جامعة بيرزيت

BIRZEIT UNIVERSITY

The Impact of Government Expenditures on Economic Growth in Palestine (2000 Q_1-2012Q_4)

أثر النفقات الحكومية على النمو الاقتصادي الفلسطيني (الربع الأول ٢٠٠٠- الربع الرابع ٢٠١٢)

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2015

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"This thesis was submitted in partial fulfillment of the requirements for the master's degree in Economics from the faculty of graduate studies at Birzeit University, Palestine".

24/1/2015

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Acknowledgment

Thanks to God for all his blessings and for helping me achieving such accomplishment. Thanks to Dr. Fathi Srouji for his effort and time and for his valuable comments that helped forming and achieving this paper. I would like also to thank the employees of Ministry of Finance, Palestine Central Bureau of Statistics and Palestine Monetary Authority for their time and kindness in providing me with the required data for achieving this paper. Many thanks for the committee, Dr. Riyad Mosa and Dr. Mohannad Ismeil for their time and valuable comments.

Dedication

To my parents, brothers Rashad and Razi and my only beloved sister Ruba who stood by me and walked me through this long journey. To my sisters in law Raneen and Ruba. To my sweet lovely niece and joy of my life Melia. To Nadia, my cousin and best friend since childhood. No words can describe how grateful and thankful I am for God's precious gift of such supportive family.

To the soul of Dr. Bassem Makhoul, whom I consider one of my idols and who touched my heart with his kindness and responsibility towards his students. May your soul rest in peace our dear Dr. Basem Makhoul.

Abstract

Using quarterly time series data of 13 years (2000-2012), this study investigates the impact of government expenditures and their components on economic growth in Palestine. It seeks to achieve several objectives, mainly identifying the categories of government expenditures (current and capital), calculating the percentage each category forms of the total government expenditures and comparing the effect of each category on economic growth. Moreover, this study discusses several policy implications that will be addressed to the opponent parties that might benefit from such a study.

This study discusses a very important economic fiscal tool, the government expenditures. Monetary policy isn't an option in the case of Palestine, as it doesn't have its own currency. Moreover, the fact that taxes, which are another fiscal tool, is affected by Israel, this leaves the Palestinian government with one economic tool to use in enhancing the economy, which is government expenditures. This study gains its value from using two methods, which few of the local studies use. It uses the Lisman and Sandee formula for transforming annual data into quarterly for some of the missing data. The study also uses the Incremental Capital Output Ratio (ICOR) method to estimate capital where direct data are missing for such a variable.

This study uses descriptive and statistical analysis of data. The descriptive analysis is used to describe and show the growth of some economic indicators such as capital, labor, current and capital expenditures as well as the total government expenditures. The data are based on secondary data obtained from Ministry of Finance concerning government expenditures while the other independent variables along with GDP are collected from Palestine Central

Bureau of Statistics. The data are also analyzed using the ARDL method to test if there is a long run relationship among the variables of interest. Moreover, VAR estimates are performed to capture the linear interdependencies among multiple time series. The Granger Causality Test in the VAR Environment using Toda and Yamamoto Procedure is performed to test causality among the variables. Two models are used in this study. In the first, real gross domestic product (RGDP) forms the dependent variable while capital (estimated using ICOR method), labor (employment), total government expenditures are adopted as the independent variables. In the second, RGDP also forms the dependent variable while labor, capital and the components of government expenditures (current and capital expenditures) form the independent variables. Two dummy variables are used in both models to represent the political and economic events that might effect the economy of Palestine during 2000-2012. R^2, F-test and t- test are calculated along with Durbin-Watson test of autocorrelation. The study is limited with the shortness of time coverage period as a result of recent establishment of Palestine Authority and its ministries in the past two decades as well as lacking some data for some of the variables at some of the quarters of the study.

Results show that labor and technology have an insignificant impact on economic growth for the period in Palestine. This is inconsistent with theory as well as the results of several literature reviews but similar to few other researches. However, capital shows a positive and significant impact on economic growth. This is consistent with theory and most of the studies of literature review. Moreover, results show that total government expenditures have a positive yet insignificant impact on economic growth, which is consistent with the neoclassical theory as well as several studies of literature review. As for current expenditures, they show negative but insignificant impact on economic growth, while capital expenditures

show positive but insignificant impact on such growth. This means government expenditures, as a whole had no significant impact on economic growth. Dummy variables, however, turned out to be significant, which means that political and security events do affect economic growth in Palestine (2000-2012).

Based on these results, several policy implications are discussed. First, more attention might be paid to raise the productivity of labor through training and qualifications. Second, government might facilitate the import of new technologies and helps keeping the existing technology up to date. Third, policy makers might direct public investment to projects that have financial and economic returns in order to achieve self-sufficiency and stop being dependent on the donations and grants from other countries. Fourth, government might encourage investment in the private sector and give facilities to encourage the Palestinians outside the country to invest in their homeland. Finally, government efficiency can be improved by reallocating its expenditures. Extra share of the total government expenditures might be dedicated to the capital expenditures.

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1. Framework of the Study

This chapter gives a brief description to the framework of the study. It consists of seven sections. Section one is an introduction to the topic of the study, which is the impact of government expenditure on economic growth in Palestine (2000-2012). Section two states the main problem of the study along with the other questions to be answered by the study. Section three states the main objectives of the study. Section four shows the importance of the study and the categories of the society that shall benefit from the study and how each category shall benefit from it. Section five is a statement of the scope and limitations of the study. Section six is a description of the study's methodology. Finally section seven is a description of the study's contents.

1. Introduction

Economic growth, which reflects the overall performance of a country, is one of the most important macroeconomic goals that a country seeks to achieve and maintain. Economic growth in one-way or another refers to the increase of the country's potential GDP. It must be sustained in order for economic development to be achieved (Desmond, et al., 2012).

Besides taxes, as an instrument of fiscal policy, governments might use their expenditures, as another instrument to achieve economic growth. "Public expenditure was born out of revenue allocation which refers to the redistribution of fiscal capacity between the various levels of government or the disposition of responsibilities between tiers of the government" (Okoro, 2013). Therefore, understanding the relationship between the government expenditures and revenues and the implementation of an efficient fiscal policy is necessary to give a clear

indication of how effective the government's policies used in managing the country's resources, establishing price stability and maintaining sustainable economic growth (Hamdi and Sabia, 2013).

The Palestinian economy was going through fluctuating behavior over the quarters of the past years of 2000-2012. It was affected by different social and political situations. Gross domestic product (GDP), the most important indicator of economic growth showed a fluctuating behavior too over these quarters. Therefore, it can be said that Palestine, as an occupied small country, has a very fragile and sensitive political, economic and social situation due to the Israeli occupation. Much attention should be paid to the Palestinian economy, in particular to the governmental policies used in order to analyze the reasons and effects of such a fragile economy on the other aspects of life. Government expenditures and their components, as an example of such policies, are studied and analyzed through this study to give an indication of how effective the Palestinian policy makers' strategies in managing and controlling the Palestinian economy and resources.

2. Problem Statement

This study highlights one of the fiscal policies' instruments and shows how it can be used in managing the Palestinian resources and maintaining the stability of the Palestinian economy. The main question to be answered: what is the relationship between the government expenditures and the economic growth in Palestine in (2000-2012)? This is achieved by answering the following sub-questions:

- How does the gross domestic product (GDP) in Palestine change ?

- What is the impact of employment, as an indicator for the labor force on GDP?
- What is the impact of capital, which is to be estimated using the Incremental Capital Output Ratio (ICOR) approach on GDP?
- What is the impact of technology on GDP?
- How do government expenditures change?
- What is the impact of the overall government expenditures on the GDP?
- What are the components of the government expenditures?
- How much does each component form as a percentage of the overall government expenditures?
- What effect does each component has on GDP ?
- What are the recommendations that can be extracted from the results of the study and how would they benefit the competent authorities?

3. The Objectives of the Study

The main objective of the study is to analyze the impact of government expenditures as a total and its components on the Palestinian economic growth. Moreover, the specific goals to be achieved are:

1- Estimating capital using the ICOR approach.
2- Converting annual data into quarterly for the missing quarterly data of some of the variables using the Lisman and Sandee Quarterly Distribution Formula.
3- Observing how GDP, labor, capital, and government expenditures change.
4- Identifying the components of the government expenditures.
5- Calculating the percentage each component form of the total government expenditures.

6- Estimating an econometric model where GDP is a function of labor, capital, technology and total government expenditures.

7- Estimating an econometric model where GDP is a function of labor, capital, technology and the components of government expenditures, which are the capital expenditures (development expenditures) and the current expenditures (wages and salaries expenditures, non-wage expenditures and net lending).

8- Analyzing the effect of each component on the overall government expenditures and GDP.

9- Analyzing the impact of the overall government expenditures on the GDP.

10- Comparing the effect of labor force, capital, technology and components of government expenditures on GDP.

11- Suggesting some recommendations and address them to the competent authorities to inhance the palestinain economy through this instrument (government expenditures).

4. The Importance of the Study

Since the Palestinian economy is directly connected to the Israeli economy, this limits the Palestinian policy makers' options in setting up the policies needed to enhance the Palestinian economy. Monetary policies are not an option in the case of Palestine since it's an occupied country and has no full control over the currency. The Palestinians don't have their own currency; instead they are forced to use the Israeli currency Shekel (NIS). However, government expenditures and taxes are two tools of fiscal policies that can be used to achieve the desired economic growth in Palestine. Government expenditures are more controlled by the Palestinian authorities, which give them the preference over the other instruments of

fiscal policy in this study. Since part of the taxes are under the control of the Israeli authorities in certain circumstances and up to certain levels, the recommendations that will come out of this study will be more effective in the case of government expenditures rather than taxes. Israel can affect the Palestinian economy in two different ways; directly through taxes' collection prevention, since they have control over the international borders, and indirectly by tax revenues' base reduction (Issac, et al., 2011).

This study is directly addressed to the Palestinian policy makers, mainly the Ministry of Finance. This study will help the policy makers in the Ministry of Finance to take into their consideration the effect of the government expenditures on the economic growth when they formulate and create the Palestinian Authority budget. This will make the budget more effective and the Palestinian resources will be allocated in a more efficient and productive way. This study will also be very helpful to the Ministry of Planning in setting up the social, economic, financial and political plans that would enhance the overall performance of the country in the previously mentioned fields. Since there is a direct relationship between GDP and unemployment rate, this fiscal policy instrument will be very helpful for Ministry of Labor in preparing its annual strategies in decreasing the unemployment rates. In addition, this study will benefit the Ministry of National Economy in choosing the projects that should be given licenses. In addition, this will help the individuals as being part of the labor force to determine how and where to invest their money so as to help in achieving better GDP growth. This study may also help the donors, since the Palestinian economy depends heavily on donation and aids. This might be a guide for those donors in determining how and where their donations should be spent to be efficiently effective to the wheel of production to the economic growth.

5. The Scope and Limitations of the Study

This study analyzes the impact of government expenditures on the economic growth in Palestine (2000-2012). It has an important limitation, which is the shortness of the time series that is taken in analyzing the impact of the government expenditures on the GDP quarterly. The time series data coverage is (2000-2012) since the Palestinian Authority was established in 1994 as a result of the Oslo Accords between the Palestine Liberation Organization and Israel. However, the quarterly data in the Palestinian Ministries and the Palestinian Central Bureau of Statistics (PCBS) start mostly from 2000. Another limitation is that there are some missing quarterly data for some of the variables so that this study needs a method to convert some of the annual data into quarterly ones for the missing quarterly data. This affects the results in one way or another since the results using estimated data would not be 100% accurate as using already available quarterly data of all the variables for (2000-2012).

6. The Methodology

The study is based on secondary quarterly data (2000-2012) of total government expenditures and their components from the Ministry of Finance whereas the GDP, capital (estimated using the ICOR approach) and employment to be taken from the Palestinian Central Bureau of Statistics.

This study consists of two models. The dependent variable of the first model is GDP whereas the independent variables are capital, labor force, technology and total government expenditures (Mohammadi, Maleki and Gashti, 2012). As for the second model the dependent variable is GDP while labor, capital, technology and the components of

government expenditures are the independent variables (Bader, 2012). According to the Ministry of Finance (2013) government expenditures in Palestine are divided into four types; expenditures on wages and salaries, non- wage expenditures, net lending and development expenditures. The first three components form one of the two main components of government expenditures (current expenditures) while the last one forms the other main component of government expenditure (capital expenditure). The stationarity of the two models is first tested using Augmented Dickey-Fuller unit root test for stationarity. Then the impact of government expenditures, as a total and their components on the GDP are examined using multiple regression analysis where the R^2, F-test and t- test are calculated. Moreover, other tests are performed such as Durbin-Watson test of autocorrelation and Granger causality test.

7. Contents of the Study

This study consists of five chapters. Chapter one contains seven sections: the introduction, the problem statement, the objectives of the study, the importance of the study, the scope and limitations of the study, the methodology and finally the contents of the study. Chapter two outlines the theoretical background and a literature review of previous studies that have the same problem of this study. Chapter three is a detailed descriptive analysis of the data on the variables of interest focusing on the allocation of the government expenditures. Chapter four analyzes the data statistically. It contains detailed description of the methodology of the study with the models to be estimated addressed in functional forms using symbols representing the dependent variable along with the independent variables. Also, the estimated models are discussed and tested economically and statistically in order to highlight the impact of

government expenditures along with their components on economic growth. Chapter five gives the final conclusions of the study and the recommendations that are to be addressed to the competent authorities.

2. Literature Review

This chapter consists of two sections. Section one is a theoretical framework review that discusses the different theories, which address the relationship between the economic growth and government expenditures. Section two is a review of empirical literature on this linkage between government expenditures and economic growth in developed and developing countries, including some Islamic and the Arab countries.

2.1 Theoretical Framework

This section focuses on the definition of economic growth and economic development and the differences between them. In addition, it defines government expenditures, as well as defining two main types of government expenditures: current expenditures and capital expenditures. In order to provide better insights into the general relationship and the impact of government expenditures on economic growth, different theories are reviewed. Moreover, this section discusses the Solow model that forms the basis of the methodology used in this study.

2.1.1 Economic Growth and Development

There have been several researchers interested in economic growth and economic development. Some economists think of economic growth and development as being the same while others oppose this and differentiate between them. While economic growth can be defined as an increase in total output or income, economic development can be defined as

"a broadly based and sustainable increase in the overall standard of living for individuals within a community" (Greenwood and Holt, 2010).

There are several differences between economic growth and economic development. First, economic development deals with the problems of underdeveloped countries while economic growth deals with the problems of advanced and rich countries. Second, development is a "discontinuous and spontaneous change in the stationary state which forever alters and displaces the equilibrium state previously existing (Jain, Khanna and Sen, 2009). On the other hand, growth is a gradual and steady change in the long-run which comes about by a general increase in the rate of savings and population (Mathur, 2001). Fourth, economic development is promoted by economic growth. Economic development involves economic growth along with structural changes in the economy. Economic growth can be seen as necessary but not sufficient for economic development, structural changes in the economy is the one that provides the sufficiency for economic development (Harrison, 1996).

More specifically, economic growth can be defined as "the increase in the total output of an economy that happens as a result of a society acquiring new resources or learning to produce more using the existing ones". "New resources may refer to an increase in capital stock or in labor force". "Accumulation of capital and technological advances are two of the most important sources of economic growth" (Case, Oster and Fair, 2012). According to (McConnell, Brue and Flynn, 2009) economic growth is "an outward shift in the production possibilities curve that results from an increase in resource supplies or quality or an improvement in technology" or it is "an increase in real GDP or in real GDP per capita over some period of time". Moreover, economic growth is the increase of a country's production

or income per capita. It is “an increase in a country’s per capita output” (Nafziger, 2006). Also, economic growth can be defined as an expansion of the economy’s ability, “a long-run trend” in producing more goods and services (Krugman and Wells, 2006).

This study uses the definition of economic growth as the increase in real GDP. Economic growth can be measured by comparing real GDP of a country for different years. GDP is defined as the total market value of all final goods and services in a country produced within a given period of time. “It measures the overall performance of an economy” (Samuelson and Nordhaus, 2010). There are several approaches for calculating GDP; the expenditure approach, the income approach and the value added approach. According to the expenditure approach, GDP is “the sum of consumption expenditures, investment expenditures, government spending on goods and services and expenditures on net exports” (Parkin, Powell and Matthews, 2005). On the other hand, the income approach calculates the total payments made to the households, which provide resources (labor, capital, land, entrepreneurship) used in the production process of goods and services. These payments are rearranged in GDP accounting into five main categories: the compensation of employees, interest, corporate profit, rental income and proprietors’ income in which their sum forms the national income (Gottheil, 2013). The value added approach, which is also known as the output approach or the product approach, “adds up the value each firm contributes to the production of final goods and services”. GDP using this approach is calculated by “subtracting the cost of intermediate goods from the firm’s revenue” (Colander and Gamber, 2006).

2.1.2 Government Expenditures

Government expenditures, which are the main focus of this study, are the acquisition of goods and services. They are either used at current time, to directly satisfy the needs of the individuals, or used in the future for certain benefits such as infrastructure investment. According to Barro and Grilli (1994), they "include all government consumption and investment but exclude transfer payments made by a state". Consumption is the purchase of final goods and services by households during the year while investment is the spending on new capital goods and on net additions to inventories (McEachern, 2012).

However, some see government expenditures to be equal to government purchases, which is really not the case. In fact, government expenditures are different from government purchases. The primary source of such gap is the transfer payments. "Transfer payments represent government expenditures they don't represent government purchases". Moreover, transfer payments are "payments made by government agencies to individuals in the form of grants rather than in return for labor or other services" (Rittenberg and Tregarthen, 2008). "Government purchases, or more specifically, government consumption and gross investment, include government spending for goods and services". Therefore, "government purchases exclude transfer payments such as social security, welfare benefits and unemployment insurance" (McEachern, 2012).

There are several classifications of government expenditures. According to (Pailwar, 2012), government expenditures could be categorized into productive and non-productive expenditures, or transfer and non-transfer expenditures. Productive and non-productive classification is based on whether expenditures are in the nature of consumption and

investment. If expenditures improve the productive capacity of an economy they are considered productive expenditures such as education, health. Unproductive expenditures are consumption expenditures such as expenses on defense, justice law and order maintenance. Transfer expenditures are the ones without receipt of goods and services such as interest payments, unemployment benefits and scholarships by a government. Non-transfer expenditures are payment for the purchases of goods and services such as the expenditures by the government on defense, education and roads.

Another classification is plan and non-plan expenditures. Plan expenditures refer to expenditures used by the government to fulfill its planned development programs such as expenditures on agriculture, communication, health, etc. It includes both consumption and investment expenditures. Non-plan expenditures are government expenditures that are beyond the scope of its planned development programs such as expenditures on defense, grants, aid, etc. (Jain, Trehan and Trehan, 2009).

A third classification of government expenditures is based on how it is distributed. It is classified according to the sector or category allocations and uses such as expenditures on education, expenditures on health and expenditures on defense (Askari, 2006). The most commonly used classification is categorizing expenditures into current and capital. The recurrent (current) expenditures are government expenses on administration such as wages, salaries, interest on loans, maintenance etc. Capital expenditures on the other hand, are expenses on capital projects such as roads, airports, health, education, electricity generation etc. (Obinna, 1985). This study uses the last classification of government expenditures.

2.1.3 The Impact of Government Expenditures on Economic Growth

There are different points of view regarding the impact of government expenditures on economic growth. Classical economists, such as Adam smith and David Ricardo, argue that government spending should be kept at its minimum because, eventually, it would lead to a reduction in the economic growth. Government spending would need the same level of taxation, which has only one effect, which is the reduction of capital accumulation and hence economic growth (Shandalow, 2010). Classical economists refuse the idea that government intervention is beneficial. They argue that any attempt to push the economy back to full employment will reduce the probability of the private sector sorting out problems and correcting the imbalances that led to the crash. They believe that government intervention will lead resources to be allocated towards political rather than economic goals. Moreover, they support cutting government spending on goods and services in order to allow the private sector to expand (Thornton, 2013).

On the other hand, the Keynesians support the view of government intervention in the economy using the needed policy instruments. Such policies can and should be used to improve economic performance. Increasing government expenditures lead to higher economic growth (Keynes, 1936). The Keynesians believe that higher government spending and lower taxation increase the total demand of economy; stimulate business investment, employment and economic growth (O'Connor, 2004). Keynesian economists believe that increasing government spending would increase the aggregate demand, which would help the economy to recover from a serious recession (Gwartney et al., 2013).

The neoclassical economists, however, see that fiscal policies cannot bring about changes in long-run growth of output. For example, Solow (1956) suggests that there is no long-run impact of government expenditures on economic growth rate since the long-run growth rate being driven by population growth and the rate of technological progress. Neoclassical economists see that government intervention, in smoothing out the business cycle, is neither necessary nor desirable since it might worsen the disturbance rather than fixing it. In their opinion, "real world fluctuations in output are regarded as short term and attributed to external shocks or unexpected government interventions" (Nattrass, Wakeford and Samson Muradzikwa, 2002).

