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The Impact of Public Debt and Public Investment on Economic Growth in Jordan

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Abstract

This study aimed to examine the impact of public debt and public investment on economic growth in Jordan for the period 1990-2017. The study used multiple linear regression to examine the study hypotheses. The study found that public debt has a negative and statistically significant impact on economic growth in Jordan, where the coefficient of effect is -0.11, i.e., with the stability of other factors, the increase of public debt by 1% leads to a decrease in economic growth in Jordan by -0.11%. While public investment has a positive and statistically significant impact on economic growth in Jordan The coefficient of impact is 0.10, i.e., with the stability of other factors, the increase of public investment by 1% leads to an increase in economic growth in Jordan by 0.10%. The study reached a number of recommendations, the most important of which is work to limit the expansion of public debt and reduce it to reduce its negative impact on economic growth in Jordan.

Key words

Public debt, public investment, economic growth, Jordan

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1. Introduction

Economic growth is one of the basic objectives that countries seek to achieve. It is one of the prerequisites for improving the standard of living of societies. It is also an important indicator of economic well-being. Economic growth is thus linked to a number of basic factors in society; these factors include the availability of high-efficiency institutions and appropriate economic, political, monetary and financial decisions. Economic growth is of great importance to countries because it supports a large number of important sectors in the country such as education and health. It also contributes to support the balance of payments, increase the level of income and contribute effectively to solving the problem of unemployment. There are many factors that affect economic growth, including public debt and public investment.

Public debt is an important source of public revenue, and is used by many countries when they are unable to cover their expenses and repayment of all loan installments and interest, so they suffer from the debt crisis. Public debt is divided into external public debt and internal public debt, and external public debt has the largest share of the country's economic policies.

On the other hand, public investment plays an influential and positive role in the economy of the country, where many countries resort to solving some of their economic problems such as poverty and unemployment. Public investment drives the wheel of development to achieve economic progress and development and is considered an economic activity that cannot be treated as a mere form in which it must be dealt with within the framework of the social and economic system.

This study seeks to examine the impact of public debt and public investment on economic growth in Jordan for the period 1990-2017. The study is arranged as follow: Section 1, Introduction, study importance, study problem and study objectives, section 2, literature review, section 3 data and methodology, section 4 Statistical Analysis and Discussion of Results and section 5 conclusions and recommendations.

1.1. Study Importance

The importance of the study is coming from the importance of economic growth, public debt and public investment in Jordan, in addition to trying to reach conclusions and recommendations that would benefit economic and political decision-makers in developing policies and strategies that contribute to improving economic growth.

1.2. Study problem

Jordan suffers from constant fluctuations in the economic growth of Jordan as in other developing countries due to many internal and external variables such as public debt and public investment. This study seeks to answer the following questions:

- What is the impact of public debt on economic growth in Jordan?
- What is the impact of public investment on economic growth in Jordan?

1.3. Study Objectives

This study aims to achieve the following objectives:

1. Measuring the impact of public debt on economic growth in Jordan.
2- Measuring the impact of public investment on economic growth in Jordan.

2. Literature review

2.1. Economic Growth

There are many developments that have improved the social and economic situation of many countries in the world, which seeks to operate and develop their economic systems in order to achieve economic growth as it is the most important goals, among these developments are the multiplicity of technological means, the development of various tools and devices in various agricultural and industrial fields; in addition to, scientific progress. The more these developments, the greater the desire to raise levels of growth and rates in production and consumption, which is important for all countries (Aziri, 2017). Economic growth is of great importance to all countries for their contribution to income growth, which provides significant assistance to a group of institutions and companies of these countries to achieve self-sufficiency and improve the living conditions of individuals, and growth contributes to providing the basic needs of society at the lowest prices to become available to all. It also supports many important sectors in the country, such as education and health, as well as balance of payments support. Economic growth also preserves available resources and uses them in a way that ensures their long-term survival and reduces the budget deficit. It increases income, improves individual incomes, reduces unemployment, and improves social life (Ranis, 1997).

2.2. The Relationship between Public Debt and Economic Growth

Public debt is an important source of public revenue and is used by many countries when they are unable to cover their expenses and repay all loan installments and benefits. There are two types of public debt: external public debt and internal public debt, and external public debt has the greatest impact on the economic policies of the state (Ogunlana, 2004).

