq$_{-1}$ +$\sum_{j=1}^{n} a1L(RGE)$ +$\sum_{j=1}^{n} a2L(RRE)$ + μ ……(5)

$\Delta L(RGDP_t)$ =B0 +B1*$\Delta L(RGDP_t)$ +B2*$\Delta L(RGE_t)$ +B3*$\Delta L(RRE_t)$ +B4*$\Delta(OT_t)$ +B5*$\Delta(PD_t)$ +B6*$\Delta(RER_t)$ +B7*$\Delta(AS_t)$ -CointEq$_{-1}$ + $\sum_{j=1}^{n} a1L * (RGE)$ + $\sum_{j=1}^{n} a2L * (RRE)$ + $\sum_{j=1}^{n} a3 * (OT) + \sum_{j=1}^{n} a4 * (PD) + \sum_{j=1}^{n} a5(RER) + \sum_{j=1}^{n} a6 * (AS)$ + μ ……..…(6)

Whereas:
Δ: is the first difference operator.
L: denotes the logarithmic formula.
B1, B2, B3, B4, B5, B6, B7: denotes the short-term coefficients.
a1, a2, a3, a4, a5, a6: denotes long-term coefficients.
CointEq-1: error correction factor.
$\sum_{j=1}^{n}$: is the number of lagged for each variable.
μ: is the error term.

Depending on the study of Sarangi et al. (2015) and Ebadi (2018) to find the size of the fiscal multiplier by elasticity, because the estimated coefficients represent the elasticity, not the multiplier:

(d ln RGDP/ d ln RGE) = ($dRGDP/ d$RGE) * (RGE_{Ave} /$RGDP_{Ave}$)……(7)

$$(dRGDP/dRGE) = (d \ln RGDP/d \ln RGE)/ (RGE_{Ave} /RGDP_{Ave}) \ldots\ldots\ldots (8)$$

Whereas:
RGDP: real GDP.
RGE: Real government expenditure.
Ave: Average
The size of the fiscal multiplier is derived from the former equation by dividing elasticity on the average government expenditure and GDP during the study period.

4.2. The description of variables and data

This study aims to estimate the size of the fiscal multiplier through the impact of government expenditure and public revenues on the GDP of Jordan for the period (1975-2017). The impact of trade openness, the exchange rate, the public debt, and the size of automatic stability on the size of the fiscal multiplier, the price level was taken into consideration, as the level of inflation affects the real level of both expenditures, revenues, and GDP (Martin et al., 2004), and prices for the year (1999) were considered as a base year to reduce the impact of inflation.

Gross Domestic Product GDP represents all the value of final goods and services produced in the Jordanian economy, where the logarithm of real GDP was used as an indicator of economic growth in Jordan.

Government expenditure defined as the amounts allocated to government departments in the Jordanian state to finance all items of their current and capital expenditures according to the annual general budget law, and this study used the logarithm of real government spending.

Public revenues are defined as taxes, fees, profits, surpluses all, and any other money returned to the public treasury. The real public revenue logarithm has been used.

The ratio of trade openness: The degree of trade openness is calculated in many ways, such as total exports to GDP, and the ratio of trade openness in this study was measured by total exports and imports to GDP.

Total public debt is defined as the size of country debt for lenders outside and within the country itself and these lenders can be individuals, firms, or even other governments. The ratio of public debt (internal and external) to GDP has been used as an indicator of public debt in the Jordanian economy.

The real exchange rate: which is represented in the real exchange rate of the Jordanian Dinar against the US Dollar, so the reason for choosing the exchange rate of the Dinar against the Dollar is that the dinar exchange rate is linked to the Dollar, in addition to the fact that most of the import goods and services are purchased in the US Dollar, as most countries in the world maintain large reserves of dollars to meet its needs in the global market. The real exchange rate for the Jordanian Dinar against the US Dollar has been used.

The size of automatic stabilizers: a set of factors that aim to reduce fluctuations in GDP, or what is known as the size of government in the economy and is expressed as the ratio of government expenditure to GDP. The ratio of government expenditure to GDP has been measured.

5. RESULTS OF EMPIRICAL ANALYSIS AND DISCUSSION

Before performing the standard analysis, some preliminary tests must be done to avoid falling into spurious regression. To reach accurate and correct results, some important tests must be done. The results in Table 1 indicate that the time series of study variables are not Stationary at level I (0) but became Stationary after taking the first difference I (1).