The 1980's witnessed the foundation of the neoclassical counterrevolution, which believes that the government intervention slows the pace of economic growth. Such economists view that too much government intervention and economy regulation may cause the failure of development (Emmanuel, 2010). In addition, the neoclassical counterrevolution focuses on the inefficiency and wasteful government agencies and that "underdevelopment results primarily from heavy government intervention and regulation of the economy" (Daquila, 2007).

Wagner (1893) postulates a positive correlation between economic growth and government activity in the long-run (Wagner's law or the law of increasing state spending). According to Wagner, there are three reasons for the direct linkage between economic growth and government activity: changes in the structure of the economy associated with new social activities of the state, increasing administrative and protective functions substituting private for public actions, and increasing control of externalities and welfare aspects. It should be

stated that while Keynes sees government expenditures as a determinant of economic growth, Wagner considers economic growth as a driving factor of government expenditures (Ismal, 2013). Wagner is concerned with short term rather than long term regarding changes in public expenditures. He states “in the future the state expenditure would increase at a rate slower than national income though it had increased at a faster rate in the past” (Bhatia, 2008).

Barro who is considered one of the founders of “Endogenous Growth Theory” emphasize the importance of government policy in economic growth. He shows that “higher taxation unambiguously reduces output. Such losses may be offset by using the proceeds for productive spending items. He emphasizes that government expenditures (on infrastructure) induces economic growth” (Barro, 1990). Economists of such a school of thought have provided theoretical basis regarding the impact of government activities on economic growth. Economists of this school, such as Paul Romer and Robert Lucas suggest that “permanent changes in variables such as saving and investment (as a result of government policies) lead to a permanent shift in the steady-state growth rate”. Moreover, they argue that various types of government expenditures have different effects on economic growth. For example, “government spending on education can be growth promoting”, and “government expenditure on health care exerts positive impact on productivity” (Nejadan, 2000).

From this part, it can be noticed that there have been different school of thoughts regarding the impact of government expenditures. While the classical school argued that government expenditures causes a reduction in economic growth, the Keynesian school argued that increasing government expenditures would enhance economic growth. Moreover, the

neoclassical school opposed the intervention of government expenditure and supported keeping it at minimum, since it would hinder economic growth rather than enhancing it. Other schools also have different thoughts on such a relationship were previously discussed.

2.1.4 The Solow Model

This study builds its model starting from the Solow growth model. According to Solow (1956) output is produced with the help of two factors of production, capital and labor. Solow states that estimating the production function can be made when capital stock and labor force are known, then one can compute the corresponding real output. So:

$$Y = f(K, L) \text{……...……..} \quad (1)$$

Where:

Y: Output of the production process

L: Labor force (input)

K: Capital stock (input)

Solow (1956) discusses several cases of possible growth patterns. He used three different shapes of the production function to address such cases:

1- Fixed proportions where the production function is represented as:

$$Y = f(K, L) = \min\left(\frac{K}{a}, \frac{L}{b}\right) \text{……..} \quad (2)$$

Which gives the smaller of the numbers in parenthesis, α represents the units of capital stock needed to produce one unit of output and b represents the units of labor force needed to produce one unit of output.

2- Cobb-Douglas function that takes the form:

$Y = AK^{\alpha} L^{1-\alpha}$

Where:

$0 < \alpha < 1$…….. (3)

A: total factor productivity.

α and b : the output elasticities of capital and labor, respectively.

3- A family of constant returns-to-scale production functions.

$Y = (\alpha K^{\rho} + (1- \alpha) L^{\rho})^{1/\rho}$ …….. (4)

Where $0 < \alpha < 1$ is the share parameter of capital, 1- α is the share parameter of labor and ρ determines the degree of substitutability of inputs.

If ρ =1 there is perfect substitution between inputs while if $\rho = -\infty$ then there is no substitution between the inputs. If ρ = 0 then there is a unitary elasticity of substitution between them and if $\rho = \infty$ then there is perfect complement between inputs.

Then, Solow added the technological change as a factor that affects the production output along with labor and capital so by taking the Cobb- Douglas case:

$Y_t = A_t L_t^{\alpha} K_t^{1-\alpha}$ …….. (5)

Taking the natural logarithm of equation 5:

$\ln (Y_t) = \ln (A_t) + \alpha \ln (L_t) + (1- \alpha) \ln (K_t)$…….. (6)

It should be stated that many economists added other variables to this production function such as government expenditure, trade openness, direct income tax, human capital and other factors. This is shown in the next section 2.2.

Despite the fact that the Solow model has many criticisms, it is still widely used in research concerned with growth. According to Reinhart and Khan (1989), most growth models concerned with developing countries depend on the framework of Solow (1956), which takes its starting point as an aggregate production function that relates output to factor inputs and a variable that represents other factor affecting growth besides labor and capital. Moreover, Rao and Cooray (2009) justified the use of the Solow model by showing that endogenous models focus on the very long run and on the incentives for expanding the technological frontiers which isn't useful for most developing countries. This was due to the fact that their main interest is restoring short-to medium-term growth and accelerating technological catch-up by adopting already known innovations. However, Solow model can be used to analyze the short, medium and long run effects of changes in the investment rate on the level of income and its short to medium term effects. Policy makers in the developing countries would be more interested in those short to medium effects since raising the investment rate is considered a simple policy to implement compared to implementing institutional reforms, which are difficult to implement and need long terms to be effective. Therefore, this study adopts the Solow model as a start and follows the leads of Rati (1996) in adding government expenditures as another factor affecting growth. Bader (2012), added expenditure on education as another factor affecting growth, as well as other researchers did.

2.2 Applied Research

Researchers all over the world have examined the impact of government expenditures on economic growth of different countries for different time series. Several studies were conducted concerning this topic. While some studies focused on the developed countries, much more attention was paid to the developing countries, including some Arab and Islamic countries.

2.2.1 Developed Countries:

Chipaumire et al. (2014) investigate the long-run relationship between government spending and economic growth in South Africa for 1990-2010. This study is based on quarterly time series data on economic growth that is used as the dependent variable while government spending, money supply and investment form the independent variables. All data are obtained from the International Monetary Fund's International Financial Statistics, South African Reserve Bank (SARB) and the National Treasury. Phillips-Perron unit root test technique is employed to test the data for stationarity, the Johansen Co-integration technique and the error correction methods are used to analyze the long-run relationship between government spending, money supply, investment and economic growth; the Granger Causality test is used as well. The results show that government expenditures are significant and that there is a long-run negative relationship between government spending and economic growth.

Hamdi (2013) investigates the dynamic relationships between government revenues, government expenditures and economic growth in Portugal, Italy, Ireland, Greece and Spain

(PIIGS countries). The study uses annual real (GDP), real government expenditures (GE) and real government revenues (GR) time series data covering the period 1995-2009 for these countries. All the data are taken from the Eurostat database. Real GDP is used as the dependent variable while the other two variables (GE and GR) represent the independent variables. The study uses the Augmented Dickey– Fuller (ADF) unit root test and the Kwiatkowski– Phillips– Schmidt– Shin (KPSS) test to investigate the stationarity of the data. In addition, it uses the Toda-Yamamato Granger Causality Tests to test the causal relationship between each two variables. Results show that only for Spain there is a double bidirectional relationship running from government expenditures to GDP, showing that an increase in government expenditures will increase GDP.

Mehdi and shoorekchali (2012) examine the impact of government expenditures on economic growth in Italy for the period 1960-2009. Using annual data from World Development Indicators (WDI) 2010, they investigate the nonlinear government size effects on economic growth in Italy. They use GDP growth as the dependent variable while the growth of fixed investment, population growth, and government consumption spending as a percentage of GDP (government size) as the independent variables. The models are estimated using the Smooth Transition Regression (STR) model. The F test, AutoRegressive Conditional Heteroskedasticity- Lagrange Multiplier test (ARCH-LM) test and Jarque-Bera test are used, as well. Results show that government size has negative effect on economic growth.

Liu, Hsu, and Younis (2008) study the relationship between the federal expenditures and GDP growth in the US using time series annual data of 1947-2002. They are interested in identifying the causal relation between economic growth and public expenditures. The study

uses linear regression analysis to estimate four models. The data under examination are the US (GDP) that forms the dependent variable, while the total federal outlays and five sub-division expenditures, namely national defense expenditures, human resources expenditures, physical resources expenditures, net interest payment and other function expenditures (expenditures on international affairs, general science, space and technology, agriculture, administration of justice, and general government) form the independent variables and year being the time trend variable. In the first linear regression model, GDP is the dependent variable and Federal total outlays act as the independent variable with year being the time trend variable. In the second regression model, GDP is the dependent variable and the five sub-categories of expenditures are the independent variables with year as the time trend variable. The third and fourth linear regression models use GDP as the dependent variable and the five sub-categories expenditures as the independent variables. In model 3, the dependent variable and independent variable are the percent change to the previous year. In Model 4, the dependent variable and independent variable are the change to the previous year. They are obtained from the official documents published by the US Office of Management and Budget and the Budget for fiscal year 2004. Granger Causality test is used as well to test the casual relationships among the variables of the study. Regression results reveal that none of the independent variables are significant. Results show that there is a unidirectional causality relation between GDP and Total Federal Outlays showing that more federal expenditures lead to a growth of the US economy. In addition, it is found that national defense expenditures are proven to have no influence on GDP growth.

Sáez and García (2006) investigate the relationship between government expenditures and economic growth in the European Union countries mainly (Austria, Belgium, Denmark,

Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Spain, Sweden, United Kingdom) for the period 1980-2000. Panel data are obtained from Organization for Economic Development and Cooperation (OECD) and the European Commission (Economic databases). Rate of increase of GDP is taken as a proxy for economic growth, which forms the dependent variable while growth rate in total government spending forms the independent variable. Regression analysis, panel data techniques and F-test are performed along with the Hausman test for determining which approach to use, the fixed effects approach or the random-effects approach. Results show that government spending is positively related to economic growth in the European Union.

Hsieh and Lai (1994) examine the nature of the relationship between government expenditures and economic growth for seven countries (Canada, France, Germany, Italy, Japan, UK and US). The growth rate of real per capita GDP is used as the dependent variable while the share of government expenditures on goods and services in annual GDP and the share of private investment in GDP as the independent variables. Multivariate time series analysis is performed along with two unit root tests to examine the stationarity of data (ADF and Phillips-Perron tests). The real per capita GDP is obtained from Maddison (1982) for 1885 to 1979 and is updated to 1979 based on various issues of the Organization for Economic Co-operation and Development's (OECD's) main economic indicators. The share of total public expenditures is computed based on data on total public expenditure, and GDP is taken from One Hundred Years of Economic Statistics that was compiled by Lienser (1989). The corresponding sample periods for the 7 countries were: Canada (1926-1987), France (1950-1987), Germany (1950-1987), Italy (1885-1987), Japan (1952-1987), the UK (1885-1987) and the USA (1889-1987). Results show that the relationship between

government expenditures and growth could vary very significantly across time as well as across the major industrialized countries that belong to the same growth club. In addition, no consistent evidence is found that government spending could increase per capita output growth. For most countries under study, it is found that public spending does contribute by a small proportion to the growth of an economy.

2.2.2 Developing Countries:

Okoro (2013), using time series data (1980-2011), investigates whether there is a relationship between government expenditures and economic growth in Nigeria, the impact of government expenditures on economic growth in Nigeria and if there is long-term causal relationship between government expenditures and economic growth in Nigeria. Real GDP is used as the dependent variable while the government recurrent expenditures and the government capital expenditures as the independent variables. Annual data on the variables are collected from the Central Bank of Nigeria's (CBN) statistical bulletin (in million Naira). Ordinary least square multiple regression analysis, Granger Causality test, Johansen Co-integration test and Error Correction Mechanism are used. The results show that there exists a long-run equilibrium relationship between government spending and economic growth in Nigeria, and that the government capital expenditures will contribute more to the economic growth of Nigeria than the government recurrent expenditures.

Using annual time series data, Altaf and Khan (2013) analyze the impact of total government expenditures and their broad components, revenue expenditures, capital expenditures and other government expenditures on the growth rate of real per capita in Assam (a state of India in the north-eastern region) for 1981-2007. The growth rate of real per capita gross state

domestic product (GSDP) represents the dependent variable while the share of total government expenditures; the share of revenue expenditures, the share of capital expenditures, the share of other expenditures in GSDP form the independent variables. The data are based on secondary data from Assam Directorate of Economics and Statistics regarding state income and government expenditure and Assam Government Budgets and Finance (Budget) Department for data regarding government expenditures in Assam. Unrestricted Error-Correction model (UECM) with the ordinary least square (OLS) estimator, Augmented Dickey-Fuller (ADF) unit root test, Autoregressive Distributed Lag (ARDL) bounds approach for studying long-run and short-run relationships among variables and the Co-integration test are used. Results show that in the long-run, the share of total government expenditures in GSDP and the share of revenue expenditures in GSDP have positive and statistically significant impact on economic growth (on the growth rate of real per capita GSDP in Assam). Moreover, it is found that in the short-run, the share of total government expenditures in GSDP and the share of revenue expenditures in GSDP have negative but statistically insignificant effect on the growth rate of real per capita GSDP in Assam. The study finds no significant impact of capital expenditures on the growth rate of real per capita GSDP in Assam.

Dao (2012) analyzes the impact of the growth of the share of various government expenditures programs in the GDP on economic growth in 28 developing countries. These countries are Argentina, Armenia, Azerbaijan, Belarus, Brazil, Bulgaria, Colombia, Cyprus, Czech Republic, Egypt Arab Republic, Hungary, India, Iran, Israel, Kazakhstan, Kyrgyz Republic, Lithuania, Madagascar, Moldova, Poland, Portugal, Russian Federation, Slovak Republic, Slovenia, South Africa, Tajikistan, Thailand and Ukraine. The researcher uses

cross sectional data for 3 years (2008-2010). The dependent variable is per capita GDP growth while the growth of per capita public health expenditures in the GDP, growth of per capita public spending on education in the GDP, population growth, growth of the share of total health expenditures in the GDP and the share of gross capital formation (gross domestic investment) in the GDP form the independent variables. Data for all variables are obtained from the World Development Indicators (2008 and 2010). Least square multiple regression analysis and the t-test are used to estimate the specified model. Results show that the share of gross physical capital formation in the GDP positively influences economic growth in the sample of developing countries examined in the study. Moreover, the growth of the share of total health expenditure in the GDP and population growth also influence per capita GDP growth of countries but negatively. On the other hand, growth of per capita public spending on education in the GDP and growth of per capita public health expenditures in the GDP are statistically insignificant.

Yu, Fan and Saurkar (2009) study the impact of the composition of government spending on economic growth in 44 developing countries (1980-2004). The aggregate national GDP is used as the dependent variable while the explanatory variables include: labor, gross capital stock, and capital stock of various government expenditures. Total government expenditures and their compositions are collected from the International Monetary Fund's Government Finance Statistics (GFS) Yearbook. The World Development Indicators (World Bank, 2006) are used for exchange rates. Dynamic generalized method of moments model (GMM) and a panel data set for 44 developing countries are used. Dickey-Fuller unit root test and Levin-Lin-Chu (2002), Im-Pesaran-Shin (2003) and Hadri Lagrange Multiplier (2000) panel unit root tests are also conducted. Results show that the various types of government spending

have different impact on economic growth. In Africa, government spending in human capital is particularly strong in promoting economic growth. In Asia, expenditures on capital, agriculture, and education promote economic growth. In Latin America, none of the government spending items has any significant impact on economic growth.

Alexiou (2009) investigates the relationship between economic growth and government spending in seven countries of South Eastern Europe (Bulgaria, Serbia, Former Yugoslav Republic of Macedonia (FYROM), Croatia, Bosnia, Albania, and Romania) using annual data for 1995-2005. The main data providers are the World Bank and the respective statistical offices and Central Banks of the countries in the sample. Whereas the economic growth forms the dependent variable, government spending on capital formation, development assistance, private investment, trade-openness and population growth form the independent variables. The study uses two different panel data methodologies as basis for analysis: standard pooled estimators (OLS) and random coefficient (RC) regression estimator (a weighted average of the least squares estimates where the weights are inversely proportional to their variance-covariance matrices). Results show that all independent variables except population growth have positive and significant effect on economic growth.

Gregoriou and Ghosh (2009) investigate the impact of government expenditures on growth, in a heterogeneous panel for 15 developing countries (Sudan, Zimbabwe, Pakistan, Malaysia, Kenya, Cameron, Tanzania, Columbia, Mexico, Chile, Indonesia, Argentina, India, Thailand and Brazil). Using annual data, per capita real GDP is chosen as the dependent variable while two types of government expenditures (capital and current expenditures) form the independent variables. Data for (1972-1999) are obtained from the Global Development

Network Growth Database, compiled by William Easterly. The study uses the generalized method of moments techniques (GMM) in analyzing the data. Results show that countries with substantial government expenditures have strong growth effects, which vary considerably across the nations. Moreover, the results show that for nations such as Brazil, current expenditures have a major role to play in determining long-run growth, whereas for countries like Sudan, current expenditures play only a minor role in the growth of the nation.

Yasin (2003) examines the impact of government spending on the growth rates of real domestic products of some Sub-Saharan African countries and the effects of two types of public spending: domestic government spending on capital formation and foreign receipts for development assistance on growth. The data cover 26 Sub-Saharan African countries (1987-1997). There are two main sources of data: the African Development Indicators 1998/1999 published by the World Bank and the yearbooks of the International Financial Statistics published by the International Monetary Fund. Annual growth rate in real GDP forms the dependent variable while private investment as percent of GDP, annual percentage change in population as a proxy for the labor force, government expenditures for capital formation as percent of GDP, net official development assistance from all donors as percent of recipient GDP and annual percentage change in the ratio of the sum of exports and imports to GDP as a proxy for trade-openness form the independent variables. The study uses panel data where all data are transformed to three-year moving averages to correct any autocorrelation problem and to make the data stationary. The research uses the White Test for heteroscedasticity. The model is estimated using two alternative estimation methods: fixed-effects and random-effects methods. Results show that government spending on capital formation and the trade-openness have positive effect on the economic growth and are statistically significant at 1%

significance level. Moreover, private investment spending is statistically significant at 5% percent level in the random-effects and at 10% level in the fixed-effects implying that the random-effects model is a better fit for the private investment spending.

2.2.3 Islamic and Arab Countries:

Mehrara et al. (2013) examine the causal relationship between government recurrent expenditures (GRE) and GDP in Iran, using annual data over the period 1970-2010. The data series are obtained from Central Bank of Iran (CBI). A bivariate model is used to empirically examine the long-run co-movement and the causal relationship between government recurrent expenditures and real GDP. Zivot and Andrews unit root tests, the Gregory-Hansen Co-integration Analysis and Granger Causality Tests are used to analyze the data. The results show that there is a long-run relationship between government recurrent expenditures and GDP. In addition, results confirm that there is an instantaneous and unidirectional causal link running from GDP to government recurrent expenditures. Findings also indicate that government expenditures don't play a significant role in promoting economic growth in Iran.

McDonald (2012) analyzes the impact of defense expenditures on economic growth using Feder-Ram model and Augmented Solow model in Islamic Republic of Iran. In that study, labor, capital investment and defense and non-defense expenditures are used as independent variables while GDP forms the dependent variable. Data from the Islamic Republic of Iran are collected for the years 1960-2007. Data on total government consumption, defense expenditures, GDP and gross private investment are obtained from the Central Bank of the Islamic Republic of Iran. Total government consumption is used as the government sector output. Non-defense government expenditures are obtained by subtracting defense

expenditures from total government consumption whereas private sector output is obtained by subtracting total government consumption from GDP. Population growth rate is used as a proxy for labor. An ordinary least squares approach is used to explain the variations in the economic growth of Iran. SIC is used to determine the proper number of lags to be used. Moreover, Augmented Dickey Fuller test is used to test stationarity. Also, Durbin Watson statistic is used to test the presence of autocorrelation and generalized least squares estimates of the parameters in the Feder-Ram model are used to correct the serial correlation of the error terms. The results show that labor is negative and non-significant in the first model while it turned out to be negative but significant in the other model. Also the Feder-Ram model shows itself to be incapable of explaining any economic growth whether through non-defense expenditures, capital investment or labor. Within the estimates of the augmented Solow model, defense expenditures appear to improve economic growth

Al Bataineh (2012) examines the impact of public expenditures on economic growth of Jordan and the composition of the public expenditures (recurring expenditures, capital expenditures, transfer payment and Interest payment) for 1990-2010. GDP is adopted as the dependent variable while recurring expenditures, capital expenditures, transfer payment and interest payment represent the independent variables. Data on variables are obtained from the Central Bank of Jordan 2010 reports (Jordanian Dinar). Using annual time series data, multiple regression analysis, Dicky-Fuller and Phillips-Perron unit root tests and Johanson Co-integration test are used. Results show that government expenditures at the aggregate level have positive impact on the growth of GDP and that government expenditures do cause the growth of GDP.