Public debt has a major impact on the national economy. This effect depends on the source of public debt if the source of debt is internal or external. The State is borrowing from abroad when revenues are unable to cover expenditures, this debt can be used to finance investments that domestic savings are unable to absorb purchasing power. Keynes believes that the state sometimes resorts to borrowing to meet

investment costs that raise the productivity of the economy and increase the income of individuals, and this leads to an increase in tax revenues and thus the state will not have to impose new taxes (Fair, 2008).

The state is borrowing to fill the deficit in the general budget or to increase the level of expenditure and increase economic activity, as well as to finance development projects, and to cope with the bad economic phenomena in the modern economy such as monetary inflation. This is achieved by absorbing the additional monetary mass that increases demand, raises prices, reduces unemployment, achieves economic balance and access to social justice, provides the debtor country with rare foreign exchange, and if linked to savings resources can increase investments and develop available country resources (Al khateeb and Shamieh, 2003).

Public debt is diversified according to several criteria on which it is based, and it is possible to distinguish between external public debt and domestic public debt (Masadeh and Ugla 2010). Domestic public debt is the debt that comes from within the state and is contracted through debt instruments such as government bonds and treasury bills (Matthew, 2016). The internal public debt affects the macroeconomic variables in the country, such as the general level of prices, interest rates, investment, GDP and other economic variables (Barakat, 1983). An external public debt is an agreement between the government and one of its institutions with an external source to obtain funds with a pledge to repay such amounts and interest thereon within a period of time agreed upon in the loan contract (Zaki, 1978). The external borrowing of the State results in several effects, including the positive and the negative (Weinstein, 1993).

The positive effects of external public debt are summarized in the fact that they contribute to the redistribution of economic resources, so as to increase investment and production by increasing imports and increasing capital formation through the importation of capital goods. The negative effects of public debt are that excessive public debt creates problems for the state, especially if these loans are used in non-productive activities where public debt increases the tax burden on the members of society. External loans, in particular, lead to an increase in trade and current account deficits, resulting in an imbalance in the balance of payments. So the State uses the foreign reserve to cover the debt burden, thus reducing the balance of foreign reserves in the State. This is in addition to the increase in the budget deficit, where the public debt service works to deduct part of the country's GDP and increase the public expenditure of the state compared with its revenues, thus increasing the budget deficit (Saleh, 2005).

2.3.The Relationship between Public Investment and Economic Growth

Public investment means what is spent by the state to buy investment goods used to establish public projects, and aims to increase capital formation in society (Taher, 1984) The public investment is in all areas of expenditure, which aim to raise the productive capacity of the state and improve the standard of living of citizens (Al-Sharh *et al.,* 1999).

The role played by public investment in economic life is important and effective because it is an essential element in the development of the productive system and the improvement of economic growth. Therefore, the distribution of investment and the volume indicates the course of economic growth, whether it increases or decreases and its relation to income and inventory. It is well known that active public investment requires the existence of enterprises with a high capacity to exploit opportunities either by establishing new projects or expanding existing ones. Investment has always been considered the main engine of the economic wheel in developing countries and the main reason for the development of developed countries (Everhat and Sumlinski, 2001).

The importance of public investment comes from its contribution to reducing unemployment and improving infrastructure such as bridges, roads and public transportation networks, completion of projects with economic objectives, economic and social growth, ensuring a stable economic environment in society, increasing national income and increasing the national revolution w here investment increases economic resources and revenues (Abu-Ismail, 1999; Black and Lyuch, 1996; Abdullah, 2015). In this regard, Al-Wadi and Al-Issawi (2007) believe that public investment is one of the elements of total expenditure. It is considered one of the most important and effective elements to increase economic activity. It also stimulates private investment and the development of productive sectors. Thus, the process of economic and social growth is based on public investment, especially in developing countries, and there are many

determinants that restrict public investment, population size, national income, and available financing resources.

2.4. Empirical Evidence

Shukri and Sator (2017) examined the effect of diversification of government investments on economic growth in Algeria for the period 1990-2016, and used the multiple linear regression and the OLS method to test the effect of independent variables on economic growth in Algeria, and found that the diversification of government investment has a positive and statistically significant impact on economic growth in Algeria.