5.1. The Unit Root Test (Augmented Dickey-Fuller test-ADF)

Table 1: Result of Augmented Dickey-Fuller test-ADF

Stationary at level			
Variables	t-statistics	critical value	Decision
LRGDP	-0.23	-3.60	non Stationary
LRGE	-0.98	-3.60	non Stationary
LRRE	-0.72	-3.60	non Stationary
OT	-2.77	-3.60	non Stationary
PD	-2.57	-3.60	non Stationary
AS	-1.81	-3.60	non Stationary
RER	0.33	-3.60	non Stationary
Stationary at first difference			
LRGDP	-4.55*	-3.60	Stationary
LRGE	-6.81*	-3.60	Stationary
LRRE	-10.35*	-3.60	Stationary
OT	-5.35*	-3.60	Stationary
PD	-4.36*	-3.60	Stationary
AS	-4.80*	-3.60	Stationary
RER	-8.11*	-3.60	Stationary

*, ** represent 1%, 5% level of significance respectively with intercept.

5.2. Cointegration Test

Table 2: BOUND Test

Equations	F-calculated	%1		5%		10%			Decision
		I0	I1	I0	I1	I0	I1	K	
result bond test for the first model									
LRGDP=f [LRGE, LRRE]	**8.42**	**4.13**	**5**	**3.1**	**3.87**	**2.63**	**3.35**	**2**	**Co-integration**
LRGE=f [LRGDP, LRRE]	5.19	4.13	5	3.1	3.87	2.63	3.35	2	Co-integration
LRRE=f [LRGE,LR	3.73	4.13	5	3.1	3.87	2.63	3.35	2	Co-integration

GDP]									
result bond test for the second model									
LRGDP=f [LRGE, LRRE, OT, PD, RER, AS]	**27.48**	**2.88**	**3.99**	**2.27**	**3.28**	**1.99**	**2.94**	**6**	**Co-integration**
LRGE=f [LRGDP, LRRE, OT, PD, RER, AS]	22.51	2.88	3.99	2.27	3.28	1.99	2.94	6	Co-integration
LRRE=f [LRGE, LRGDP, OT, PD, RER, AS]	12.82	2.88	3.99	2.27	3.28	1.99	2.94	6	Co-integration
OT=f [LRGE, LRRE, LRGDP, PD, RER, AS]	33.51	2.88	3.99	2.27	3.28	1.99	2.94	6	Co-integration
PD=f [LRGE, LRRE, OT, LRGDP, RER, AS]	51.02	2.88	3.99	2.27	3.28	1.99	2.94	6	Co-integration
RER=f [LRGE, LRRE, OT, PD, LRGDP, AS]	49.83	2.8	3.99	2.27	3.28	1.99	2.94	6	Co-integration
AS=f [LRGE, LRRE, OT, PD, RER, LRGDP]	19.82	2.88	3.99	2.27	3.28	1.99	2.94	6	Co-integration

* ***Source:*** Prepared by the researcher using a program Eviews.

Meanwhile all variables of the study were still at the level and become Stationary when the first difference I(1), the results of the bond test shown in the table above that the variables in the previous models have long-term relationships by comparing the value of F-calculated with the bond, and therefore do not accept the null hypothesis. Therefore, we do not accept the null hypothesis, which states that there is no co-integration, which showed that the value of F-calculated is higher than the higher value (I1) in the first model and the second model. Therefore, we reject the zero hypotheses that there is no co-integration between the study variables, and this indicates the existence of a long-term relationship between the study variables.

5.3. Multicollinearity by Using Correlation Matrix Test

Table 3: Correlation Matrix

	LRGDP	LRGE	LRRE	OT	PD	RER	AS
LRGDP	100%	98%	98%	33%	-6%	27%	-82%
LRGE	98%	100%	97%	37%	-10%	20%	-71%
LRRE	98%	97%	100%	43%	-3%	33%	-79%
OT	33%	37%	43%	100%	-10%	32%	-15%
PD	-6%	-10%	-3%	-10%	100%	66%	-8%
RER	27%	20%	33%	32%	66%	100%	-47%
AS	-82%	-71%	-79%	-15%	-8%	-47%	100%

*** *Source:*** Prepared by the researcher using a program Eviews.

Through the results of Table (3), it is clear there is a problem Multicollinearity between the independent variables in the model, and that between government spending and public revenue, because the value correlation coefficient has reached (97%), and to solve this problem, a variable has been separated government spending and public revenue, as it appears from Table (3) when excluding the public revenue variable that the highest percentage of correlation between independent variables in the model is (71%). Therefore, there is no problem with Multicollinearity, which is a good and desirable quality in the model.