Mohammadi, Maleki and Gashti (2012) analyze the impact of governmental expenditures composition on economic development in Economic Cooperation Organization Countries (ECO): Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan and Turkey. The study uses annual data for (1995-2009). The authors focus on three types of government expenditures: health expenditures, education and defense. The real GDP per capita is the dependent variable while real per capita of GDP in the previous period, government expenditures on health to GDP ratio, government expenditures on education to GDP ratio, government expenditures on defense to GDP ratio, investment, total of Population growth rate, technological growth and the depreciation rate and other financial variables as a share of GDP are the independent variables. The dynamic panel data method, the generalized method of moments (GMM) and the Sargan test are conducted. The results show that the health expenditures have significant and negative effect on growth while educational expenditures and governmental defense expenditures both have significant and positive effect on the economic development of ECO countries.

Samimi, Nademi and Zobeiri (2010) test the presence of a non-linear Armey curve[1] relationship between the government size and economic growth in some Islamic countries from World Development Indicators (WDI) 2008 annual data of eight Islamic countries are collected for 1980-2007 (Iran, Pakistan, Turkey, Egypt, Algeria, Indonesia, Oman, Jordan). The economic growth model is built where economic growth forms the dependent variable while investment rate, growth of labor force and multiplication effects of government expenditure growth times government size are the independent variables. Threshold and

[1] Armey curve is named after the economists Richard Armey that explains the optimal government size that ensures positive incremental economic growth for a particular country. Armey maintains that low government expenditures can increase economic growth until it reaches a critical level; nevertheless, excessive government expenditures can harm economic growth (Herath, 2012).

linear regression are performed. Results show that there is a nonlinear relationship between government size and economic growth in these Islamic countries. Moreover, it is found that government size and economic growth have a significantly positive relationship when the government size is small. When the government size is large, however, government size and economic growth have a significantly negative relationship. In turkey and Jordan, government size doesn't have any significant impact on economic growth in large government size.

Haliciog˘lu (2004) shows interest in studying the relationship between the level of economic growth and defense expenditures in Turkey for 1950–2002. The dependent variable used is the real aggregate output while the independent variables are military and government expenditures and real interest rates. Data are collected from Stockholm International Peace Research Institute (SIPRI) yearbooks, State Institute of Statistics (SIS) of Turkey and Ministry of Finance of Turkey. Augmented Dickey Fuller and Phillips-Perron unit root tests along with Johanson Co-integration test are performed to test for stationarity. Moreover, the Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) tests are used for testing the stability of the long-run coefficients obtained in the model used. Results show that a rise or a fall in Turkish military spending will cause changes in the macroeconomic equilibrium in the long-run. The impact of military expenditures on the real output level are positive and about one tenth of the size of the real non-military defense expenditures.

Fasano and Wang (2001) investigate the relationship between government expenditures, which is broken down into capital and current spending, and non-oil real GDP growth of the

Gulf Cooperation Council (GCC) (Saudi Arabia, United Arab Emirates, Qatar, Oman and Bahrain) for 1980-1999. Kuwait is excluded as a result of lack of information. Data are obtained from national authorities of GCC and IMF staff estimates. Non-oil real GDP represents the dependent variable while current and capital expenditures are the independent variables. The paper uses a multivariate co-integration and error correction model to investigate such relationship. Augmented Dickey Fuller test along with Johanson Co-integration test and Granger Causality test are used to test for stationanarity. Results show that in the short-run current expenditures have a negative weak effect on non-oil economic growth and capital spending has a positive weak one. In the long-run, however, it is found that in most GCC countries non-oil real GDP is negatively related to capital spending and positively related to current spending.

Al Batel (2000) investigates the role of the government in Saudi Arabia and its impact on the growth and development of the country by examining the effects of changes in the government expenditures and incentive policies on economic growth and development of Saudi Arabia. Growth of real non-oil GDP is the dependent variable whereas the independent variables are the total non-oil investment, private investment, labor, government expenditures that are divided into non-oil government investment, government consumption and the ratio of government expenditures to GDP. Time series annual data (1964-1995) are obtained from Ministry of Planning and from Saudi Arabian Monetary annual reports. OLS regression and Dickey- Fuller test, Co-integration test, Granger Causality test and error correction test are conducted. Results show that government investment and government consumption both cause economic growth and that there is a bi-directional causal linkage between total investment and government expenditures and economic growth. Also, it is found that

government expenditures exert positive impact on economic growth, which means that the government has played an important role in the economic development in Saudi Arabia.

From the previous three parts, it can be noticed that the results of applied research show that government expenditures all over the world have different impact on the economic growth of the different countries. For some, they have positive impact as in Sáez and García (2006), Okoro (2013) and Al Batel (2000) for the developed, developing and Arabic and Islamic countries respectively. In others, however, government expenditures show a negative impact, as in Chipaumire et al. (2014), Dao (2012) and Mohammadi, Maleki and Gashti (2012). Results of third group of studies show that government expenditures have no influence on economic growth, as in Liu, Hsu, and Younis (2008), Yu, Fan and Saurkar (2009) and Samimi, Nademi and Zobeiri (2010).

2.3 The Current Study

This study is an application of previous theories and applied research on Palestine. In particular, the study analyzes the impact of government expenditures on GDP in Palestine (2000-2012), using quarterly data. It focuses on total government expenditures and its two main components, which are current and capital expenditures as important independent variables that might affect economic growth. While most studies build their models based on the assumption that GDP is a function of government expenditures' components such as current and capital expenditure only, this study uses the Solow model that takes the GDP as a function of capital stock and labor. Following the steps of Mohammadi, Maleki and Gashti (2012) government expenditures and their components were added to the Solow model in

two different models that will be explained in details in chapter four. The added value of this study is that it extends the period of the research to 2012, which is the latest and up to date available data. Up to the researcher's knowledge, there hadn't been any previous studies studying this topic in Palestine for (2000-2012). Moreover, the data used are quarterly data while most of the previously conducted studies use annual data. As quarterly data cannot be obtained for all variables of this study, a derivation method of quarterly data from annual data is used based on the equations of Lisman and Sandee (1964). Also, as capital stock cannot be collected directly, this study estimates capital stock using the incremental capital output ratio (ICOR) method following the steps of Al Nakeeb (2006) while most studies uses an approximation for capital such as using fixed capital formation as an indicator of such a variable.

3. Descriptive Data Analysis

Government expenditures are one of the main components of the GDP calculations using the expenditure approach. The GDP in different years can be used as an indicator of economic growth. The relationship between government expenditures and economic growth has been always a debate between different views of economists as well as different schools of thoughts[2]. This chapter describes the changes and variations of the government expenditures and its components, as well as other variables (GDP, labor and capital) used in the analysis, over the quarters of 2000-2012 in Palestine. It discusses the different reasons behind such variations and highlights some of the different indicators that help figuring out the impact of government expenditures on economic growth.

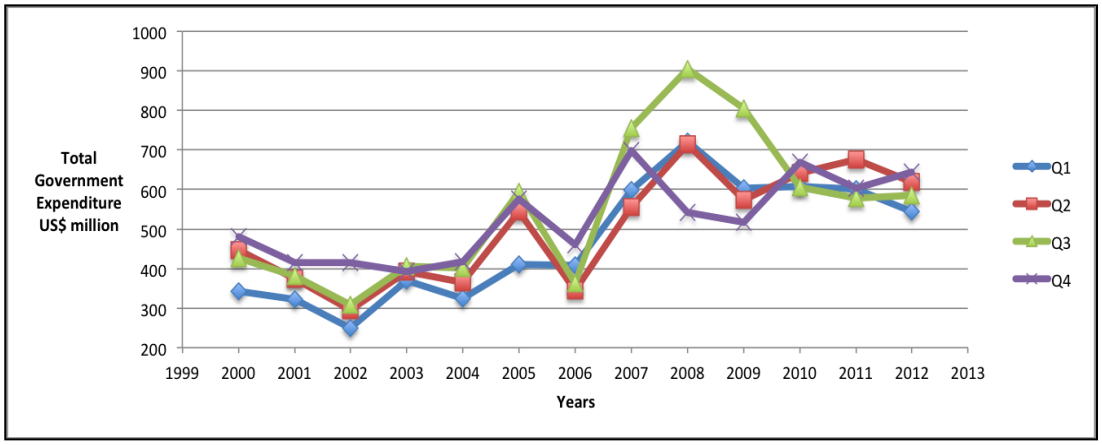
3.1 Total Government Expenditures

Data on total government expenditures for the quarters of 2000-2012 in Palestine were collected from the Ministry of Finance and from the Palestine Monetary Authority. Total government expenditures, which are shown in table 2 in appendix A, reached US$511.49 million, on average, per quarter (at constant prices). They reached their maximum during the second quarter of 2008 with US$905.88 million and their minimum during the first quarter of 2002 with US$249.27 million.

[2] For more details see 2.1.

Figure 1 shows the variation in total government expenditures during the targeted period.

Figure 1: Total Government Expenditures (US$ million) in Palestine (2000-2012) Quarterly



Sources: 1- Ministry of Finance, General Administration of General Accounts, Reporting Department, Fiscal Operations: Revenues, Expenditures and Financing Sources (Cash Basis) (personal contact).

2- Palestine Monetary Authority based on data from Ministry of Finance, Statistics, Public Finance, Revenues, Expenditures and Financing Sources of PNA Fiscal Operations (Cash Basis), http://www.pma.ps/Portals/1/Users/002/02/2/Time%20Series%20Data%20New/Public_Finance/revenues_expenditures_and%20financing_sources_of_pna_fiscal_operations_00-12.xls

It can be noticed that there were fluctuations and variations in the behavior of these expenditures over the period. However, it can be noticed that government expenditures showed almost the same behavior over each quarter of the different years during the period. In order to be more certain that these quarters share the same behavior, the analysis of variance (ANOVA) technique was performed. The null hypothesis assumes that the mean of the variable, in this case the total government expenditures through the different quarters is the same while the alternative hypothesis assumes that at least one mean is different. From

the ANOVA analysis in table 1 in appendix B, it can be noticed that the p-value is 0.582, which means that the null hypothesis cannot be rejected. That is, all the means of total government expenditures in the different quarters of the period were statistically not different. This confirms the idea that government expenditures in different quarters, generally, shared the same behavior. This could be due to the fact that the period of the study is short, which doesn't give enough time for the expenditures to show much change.

Moreover, the Israeli measures and the economic siege forced on the country limited the structure of the government expenditures and the share each category can have from the total government expenditures. Indeed, most of the government expenditures are wages and salaries, which leaves fewer portions to the capital expenditures, which are the ones that could have a financial return and might change the government expenditures over the next years. In addition, the fact that the Palestinian economy is heavily dependent on aids from outside makes the expenditures limited in value and direction.

Looking more into details, it can be noticed that for certain years, government expenditures over the different quarters showed some differences in behavior. However, this didn't affect the general behavior of the total government expenditures over all the quarters. For example, the behavior of government expenditures witnessed variations over the quarters of 2003. Government expenditures witnessed an increase over the first and third quarters of this year while they witnessed a decrease in the second and fourth quarters of the same year. Moreover, they witnessed an increase over the fourth quarter of 2004 while witnessing a decrease over the first three quarters. These fluctuations in the value and behavior of government expenditures in these two successive years could be explained by the Israeli

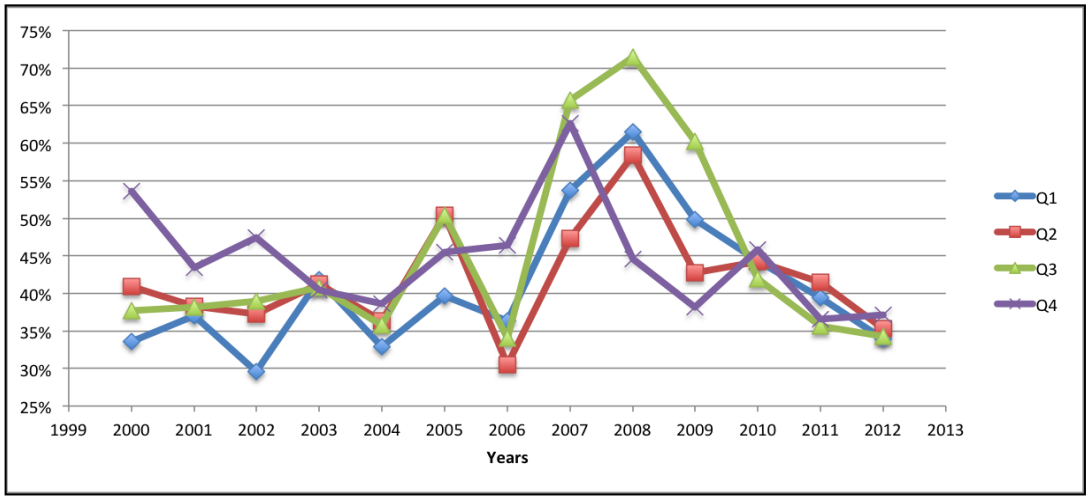
military measures during the years of the second *Intifada* (2000-2005). Moreover, government expenditures over the fourth quarter of 2008 behaved differently from the other three quarters of this year. They witnessed a decrease over that quarter while witnessing an increase over the other quarters. This could be due to the unstable economic and political situation that followed Hamas winning the elections in 2006 when Israel forced extra economic obstacles on the Palestinians such as import and export restrictions, which affected the Palestinian economy as a whole. Moreover, the split of the Palestinian government into two governments in 2007 affected the financial and economic returns of the government as the trade exchanges between Gaza Strip and the West Bank almost stopped. In addition, as two governments were in effect, one in Gaza Strip and the other in the West Bank, the world and Arab aids were split into the two governments. Also, the Palestinian authority was still responsible for some of the services of the Gaza Strip such as providing the fuel and electricity and with lower finance. This put extra load on the government. As many of the governments over the world including the Arab World oppose Hamas government, trade and financial and economic transactions of the country were affected, which led to economic recession. In addition, the war that was forced on Gaza Strip at the fourth quarter of 2008 and ended by the end of the first quarter of 2009 has affected the Palestinian economy too. Government expenditures over the first and second quarters of 2010 witnessed an increase while they witnessed a decrease over the second and third quarters of the same year. Government expenditures over the second quarter of 2011 behaved differently from those in the other quarters of this year. As they witnessed an increase over the second quarter of 2011, they witnessed a decrease over the other quarters of the same year. These fluctuations could be a result of the consequences that followed “the Arab Spring” by the end of 2010. Due to

the fact that the Palestinian economy depends on aids from the Arab's countries, government expenditures were affected by the political and economic conflicts in the Arab World. For example, according to the Ministry of Finance international donations including the Arabs' donations in the fourth quarter of 2010 were US$443.4 million while they witnessed a decrease in the second quarter of 2011, US$419.9 million. These aids are shown in table 4 in appendix B. Also, 2012 witnessed a fluctuating behavior over the quarters. While the first two quarters of 2012 witnessed a decrease in the government expenditures, the later two quarters witnessed a noticeable increase in these expenditures. This could be due to the fact that the Arab World was still going through local political conflicts, which affected the Palestinian economy, since it depends so much on the donations from the outside world, including the Arab countries. It can be noticed that these donations witnessed a fluctuating behavior too in 2012. While these donations recorded an average of US$739.2 million and US$771.4 million for the first and second quarters respectively, it witnessed a decrease in the third quarter and recorded an average of US$723.5 million. Moreover, Gaza Strip witnessed another war at the last quarter of 2012, which caused a recession in the economy affecting the behavior of government expenditures as well.

Another important indicator that should be discussed is the ratio of the total government expenditures to GDP, which is shown in figure 2. It can be noticed from this figure that this ratio over all the quarters, except for the fourth quarters, had its maximum values in 2008 with about 62%, 58% and 71% for the first, second and third quarters, respectively. This is because government expenditures were at their highest values in these three quarters. The reasons behind this were discussed earlier. As for the fourth quarters, this ratio reached its maximum in 2007 where the government expenditures were at their highest level. The

reasons behind this were also clarified earlier.

Figure 2: Total Government Expenditures as Ratio of GDP in Palestine (2000-2012) Quarterly



Sources: 1- Ministry of Finance, General Administration of General Accounts, Reporting Department, Fiscal Operations: Revenues, Expenditures and Financing Sources (Cash Basis) (personal contact).

2- Palestine Monetary Authority based on data from Ministry of Finance, Statistics, Public Finance, Revenues, Expenditures and Financing Sources of PNA Fiscal Operations (Cash Basis), http://www.pma.ps/Portals/1/Users/002/02/2/Time%20Series%20Data%20New/Public_Finance/revenues_expenditures_and%20financing_sources_of_pna_fiscal_operations_00-12.xls

As for the minimum values of this ratio, it can be noticed that for the second and the third quarters, this ratio reached its lowest values in 2006 with about 30% and 34% for the quarters, respectively. This could be due to the political and economic situations followed Hamas winning the elections, as discussed earlier. As for the first quarters, this ratio reached its minimum in 2002 with about 30%. This low value is a result of the Israeli measures that were forced during the second *Intifada* as discussed earlier. As for the fourth quarters, this

ratio reached its minimum in 2011 with about 37%. This low ratio can be explained by the fact that aids to Palestine, hence its total government expenditures, were affected by the "Arab Spring". The average ratios of these expenditures to GDP were about 41%, 42%, 45% and 45% during the quarters, respectively.

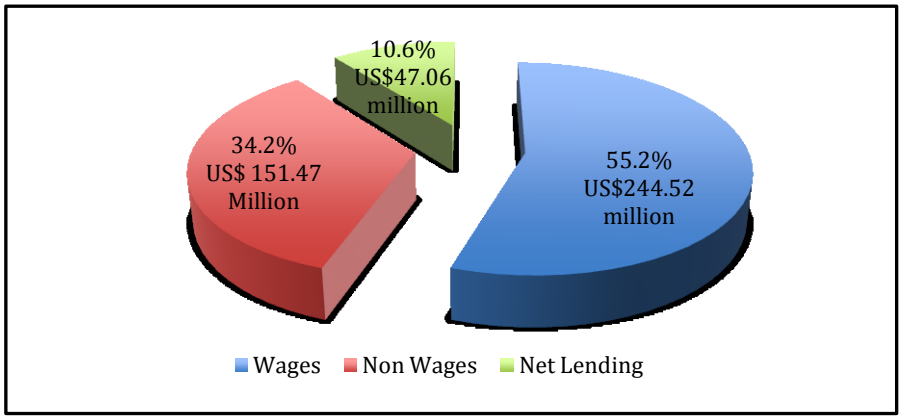
Fluctuations in the behavior of the total government expenditures are the main reasons behind conducting this study. These fluctuations make it unclear and unpredictable whether or not these expenditures have any kind of effect on economic growth. Hence, this study tries to analyze such behavior and investigate whether government expenditures induce economic growth in Palestine (2000-2012) or not. The following two sub-sections describe the decomposition the total government expenditure into two components, capital government expenditures and current government expenditures.

3.1.1 Current Government Expenditures

Current expenditures of the Palestinian government consist of three components: gross wages and salaries, non-wage expenditures, and net lending. The components are shown in figure 3. The gross wages and salaries refer to "wages and salaries of permanent civilian and security employees". The non-wage expenditures include "operational expenditures, transfers and minor development and capital expenditures". Finally, the net lending, includes "transfers to local government to cover clearances revenue deductions by Israel for water, electricity, and health and Ministry of Agriculture services" (Ministry of Finance, 2007). From figure 3, it can be noticed that gross wages and salaries formed about 55% of current expenditures while non-wage expenditures formed about 34% and net lending formed about 11% of the total current expenditures for 2000-2012. On total current expenditures, which are shown in table

2 in appendix A formed about 87% (US$443.06 million) of total government expenditures.

Figure 3: Components of Current Government Expenditures as Percentages from Total Current Government Expenditures in Palestine (2000-2012)



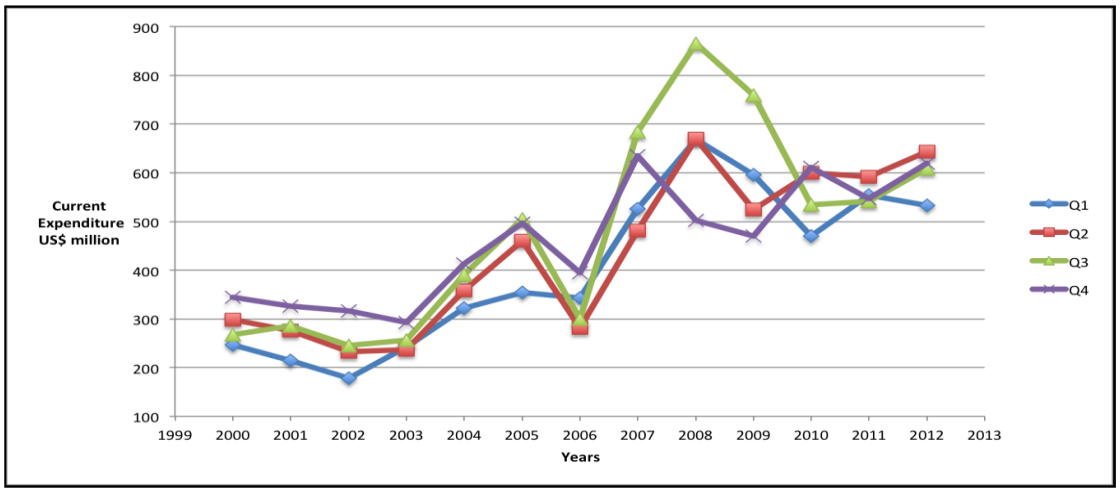
Sources**:** 1- Ministry of Finance, General Administration of General Accounts, Reporting Department, Fiscal Operations: Revenues, Expenditures and Financing Sources (Cash Basis) (personal contact).