Al-Adayla and others (2015) examined the effect of the public debt structure on the economic growth in Jordan for the period 1980-2012, and used the co-integration and the error correction model and the OLS method to examine the effect of the independent variables on economic growth. The study concluded that the external public debt has a negative and statistically significant impact on the economic growth in Jordan while the domestic public debt has a positive impact and a statistical indication of economic growth in Jordan, and the researchers recommended the need to review legislation on foreign borrowing operations and the need to invest in productive projects to reduce the burden of debt on the State.

Aziri (2017) testing the effect of public investment on economic growth in Macedonia for the period 2003-2014. The study used the simple linear regression model and the method of OLS to test the hypothesis of the study. The study concluded that public investment has a positive and statistically significant impact on economic growth. The study recommended that public investments in the long term, such as productive investment, investment in infrastructure, power stations, education, health and technology, should increase growth.

Matthew and Mordecai (2016) examining the effect of public debt on the economic development of Nigeria for the period (2014-1986). This study was based on the test of the co-integration of study variables. This study concluded that there is a long-term relationship between public debt and economic growth in Nigeria. Foreign affairs have no role in the process of developing the economy due to embezzlement, so the government should reduce the size of external debt to avoid increasing its size over time.

Almada and Juarez (2016) investigated the effect of public debt and public investment on economic growth in Mexico, where the simple regression model and the (OLS) method were used. The study concluded that public debt is positively correlated with public investment, which has a positive effect on economic growth in Mexico. The study recommended that the legal framework on public debt should be reformed to improve economic growth.

Rabnawaz and Jafar (2016) examined the impact of public investment on economic growth in Pakistan for the period 1980-2009.They used multiple linear regression. The data were collected from the main sources of the Research Institute, the Central Bank of Pakistan and the Pakistan General Statistics Center. This study found a positive relationship between the output GDP and public investment. There is also a positive relationship between them, which was that any increase in any party would result in an increase in the other party.

It is noted from previous studies that the overall examined the effect of public debt on economic growth and public investment on economic growth. Most of the studies used simple linear regression. The results of these studies showed the positive effect of public debt and public investment on growth.

The present study is examined the impact of public debt and public investment on economic growth in Jordan. This study is an extension of previous studies and provides additional proof from a developing country, Jordan.

3. Methodology of research

3.1. Data

Secondary sources were used: the Central Bank database and the Jordanian Department of statistics to collect the study data for the period 1990-2017, the period during which the study data are available.

3.2. Study Methodology

This study uses descriptive and econometric analysis based on the methodology of the study of Almada and Juarez (2016) in Mexico.

3.3. Study model

This study was based on the following model in examining the study hypotheses:

$GGDP=B0+B_1LNP_D+B_2LNP_I+E_t$

GGDP: - Growth rate of GDP

B0: - Fixed.

- LNPD (public debt): The natural logarithm of public debt.
- LNPI: (public investment): - The natural logarithm of public investment.
- B1 + B2: - coefficients.
- E: - The error term.

Study Variables

Dependent Variable

Economic Growth in Jordan = Gdp2-Gdp1/Gdp1

Economic Growth is a set of ways that contribute to higher income through available economic resources, including all operations that are based on an increase in per capita income and to increase the quantity of goods and services in a given period of time to change all aspects of social life and to move the society into a sophisticated political and economic situation aimed at improving the infrastructure to achieve economic stability of the state.

Independent Variables

Public Debt is the sum of money that the state borrows from individuals or financial institutions, private and public or from other countries to cover their expenses and fill the budget deficit, so public debt is a source of public revenue, where the state resorted to achieve economic and social goals in the development and stability in the state.

Public Investment is the investment by which a group of public institutions that belong to the state, where these investments move the economic activity directly or indirectly, so it enters the cycle of production that affect the capital, where investment for long periods of time as construction projects, buildings, roads and others, and the main objective is to raise the productivity of projects responsible for the government.

3.4. Study Hypotheses

This study examines the following hypotheses:

$H_0$1 There is no statistically significant effect at the level of ($\alpha \leq 0.05$) of the public debt on economic growth in Jordan.

$H_0$2 There is no statistically significant effect at the level ($\alpha \leq 0.05$) of public investment on economic growth in Jordan.