5.4. Estimate the model

After the results of the preliminary statistical tests showed that the variables stationary, the first difference, I (1), showed the existence of a co-integration between the variables in the long term, the model estimate using the ARDL. Note that the fiscal multiplier of government expenditure was estimated first, and then the fiscal multiplier of public revenues was estimated separately because of the problem of multiple linear correlations between two variables in the model (Multicollinearity Problem), which can lead to misleading and unrealistic results.

First, Estimate the fiscal multiplier of government expenditure:

Table 4: The results of long and short-term estimate by using the method (ARDL)

	(1) Short term Coefficient			
Variable	Coefficient	Std. Error	T-statistic	Prob.
D(LRGDP(-1))	0.216988	0.146171	1.484477	0.1481
D(LRGDP(-2))	0.28623***	0.144595	1.979528	0.0570
D(LRGE)	0.474369*	0.083342	5.691854	0.0000
D(LRGE(-1))	-0.143401	0.110132	-1.302087	0.2028
D(LRGE(-2))	-0.173544***	0.101449	-1.710658	0.0975
D(LRGE(-3))	-0.339926*	0.081668	-4.162293	0.0002
CointEq(-1)*	-0.300002*	0.070235	-4.271425	0.0002
Diagnostic tests				
R-squared	0.605574		S.E. of regression	0.040542
Adjusted R2	0.531619			

(2) long term Coefficient				
C	-0.893813***	0.451259	-1.980711	0.0569
LRGE	1.260327*	0.059083	21.331420	0.0000
Diagnostic tests				
R-squared	0.994454		S.E. of regression	0.041871
Adjusted R2	0.992975		F-statistic	672.3614 [0.000]
Estimate the size of the fiscal multiplier				
Short-run Elasticity	0.47			
Long-run Elasticity	1.26			
G/GDP in Average	0.35			
Short-run Multiplier	1.34			
Long-run Multiplier	3.60			

Note: *,**,*** represent 1%, 5%,10% level of significant respectively.
* ***Source****:* Preparing the researchers by analyzing the study model using Eviews.

The value of the fiscal multiplier for government expenditure in the short and long term was set at (1.34) and (3.60), respectively, as shown in table (4). This means that if government expenditure in the short-term increases by (1) dinars, then the real gross domestic product will increase by (1.34). In other words, the increase in real government spending by approximately (0.75) dinars leads to an increase in real GDP by (1) Dinar. For the long term, if government expenditure increases by (1) dinars, then the real gross domestic product increases by (3.60) Dinars. In other words, an increase in real government expenditure by (0.28) dinars almost lead to an increase in real GDP by (1) Dinar. The results have shown that they are consistent with the assumption of economic theory. The results of this study are consistent with the positive effect of the multiplier with a study (Ilzetzki et al. 2013; Sarangi et al. 2015).

Second, Estimate the fiscal multiplier of government expenditure with all variable's determinants:

Table 5: The results of long and short-term estimate by using the method (ARDL)

(1) Short term Coefficient				
Variable	Coefficient	Std. Error	T-statistic	Prob.
D(LRGDP(-1))	-0.239005	0.135672	-1.761635	0.1059
D(LRGDP(-2))	0.171267*	0.042097	4.068443	0.0019
D(LRGDP(-3))	0.165318*	0.042863	3.85693	0.0027
D(LRGE)	0.981298*	0.035846	27.37527	0.0000
D(LRGE(-1))	0.237736	0.138154	1.720802	0.1133
D(LRGE(-2))	-0.060996**	0.026231	-2.325314	0.0402
D(LRGE(-3))	-0.05338**	0.019835	-2.691166	0.0210
D(OT)	-0.050613**	0.018858	-2.683909	0.0213
D(OT(-1))	0.08901**	0.029527	3.014524	0.0118
D(OT(-2))	0.072494*	0.021054	3.443176	0.0055
D(OT(-3))	0.069964*	0.018906	3.700561	0.0035
D(PD)	-0.009348	0.013399	-0.697634	0.4999