2- Palestine Monetary Authority based on data from Ministry of Finance, Statistics, Public Finance, Revenues, Expenditures and Financing Sources of PNA Fiscal Operations (Cash Basis), http://www.pma.ps/Portals/1/Users/002/02/2/Time%20Series%20Data%20New/Public_Finance/revenues_expenditures_and%20financing_sources_of_pna_fiscal_operations_00-12.xls

Current government expenditures are shown in table 2 in appendix A and in figure 4. Current government expenditures recorded an average of US$443.06 million. They reached their maximum in the third quarter of 2008 with US$865.14 million. This might be due to the recovery from the Palestinian Union Split in 2006-2007. However, they reached their minimum in the first quarter of 2002 with US$177.73 million. This could be due to the unstable political and economic status of Palestine during the years of the second *Intifada*. It can be noticed that current expenditures recorded their lowest values during the years of the

second *Intifada* compared to the years that followed.

Figure 4: Current expenditures (US$ million) in Palestine (2000-2012) Quarterly.



Sources: 1- Ministry of Finance, General Administration of General Accounts, Reporting Department, Fiscal Operations: Revenues, Expenditures and Financing Sources (Cash Basis)

2- Palestine Monetary Authority based on data from Ministry of Finance, Statistics, Public Finance, Revenues, Expenditures and Financing Sources of PNA Fiscal Operations (Cash Basis), http://www.pma.ps/Portals/1/Users/002/02/2/Time%20Series%20Data%20New/Public_Finance/revenues_expenditures_and%20financing_sources_of_pna_fiscal_operations_00-12.xls

It can be also noticed that current expenditures showed almost the same behavior over all the quarters of 2000-2012. Using the p-value in the ANOVA analysis in table 1 in appendix B (0.683), it can be confirmed that current expenditures behavior over the different quarters is almost the same. However, looking more into details, it can be noticed that for certain years, current expenditures over all the quarters showed some difference in behavior (figure 4). It can be noticed that current expenditures over all the quarters of 2001 showed some decrease compared to respective quarters of 2000, except for the third quarter, where they showed

some increase. Moreover, current expenditures over all the first three quarters of 2003 showed some increase while they showed some decrease during the fourth quarter. These fluctuations can be explained by the Israeli military measures during the years of the second *Intifada* (2000-2005).

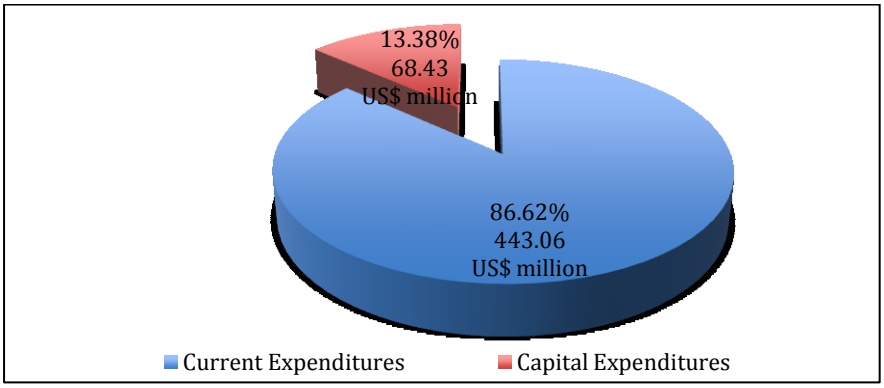
Current expenditures over all the quarters of 2008 witnessed an increase except for the first quarter where they witnessed a decrease. This could be a result of the unstable economic and political situation that followed the union split in Palestine in 2006-2007. Moreover, the war on Gaza Strip that started at the last quarter of 2008 had affected the economy as well. In 2012, current expenditures witnessed a decrease at the first and second quarters while witnessed an increase at the last two quarters. This can be explained by the consequences that followed "the Arab Spring" by the end of 2010 and the political and economic consequences of the war of 2012 at the Gaza Strip. Generally speaking, current expenditures showed an increasing trend over the years of the targeted period.

3.1.2 Capital Government Expenditures

Capital expenditures share from total government expenditures, compared to the share of current expenditures are shown in figure and in table 2 in appendix A. Capital government expenditures formed only about 13% (US$68.43 million) of total government expenditures. They recorded an average of US$68.66 million. They reached their maximum in the third quarter of 2000. Such high level can be explained by the fact that this was before the second *Intifada* took place on the 28th September 2000 when extra Israeli military measures were forced, which affected the Palestinian economy after. They reached their minimum in the first quarter of 2004 with US$2.57 million. It can be noticed that in 2004 capital government

expenditures recorded their lowest values. This is the year when Yasser Arafat, the president of Palestine passed away and the country was going into chaos, as the second *Intifada* was still going on. Moreover, Israel forced a siege on Palestine during this period, which made it very difficult for the Palestinian government to construct any projects.

Figure 5: Current and Capital Government Expenditures as Percentages of Total Government Expenditures in Palestine, Average (2000-2012)



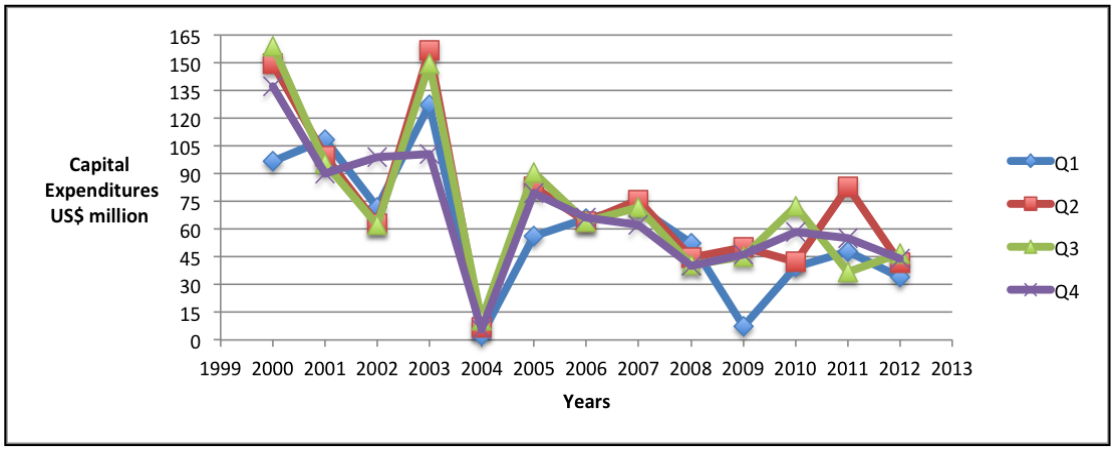
Sources: 1- Ministry of Finance, General Administration of General Accounts, Reporting Department, Fiscal Operations: Revenues, Expenditures and Financing Sources (Cash Basis) (personal contact).

2- Palestine Monetary Authority based on data from Ministry of Finance, Statistics, Public Finance, Revenues, Expenditures and Financing Sources of PNA Fiscal Operations (Cash Basis), http://www.pma.ps/Portals/1/Users/002/02/2/Time%20Series%20Data%20New/Public_Finance/revenues_expenditures_and%20financing_sources_of_pna_fiscal_operations_00-12.xls

Capital government expenditures, like current government expenditures, showed the same general behavior over all the quarters of 2000-2012. This is shown in figure 6. From this figure it can be shown that capital expenditures during the first quarter of 2001 showed some increase while they showed some decrease during the other quarters of that year. During the

fourth quarter of 2002, they showed some increase while they witnessed some decrease during the first three quarters of the same year. These fluctuations during this period are a result of the Israeli military measures that affected the Palestinian economy during the years of the second *Intifada* as mentioned before.

Figure 6: Capital Government Expenditures (US$ million) in Palestine (2000-2012) Quarterly



Sources: 1- Ministry of Finance, General Administration of General Accounts, Reporting Department, Fiscal Operations: Revenues, Expenditures and Financing Sources (Cash Basis) (personal contact).

2- Palestine Monetary Authority based on data from Ministry of Finance, Statistics, Public Finance, Revenues, Expenditures and Financing Sources of PNA Fiscal Operations (Cash Basis), http://www.pma.ps/Portals/1/Users/002/02/2/Time%20Series%20Data%20New/Public_Finance/revenues_expenditures_and%20financing_sources_of_pna_fiscal_operations_00-12.xls

Moreover, capital expenditures witnessed an increase during the first quarter of 2006 while they witnessed a decrease over the other quarters of this year. They witnessed some decrease during the fourth quarter of 2007 while showing some improvement during the other quarters of 2007. Capital expenditures in 2009 and 2010 witnessed some variations. They showed

tremendous decrease during the first quarter of 2009 while they showed an increase during the later three quarters. As for 2010, capital expenditures during the second quarter behaved differently. They showed some decrease during that quarter while they showed some increase during the other quarters of 2010. These fluctuations and variations can be explained by the fact that these are the years of the Palestinian union split and the economy was affected by such political situation. This made it difficult to construct development projects. This political situation took the attention of the government away from constructing such projects and directed it toward solving such local conflict.

Capital government expenditures in year 2011 and in 2012 showed some variations too. During the first two quarters of 2011, they showed some increase while they showed some decrease during the latter two quarters. In 2012, capital government expenditures during the third quarter behaved differently as they showed some increase compared to their level during the third quarter of 2011 while during the other three quarters of 2012, they showed some decrease. These fluctuations in these two years can be explained by the political and economic consequences of the "Arab Spring' which affected the Arab World as previously discussed and by the economic and political consequences of the war on Gaza Strip that started at the end of 2012. Generally, capital government expenditures showed a decreasing trend over the years of the targeted period.

3.2 Employment in the Palestinian Economy

One of the main variables that is included in the production function is labor. Employed individuals are used to represent labor in this study in Palestine (2000-2012). According to the Palestinian Central Bureau of Statistics (2013a) employed people are "Persons aged 15

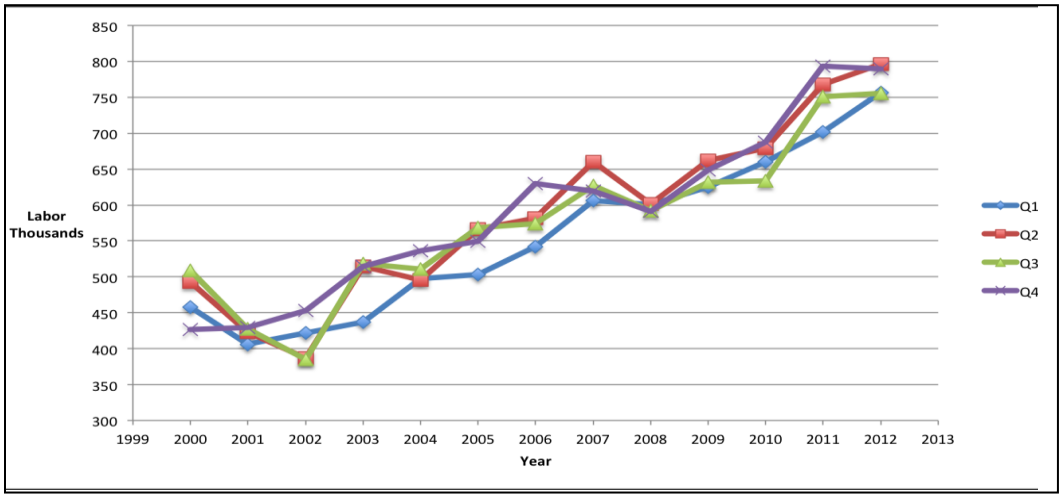
years and over who were at work at least one hour during the reference period, or who were not at work during the reference period, but held a job or owned business from which they were temporarily absent (because of illness, vacation, temporarily stoppage, or any other reason) he/she was employed, unpaid family member or other".

Labor in this study is measured by the number of employed person in the Palestinian Territory, excluding those working in Israel or in the settlements. They recorded an average of 577 thousand workers. The number of workers reached its maximum during the second quarter of 2012 with 797 thousands. As Israel has put more restrictions on the Palestinians, they could no more work in Israel, which continuously increased the number of employed individuals in the Palestinian Territory. Moreover, more children are forced to join the labor force to support their families. According to (Palestinian Central Bureau of Statistics, 2013b) children of (15-17) age group in Palestine record an average of about 0.7% of total employment in Palestine (2000-2012). Child labor is shown in table 5 in appendix A. The number of labor reached its minimum during the third quarter of 2002. This could be explained by the chaos and unstable political and economic situation that the country was going as a result of the Israeli military measures through the years of the second *Intifada*.

Labor is shown in table 1 in appendix A and in figure 7. It can be shown that the number of labor showed the same general behavior over each quarter of the different years of the period, which is confirmed by the p-value (0.872) in the ANOVA analysis in table 1 in appendix B and in figure 7. However, it showed some fluctuating behavior over some quarters of certain years. For example, while it showed some decrease during the fourth quarter of 2001, it showed some improvement during the other three quarters. During the second and third

quarters of 2002, it showed a different behavior than the other two quarters. It showed an increase during the first and fourth quarters unlike the second and third quarters where it showed a decreasing behavior. During the second and third quarters of 2004 employment behaved differently than it did in the first and second quarters where it showed some increase as well as in those of year 2002. These fluctuations during this period can be explained by the unstable economic and political situation of the country during the years of Israeli measures that followed the second *Intifada*. During all quarters of 2007, it witnessed an increase except for the fourth quarter. This could be a result of Palestinian union split that divided the Palestinian government into two, Hamas in Gaza Strip and Fatih in the West Bank. This affected the number of employed labor and its behavior during this period. In general, employed labor showed an increasing trend over the years of the targeted period.

Figure 7: Employed Labor (Thousands) in Palestine (2000-2012) Quarterly.



Source: Palestinian Central Bureau of Statistics, Department of Users Services, Employed persons aged 15 Years and Above in Palestine excluding employed in Israel and settlements 2000q1-2012q4 (personal contact).

3.3 Capital Stock in the Palestinian Economy

The other important variable that is usually included in the Cobb-Douglas production function is capital. Since there are no direct available data on capital stock in Palestine 2000-2012, this study estimates capital stock using the incremental capital output ratio (ICOR) method. ICOR is shows how many additional units of capital needed to produce one more unit of output. It is the ratio of the investment ratio to the growth rate (Easterly, 2003).

$$ICOR = \frac{\Delta K}{\Delta Y} = \frac{\frac{\Delta K}{Y}}{\frac{\Delta Y}{Y}}$$

Where:

K: capital

Y: gross domestic product (GDP)

I: net investment (gross fixed capital formation minus depressiation).

Initial capital (K_0) is calculated as:

$$K_0 = \frac{G.F.C.F_{t_0}}{\delta_0 + g_0}$$

Where:

$G.F.C.F_{t_0}$: the gross fixed capital formation for the initial year of the period (2000 in this study).

δ_0: the depreciation rate for the initial year (Palestinian Central Bureau of Statistics).

g_0: initial growth in the gross fixed capital formation.

ICOR can be used as an average for the whole period of study as in (Bader, 2012) or it can be calculated annually as in (Banerji, 1968). This study uses the second alternative of ICOR approach as all the needed data is available annually and sometimes quarterly for certain variables and the fact that capital changes, in Palestine, continuously from year to year, one cannot neglect these changes and use an average for a grouped years.

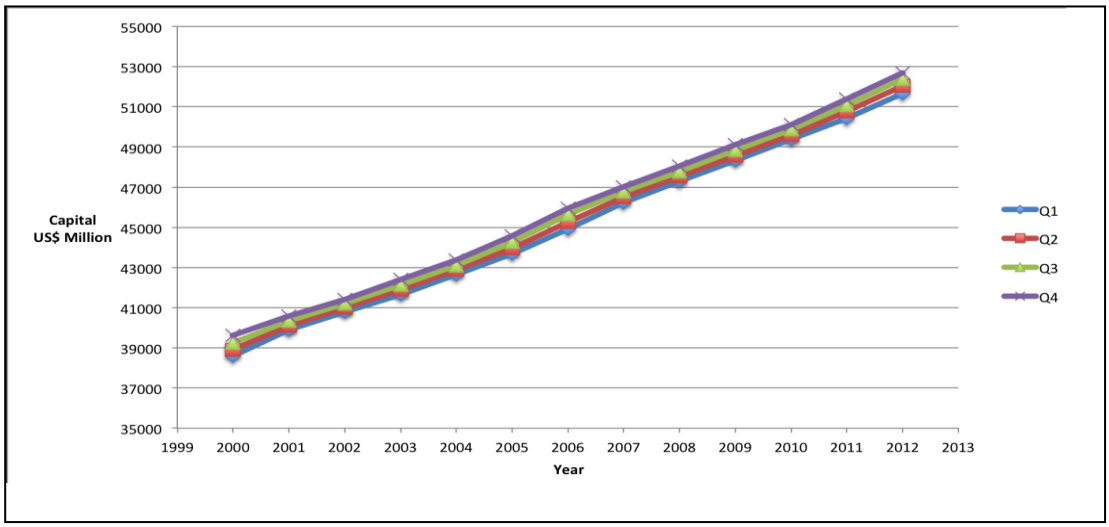
It should be noticed that this method uses the gross fixed capital formation (G.F.C.F) that is obtained from Palestinian Central Bureau of Statistics. However, there is no quarterly available data of G.F.C.F. Therefore, this study transforms the annual data of the G.F.C.F into quarterly data using The Lisman and Sandee Quarterly Distribution Formula. Lisman and Sandee uses four equation in transforming annual data into quarterly one (Lisman and Sandee, 1964):

Starting from the annual totals X_t (t = 1, . . . , n) for each year and divide them into four equal quarterly figures, $x_t^I = x_t^{II} = x_t^{III} = x_t^{IV} = x_t = ¼X_t$. Denote the quarterly figures to be found by y_t^I, y_t^{II}, y_t^{II} and y_t^{IV}. It follows that $\sum_I^{IV} y_t^i = 4x_t$. Assume the quarterly figures y_t^i to be a weighted sum of x_{t-1}, x_t and x_{t+1}. For more details on the coefficients used in the matrix see appendix C.

$$\begin{bmatrix} y_t^I \\ y_t^{II} \\ y_t^{III} \\ y_t^{IV} \end{bmatrix} = \begin{bmatrix} 0.291 & 0.793 & -0.084 \\ -0.041 & 1.207 & -0.166 \\ -0.166 & 1.207 & -0.041 \\ -0.084 & 0.793 & 0.291 \end{bmatrix} \begin{bmatrix} x_{t-1} \\ x_t \\ x_{t+1} \end{bmatrix}$$

Estimated quarterly capital stock is shown in table 1 in appendix A and in figure 8.

Figure 8: Estimated Capital Stock (US$ million) in Palestine (2000-2012) Quarterly



Sources: The Author's Calculations of Capital using the ICOR method using (G.F.C.F and depreciation rate).

Data of G.F.C.F : Palestinian Central Bureau of Statistics, Guide to Palestinian Statistics,

1- Gross Domestic Product by Expenditure for the Years 1994-2011 at Constant Prices: 2004 is the Base Year

http://www.pcbs.gov.ps/Portals/_Rainbow/Documents/EXPconstant%2094-11E.htm

2- Gross Domestic Product by Expenditure and region for the quarters of the years 2011-2012 at constant prices: 2004 is the base year.

Data for depreciation rate: Palestinian Central Bureau of Statistics, Publications, Economic Surveys Series

http://www.pcbs.gov.ps/pcbs_2012/Publications.aspx

Capital recorded an average of US$45,451.04 million. It reached its maximum in the fourth quarter of 2012 with US$52,712.48 million while it reached its minimum in the first quarter of 2000 with US$38,585.38 million. From figure 8, it can be noticed that capital stock showed an increasing behavior all way long through the period of 2000-2012. This can be explained by the fact that capital is an accumulation of investment in previous years, which

explains the fact that capital showed an increasing trend over the years of the targeted period. It can be also noticed that capital behavior through all the quarters of the different years is the same. This is again can be assured using the p-value (0.964) in the ANOVA analysis in table 1 in appendix B.