4. Statistical Analysis and Discussion of Results

4.1. Time Series Stability Test for Study Variables

In order to test the stability of the time series of the study variables, both the Augmented Dickey Fuller (ADF) test and Phillips Peron (PP) were used to ascertain the stability of the time series. since the non-stability of the time series leads to a spurious regression results, and therefore the tests were conducted for the variables of The results in Table (1) show that all the variables are not stable at the level, where the value of the probability of both tests is greater than 5%. Thus, the null hypothesis that the existence of the root of the unit (time series instability) is accepted. Therefore, it is necessary to take the first difference for all variables and then re-test, After taking the first difference, the two tests (ADF and PP), Through the probability value which was less than 5% for both tests, thus rejecting the null hypothesis

and accepting the alternative hypothesis which states that there is no unit root, that is, the time series of the study variables has become stationary.

Table 1. Phillips Byrne Test (PP) and Dicky Fuller Developer Test (ADF)

Variable		ADF	prob	PP	prob	Result
GGDP	Level	-1.7450	0.3976	-3.8728	0.0069	unstationary
	1rst difference	-11.6274	0.0000	-11.3628	0.0000	stationary
LNPD	Level	2.8188	1.0000	2.3615	0.9999	Unstationary
	1rst difference	-3.1093	0.0382	-11.3682	0.0000	stationary
	Level	-1.7782	0.3827	-1.5787	0.3918	unstationary
LNPI	1rst difference	-7.6845	0.0000	-7.8661	0.0000	stationary

4.2. Serial Correlation Test

The Breusch-Godfrey test was used to ensure that there was no serial correlation between the errors and the results were shown in Table 2 and by the probability value, which was greater than 5%, where the null hypothesis is accepted which states that there is no serial-correlation between the errors.

Table 2. Results of Self-Correlation Test

Breusch-Godfrey Serial Correlation		Probability
F-statistic	0.955481	0.4000
Obs-R-square	2.157838	0.3400

4.3. Test the Heterogeneity of Errors

The Breusch-Pagan-Godfrey test was used, where the results in Table (3) and the probability value, which was greater than 5%, show the acceptance of the null hypothesis, which states the homogeneity of the variance of the errors.

Table 3. Results of Heterogeneity Test

Heteroskedaticity Test Breusch-Pagan-Godfrey		Probability
F-Statistic	2.018581	0.1548
Obs-R-square	3.887818	0.1431

Source: Prepared by the researcher based on EVIEWS outputs.

4.4. Test the Normal Distribution of Errors

As shown in Figure 1 and through the value of Jarque-Bera and its probability value (0.708149), which was greater than 5%, the errors are distributed naturally.

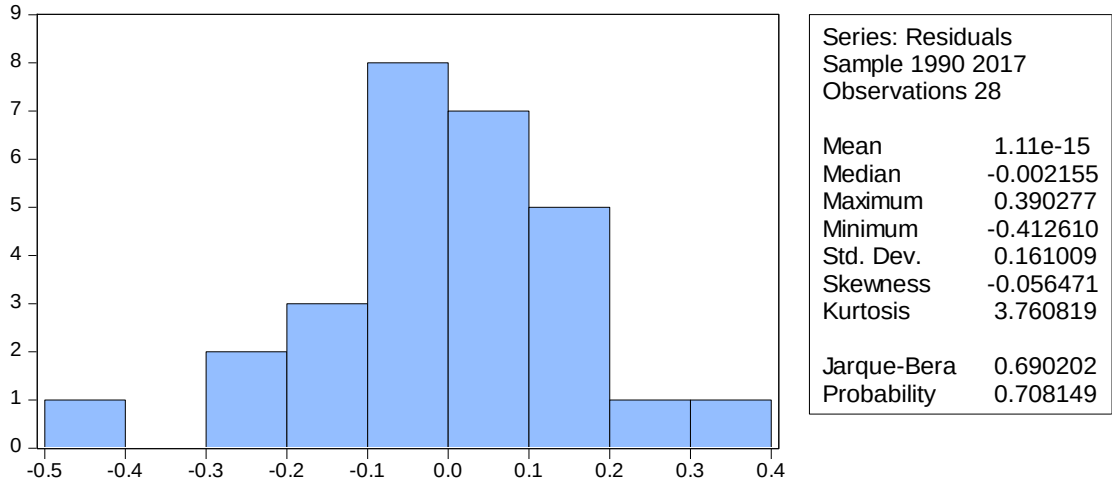

Figure 1. Normal distribution test results

Source: Prepared by the researcher based on EVIEWS outputs.