D(PD(-1))	-0.02966**	0.014119	-2.100758	0.0595
D(PD(-2))	0.018561	0.011669	1.590569	0.1400
D(PD(-3))	0.038785*	0.010817	3.585496	0.0043
D(RER)	-0.07446	0.054247	-1.372621	0.1972
D(RER(-1))	0.031673	0.064774	0.488976	0.6345
D(RER(-2))	-0.201073**	0.074828	-2.68712	0.0211
D(RER(-3))	-0.22454*	0.068786	-3.26433	0.0075
D(AS)	-2.501392*	0.118737	-21.06667	0.0000
D(AS(-1))	-0.700732***	0.341931	-2.049337	0.0650
CointEq(-1)*	-0.838892*	0.173262	-4.841765	0.0005
Diagnostic tests				
R-squared	0.995161		S.E. of regression	0.006161
Adjusted R2	0.989182			
(2) long term Coefficient				
C	1.733511*	0.247596	7.001367	0.0000
LRGE	1.039007*	0.026203	39.65245	0.0000
OT	-0.164465**	0.068371	-2.40548	0.0349
PD	0.011861	0.012672	0.936007	0.3694
RER	0.018302	0.071776	0.254991	0.8034
AS	-2.529747*	0.215875	-11.71857	0.0000
Diagnostic tests				
R-squared	0.999932		S.E. of regression	0.007659
Adjusted R-2	0.999765		F-statistic	5986.267[0.000]
Estimate the size of the fiscal multiplier				
Short-run Elasticity			0.98	
Long-run Elasticity			1.04	
G/GDP in Average			0.35	
Short-run Multiplier			2.80	
Long-run Multiplier			2.97	

Note: *,**,*** represent 1%, 5%,10% level of significant respectively.

*** *Source:*** Preparing the researcher by analyzing the study model using Eviews.

The fiscal multiplier for government expenditure in the short and long term by about (2.80) and (2.97), respectively, as shown in Table (5), meaning that if real government expenditure in the short term increases (1) dinar, then the real GDP increases by (2.80) dinar, in other words, the increase in real government expenditure by (0.35) dinar increases the real GDP by (1) Dinar. As for the long term, if the government expenditure increases (1) dinar, the real GDP increases by (2.97). In other words, the increase in real government expenditure by (0.34) dinar leads to an increase in the real GDP by (1) Dinar. It is noted from previous results that the size of the fiscal multiplier in the short term without any determinants that do not conform to economic theory, and the reason for this is due to the presence of variable size of automatic stabilizers (the ratio of government spending to GDP) which Increases the size of the fiscal multiplier most of the short only, and also notes that the size of the government spending multiplier is lower in the long term with determinants. These are consistent with economic theory and with a study (Ilzetzki et al., 2013).

The fiscal multiplier of public revenues was estimated separately from the fiscal multiplier of government expenditure because of the multicollinearity problem between independent variables

in the model between government expenditure and public revenue, so the value of the correlation (97%) [Table 3]. To solve this problem, the fiscal multiplier of public revenues was estimated by excluding the government spending variable from the model. The fiscal multiplier for public revenues is estimated at (1.17) and (4.10), respectively, in the short and long term. When adding the determinants of the study, such as trade openness, public debt, the exchange rate, and the size of automatic stabilizers, the multiplier revenues decrease to (0.80) and (3.97) in the short and long term. When comparing the government expenditure multiplier with the public revenue multiplier, the public revenue multiplier appears to be less than the government expenditure multiplier in the short term. In the long term, the public revenue multiplier is higher than the government expenditure multiplier. The government expenditure multiplier is estimated to be: (1.34) and (3.60), respectively, in the short and long term.

It also appears that if the determinants are present, the public revenue multiplier in the short term is less than the value of the government expenditure multiplier. In contrast, in the long term, the value of the public revenue multiplier is higher than the value of the government expenditure multiplier, where the multiplier government expenditure was estimated (2.80) and (2.97), respectively, in the short and long term.