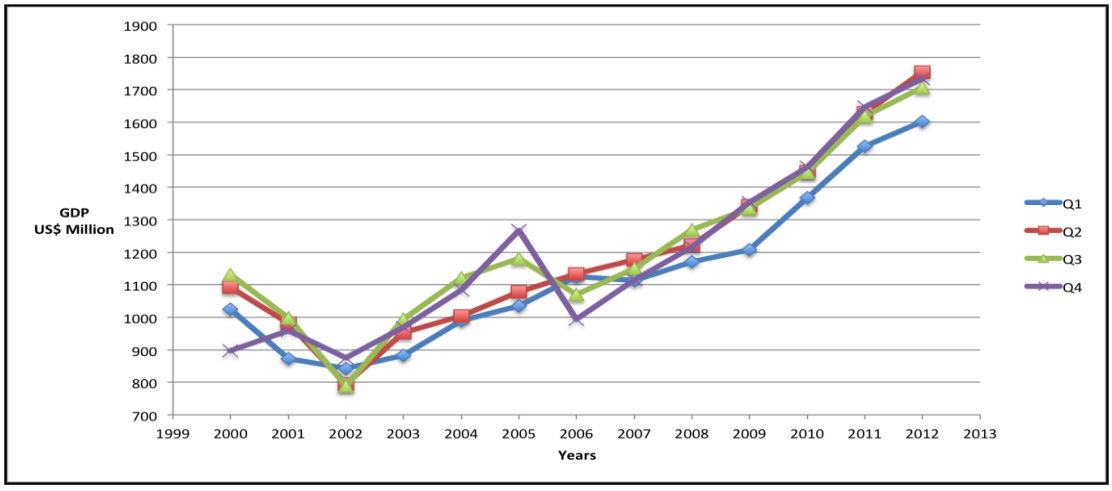
3.4 Gross Domestic Product (GDP)

In this study, GDP is used as an indicator of economic growth. This section analyzes the behavior of GDP in Palestine over the different quarters of the period 2000-2012. GDP, which is shown in table 1 in appendix A, recorded an average of US$1,187.59 million. It reached its maximum in the third quarter of 2012 with US$ 1,754.5 million and reached its minimum in the third quarter of 2002 with US$ 789.2 million. These fluctuations can be explained by the same reasons previously discussed (Israeli military measures, second *Intifada*, Arab Springs and Palestinian union split).

GDP showed the same general behavior over each quarter through the period 2000-2012. This is shown in figure 9. This can also be also assured using the p-value (0.871) from the ANOVA analysis in table 1 in appendix B. Like the previously discussed variables, GDP showed some variations in some quarters over certain years. For example, GDP during the first three quarters of 2001 showed some decrease while it showed some increase during the fourth quarter. GDP in 2006 and 2007 witnessed some variations over the quarters. While it witnessed some increase during the first and second quarters of year 2006, it showed some decrease during the other two quarters of 2006. As for 2007, while GDP during all the quarters showed some increase, it showed some decrease during the first quarter of the same year. These fluctuations are the results of the unstable political and economic situation the

country witnessed during the second *Intifada* and during the Palestinian union split. Generally, GDP showed an increasing trend over the years of the targeted period.

Figure 9: GDP (US$ million) in Palestine for (2000-2012) Quarterly.



Sources: Palestinian Central Bureau of Statistics, Guide to Palestinian Statistics, National Accounts (GDP),

1-Value added in Palestine by economic activity and quarter for the years 2000-2008 at constant prices: 2004 is the base year

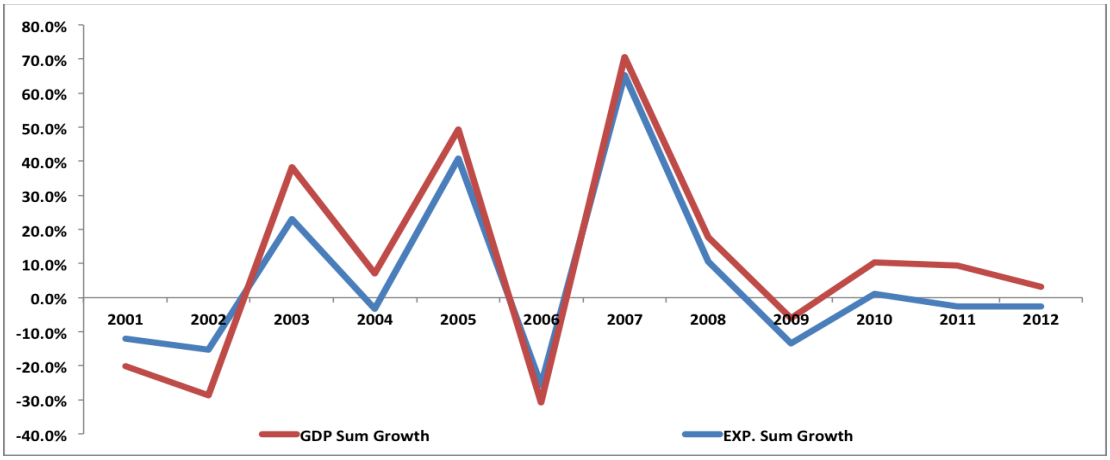
http://www.pcbs.gov.ps/Portals/_Rainbow/Documents/GDP-ValueaddedRWBG2000-2008E.htm

2- Gross Domestic Product by Expenditure and region for the quarters of the years 2011-2012 at constant prices: 2004 is the base year.

3.5 GDP Growth versus Total Government Expenditures Growth.

Comparing the annual growth of total government expenditures to the annual GDP growth 2000-2012, it can be noticed and through table 3 and figure 10 that both variables were moving together through all the period of the study except for some of the years.

Figure 10: Annual GDP Growth in Comparison with Annual Total Government Expenditures Growth in Palestine Annually (2000-2012)



Sources: GDP: Palestinian Central Bureau of Statistics, Guide to Palestinian Statistics, National Accounts (GDP):

1-Value added in Palestine by economic activity and quarter for the years 2000-2008 at constant prices: 2004 is the base year

http://www.pcbs.gov.ps/Portals/_Rainbow/Documents/GDP-ValueaddedRWBG2000-2008E.htm

2- Gross Domestic Product by Expenditure and region for the quarters of the years 2011-2012 at constant prices: 2004 is the base year

For total government expenditures: 1- Ministry of Finance, General Administration of General Accounts, Reporting Department, Fiscal Operations: Revenues, Expenditures and Financing Sources (Cash Basis)

2- Palestine Monetary Authority based on data from Ministry of Finance, Statistics, Public Finance, Revenues, Expenditures and Financing Sources of PNA Fiscal Operations (Cash Basis), http://www.pma.ps/Portals/1/Users/002/02/2/Time%20Series%20Data%20New/Public_Finance/revenues_expenditures_and%20financing_sources_of_pna_fiscal_operations_00-12.xls

For example, during 2004 while total government expenditures recorded a decrease in growth by about 3%, GDP growth witnessed a growth of 10%. This decrease in the total government expenditures resulted from the previously discussed reasons in details in 3.1, 3.1.1 and 3.1.2

(consequences of measures forced by Israel on the Palestinian government during the years of the second *Intifada* and the death of President Yasser Arafat). Also during 2009, total government expenditures witnessed a decrease of about 13% in growth while GDP witnessed an increase of about 7% in growth. This decrease in total government expenditures resulted from the previously discussed reasons in details in 3.1, 3.1.1 and 3.1.2 (consequences of the Palestinian unit split, the extra Israeli measures imposed on the Palestinian economy and the consequences of the Israeli war on Gaza strip 2008-2009). Moreover, during 2011 and 2012 total government expenditures witnessed a decrease in growth by about 3% for both years respectively while GDP recorded an increase in growth by about 13% and 6% for both years respectively. The reasons behind such decrease in both years are the consequences of the Arab Spring that caused a reduction in donations from Arab and world donors. For more details return to 3.1, 3.1.1 and 3.1.2.

As for 2001, 2002 both variables witnessed a decrease in growth. While total government expenditures recorded a decrease in growth of about 8% and 13% respectively GDP witnessed a decrease of about 12% and 15% respectively. The reasons behind such decrease in both variables were discussed in details in 3.1, 3.1.1, 3.1.2 and 3.4 (consequences of the extra Israeli measures imposed on the whole Palestinian economy). As for 2006 total government expenditures witnessed a decrease in growth by about 25% while GDP growth witnessed a decrease of about 5%. The reasons behind such decrease in the growth of both variables are the consequences resulted from Hamas winning the elections in 2006 as well as the Palestinian unit Split that followed this win. Also, the fact that the Hamas government didn’t gain the Arab and world approval, resulted in reduction in donations upon which the economy of the country depends so much on. Return to 3.1, 3.1.1 and 3.1.2 for more details.

4. Data Analysis and Empirical Results

This chapter describes and estimates the model that relates government expenditures to GDP in Palestine, using quarterly data (2000-2012). According to the economic theory, capital, labor and technology are the main variables that have direct impact on GDP. However, the impact of government expenditures and their two components (current and capital expenditures) have been always a debate between different theories and different economists. Hence, this chapter analyzes the effect of such variables (government expenditures and their components) along with capital, labor and technology on GDP.

4.1 The Models

Two models are used in this study. The first shows the relationship between total government expenditures, labor and capital and the GDP as an indicator to economic growth. The second model shows the relationship between the two components of government expenditures (current and capital expenditures) and the GDP along with labor and capital. As a result, capital, labor and technology were included in both models since they are expected to have a more significant impact on economic growth than government expenditures and their components as they form the main factors of production. According to Liu et al. (2010), Adam Smith in his book called "The nature and causes of wealth of the nation" proposed that "the engine of growth lies in the division of labor, capital accumulation and technology progress".

Model One:

$$GDP_t = A_t L_t^{\beta_0} K_t^{\beta_1} EX_t^{\beta_2}$$

If $\beta_0 + \beta_{1+} \beta_2 = 1$ then it's a constant return to scale.

If $\beta_0 + \beta_{1+} \beta_2 > 1$ then it's an increasing return to scale.

If $\beta_0 + \beta_{1+} \beta_2 < 1$ then it's a decreasing return to scale (Berg, and Lewer, 2007).

Where:

GDP: Real Gross Domestic Product (US$ million).

K: Capital (estimated using ICOR method US$ million).

L: Labor force (Thousands).

EX: Total government expenditures (US$ million).

A_t: The constant term that is usually explained as a measure of changes in technology.

β*'s* : Parameters to be estimated.

Then, for statistical reasons this model is transformed into natural logarithm form:

$$LnGDP_t = LnA_t + \beta_0 LnL_t + \beta_1 LnK_t + \beta_2 LnEX_t + u_t$$

$$LnGDP_t = A_0 + \beta_0 LnL_t + \beta_1 LnK_t + \beta_2 LnEX_t + u_t$$

Where:

A_0: changes in technology

u_t : represents error term.

Model two:

$$GDP_t = A_t L_t^{\beta_0} K_t^{\beta_1} CapEX_t^{\beta_2} CurEX_t^{\beta_3}$$

Then, for statistical reasons this model is transformed into natural logarithm form:

$$LnGDP_t = LnA_t + \beta_0 LnL_t + \beta_1 LnK_t + \beta_2 LnCapEX_t + \beta_3 LnCurEX_t + u_t$$

$$LnGDP_t = A_0 + \beta_0 LnL_t + \beta_1 LnK_t + \beta_2 LnCapEX_t + \beta_3 LnCurEX_t + u_t$$

Where:

CapExp: Capital expenditures (US$ million).

CurrExp: Current expenditures (US$ million).

Based on economic theory, capital, labor force and technology are expected to have positive impact on economic growth. Growth in labor force, capital accumulation, and technological progress increases production of goods and services, which means growth in real GDP (Mankiw, Kneebone and McKenzie, 2010). As for the government expenditures, the debate continues on their possible impact. Some theories believe they have negative impact on economic growth while others believe they motivate such growth. Moreover, others believe that there is no long-run impact for government expenditures on economic growth as discussed earlier in chapter two[3].

4.2 Some Necessary Pre-tests

As mentioned earlier in the introductory chapter (chapter one), several pre-tests should be applied before estimating any model. Therefore, the unit root test for both models is estimated as a start. Augmented Dickey Fuller (ADF) unit root test results are shown in table 1 for all variables included in both models. Since the sample size is small, (51 observations) and it's a quarterly data, 4 lags are used in the ADF test. It should be stated that the number of lags to be used in the unit root test are chosen based on Schwarz

[3] Refer to section one in chapter two for more details.

Information Criterion (SIC). From table 1 it can be noticed that the variables are integrated with different orders of stationarity. While LnGDP is integrated of the first order, all other variables are integrated at the zero level I(0).

Table 1: Augmented Dickey Fuller Unit Root Test Results for the Variables of Interest.

Variable	Level			1st Difference			Decision
	Intercept	Intercept + Trend	None	Intercept	Intercept + Trend	None	
LnGDP(1)	-0.37	-3.01	1.10	-6.87	-7.33	-6.69	I(1)
LnLabor(1)	-0.72	-3.66	1.21	-9.07	-9.08	-8.89	I(0)
LnCapital(2)	-0.04	-2.75	3.13	-3.26	-3.10	0.92	I(0)
LnExpend(4)	-2.62	-4.02	0.47	-6.58	-6.51	-6.61	I(0)
LnCapExp(4)	-2.62	-4.02	-0.47	-6.58	-6.51	-6.62	I(0)
LnCurrExp(4)	-1.40	-4.10	0.86	-6.60	-6.52	-6.55	I(0)
5% Critical Value	-2.92	-3.5	-1.95	-2.92	-3.5	-1.95	

* $Note_1$: The value in brackets at the variable column represents the optimal lag used for each variable in the ADF test based on SIC.

* $Note_2$: Results are obtained using Eviews 7.1 Software.

After performing the ADF unit root test, a co-integration test is needed to forecast long-run relationships among the variables in the model. There are several options for such a test. Johansen Co-integration test is one option. However, such a test is only performed when all variables have the same order of integration, which isn't the case here (Johansen, 1988).

Another co-integration test is the Autoregressive Distributed Lag (ARDL) modeling approach. This approach has advantages over the previous co-integration test in that it allows the variables to have different orders of integration that is I(0) and I(1) but not I(2) for the independent variables, and I(1) for the dependent variable. Moreover, this procedure is suitable for small data size (Pesaran, Shin and Smith, 2001). Therefore, this procedure is used in the study.

According to Pesaran, Shin and Smith (2001), the ARDL procedure includes two steps. The first step is to examine the existence of the long-run relationship among the variables under estimation using the F-test. The asymptotic distribution of the F-statistic is non-standard. The null hypothesis is that there exists no level relationship, irrespective of whether the regressors are I(0) or I(1). Two sets of asymptotic critical values are provided: one when all regressors are purely I(1), and the other if they are all purely I(0). These two sets of critical values provide a band covering all possible classifications of the regressors into purely I(0), purely I(1) or mutually co-integrated. In this step, the computed values of the F-statistic are compared to the ones suggested by Pesaran, Shin and Smith (2001). If the computed F-statistic exceeds the upper critical bounds value, then there exists a long run relationship among the variables under estimation. If the F-statistic is below the lower critical bounds value, it implies that there is no co-integration. Lastly, if the F-statistic falls into the bounds, then the test becomes inconclusive.

The second step of this procedure is estimating the long-run and short-run coefficients of the estimated ARDL equation. The ARDL equation is estimated using the OLS procedure. It should be stated here that the lag length of the ARDL model could be chosen by any criteria,

such as the Akaike Information Criterion (AIC) and the Schwartz Bayesian Criterion (SBC). This study uses the SBC criteria following Pesaran, Shin and Smith (2001). Table 2 shows that the best choice for the lag length to be used in the ARDL model is one lag.

Table 2: **Lag Length Selection for ARDL model**

No. of lags	SBC criteria
1	-2.868404
2	-2.788451
3	-2.587448
4	-2.370048

Since the political and military situation may affect the GDP level two dummy variables are added to each model. The first ARDL model to be estimated is:

$$\Delta LnGDP_t = A_0 + \beta_0 DUM_{1(t-i)} + \beta_1 DUM_{2(t-i)} + \beta_2 (LnGDP)_{t-i} + \beta_3 (LnL)_{t-i} +$$

$$\beta_4 (LnK)_{t-i} + \beta_5 (LnEX)_{t-i} +$$

$$\sum_{i=1}^{p} \beta_6 \Delta (LnGDP)_{t-i} + \sum_{i=0}^{q} \beta_7 \Delta (LnL)_{t-i} + \sum_{i=0}^{r} \beta_8 \Delta (LnK)_{t-i} + \sum_{i=0}^{s} \beta_9 \Delta (LnEX)_{t-i} + u_t$$

……(1)

Where:

Δ: first difference operator.

Dum_1: a dummy variable that represents the political situations and events in Palestine for 2000-2012 that affects the economy. It takes the value 0 when there is no political event and 1 when there is.

Dum_2: It's a slope dummy variable, which equals Dum_1 multiplied by Capital.

u_t : the error term.

p, q, r, s: represents the lag order for LnGDP, LnL, LnK, LnEX, respectively.

From the estimated coefficients of equation 1, the long-run and short-run effects can be captured. The short-run effects for labor, capital and total expenditures are represented by the coefficients of the first-differenced variables (β_7, β_8, β_9) respectively. The long-run effects for labor, capital and total government expenditures are represented by (β_3/β_2), (β_4/β_2) and (β_5/β_2), respectively.

The Wald-test (F-statistic) is performed by imposing restrictions on the coefficients of the long-run coefficients, where:

H_0: $\beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$.

H_1: $\beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$.

If null hypothesis is accepted, it can be concluded that the variables aren't co-integrated and that there is no long-run relationship among them. If the alternative hypothesis is accepted, then variables are co-integrated and there is a long-run relationship among them (Pesaran, Shin and Smith, 2001).

The same is done for the second model, where its ARDL is represented by:

$$\Delta LNGDP_t = A_0 + \beta_0 DUM_{1(t-i)} + \beta_1 DUM_{2(t-i)} + \beta_2 (LnGDP)_{t-i} + \beta_3 (LnL)_{t-i} +$$

$$\beta_4 (LnK)_{t-i} + \beta_5 (LnCapEX)_{t-i} + \beta_6 (LnCurEX)_{t-i} +$$

$$\sum_{i=1}^{m} \beta_7 \Delta (LnGDP)_{t-i} +$$

$$\sum_{i=0}^{n} \beta_8 \Delta (LnL)_{t-i} + \sum_{i=0}^{o} \beta_9 \Delta (LnK)_{t-i} + \sum_{i=0}^{p} \beta_{10} \Delta (LnCapEX)_{t-i} +$$

$\sum_{i=0}^{q} \beta_{11} \Delta(LnCurEX)_{t-i} + u_t$ …….....……(2)

Where:

m, n, o, p, q: represents the lag order for LnGDP, LnL, LnK, LnCapEX, LnCurEX, respectively.

Again:

H_0: $\beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$

H_1: $\beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$

Looking at the calculated F- values for both models in table 3, it can be noticed that in both models, the estimated F-values that are less than the lower bound of the F-tabulated suggested by (Pesaran, Shin and Smith, 2001). This means that in both models the variables aren't co-integrated, and there are no long relationships among the variables under estimation.

Table 3: F-statistics for Testing the Existence of a Long-run Relationship

Lag length	Model One		Model Two	
	Without trend	F-tabulated	Without trend	F-tabulated
1	2.55	3.23-4.35	2.62	2.86-4.01
2	0.76	3.23-4.35	0.82	2.86-4.01

*Note: the F-values are calculated for k=3 for model one and k=4 for model two (k=the number of explanatory variables) at 5% level of significance using Eviews 7.1

Therefore, based on the F-test results there, it can be concluded that there is only a short-run relationship among variables. Therefore, the error correction mechanism (ECM) isn't an option in this case. "The Granger representation theorem states that if two variables Y and X are co-integrated then, the relationship between the two can be expressed as ECM" (Gujarati, 2003). Therefore, the vector autoregressive (VAR) model should be estimated in the case of no co-integration among the variables, but not ECM. According to Bondt (2000), if all variables are of I(1) and there is no co-integration relations, the vector error correction model (VECM) cannot be used. Instead, a standard VAR model in first differences will be the right procedure. However, if all variables are of I(0) and there is no co-integration among the variables, then the VAR model in levels should be used. Moreover, Harvey (1990) sees that "the usual approach adopted by VAR aficionados is therefore to work in levels, even if some of these series are stationary. In this case, it is important to recognize the effect of unit roots on the distribution of estimators". Therefore, this study estimates the VAR model in levels. Khan and Ali (2003) argue that when there is a mixture of order of integration, the VAR model at level is applicable rather than VEC model. On the other hand, VAR in difference will be a misspecification when variables are co-integrated. In such a case, with co-integration, VEC models are appropriate.

4.3: Results of the Estimated Models

This section consists of two sub-sections. The first sub section is a detailed analysis of the first model that is estimated using the VAR model. The second sub section is a detailed analysis of the second model that is estimated using the VAR model too. Also this section contains a detailed analysis of the Granger causality test results in VAR environment.