4.5. Test the Normal Distribution of Data

The tests of Kolmogorov-Smirnov and Shapiro-Wilk were used to determine if the data obtained from the study sample were distributed naturally. Kolmogorov-Smirnov and Shapiro-Wilk test showed that the data follow the normal distribution, as shown in Table 4 and the value of the probability, which was greater than 5% for both tests, and thus accept the null hypothesis that the distribution of data follows normal distribution.

Table 4. Results of Normal Distribution Test

Tests of Normality	Kolmogorov-Smirnov(a)		Shapiro-Wilk	
	Statistic	Sig.	Statistic	Sig.
Gdpg	0.39	0.290(*)	0.845	0.385
LNPD	0.254	0.207	0.749	0.372
LNPI	0.354	0.232	0.778	0.372

Source: Prepared by the researcher based on EVIEWS outputs.

4.5. Regression Results and Results Discussion

After the tribal tests required by the regression, the data is ready for analysis, and thus the impact of public debt and public investment on economic growth in Jordan can be measured.

Table 5 shows the results of the regression. The table shows a negative and significant effect of the public debt on economic growth in Jordan, where the coefficient of effect is -0.11, meaning that with the stability of the other factors, 1% of the change in public debt leads to -0.11% Of the change in economic growth in Jordan, Thus, the first hypothesis, which states that there is no statistically significant effect at the level of ($\alpha \leq 0.05$) of the public debt in economic growth in Jordan, is rejected and accept the alternative hypothesis that states there is a statistically significant impact of public debt on economic growth in Jordan.

The results showed that there is a positive and significant effect of public investment on economic growth in Jordan, where the coefficient of the effect is 0.10, i.e., with the stability of other factors, 1% of the change in public investment leads to 0.10% of the change in economic growth in Jordan, Consequently, the second sub-hypothesis, which states that there is no statistically significant effect at the level of($\alpha \leq 0.05$) for public investment in economic growth in Jordan, is rejected and the alternative hypothesis that there is a statistically significant effect of public investment in Jordan's economic growth. The result of this study is consistent with the result of Shukri and Sator (2017); Aziri (2017); Almada and Juarez (2016); Rabnawaz and Jafar (2016).

As can be seen from the value of the determinative factor R square, 31% of the changes in economic growth in Jordan are due to both public debt and public investment, as demonstrated by the value of F (5.43) and its significance that the model is valid for measuring the causal relationship between the independent variables and the dependent variable.

Table 5. Multiple Linear Regression Results

Dependent Variable: GGDP
Method: Least Squares
Date: 11/07/18Time: 18:52
Sample (adjusted): 1991 2017

	Included observations: 27 after adjustments			
Prob.	**t-Statistic**	**Std. Error**	**Coefficient**	**Variable**
0.0262	2.370243	0.176461	0.418255	C
0.0033	-3.258568	0.033975	-0.110710	LNPD
0.0066	2.976384	0.035714	0.106299	LNPI
5.434296	F-statistic		0.311701	R-squared
0.011306	Prob(F-statistic)		0.254343	Adjusted R-squared

Source: Prepared by the researcher based on EVIEWS outputs.

5. Conclusions and recommendations

5.1. Conclusions

The data analysis showed that:

1. There is a negative and significant effect of public debt on economic growth in Jordan, where the coefficient of effect is -0.11, i.e., with the stability of other factors, 1% of the change in public debt leads to -0.11% of the change in economic growth in Jordan.

2. The results showed a positive and significant effect of public investment in economic growth in Jordan, where the coefficient of impact was 0.10, i.e., with the stability of other factors, 1% of the change in public investment leads to 0.10% of the change in economic growth in Jordan.

5.2. Recommendations

Based on the findings, the study recommends that:

1. The public debt has had a negative impact on economic growth in Jordan. Therefore, the study recommends that political and economic decision-makers work to limit the expansion of public debt and work to reduce its negative effects on economic growth in Jordan.

2. The results have shown that public investment has a positive impact on economic growth in Jordan. Therefore, the study recommends that political and economic decision-makers work to expand public investment to ensure that it has a positive impact on economic growth in Jordan.

3. The study recommends that researchers undertake further studies on the impact of public debt represented by public external debt and internal public debt on economic growth in Jordan.

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