Third, Estimate the fiscal multiplier of public revenues:

Table 6: The results of long and short-term estimate by using the ARDL

(1) Short term Coefficient				
Variable	Coefficient	Std. Error	T-statistic	Prob.
D(LRGDP(-1))	0.250286	0.154363	1.621406	0.11800
D(LRGDP(-2))	0.360413**	0.160444	2.246346	0.03420
D(LRGDP(-3))	-0.070124	0.171100	-0.409841	0.68560
D(LRGDP(-4))	0.226222	0.146824	1.540768	0.13650
D(LRGDP(-5))	0.291168**	0.126837	2.295607	0.03070
D(LRRE)	0.350581*	0.097083	3.611145	0.00140
D(LRRE(-1))	-0.101881	0.137656	-0.740115	0.46640
D(LRRE(-2))	-0.122831	0.113768	-1.079661	0.29100
D(LRRE(-3))	-0.232282***	0.113790	-2.041320	0.05240
D(LRRE(-4))	-0.234695**	0.092434	-2.539069	0.01800
CointEq(-1)*	-0.474509*	0.114941	-4.128296	0.00040
Diagnostic tests				
R-squared	0.665071		S.E. of regression	0.041163
Adjusted R-2	0.536252			
(2) long term Coefficient				
C	-0.551295	0.324578	-1.698498	0.10230
LRRE	1.227019*	0.043774	28.030580	0.0000
Diagnostic tests				
R-squared	0.994746		S.E. of regression	0.042844
Adjusted R-2	0.992119		F-statistic	378.6648[0.000]

Note: *,**,*** represent 1%, 5%,10% level of significant respectively.

Fourth, Estimate the fiscal multiplier of public revenues with all variable's determinants:

Table 7: The results of long and short-term estimate by using the method (ARDL)

(1) Short term Coefficient				
Variable	Coefficient	Std. Error	T-statistic	Prob.
D(LRGDP(-1))	-0.254635*	0.076764	-3.317125	0.0025
D(RER)	0.244091**	0.096464	2.530395	0.0171
D(RER(-1))	-0.617126*	0.097648	-6.31991	0.0000
D(AS)	-0.642611*	0.13561	-4.738677	0.0001
D(AS(-1))	-0.238837***	0.128599	-1.857216	0.0735
CointEq(-1)*	-0.241891*	0.02038	-11.86894	0.0000
Diagnostic tests				
R-squared	0.868555		S.E. of regression	0.022466
Adjusted R-2	0.849777			
(2) long term Coefficient				
C	0.197650	1.196341	0.165212	0.8699
LRRE	1.189909*	0.108201	10.9972	0.0000
OT	-0.133932	0.237411	-0.564136	0.5770
PD	-0.284535*	0.101085	-2.814795	0.0087
RER	0.179059	0.414645	0.431838	0.6691
AS	-0.076226	1.147375	-0.066435	0.9475
Diagnostic tests				
R-squared	0.998383		S.E. of regression	0.024681
Adjusted R-2	0.997770		F-statistic	1,627.803[0.000]

Note: *,**,*** represent 1%, 5%,10% level of significant respectively.

5.5. Diagnostic Tests

First: To ensure the efficiency of the used model and that it is not an econometrics problem, the following tests were performed.

Table 8: Diagnostic Tests

Equation	Diagnostic Test	Test Statistic	Prob.
LRGDP=F(LRGE)	Serial Correlation (Breusch-Godfrey Test)	F-statistic = 0.6303	Prob. F (2,28) = 0.5398
	Heteroscedasticity (Breusch-pagan-Godfrey Test)	F-statistic = 0.9553	Prob. F (8,30) = 0.4881
	Jarque-Bera Test	Jarque-Bera = 0.000664	Prob.=14.6352
LRGDP=F(LRGE,OT,PD, RER,AS)	Serial Correlation (Breusch-Godfrey Test)	F-statistic = 0.6792	o F (2,9) = 0.5312
	Heteroscedasticity (Breusch-pagan-Godfrey Test)	F-statistic = 0.5723	Prob. F (27,11) = 0.8843
	Jarque-Bera Test	Jarque-Bera = 2.2179	Prob. = 0.3298
LRGDP=F (LRRE)	Serial Correlation (Breusch-Godfrey Test)	F-statistic = 0.7420	F (2,35) = 0.4835
	Heteroscedasticity (Breusch-pagan-Godfrey Test)	F-statistic = 2.0133	b. F (3,37) = 0.1289
	Jarque-Bera Test	Jarque-Bera = 37.1313	Prob. = 0.0000
LRGDP=F(	Serial Correlation	F-statistic = 0.3162	ɔb. F (2,11) = 0.7353