4.3.1: Models 1: Using Total Government Expenditures as an Explanatory Variable

The estimated VAR model for the first model (total government expenditures) is as follows:

$$\Delta LNGDP_t = A_0 + \beta_0 LnGDP_{t-1} + \beta_1 LnL_{t-1} + \beta_2 LnK_{t-1} + \beta_3 LnEX_{t-1} + \beta_4 Dum_{1(t-1)} + \beta_5 Dum_{2(t-1)} + u_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

$$LnGDP_t = -3.85 + 0.63LnGDP_{t-1} - 0.12LnL_{t-1} + 0.67LnK_{t-1} + 0.02LnEX_{t-1} - 0.6Dum_{1(t-1)} + 1.30e^{-05}Dum_{2(t-1)} + u_t$$

(-1.6) (5.06) (-0.71) (2.36) (0.34) (-2.03) (2.00)

$R^2 = 0.926$ $\bar{R} = 0.916$ F-statistic = 91.67 D.W=1.8

The values in brackets are the t-statistics for each estimated variable. The R^2 is 0.926, which means that 92.6% of the variation in the dependent variable (LnGDP) can be explained by the variations of the independent variables (LnL), LnK, LnEX). Results also show that the F-calculated is about 91.67, which is a measure of the overall significance of the estimated model. Since this value is high compared to the tabulated value, it can be said that this model is statistically significant and can be used in analyzing the relationship between economic growth and all the independent variables (LnL, LnK, LnEX). Moreover, the value of Durbin Watson (D.W) is 1.8, which shows that the model has no autocorrelation problem.

As for the calculated t-statistics, which are used in testing the significance of each independent variable individually, it can be noticed that LnK(-1), LnGDP(-1) and both dummy variables are significant at level of 5%, while the other independent variables (LNL(-1) and LNEX(-1)) are statistically indifferent from zero, and cannot be used in explaining the variations of the dependent variable (LnGDP) in the short-run.

The coefficient of LnK is positive as expected (consistent with the economic theory). This indicates that LnK in the short-run is a main determinant of economic growth. The coefficient of LnK measures the elasticity of GDP with respect to capital, holding the influence of labor and total government expenditures constant. This coefficient indicates that the relative percentage change in GDP for a given percentage change in capital is about 0.67. This means that 1% increase in capital raises GDP by 0.67%, holding both labor and total government expenditures constant (Gujarati and Porter, 2010). This result is consistent with the economic theory, which states that there is a positive relationship between capital and economic growth. In fact, capital along with labor and technology are considered to be the main factors of production that leads to economic growth. This was discussed earlier (the Solow model).

This result is consistent with Dao (2012) where the share of gross physical capital formation in the GDP, which was used as an indicator for capital, was found to be positively influencing economic growth of the developing countries that were under examination in that study. This is also consistent with Yu, Fan and Saurkar (2009) who found that capital accumulation stimulated economic growth in Asia. The fact that capital in Palestine (2000-2012) was found to be continuously increasing, and since theory states that capital and economic growth are positively related, then it's a common sense to get such result regarding the impact of capital on economic growth. Continuous increase in the capital stock means continuous increase in production when labor and technology are constant. This means GDP will continue to increase which will lead eventually to economic growth.

As for the capital not having a relationship with the economic growth in the long run, this result is unexpected. It opposes the economic theory (Solow theory of economic growth) and

the results of most researches. However, this result is consistent with the neoclassical economists view regarding the impact of capital on economic growth in the long run. According to (Lensink and Kuper, 1998) "Neoclassical economists not only doubt the long run effect of physical capital accumulation for economic growth, they also argue that the short-run effect of capital formation on economic growth is small". According to these economists, the main reason behind this modest effect of capital formation is that "the elasticity of output with respect to capital equals the capital share in GDP, which is usually only about one-third".

In the case of labor, the results are unexpected. It is found that LnL is negative but insignificant, which means that it has no significant impact on economic growth in the short-run. This result also applies for the long run where labor is found to have no long-run relationship with economic growth. This result is inconsistent with the economic theory which states that there should be a positive relationship between labor and economic growth as discussed earlier (the Solow theory). However, this result is similar to that obtained by Yasin (2003) where labor, which has been proxied by the growth rate in population rather than by the actual growth rate in labor force, was found to be negative but insignificant. This result is also consistent with McDonald (2012) where labor was found to be negative and non-significant in the first model while it turned out to be negative but significant in the other model. Also the Feder-Ram model shows itself to be incapable of explaining any economic growth whether through non-defense expenditures, capital investment or labor. Within the estimates of the augmented Solow model, defense expenditures appear to improve economic growth. This could be due to the lack of experience of the labor force in the short-run which would delay the growth in the economy and cause such a result.

As for the long-run relationship the results could be due to the fact that some variables were estimated such as capital using the ICOR method and transformed from annual to quarterly data and data of government expenditures over some quarters are estimated too, which might have affected the accuracy of the results. Moreover, the political situation and the Israeli measures forced on the Palestinian workers, may have affected the productivity of labor force, which eventually hindered the wheel of production and caused labor to be insignificant for both the long-run and short-run. Moreover, the fact that the employed individuals at the public sector forms on average about 25% from the total employment in Palestine (2000-2012), excluding the workers in Israel and the settlements, affects the total impact of labor on economic growth since the employees of this sector are less productive than the private sector. According to Yavuz (2011) "When faced with budgetary pressures, it is easier politically for governments to cut investment outlays or maintenance expenditure than to fire public sector workers, which brings relative job security for public sector employees. Therefore, overemployment and hence, low labor productivity becomes another characteristic of the public sector". The percentages of employed individuals in both the public and private sectors are shown in table 6 appendix A.

In the case of technology, which is represented by the constant term in the VAR equation, it is found to be negative but insignificant in the short-run, as well as having no relationship with GDP in the long run. This result is consistent with the results of the study conducted by Chow (1993). In his study, he attempted to measure the contribution of capital formation to the growth of five sectors in China for 1952-1980. His main findings were that capital constituted the major source of growth while "technological change was absent in the growth

of the Chinese economy from 1952- to 1980". However, this is inconsistent with the economic theory, which expects that technology, as well as labor and capital are expected to have positive effects on production. That is, according to economic theory, technology should have a positive impact on economic growth. Also, this result is inconsistent with the results obtained by Mohammadi, Maleki and Gashti (2012) who found that technology has a positive impact on economic growth.

In the short-run, labor force lacking the experience and the right knowledge of new technology might delay the excepted positive impact of such a variable. Moreover, Palestine as a developing country under occupation has limited access to and old technology, which might be also old. Israel is the one that has a full control over the borders of the country, which limits what can be imported, and therefore the production process has to keep going with old technology. The unstable political and security situation also affects the productivity and the development of technology. According to Aisen and Veiga (2010) "It is also possible that political instability adversely affects productivity. By increasing uncertainty about the future, it may lead to less efficient resource allocation. Additionally, it may reduce research and development efforts by firms and governments, leading to slower technological progress". In addition, the condition of Palestine as an underdeveloped country that is under occupation very low and incapable of having a significant positive impact on the economic growth. "It is neither desirable nor possible for underdeveloped countries to adopt labor saving and capital intensive technology of the advanced countries. As a matter of fact these countries should neither adopt very old technology nor the most modern Western technology, which consists of an adoption of modern methods to special conditions of the underdeveloped world. In other words, they should evolve a new technology of their own

suitable under their circumstances" (Somashekar, 2003). However such third technology doesn't exist and that's why technology is excpected to have no impact on economic growth of such countries.

Most importantly, however, total government expenditures and their components are the main variables discussed. Total government expenditures are found to be positive but insignificant in the short run. The result is consistent with the neo-classical theory, which suggested that there is no long-run impact of government expenditures on economic growth. Moreover, the result is consistent with Yu, Fan and Saurkar (2009) who found that, in Latin America, none of the government spending items has any significant impact on economic growth. However, this result is inconsistent with Al Batel (2000), Sáez and García (2006) and Al Bataineh (2012) who found that the government expenditures at the aggregate level have positive impact on economic growth. Moreover, it is inconsistent with (Chipaumire, 2014) who found that government expenditures are significant and that there is a long-run negative relationship between government expenditures and economic growth. This result is consistent with the classical school view regarding the impact of government expenditures on economic growth. This school sees that countries with higher government expenditure would experience lower economic growth.

Such result, concerning total government expenditures, isn't surprising with such a fragile economy as the economy of Palestine. The result behind such a behavior is discussed earlier in chapter three. In summary, the economy of Palestine depends so much on external financing through international and Arab aids. Moreover, current expenditures form the majority of the total government expenditures, about 87% of total government expenditures,

while capital expenditures form only about 13% of the total government expenditures. As capital expenditures are expected to have future financial and economic returns and benefits, having such moderate portion of total government expenditures makes the total financial returns impact of total expenditures on economic growth weak and insignificant. The fact that most of the donors determine the scope and field where expenditures should be disposed, leaves the benefits and returns of such expenses limited.

Moreover, the Palestinian government has a specific budget that is limited and targeted towards certain directions and aspects such as wages and salaries, which consumes most of its budget. This leaves little and insufficient portion of the budget to the importation development and maintenance of the technology used in the production process, which affect the performance of the capital used in the production process, and impose extra burdens on the workers, which will eventually slow and limit the production process. Also the fact that much of the government expenditures are wages and salaries reduces the opportunity of having financial returns from such expenditures. Such expenditures are affected by the Israeli measures, as well as the internal political situation of the country. For example and after the Palestinian union split, the government was forced to pay to the employees of Gaza Strip who refused to stay in their positions after Hamas took over the Strip. In addition, the fact that even after Hamas took over Gaza, the Palestinian National Authority was still responsible of Gaza in certain fields, such as providing electricity and water. On the other hand and not having any financial returns from Gaza, left such government with extra burdens without foreseen benefits. All of these factors increased government expenditures while decreased the financial benefits and returns out of them.

Finally, the Israeli measures imposed on Palestine during the second intifada affected the Palestinian economy as a whole. Government expenditures and mostly capital expenditures were also affected by such measures. For example in 2004, capital expenditures reached zero. Restrictions on industry, internal trade, exports and imports, agriculture and every economic aspect have increased. Such restrictions have decreased the opportunity of financial returns for the country in general and the government in particular. Therefore, it is not surprising that the impact of government expenditures on economic growth turned out to be insignificant.

As for the two dummy variables that were used, it was found that both dummies in both models are significant, which means that the political situations and events have impact on the economic growth in the short run. The political and economic events were discussed in details in chapter 3. In each model, two dummies are used, a slope dummy and an intercept dummy. The coefficient of the intercept dummy variable can be explained as the amount by which LnGDP with political and economic events exceeds LnGDP without these events. "A common approach for measuring the effects of a dummy variable on the probability of an event is to calculate odd ratios. Odds ratios represent the ratio of the probabilities of the outcome occurring for sample members who have a value of one for the dummy variable for those in the reference group. They are found simply by exponentiating dummy variable coefficients" (Crown, 1998). Therefore, the percentage change in the predicted values between LnGDP with political and economic events and without these events, with all other included explanatory variables held constant, can be computed as follows:

$$\frac{GDP_{events=1} - GDP_{events=0}}{GDP_{events=0}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

The percentage difference then can be expressed as:

$$\frac{GDP_{events=1}}{GDP_{events=0}} - 1$$

$$Ln(GDP_{events=1}) - Ln(GDP_{events=0})$$

$$\frac{Ln(GDP_{events=1})}{Ln(GDP_{events=0}} = 0.6$$

Now, taking the anti-log:

$$\frac{Ln(GDP_{events=1})}{Ln(GDP_{events=0}} = e^{0.6} = 1.822$$

$$\frac{GDP_{events=1} - GDP_{events=0}}{GDP_{events=0}} = \frac{GDP_{events=1}}{GDP_{events=0}} - 1 = e^{0.6} - 1 = 0.822$$

The intercept dummy variable picks up the change in the intercept of the regression. In the estimated model here, GDP with the political and economic events is less than GDP without these events by about 82.2%. It should be stated here that since the technology factor turned out to be insignificant, the coefficient A_0 is not added to the value of the intercept dummy variable, which turned out to be significant.

The slope dummy, on the other hand, picks up a change in the slope of the regression line leaving the intercept unchanged. When DUM_1=1 and taking into account that DUM_2 =DUM_1 × LnK, equation 4 can be transformed into:

$$LnGDP_t = A_0 + \beta_0 LnGDP_{t-1} + \beta_1 LnL_{t-1} + (\beta_2 + \beta_5) LnK_{t-1} + \beta_3 LnEX_{t-1} +$$

$\beta_4 Dum_{(t-1)} + u_t$ ……..(5)

When DUM_1=0:

$$\frac{\Delta LnGDP_t}{\Delta LnK_{t-1}} = \beta_2$$

β_2 represents the elasticity of GDP_t with respect to K_{t-1}, that is, the percentage change in GDP_t for a given percentage change in K_{t-1}. In this model the elasticity of GDP_t with respect to K_{t-1} is 0.67, which means that if capital goes up by 1% on average GDP goes up by about 0.67%.

However, when DUM_1=1:

$$\frac{\Delta LnGDP_t}{\Delta LnK_{t-1}} = \beta_2 + \beta_5$$

The elasticity, in this case, turns out to be equal to $\beta_2 + \beta_5$. That is, taking the political and economic events into consideration, the elasticity of GDP_t with respect to K_{t-1} is about 0.68%, which indicates that if capital goes up by 1%, on average, GDP goes up by about 0.68%. To conclude, from the interpretation of the coefficients of dummy variables, it can be said that the political and economic events do affect the economic growth of Palestine for (2000-2012).

4.3.2: Model 2: Using the Components of Government Expenditures as Explanatory Variables

The estimated VAR model for the second model (components of government expenditures) is as follow:

$$LnGDP_t =$$

$$A_0 + \beta_0 LnGDP_{t-1} + \beta_1 LnL_{t-1} + \beta_2 LnK_{t-1} + \beta_3 LnCapEX_{t-1} + \beta_4 LnCurEX_{t-1} +$$

$$\beta_5 Dum_{1(t-1)} + \beta_6 Dum_{2(t-1)} + u_t$$

$$\underset{(-1.71)}{LnGDP_t = -5.31} + \underset{(4.70)}{0.61 LnGDP_{t-1}} - \underset{(-.09)}{0.17 LnL_{t-1}} + \underset{(2.26)}{0.84 LnK_{t-1}} + \underset{(0.80)}{0.11 LnCapEX_{t-1}} - \underset{(-0.73)}{0.09 LnCurEX_{t-1}} - \underset{(-2.15)}{0.69 DUM_{1(t-1)}} + \underset{(2.12)}{1.47 e^{-05} DUM_{2(t-1)}} + u_t$$

$$R^2 = 0.93 \qquad \bar{R} = 0.91 \qquad \text{F-statistic} = 77.8 \qquad \text{D.W} = 1.85$$

The R^2 is 0.93, which means that 93% of the variations in the dependent variable (LnGDP) can be explained by the variations of the independent variables (LnLabor, LnCapital, LnCapExpend and LnCurrExpend). Results also show that the F-calculated is about 77.8. Since this value is high compared to the tabulated value, it can be concluded that this model is statistically significant and can be used to analyze the relationship between economic growth and all the independent variables (LnLabor, LnCapital, LnCapExpend and LnCurrExpend). Moreover, the value of Durbin Watson (D.W) is 1.85, which indicates that the model has no autocorrelation problem.

The results of the estimated model are similar to the results of the previous one. That is all its independent variables are insignificant except for capital and LnGDP(-1) along with both dummy variables. Results regarding LnLabor, LnCapital and technology were discussed and explained above, in the previous section. As for the two dummy variables, from the intercept dummy of this model it can be noticed that GDP with the political and economic events is less than GDP without these events by about 99.4%. As for the slope dummy variables it can be noticed that taking the political and economic events into consideration, the elasticity of

GDP_t with respect to K_{t-1} is about 0.85%, which indicates that if capital goes up by 1%, on average, GDP goes up by about 0.85%. This again means that that the political and economic events do affect the economic growth of Palestine for (2000-2012).

The government capital expenditures and the current expenditures are found to be insignificant in the short-run. This is consistent with the neo-classical theory, as was discussed earlier. Moreover, it is consistent with the results of Altaf and Khan (2013) who found that there isn't any significant impact of capital expenditures on the growth rate of real per capita GSDP in Assam in India. However, it is inconsistent with the results obtained by Okoro (2013) where it was found that there exists a long-run equilibrium relationship between government capital and current expenditures and and economic growth in Nigeria, and that the government's capital expenditure will contribute more to the economic growth of Nigeria than the government recurrent expenditure. Also, Gregoriou and Ghosh (2009) found that for nations such as Brazil, current expenditures have a major role to play in determining long-run growth, whereas for other countries like Sudan, current expenditures play only a minor role in the growth of the nation. Reasons behind such results regarding the components of government expenditure were discussed in details in chapter 3 and in section 4.3.1.

In summary, the results regarding the impact of government expenditures on economic growth are consistent with the neoclassical school, which sees that budget should be balanced and government expenditures should be kept to their minimum. On their justification of this view, they refer to a phenomenon called "real crowding-out". They argue that "Any government expenditure must displace either private investment and/or consumption". Moreover, "if the government borrows, a portion of private borrowing will be crowded out. If

the government debt is financed through foreign borrowing and/or it causes private investment to be financed through borrowing, currency will appreciate, the volume of exports may decline and service payments for the debt will leave the country, thus deficits may arise in the current account" (Musgrave, 1959). Moreover, Rowley (1986) gives two reasons why government intervention should be kept at minimum. "First, increasing government expenditures will increase the size and scope of the state at the expense of individual liberty. Second, the public sector cannot allocate resources as efficiently as the private sector".

As for the causality test, Toda-Yamamoto causality test seems to be the most appropriate method to use in a case where variables are of different order of integration. According to Mohamed, Saafi and Farhat (2014) "The underline objective of the Toda-Yamamoto causality test is to overcome the problem of invalid asymptotic critical values when causality tests are performed in the presence of non-stationary series or even co-integrated". In such a procedure, there is no need for to test for co-integration or transform VAR into VECM. This procedure uses a Modified Wald (MWALD) test for restrictions on the parameters of the VAR model. According to Toda and Yamamoto (1995) the procedure includes three steps. First, testing each of the time-series to determine the maximum order of integration (d_{max}) of the variables in the system. Second, determining the optimal lag length (p) of the model using one of the known criterion such as AIC, SC, etc. Third, using the modified Wald procedure to test the VAR(k) model for causality with the optimal lag length equal to $k = (p + d_{max})$.

In this study, it is found that the maximum order of integration is one (d_{max}) for both models and that the optimal lag length of the VAR model in both cases is 1 lag (p). Therefore, the VAR model is to be tested for causality using optimal lag length k=2 for both models. The

results of the causality test are presented in table 4 and table 5. From the results, it can be concluded that in both models only capital causes GDP in the short-run. This isn't surprising since capital is considered to be one of the main sources of production. Policy makers should take this into consideration. They should encourage both private and public investment or at least increasing its capital expenditures. Government should encourage investment in the private sector as well, and should give facilities to encourage the Palestinians outside the country to invest in their homeland. Much attention should be directed towards capital as being one of the main sources of production.

Table 4: Granger Causality Test Results in VAR Environment Using Toda and Yamamoto Procedure for Model 1 (Dependent variable: LnGDP)

Independent Variable	Chi-square	d.f	Prob.
LnLabor	1.111612	2	0.5736
LnCapital	8.647214	2	0.0133
LnExpend	0.157291	2	0.9244
Dum1	1.811233	2	0.4043
Dum2	1.777780	2	0.4111
All	17.28839	10	0.0682

Table 5: Granger Causality Test Results in VAR Environment Using Toda and Yamamoto Procedure for Model 2 (Dependent variable: LnGDP)

Independent Variable	Chi-square	d.f	Prob.
LnLabor	1.537051	2	0.4637
LnCapital	6.851657	2	0.0325
LnCapExpend	0.570405	2	0.7519
LnCurrExpend	0.743112	2	0.6897
Dum1	2.473494	2	0.2903
Dum2	2.429675	2	0.2968
All	17.44422	10	0.1336

5. Conclusions and Policy Implications

This study analyzes the impact of total government expenditures on economic growth in Palestine, using quarterly data (2000-2012). Moreover, it identifies the components of government expenditures (capital and current expenditures) and the impact of each component on the economic growth. It introduces the meaning of each component and shows the subdivisions of each component. Since economic growth may be affected by other important variables, the study analyzes the impact of such variables on economic growth. These variables are labor, capital and technology. This study also highlights the impact of the political situations and security events on economic growth. In addition, this study esimates capital stock using the ICOR method. It converts annual data into quarterly using the Lisman and Sandee Quarterly Distribution Formula. This chapter summarizes the descriptive and empirical results of the study as well as raising some policy implications that can be adopted by the policymakers in the country to facilitate economic growth.