Equation	Diagnostic Test	Test Statistic	Prob.
LRRE,OT,PD ,RER,AS	(Breusch-Godfrey Test) Heteroscedasticity (Breusch-pagan-Godfrey Test)	F-statistic = 0.7633	b. F (25,13) = 0.7288
	Jarque-Bera Test	Jarque-Bera = 0.3084	Prob. = 0.8570

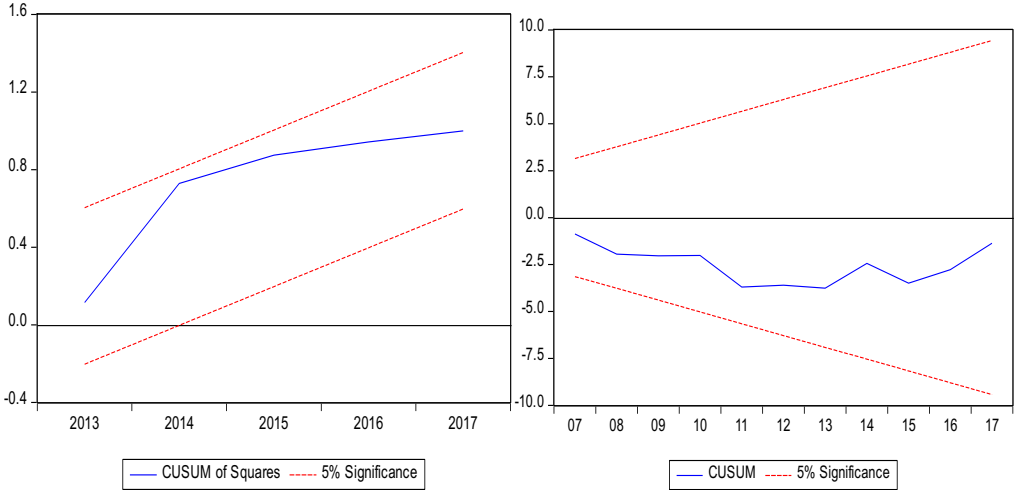
*** *Source:*** Prepared by the researcher using a program Eviews.

The results of Table (8) show that the four models were not a problem of Serial Correlation since the value of F-statistic was greater than 5%, so it is accepted the null hypothesis that there is no problem with Serial Correlation between Errors. Besides, they were also not a problem with the stability error variance Homoscedasticity, as the value of F-statistic was greater than 5%. It should be noted that the null hypothesis can be accepted that there is no problem with Homoscedasticity. The results also show that the four models were not the problem of normal distribution since the probability value of the Jarque-Bera test was greater than 5%, and therefore the remainder of the model follows the normal distribution.

Second: To reveal the stability of the parameters of the model, the accumulated residual path test (Test Cusum) and (Cusum of Squares) must be performed.

After performing the two tests, it was found that the error limit value falls within the critical limits and at a significant level (5%). This means that the variables are stable during the time used in the study, and there is no need to divide the time into partial periods (Malawi, 2006). As shown in the following figures:

Figure 2: CUSUM OF SQUARES Test & CUSUM Test



6. CONCLUSIONS

There is a direct statistically significant relationship between real government expenditure and real GDP, where the coefficient government expenditure in the short and long term (0.47 and

1.26), respectively, and the size of fiscal multiplier for government expenditure in the short and long term (1.34 and 3.60) respectively. The results showed an increase in the size of the fiscal multiplier for government expenditure in the short term when adding the determents of study: trade openness, public debt, exchange rate, and the size of automatic stabilizers, as the size of government expenditure multiplier in the short term was estimated at (2.80), but in the long term it decreased multiplier size to (2.97). Also, there is a direct statistically significant relationship between real public revenues and real GDP, where the size of the coefficient public revenue in the short and long term is (0.35 and 1.23), respectively, and the size of the public revenue multiplier in the short and long term was estimated at (1.17 and 4.10) respectively, the results showed a decrease in the size of the fiscal multiplier for public revenues in the short and long term when adding the determents of study. The size of the public revenue multiplier in the short term was estimated at (0.80), but in the long-term multiplier decreased to (3.97).