As part of analyzing the data, minimum and maximum values as well as the averages of the variables used in this study are calculated. Percentages and the growth of the variables are calculated as well. Using quarterly time series data and adopting the ARDL approach, a multiple regression analysis is performed. Two models are estimated. In the first model, natural logarithm of GDP forms the dependent variable while natural logarithms of labor, capital and total government expenditures form the independent variables. As for the second model, the natural logarithm of GDP forms the dependent variable while the natural logarithms of labor, capital, current expenditures and capital expenditures form the independent variables. Moreover, two dummies are added to both models as another

independent variables to represent the political and economic events that might affect the economy of Palestine as well. This study is based on secondary quarterly data (2000-2012) where those of total government expenditures and their components are taken from the Ministry of Finance whereas those of GDP, capital (estimated using the ICOR approach) and employment to be taken from the Palestinian Central Bureau of Statistics.

5.1 Conclusions

The results of the study indicate that there is a fluctuating behavior of total government expenditures through the period of the study (2000-2012). They reach their minimum during the first quarter of 2002 and their maximum during the third quarter of 2008. Some of the years witness a tremendous increase through all the quarters such as 2001, 2002 and 2004 while others witness tremendous variations through the quarters such as 2008. Government expenditures recorded an average of US$720.94 during the first quarter of this year (2008) while recorded an average of US$713.75 million during the second quarter. Then, it increased tremendously during the third quarter to reach US$905.88 million, and then decreased tremendously to US$ 541.86 million during the fourth quarter. As for the growth of total government expenditures, it reaches its minimum during the third quarter of 2006, whereas it reaches its maximum during the third quarter of 2007. The growth of total government expenditures shows a fluctuating behavior. While some of the years witness a tremendous increase in the growth through all the quarters such as 2005 and 2007, others witness a tremendous decrease in the growth through all the quarters such as 2006 and 2009.

As for current government expenditures, they show the same general behavior as the total government expenditures for the most of the quarters through the different years. The fact that current expenditures forms about 87% of total government expenditures makes their impact very powerful on the general behavior of total government expenditures. Moreover, capital expenditures in some years forms on average only about 1% of total government expenditures such as the case of 2004, which makes the behavior of government expenditures in those years very similar to those of current expenditures. Nevertheless, current expenditures behaves differently in some years behaves differently. For example, the first three quarters of 2004 and 2011, the first quarters of 2010 and 2002, the second quarter of 2003 and the third quarter of 2001 current expenditures shows an opposite behavior to that of total government expenditures. The behavior of both variables in those years was discussed in details in 3.1 and 3.1.1.

As for capital expenditures, they reach their minimum during the first quarter of 2004 and their maximum during the third quarter of 2000. While some of the years witness a tremendous decrease through all the quarters such as 2001 others witness tremendous variations through the quarters such as 2010. Capital expenditures recorded an average of US$ 39.82 million during the first quarter while recording an average of US$42.38 million during the second quarter then it increased tremendously during the third quarter to reach US$72.44 million while decreasing back to US$58.22 million during the fourth quarter. Moreover, the results show that current expenditures formed the largest share of total government expenditures where they form about 86.62% of them and capital expenditures form only about 13.38% of them. In addition, gross wages and salaries form the highest share of total government expenditures where they form about 55.2% of them while non-wages

expenditures formed 34.2% and net lending form only 10.6%. This implies that almost half of the government expenditures are dedicated to wages and salaries while expenses on projects such as roads, hospitals, etc. form only about one eighth of total government expenditures.

As for labor, it is found that it reaches its minimum during the third quarter of 2002 and its maximum during the second quarter of 2012. While some of the years witness a tremendous increase through all the quarters such as 2001, others witness variations through all the quarters such as 2012. Labor recorders an average of 756 thousands during the first quarter while recording an average of 797 thousands during the second quarter. Then it decreased back to 756 during the third quarter while increasing up to 790 thousands during the fourth quarter. As for the growth of labor, it witnesses a fluctuating behavior as well. It reaches its minimum during the third quarter of 2001 and its maximum during the third quarter of 2003. As for capital, which is estimated using the ICOR method, it is found that it shows an increasing behavior through all the quarters of 2000-2012.

This study performs some necessary pre-tests needed, the ADF test for the stationarity of data and the Wald test for examining the existence of long- run relationship among the variables. The ADF test results show that the variables are integrated with different orders of stationary. While LnGDP is integrated at the first order I(1), all the other variables (LnLabor, LnCapital, LnExpend, LnCapExpend and LnCurrExpend) are integrated at zero (level) I(0). As for the Wald test results, it is found that in both models there are no long- run relationships among the variables, which means that such variables aren’t co-integrated.

The empirical results of the estimated two models show that:

- Labor force, mainly employment, had a positive but insignificant impact on economic growth in the short run, which makes it statistically indifferent from zero.

- Capital, which was estimated using the ICOR method, had a positive and significant impact on economic growth in the short run.

- Total government expenditures had a positive and insignificant impact on economic growth, which makes it statistically indifferent from zero in the short run.

- Technology had insignificant impact on economic growth, which makes it statistically indifferent from zero in the short run.

- The two dummy variables that were used to represent the political and economic events in Palestine (2000-2012) had significant impact on economic growth. While the intercept dummy had a negative impact on economic growth the slope dummy had a tiny positive impact on the economic growth in both models.

- Capital government expenditures had insignificant impact on economic growth, which makes it statistically indifferent from zero in the short run.

- Current government expenditures had insignificant impact on economic growth, which makes it statistically indifferent from zero in the short run.

- From Toda and Yamamoto Procedure to test causality, it is found that only LnCapital causes LnGDP in the short run.

5.2 Policy Implications

Government expenditures play a significant role in improving economic growth in developed countries [Hamdi (2013), Sáez and García (2006) and Hsieh and Lai (1994)]. However, their role becomes insignificant or minor in most developing countries as in Yu, Fan and Saurkar (2009) regarding Latin America, Alexiou (2009) and Gregoriou and Ghosh (2009) regarding Sudan where government expenditures is found to play only a minor role in growth. Government expenditures in Palestine, which is a developing country under occupation, with its present structure show insignificant impact on economic growth. Based on the results of this study, some policy implications are discussed to improve the fiscal situation of the government.

In the contrary to what was expected, the results of the study show that employment has insignificant impact on economic growth. Therefore, more attention might be paid to increase labor productivity through training and qualifications of the employees. This might be done through workshops and training courses. In addition, education can play an important role in enhancing the returns of the labor force of a country as well as achieving economic growth. According to (Fasih, 2008) “Education plays a central role in preparing individuals to enter the labor force and in equipping them with the skills needed to engage in lifelong learning experiences”. Also he states “the role of education needs to be seen in a broader macroeconomic context to ensure that education contributes to the growth of a country’s economy”. Moreover, redistributing the employees in other sectors such as the agriculture sector might stimulate the production process and help achieve economic growth.

Being a country under occupation, imposes extra measures on the labor market in Palestine and attracts many of the Palestinian workers to join the labor market of Israel and the settlements where wages are higher, which affects the wheel of production at the Palestinian side. From table 7 in appendix A it can be noticed that employed persons in Israel and the settlements forms on average about 10% of the total employment in Palestine (2000-2013). Moreover, it can be noticed from table 8 in appendix A that the average daily wage of the employed persons in Palestine is about 75.6 NIS in the public sector and about 70.7 NIS in the private sector while the average daily wage of the employed persons in Israel and the settlements is about 136.6 NIS for (2000-2013). This means that the average daily wages in Israel and the settlements are almost double those of Palestine. This attracts the Palestinian to go work in Israel and the settlements which affects the labor market of Palestine and hence the economic growth of the whole country.

Despite being another important variable that is expected to positively affect economic growth, the results show that technology has no significant impact on economic growth. Palestine as a developing country, and with the Israeli military measures and restrictions, lacks the required advanced technology needed to enhance production and achieve economic growth. Government might facilitate the import of new technologies and might try to keep the existing technology up to date. Investors might hire more qualified and well-trained experts to make sure that technologies are used in the best ways. More attention might be paid to the training of the employees to use such technology in a way that achieves the economic growth.

Capital turned out to be significant. Therefore, government might encourage investment in the private sector and might give facilities to encourage the Palestinians outside the country to invest in their homeland. Investment promotion is expected to strengthen the wheel of production and achieve economic growth.

Total government expenditures turned out to be insignificant. Therefore, Government efficiency might be improved by reallocating its expenditures. Extra share of the total government expenditures might be dedicated to the capital expenditures since it's supposed to have a greater impact on economic growth than current expenditures. Government might ensure that both capital and current expenditures managed in a way that increases the production of the country and achieves economic growth.

Wages and salaries form about 55.2% of current government expenditures. Therefore, government might change their policies in paying employees who don't actually work, as in the case of the employees of Fatih in Gaza Strip after the split of the Palestinian Union. Moreover, government might have more restrictions on such cases where individuals are paid without working in order to reduce such phenomenon. In doing so, the government might save money that can be invested in more productive fields.

Policymakers might facilitate investment in fields that have financial and economic returns in order to achieve self-sufficiency and reduce the dependency on the donations and grants from other countries. Such donations are most of the time directed towards specific areas and targets such as paying the salaries of government's employees. This reduces the number and the scoop of development projects. Government might encourage and facilitate investment in these projects by giving privileges to the investors in such projects. This might encourage

even the Palestinians outside the country to invest in these projects. These projects might move the wheel of production and achieve economic growth.

Government might seek all possible political and economic ways to stop relying on the Israeli providing water, electricity and health services as net lending forms about 10.6% of current expenditures. The government might try to make economic deals regarding providing these services from other sources such as the nearby Arabic countries. For example, medical referral might change its destination from the Israeli hospital to one of the Arab countries, which have the same level of health services with fewer costs. Moreover, the government might develop more projects such as the one that linked Jericho and Al Aqwar with electricity from Jordan to stop relying on Israel in providing such services. If this were achieved such expenditures might be invested in capital expenditures instead. This will add to the production process and achieve economic growth.

Government might seek to achieve the Palestinian union since it was shown that the split of the Palestinians had contributed in hindering the wheel of production as well as slowing the economic growth of the country.

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Appendices

Appendix A: Raw Data

Table 1: Some Important Economic Indicators in Palestine (2000-2012).

Quarters	GDP (US$ million)	Labor (Thousands)	Capital (US$ million)	G.F.C.F (US$ million)	Depreciation Rate	Consumer Price Index (CPI)
2000q1	1,023.9	458	38,585.38	372.17	38.87	87.31
2000q2	1,093.6	493	38,912.97	349.89	40.16	86.83
2000q3	1,130.8	509	39,228.96	326.74	40.49	86.45
2000q4	898.4	426	39,609.96	302.70	39.87	87.03
2001q1	872.3	406	39,892.19	274.03	39.03	87.52
2001q2	980.8	422	40,110.83	245.83	38.58	87.86
2001q3	998.8	428	40,335.73	229.03	38.66	87.74
2001q4	958.9	430	40,568.64	223.61	39.26	88.75
2002q1	842.9	422	40,808.05	210.44	40.20	90.50
2002q2	793.8	387	41,012.82	192.84	40.92	92.53
2002q3	789.2	385	41,208.55	194.60	40.83	94.21
2002q4	875.5	453	41,403	215.71	39.93	94.72
2003q1	883.0	437	41,643.44	242.50	38.58	96.03
2003q2	953.3	514	41,885.47	261.30	37.56	97.36
2003q3	994.6	519	42,140.98	266.58	37.65	96.76
2003q4	969.6	515	42,405.96	258.32	38.83	98.19
2004q1	988.9	498	42,644.61	243.39	40.42	99.64
2004q2	1,003.8	496	42,875.24	234.11	41.56	99.64
2004q3	1,120.9	511	43,091.02	240.96	41.71	99.62
2004q4	1,084.8	537	43,363.75	263.94	40.88	101.11
2005q1	1,034.9	503	43,668.87	291.08	37.99	103.05
2005q2	1,077.3	566	43,968.19	311.58	35.54	103.28
2005q3	1,180.8	568	44,262.17	322.22	38.17	104.05
2005q4	1,266.5	550	44,563.32	323.01	45.88	106.05
2006q1	1,126.0	542	44,934.51	330.01	55.60	106.65

2006q2	1,132.9	582	45,273.3	340.86	63.21	108.18
2006q3	1,070.4	575	45,629.08	336.15	65.99	108.61
2006q4	993.0	630	45,969.57	315.87	63.96	109.00
2007q1	1,113.2	607	46,230.21	292.19	61.54	107.90
2007q2	1,177.1	660	46,490.2	274.91	61.09	107.94
2007q3	1,149.3	627	46,762.25	265.63	61.46	110.65
2008q4	1,114.5	620	47,034.88	264.37	62.63	113.99
2008q1	1,171.7	600	47,281.95	259.75	62.34	117.08
2008q2	1,221.8	602	47,523.58	251.97	61.75	120.77
2008q3	1,268.5	592	47,766.92	252.63	64.81	122.97
2008q4	1,216.3	591	48,039.9	261.75	71.51	123.21
2009q1	1,207.3	625	48,316.86	274.92	81.16	121.98
2009q2	1,342.9	662	48,572.69	284.56	89.27	123.03
2009q3	1,335.9	631	48,858.6	284.42	90.18	125.37
2009q4	1,353.2	649	49,129.59	274.50	83.89	126.99
2010q1	1,368.4	660	49,383.63	256.89	75.28	127.58
2010q2	1,449.1	679	49,613.49	243.42	69.65	127.66
2010q3	1,445.4	633	49,862.82	248.69	69.57	129.36
2010q4	1,461.6	687	50,132.5	272.70	75.04	131.41
2011q1	1,527.2	702	50,421.81	302.30	79.55	131.88
2011q2	1,629.1	768	50,765.67	366.80	81.83	131.82
2011q3	1,618.6	751	51,077.18	309.50	86.62	132.79
2011q4	1,646.5	793	51,380.45	308.50	93.94	134.38
2012q1	1,601.7	756	51,681.34	292.70	108.54	135.86
2012q2	1,754.5	797	52,033.81	386.10	121.94	135.25
2012q3	1,707.9	756	52,384.73	341.60	117.46	136.94
2012q4	1,733.2	790	52,712.48	332.60	95.11	137.57

Sources:

Data of Real GDP: Palestinian Central Bureau of Statistics, Guide to Palestinian Statistics, National Accounts (GDP),

1-Value added in Palestine by economic activity and quarter for the years 2000-2008 at constant prices: 2004 is the base year

http://www.pcbs.gov.ps/Portals/_Rainbow/Documents/GDP-ValueaddedRWBG2000-2008E.htm

2- Gross Domestic Product by Expenditure and region for the quarters of the years 2011-2012 at constant prices: 2004 is the base year

http://www.pcbs.gov.ps/Portals/_Rainbow/Documents/GDP-EXPCon2011-2012E.htm

Data of Labor: Palestinian Central Bureau of Statistics, Department of Users Services, Employed persons aged 15 Years and Above in Palestine excluding employed in Israel and settlements 2000q1-2012q4

Data of G.F.C.F : Palestinian Central Bureau of Statistics, Guide to Palestinian Statistics,

1- Gross Domestic Product by Expenditure for the Years 1994-2011 at Constant Prices: 2004 is the Base Year

http://www.pcbs.gov.ps/Portals/_Rainbow/Documents/EXPconstant%2094-11E.htm

2- Gross Domestic Product by Expenditure and region for the quarters of the years 2011-2012 at constant prices: 2004 is the base year

http://www.pcbs.gov.ps/Portals/_Rainbow/Documents/GDP-EXPCon2011-2012E.htm

Data for depreciation rate: Palestinian Central Bureau of Statistics, Publications, Economic Surveys Series

http://www.pcbs.gov.ps/pcbs_2012/Publications.aspx

Data of CPI: Palestinian Central Bureau of Statistics, Department of Users Services, Quarterly Consumer Price Index Number and Percent Change by Region for: Quarter One 1996 - Quarter Four 2012.

Note1: Annual data for G.F.C.F (2000-2010) is transformed into quarterly by the researcher using the Lisman and Sandee Quarterly Distribution Formula.

Note2: Capital is calculated by the researcher using the ICOR method.

Table 2: Real Government Expenditures with their Components in Palestine (2000-2012).

Quarters	Wages and Salaries (US$ million)	Non-Wages Expenditures (US$ million)	Net Lending (US$ million)	Current Expenditures (US$ million)	Capital Expenditures (US$ million)	Total Expenditures (US$ million)
2000q1	157.90	89.01	0.00	246.91	96.56	343.47
2000q2	171.14	127.34	0.00	298.47	149.41	447.88
2000q3	133.44	134.12	0.00	267.56	158.69	426.25
2000q4	229.22	115.49	0.00	344.72	137.18	481.9
2001q1	133.10	81.55	0.00	214.65	108.48	323.13
2001q2	179.73	96.08	0.00	275.81	99.26	375.07
2001q3	181.92	103.91	0.00	285.84	95.67	381.51
2001q4	228.64	97.29	0.00	325.93	90.05	415.98
2002q1	117.71	60.02	0.00	177.73	71.54	249.27
2002q2	174.54	57.85	0.00	232.4	62.98	295.38
2002q3	171.68	73.81	0.00	245.49	62.32	307.81
2002q4	234.65	82.27	0.00	316.92	98.76	415.68
2003q1	169.36	71.08	1.90	242.34	127.19	369.53
2003q2	164.68	70.51	1.32	236.5	156.47	392.97
2003q3	172.78	77.45	6.39	256.62	149.39	406.01
2003q4	186.54	88.74	16.82	292.1	100.56	392.66
2004q1	215.84	73.79	32.77	322.4	2.57	324.97
2004q2	219.55	100.14	38.62	358.31	6.65	364.96
2004q3	219.30	137.25	33.91	390.46	10.86	401.32
2004q4	216.45	145.01	51.25	412.72	5.73	418.45
2005q1	221.93	76.07	55.94	353.93	56.16	410.09
2005q2	223.77	148.93	87.89	460.59	82.69	543.28
2005q3	245.33	187.69	71.37	504.38	90.52	594.9
2005q4	270.00	178.35	47.74	496.08	79.41	575.49
2006q1	163.66	101.85	78.00	343.52	65.71	409.23
2006q2	121.54	78.03	81.77	281.34	63.77	345.11
2006q3	131.63	79.08	88.97	299.69	64.18	363.87
2006q4	191.76	103.74	98.83	394.33	66.27	460.6
2007q1	151.07	235.41	139.95	526.43	71.72	598.15
2007q2	225.13	114.88	140.82	480.84	75.73	556.57

2007q3	424.75	147.31	112.06	684.11	72.01	756.12
2007q4	432.51	107.91	94.75	635.17	62.46	697.63
2008q1	406.99	195.42	66.19	668.61	52.33	720.94
2008q2	378.16	188.79	102.10	669.05	44.7	713.75
2008q3	467.90	284.69	112.54	865.14	40.74	905.88
2008q4	212.80	201.36	87.41	501.57	40.29	541.86
2009q1	263.41	269.07	62.72	595.19	7.13	602.32
2009q2	277.26	180.12	66.41	523.79	50.23	574.02
2009q3	406.01	261.55	91.97	759.53	45.31	804.84
2009q4	198.28	207.88	63.94	470.1	46.14	516.24
2010q1	290.95	204.41	71.72	567.08	39.82	606.9
2010q2	309.72	237.34	52.25	599.3	42.38	641.68
2010q3	288.97	199.45	45.61	534.03	72.44	606.47
2010q4	322.13	254.32	35.23	611.69	58.22	669.91
2011q1	324.19	204.32	25.11	553.62	48	601.62
2011q2	340.48	228.98	22.54	592	83.01	675.01
2011q3	309.46	209.91	21.47	540.84	37.04	577.88
2011q4	293.07	218.35	35.69	547.1	55.11	602.21
2012q1	309.71	193.58	30.03	510.63	32.83	543.45
2012q2	344.36	272.07	26.98	580.92	37.59	618.51
2012q3	320.20	236.56	51.84	542.85	51.60	584.45
2012q4	258.37	254.03	106.99	601.60	42.65	644.25

Sources: 1- Ministry of Finance, General Administration of General Accounts, Reporting Department, Fiscal Operations: Revenues, Expenditures and Financing Sources (Cash Basis)

2- Palestine Monetary Authority based on data from Ministry of Finance, Statistics, Public Finance, Revenues, Expenditures and Financing Sources of PNA Fiscal Operations (Cash Basis), http://www.pma.ps/Portals/1/Users/002/02/2/Time%20Series%20Data%20New/Public_Finance/revenues_expenditures_and%20financing_sources_of_pna_fiscal_operations_00-12.xls

Table 3: Annual Government Expenditures along with its Growth and Annual GDP along with its Growth.