The government should work to increase government capital expenditures and incurring additional debt for a short period, to spend on infrastructure, investment, and production projects, which will reflect positively on economic growth in the long term, at the same time working to attract new investments as well as working to develop an industrial base to encourage exports, buy national products by individuals, companies, and the government itself, and reduce the volume of imports of luxury goods as much as possible. Future researchers are encouraged to conduct studies to know and measure the effectiveness of both spending and revenues on economic growth by introducing functional and economic divisions.

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Appendix

Appendix 1: The data used in the econometric analysis

Year	Real GDP	Public debt	Real government expenditure	Real public revenue	Log real GDP	Log Real government expenditure	Log Real public revenue
1975	2,134.7	127.6	953.0	897.1	7.67	6.86	6.80
1976	2,497.5	209.0	1,123.5	765.1	7.82	7.02	6.64
1977	2,652.6	270.0	1,250.6	1016.2	7.88	7.13	6.92
1978	2,853.2	380.8	1,259.1	861.6	7.96	7.14	6.76
1979	3,090.5	491.6	1,580.0	1252.5	8.04	7.37	7.13
1980	3,298.2	606.8	1,527.4	1233.1	8.10	7.33	7.12
1981	3,805.7	785.6	1,639.8	1373.1	8.24	7.40	7.22
1982	4,038.5	962.5	1,651.7	1375.1	8.30	7.41	7.23
1983	4,160.5	1151.9	1,555.8	1396.0	8.33	7.35	7.24
1984	4,286.2	1332.0	1,510.1	1191.1	8.36	7.32	7.08
1985	4,292.6	1472.3	1,654.1	1409.6	8.36	7.41	7.25
1986	4,879.4	1581.9	1,794.8	1461.1	8.49	7.49	7.29
1987	4,989.6	1840.4	1,909.5	1476.7	8.52	7.55	7.30
1988	4,803.0	4758.7	2,171.6	1474.5	8.48	7.68	7.30
1989	3,949.0	6404.4	1,616.1	1392.9	8.28	7.39	7.24
1990	3,867.1	6101.7	1,446.3	1314.1	8.26	7.28	7.18
1991	3,829.4	6020.4	1,637.4	1446.0	8.25	7.40	7.28
1992	4,496.5	5619.1	1,608.1	1692.1	8.41	7.38	7.43
1993	4,683.5	5373.4	1,611.7	1695.4	8.45	7.39	7.44
1994	5,074.4	5901.8	1,738.3	1790.2	8.53	7.46	7.49
1995	5,363.9	5877.9	1,825.8	1843.0	8.59	7.51	7.52
1996	5,245.9	6158.9	1,822.9	1840.5	8.57	7.51	7.52
1997	5,326.6	5912.3	1,953.6	1680.5	8.58	7.58	7.43
1998	5,643.2	6485.7	2,040.7	1711.4	8.64	7.62	7.45
1999	5,778.2	5664.1	1,956.3	1815.9	8.66	7.58	7.50
2000	5,959.3	6278.5	1,957.2	1838.1	8.69	7.58	7.52
2001	6,210.9	6121.5	2,072.5	1920.6	8.73	7.64	7.56
2002	6,511.7	6685.3	2,129.4	1932.7	8.78	7.66	7.57
2003	6,769.4	7095.5	2,287.1	2213.1	8.82	7.74	7.70
2004	7,383.0	7182.3	2,674.6	2568.0	8.91	7.89	7.85
2005	7,853.5	7493.7	2,731.5	2695.9	8.97	7.91	7.90
2006	8,840.0	7349.6	3,196.7	2872.4	9.09	8.07	7.96
2007	9,591.0	8199.6	3,589.3	3139.7	9.17	8.19	8.05
2008	10,816.4	8551.3	3,767.9	3533.2	9.29	8.23	8.17
2009	11,820.4	9660.2	4,214.9	3160.0	9.38	8.35	8.06
2010	12,507.8	11462.3	3,805.3	3108.4	9.43	8.24	8.04
2011	13,104.8	13401.7	4,349.7	3464.7	9.48	8.38	8.15
2012	13,449.7	17610.4	4,211.6	3094.7	9.51	8.35	8.04
2013	13,930.6	20674	4,133.4	3363.4	9.54	8.33	8.12
2014	14,439.1	22651.6	4,456.6	4125.3	9.58	8.40	8.32
2015	15,254.7	24876.8	4,422.8	3892.0	9.63	8.39	8.27
2016	15,841.9	26092.7	4,587.9	4080.6	9.67	8.43	8.31
2017	15,891.4	27269.2	4,565.6	4147.7	9.67	8.43	8.33
Average spending and revenue / average output			0.35			0.30	

Appendix 2: Follow up Appendix 1: The data used in the econometric analysis

Year	Automatic stabilizers	Real exchange rate	Public debt/GDP	trade openness	CPI 1999= 100
1975	0.45	0.52	0.29	0.65	0.2042
1976	0.45	0.50	0.37	0.72	0.2271
1977	0.47	0.44	0.39	0.78	0.2603
1978	0.44	0.41	0.48	0.69	0.2788
1979	0.51	0.40	0.50	0.72	0.3179
1980	0.46	0.43	0.52	0.76	0.3532
1981	0.43	0.49	0.54	0.89	0.3807
1982	0.41	0.50	0.58	0.85	0.4085
1983	0.37	0.52	0.64	0.73	0.4294
1984	0.35	0.57	0.70	0.71	0.4455
1985	0.39	0.52	0.75	0.70	0.4590
1986	0.37	0.49	0.71	0.49	0.4592
1987	0.38	0.49	0.80	0.54	0.4583
1988	0.45	0.69	2.03	0.60	0.4892
1989	0.41	0.79	2.64	0.77	0.6142
1990	0.37	0.74	2.21	0.85	0.7139
1991	0.43	0.71	2.04	0.78	0.7725
1992	0.36	0.72	1.56	0.79	0.8030
1993	0.34	0.74	1.38	0.81	0.8293
1994	0.34	0.73	1.35	0.72	0.8587
1995	0.34	0.73	1.25	0.76	0.8790
1996	0.35	0.71	1.25	0.83	0.9362
1997	0.37	0.71	1.15	0.77	0.9645
1998	0.36	0.70	1.16	0.67	0.9941
1999	0.34	0.71	0.98	0.64	1.0000
2000	0.33	0.73	1.05	0.72	1.0066
2001	0.33	0.74	0.96	0.76	1.0246
2002	0.33	0.73	0.98	0.76	1.0434
2003	0.34	0.73	0.98	0.80	1.0679
2004	0.36	0.73	0.89	1.00	1.0959
2005	0.35	0.73	0.84	1.12	1.1365
2006	0.36	0.71	0.69	1.04	1.2076
2007	0.37	0.70	0.68	1.06	1.2649
2008	0.35	0.64	0.55	1.06	1.4416
2009	0.36	0.64	0.57	0.81	1.4308
2010	0.30	0.62	0.61	0.81	1.5000
2011	0.33	0.61	0.65	0.89	1.5625
2012	0.31	0.60	0.80	0.89	1.6332
2013	0.30	0.58	0.87	0.86	1.7122
2014	0.31	0.57	0.89	0.84	1.7617
2015	0.29	0.58	0.93	0.73	1.7462
2016	0.29	0.59	0.95	0.66	1.7324
2017	0.29	0.58	0.96	0.67	1.7902

Appendix 3: Method for estimating the size of the fiscal multiplier for government expenditure and public revenues

To estimate fiscal multiplier by following these steps:
1- Estimate the elasticity of government expenditure and public revenues in the short and long term using the (ARDL) approach.
2- Divide the average government expenditure or public revenues by the average gross domestic product during the study period.
3- To derive the size of the fiscal multiplier through elasticity, the elasticity estimated by the average spending or revenues is divided from the average gross domestic product.
(d ln RGDP/ d ln RGE) =($dRGDP/ d$RGE) * (RGE_{Ave} / $RGDP_{Ave}$)…
(dRGDP/ dRGE)= (d ln RGDP/ d ln RGE)/ (RGE_{Ave} / $RGDP_{Ave}$)…
whereas:
RGDP: real GDP. RGE: Real government expenditure. Ave: Average. (dRGDP / dRGE) = fiscal multiplier for government expenditure. (d ln RGDP / d ln RGE) = elasticity of government expenditure