Year	Annual Government Expenditures	Growth of Annual Government Expenditures	Annual GDP	Annual GDP Growth
2000	1699.50	--	4146.7	--
2001	1495.69	-12.0%	3810.8	-8.1%
2002	1268.14	-15.2%	3301.4	-13.4%
2003	1561.17	23.1%	3800.5	15.1%
2004	1509.70	-3.3%	4198.4	10.5%
2005	2123.76	40.7%	4559.5	8.6%
2006	1578.81	-25.7%	4322.3	-5.2%
2007	2608.47	65.2%	4554.1	5.4%
2008	2882.43	10.5%	4878.3	7.1%
2009	2497.42	-13.4%	5239.3	7.4%
2010	2524.96	1.1%	5724.5	9.3%
2011	2456.72	-2.7%	6421.4	12.2%
2012	2390.67	-2.7%	6797.3	5.9%

Table 4: Total Grants and Donations (US$ million) from Arab and International Donors for Palestine (2007-2012) Quarterly.

Year	Q_1	Q_2	Q_3	Q_4	Total
2007	219.1	355.1	225.5	212.3	1012
2008	525.6	410.4	476.1	351	1,763.1
2009	259	148.3	663.4	284.2	1,354.9
2010	207.6	317.6	1,77.9	443.4	1,146.5
2011	686	419.9	1,314.4	494.9	2,915.2
2012	739.2	771.4	723.5	751.3	2,985.4

Where Q_1, Q_2,Q_3,Q_4: Represents the four quarters respectively.

Source: Ministry of Finance, General Administration of General Accounts, Reporting Department, External Financing for 2008-2012 quarterly.

Table 5: Child Labor (15-17) Aged and Child Labor percentage from Total Employment in Palestine (2000-2012)

Year	Child Labor	Total Employment	(Child Labor/Total Employment)%
2000	17,500	1,885,400	0.93%
2001	11,300	1,686,300	0.67%
2002	8,400	1,646,800	0.51%
2003	12,600	1,984,400	0.63%
2004	11,200	2,041,000	0.55%
2005	14,400	2,187,100	0.66%
2006	19,100	2,328,100	0.82%
2007	19,000	2,513,200	0.76%
2008	17,200	2,385,200	0.72%
2009	17,800	2,567,200	0.69%
2010	17,100	2,659,000	0.64%
2011	22,300	3,013,900	0.74%
2012	22,500	3,098,500	0.73%

Source: Palestinian Central Bureau of Statistics (2014), Department of Users Services, Employed persons aged 15-17 Years in Palestine excluding employed in Israel and settlements 2000-2012. Obtained on Sep 13th, 2014 (Personal contact).

Table 6: Comparison between the Number of Employed Individuals in the Public and Private Sectors in Palestine (2000-2012) Annually.

Year	Sectors		
	Public Sector	**Private Sector**	**Total**
2000	110,400	353,500	463,900
2001	109,700	309,500	419,200
2002	105,400	304,100	409,500
2003	110,000	380,800	490,800
2004	121,700	383,900	505,600
2005	135,500	411,200	546,700
2006	147,300	433,600	580,900
2007	156,500	471,800	628,300
2008	161,100	436,800	597,900
2009	177,200	464,600	641,800
2010	178,300	486,400	664,700
2011	188,000	565,500	753,500
2012	194,400	580,200	774,600

Source: Palestinian Central Bureau of Statistics, Department of Users Services, Employed persons in the public and private sectors aged 15 years and above in Palestine excluding employed individuals in Israel and settlements 2000q1-2012q4 (personal contact).

Table 7: Percentage Distribution of Employed Palestinians in Israel and the Settlements (2000-2013) Annually.

Years	West Bank	Gaza Strip	Palestine
2000	21.4	12.6	18.8
2001	16.4	1.8	12.5
2002	12	2.5	9.3
2003	11.2	3.1	8.7
2004	10.7	1.1	8
2005	12.9	0.4	9.3
2006	11.7	0	8.6
2007	12.5	0	8.9
2008	13.8	0	10.1
2009	13.9	0	10.2
2010	14.2	0	10.5
2011	14	0	10
2012	13.8	0	9.7
2013	16.1	0	11.2

Source: Palestinian Central Bureau of Statistics, 2014. Database of Labour Force, 2013. Percentage Distribution of Employed Persons From Palestine by Region, Sex and Place of Work, 1995-2013. Ramallah- Palestine. Accessed on December 3rd, 2014 from: http://www.pcbs.gov.ps/Portals/_PCBS/Downloads/Book2049.pdf

Table 8: Percentage Distribution of Employed Person and Average Daily Wage in NIS for Wage Employees From Palestine by Region and Sector, 2000-2013.

Years	West Bank			Gaza Strip			Palestine		
	Public Sector	Private Sector	Israel & Settlements	Public Sector	Private Sector	Israel & Settlements	Public Sector	Private Sector	Israel & Settlements
2000	62.9	73.7	108.6	55.2	49.2	117.2	59.0	66.8	110.5
2001	62.8	73.1	108.2	55.7	51.6	63.2	59.3	67.9	106.5
2002	62.3	76.5	117.7	56.9	52.0	97.2	59.6	69.6	116.0
2003	64.1	76.9	125.0	58.5	47.6	106.6	61.4	66.9	122.8
2004	69.3	74.1	125.5	63.1	51.6	22.2	66.2	67.3	125.3
2005	71.5	74.1	125.4	69.4	51.9	0	70.4	67.4	125.6
2006	77.5	76.0	129.6	79.4	52.9	0	78.5	69.7	129.8
2007	81.6	74.8	130.1	76.2	52.6	0	79.3	69.0	130.0
2008	83.0	81.1	138.3	71.7	50.6	0	79.2	74.7	138.3
2009	90.2	83.6	148.1	72.3	55.0	0	84.4	77.0	148.1
2010	90.5	83.6	158.0	74.0	48.7	0	85.2	74.3	158.0
2011	94.2	81.0	162.2	79.2	52.0	0	89.1	72.6	162.2
2012	99.0	81.9	164.1	79.1	56.1	0	91.9	74.1	164.1
2013	102.2	82.6	175.6	82.0	52.7	0	95.2	73.1	175.6

Source: Palestinian Central Bureau of Statistics, 2014. Database of Labour Force, 2013. Percentage Distribution of Employed Person and Average Daily Wage in NIS for Wage Employees from Palestine by Region and Sector, 2000-2013. Ramallah- Palestine. Accessed on December 3rd, 2014 from:

http://www.pcbs.gov.ps/Portals/_PCBS/Downloads/Book2049.pdf

Appendix B: Tests Results

Table 1: **Analysis of Variance Technique (ANOVA) for GDP, Labor, Capital, Current Expenditures, Capital Expenditures and Total Government Expenditures in Palestine for 2000-2012.**

		Sum of Squares	df	Mean Square	F	Sig.
GDP	Between Groups	49579.201	3	16526.400	.236	.871
	Within Groups	3359574.02	48	69991.125		
	Total	3409153.22	51			
LABOR	Between Groups	9665.941	3	3221.980	.235	.872
	Within Groups	659122.729	48	13731.724		
	Total	668788.670	51			
CAPITAL	Between Groups	4994620.62	3	1664873.54	.092	.964
	Within Groups	868456830	48	18092850.6		
	Total	873451451	51			
Curr.Expend	Between Groups	40110.547	3	13370.182	.501	.683
	Within Groups	1280374.38	48	26674.466		
	Total	1320484.93	51			
Cap.Expend	Between Groups	1452.766	3	484.255	.317	.813
	Within Groups	73365.630	48	1528.451		
	Total	74818.396	51			
Total.Expend	Between Groups	43241.765	3	14413.922	.658	.582
	Within Groups	1051387.80	48	21903.913		
	Total	1094629.57	51			

Table 2: Empirical Results of Vector Autoregression (VAR) for Model One Using Eviews 7.1 Software

Vector Autoregression Estimates
Date: 08/31/14 Time: 22:11
Sample (adjusted): 2000Q2 2012Q4
Included observations: 51 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DUM1	DUM2	LNLABOR	LNGDP	LNEXPEND	LNCAPITAL
DUM1(-1)	-0.060809	-34736.39	-0.738300	-0.600345	-0.905123	-0.005908
	(1.75882)	(79786.4)	(0.25574)	(0.29564)	(0.76232)	(0.00341)
	[-0.03457]	[-0.43537]	[-2.88696]	[-2.03068]	[-1.18733]	[-1.73505]
DUM2(-1)	1.59E-05	1.434444	1.62E-05	1.30E-05	1.66E-05	1.32E-07
	(3.9E-05)	(1.75014)	(5.6E-06)	(6.5E-06)	(1.7E-05)	(7.5E-08)
	[0.41336]	[0.81961]	[2.88981]	[1.99760]	[0.99422]	[1.77001]
LNLABOR(-1)	-2.637483	-121945.4	0.412359	-0.124647	0.748099	0.003975
	(1.04908)	(47589.9)	(0.15254)	(0.17634)	(0.45470)	(0.00203)
	[-2.51410]	[-2.56242]	[2.70332]	[-0.70686]	[1.64527]	[1.95725]
LNGDP(-1)	1.877176	86986.43	-0.084668	0.630123	-0.713791	0.003793
	(0.74063)	(33597.8)	(0.10769)	(0.12449)	(0.32101)	(0.00143)
	[2.53456]	[2.58905]	[-0.78622]	[5.06156]	[-2.22359]	[2.64480]
LNEXPEND(-1)	0.056519	2115.273	-0.000152	0.018415	0.332264	-4.90E-05
	(0.32452)	(14721.2)	(0.04719)	(0.05455)	(0.14065)	(0.00063)
	[0.17416]	[0.14369]	[-0.00323]	[0.33759]	[2.36229]	[-0.07796]
LNCAPITAL(-1)	0.859552	52741.26	0.929205	0.667064	0.954715	0.977276
	(1.68511)	(76442.9)	(0.24502)	(0.28325)	(0.73037)	(0.00326)
	[0.51009]	[0.68994]	[3.79238]	[2.35505]	[1.30716]	[299.542]
C	-5.876996	-409562.0	-5.626565	-3.847754	-5.700292	0.198010
	(13.9075)	(630893.)	(2.02217)	(2.33768)	(6.02784)	(0.02693)
	[-0.42258]	[-0.64918]	[-2.78244]	[-1.64597]	[-0.94566]	[7.35378]
R-squared	0.512135	0.526165	0.937835	0.925930	0.735462	0.999944
Adj. R-squared	0.445608	0.461551	0.929358	0.915830	0.699389	0.999937
Sum sq. resids	5.930910	1.22E+10	0.125389	0.167570	1.114164	2.22E-05
S.E. equation	0.367142	16654.89	0.053383	0.061712	0.159129	0.000711
F-statistic	7.698141	8.143218	110.6319	91.67253	20.38795	131620.9
Log likelihood	-17.49884	-564.3446	80.84212	73.44767	25.13902	301.1020
Akaike AIC	0.960739	22.40567	-2.895769	-2.605791	-0.711334	-11.53341
Schwarz SC	1.225891	22.67082	-2.630617	-2.340638	-0.446181	-11.26826
Mean dependent	0.607843	27644.37	6.342129	7.059875	6.203361	10.72344
S.D. dependent	0.493089	22697.05	0.200850	0.212713	0.290232	0.089337

Table 3: Empirical Results of Vector Autoregression (VAR) for Model Two Using Eviews 7.1 Software

Date: 08/31/14 Time: 22:16
Sample (adjusted): 2000Q2 2012Q4
Included observations: 51 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DUM1	LNLABOR	LNGDP	LNCAPITAL	DUM2	LNCURREX...	LNCAPEXP...
DUM1(-1)	-1.804540	-0.905769	-0.688175	-0.006859	-113147.1	-1.127350	-1.359635
	(1.78390)	(0.27067)	(0.32066)	(0.00370)	(81035.0)	(0.89129)	(0.81118)
	[-1.01157]	[-3.34640]	[-2.14613]	[-1.85562]	[-1.39628]	[-1.26486]	[-1.67611]
LNLABOR(-1)	-3.527023	0.326927	-0.169452	0.003491	-161945.6	0.833338	0.516236
	(1.04372)	(0.15836)	(0.18761)	(0.00216)	(47411.8)	(0.52147)	(0.47461)
	[-3.37928]	[2.06442]	[-0.90321]	[1.61412]	[-3.41572]	[1.59805]	[1.08772]
LNGDP(-1)	1.415707	-0.128988	0.606879	0.003541	66235.42	-0.951936	-0.834075
	(0.71847)	(0.10901)	(0.12915)	(0.00149)	(32637.2)	(0.35897)	(0.32671)
	[1.97044]	[-1.18323]	[4.69914]	[2.37867]	[2.02945]	[-2.65186]	[-2.55297]
LNCAPITAL(-1)	4.364236	1.265797	0.843592	0.979186	210337.2	2.232419	1.868227
	(2.07855)	(0.31538)	(0.37362)	(0.00431)	(94419.8)	(1.03850)	(0.94517)
	[2.09965]	[4.01360]	[2.25787]	[227.365]	[2.22768]	[2.14965]	[1.97661]
DUM2(-1)	5.11E-05	1.96E-05	1.47E-05	1.51E-07	3.014599	2.00E-05	2.58E-05
	(3.9E-05)	(5.9E-06)	(7.0E-06)	(8.0E-08)	(1.75790)	(1.9E-05)	(1.8E-05)
	[1.32016]	[3.33563]	[2.11674]	[1.88778]	[1.71489]	[1.03439]	[1.46527]
LNCURREXPEND(-1)	-1.708822	-0.164116	-0.086072	-0.000931	-76840.99	0.231634	-0.445412
	(0.65609)	(0.09955)	(0.11793)	(0.00136)	(29803.5)	(0.32780)	(0.29834)
	[-2.60454]	[-1.64860]	[-0.72983]	[-0.68511]	[-2.57825]	[0.70663]	[-1.49296]
LNCAPEXPEND(-1)	1.785698	0.165919	0.105512	0.000893	79871.68	-0.004552	0.782983
	(0.73065)	(0.11086)	(0.13134)	(0.00151)	(33190.4)	(0.36505)	(0.33225)
	[2.44398]	[1.49664]	[0.80337]	[0.59017]	[2.40647]	[-0.01247]	[2.35664]
C	-34.88570	-8.412579	-5.308893	0.182200	-1714003.	-17.69134	-13.26154
	(17.1755)	(2.60602)	(3.08732)	(0.03559)	(780209.)	(8.58135)	(7.81011)
	[-2.03114]	[-3.22813]	[-1.71958]	[5.11987]	[-2.19685]	[-2.06160]	[-1.69800]
R-squared	0.578613	0.941530	0.926837	0.999945	0.589608	0.823882	0.748499
Adj. R-squared	0.510015	0.932012	0.914926	0.999936	0.522800	0.795212	0.707557
Sum sq. resids	5.122749	0.117935	0.165520	2.20E-05	1.06E+10	1.278785	1.059257
S.E. equation	0.345157	0.052371	0.062043	0.000715	15679.05	0.172451	0.156952
F-statistic	8.434838	98.91798	77.81794	111457.4	8.825395	28.73645	18.28190
Log likelihood	-13.76344	82.40501	73.76160	301.3788	-560.6790	21.62497	26.42770
Akaike AIC	0.853468	-2.917843	-2.578886	-11.50505	22.30114	-0.534312	-0.722655

Table 4: Granger Causality Test Results in VAR Environment Using Toda and Yamamoto Procedure for Model One (Dependent variable: LnGDP) Using Eviews 7.1 Software

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 12/05/14 Time: 21:24
Sample: 2000Q1 2012Q4
Included observations: 50

Dependent variable: LNGDP

Excluded	Chi-sq	df	Prob.
LNCAPITAL	8.647214	2	0.0133
LNEXPEND	0.157291	2	0.9244
LNLABOR	1.111612	2	0.5736
DUM1	1.811233	2	0.4043
DUM2	1.777780	2	0.4111
All	17.28839	10	0.0682

Table 5: Granger Causality Test Results in VAR Environment Using Toda and Yamamoto Procedure for Model Two (Dependent variable: LnGDP) Using Eviews 7.1 Software

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 12/05/14 Time: 21:30
Sample: 2000Q1 2012Q4
Included observations: 50

Dependent variable: LNGDP

Excluded	Chi-sq	df	Prob.
LNCAPITAL	6.851657	2	0.0325
LNLABOR	1.537051	2	0.4637
DUM1	2.473494	2	0.2903
DUM2	2.429675	2	0.2968
LNCURREX...	0.743112	2	0.6897
LNCAPEXP...	0.570405	2	0.7519
All	17.44422	12	0.1336

Appendix C: Lisman and Sandee Matrix Derivation

Starting from the annual totals X_t (t = 1, . . . , n) for each year and dividing them into four equal quarterly figures, $x_t^I = x_t^{II} = x_t^{III} = x_t^{Iv} = X_t = ¼X_t$. Denote the quarterly figures to be found by y_t^I, y_t^{ll},y_t^{II} and y_t^{lV}. It follows that $\sum_I^{IV} y_t^i = 4x_t$

Assume the quarterly figures y_t^i to be a weighted sum of x_{t-1}, x_t and x_{t+l}. Then:

$$\begin{bmatrix} y_t^I \\ y_t^{II} \\ y_t^{III} \\ y_t^{IV} \end{bmatrix} = \begin{bmatrix} a & e & d \\ b & f & c \\ c & f & b \\ d & e & a \end{bmatrix} \begin{bmatrix} x_{t-1} \\ x_t \\ x_{t+1} \end{bmatrix} \text{.....(1)}$$

$$a + b + c + d = 0 \text{ … … … … … … … … … … (2)}$$

$$2(e + f) = 4 \text{ … … … … … … … … … … … (3)}$$

Moreover, if x_{t-1}, = x_t = x_{t+l} then $y_t^i = x_t$, and hence:

$$a + e + d = 1 \text{ … … … … … … … … … … … . (4)}$$

$$b + f + c = 1 \text{ … … … … … … … … … … … . (5)}$$

If the annual values x_t increase (or decrease) by a constant amount p per annum, the quarterly figures y_t^i must increase (decrease) by a constant amount (¼p) per quarter so that:

$$y_t^i - y_t^{i-1} = \frac{1}{4}p$$

$$y_t^{II} = bx_{t-1} + fx_t + cx_{t+1}$$

$$y_t^I = ax_{t-1} + ex_t + dx_{t+1}$$

$$\frac{1}{4}p = (b-a)x_{t-1} + (f-e)x_t + (c-d)x_{t+1}$$

Substituting $x_{t-1} = x_t - \frac{1}{4}p$ and $x_{t+1} = x_t + \frac{1}{4}p$, we find

$$a - b + c - d = \frac{1}{4} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Subtraction of y_t^{II} from y_t^{III}:

$$2(b-c) = \frac{1}{4} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

The variables (a, b, etc.) can be expresses in terms of α (the choice of α is largely arbitrary):

$$\begin{bmatrix} y_t^I \\ y_t^{II} \\ y_t^{III} \\ y_t^{IV} \end{bmatrix} = \frac{1}{16}\begin{bmatrix} 3 & 16 & -3 \\ 1 & 16 & -1 \\ -1 & 16 & 1 \\ -3 & 16 & 3 \end{bmatrix}\begin{bmatrix} x_{t-1} \\ x_t \\ x_{t+1} \end{bmatrix} + \frac{\alpha}{16}\begin{bmatrix} -1 & 2 & -1 \\ 1 & -2 & 1 \\ 1 & -2 & 1 \\ -1 & 2 & -1 \end{bmatrix}\begin{bmatrix} x_{t-1} \\ x_t \\ x_{t+1} \end{bmatrix}$$

Introduce a quite reasonable and natural condition in the case of an alternating series of x_t: it is assumed that the trend will be a sinusoid. Taking q for the absolute difference between successive years, and *r* for the amplitude:

$$y_t^I = r\ sin22^0\ 30'$$

$$y_t^{II} = r\ sin67^0\ 30'\ \text{etc.}$$

so that :

$$y_t^I = \frac{1}{2}q = 2.613r$$

so:

$r = 0.765q$

For $y_t^{II} - y_t^I$ it is found that 0.765q sin $67^0\ 30'$ - sin $22^0\ 30'$ = 0.414 q

By using $x_{t-1} = x_{t-q}$ and $x_{t-1} = x_{t-q}$ it is found that

$a - b + c + d = 0.414$

Solving the equations it is found that α = -1.656 .....(8)

Calculating the coefficients gives:

$$\begin{bmatrix} y_t^I \\ y_t^{II} \\ y_t^{III} \\ y_t^{IV} \end{bmatrix} = \begin{bmatrix} 0.291 & 0.793 & -0.084 \\ -0.041 & 1.207 & -0.166 \\ -0.166 & 1.207 & -0.041 \\ -0.084 & 0.793 & 0.291 \end{bmatrix} \begin{bmatrix} x_{t-1} \\ x_t \\ x_{t+1} \end{bmatrix}$$

الملخص التنفيذي

تهدف هذه الدراسة الى تحليل تأثير النفقات الحكومية ومكوناتها الرئيسية على النمو الاقتصادي في فلسطين (٢٠٠٠-٢٠١٢). تسعى الدراسة لتحقيق مجموعة من الأهداف أهمها التعرف على مكونات النفقات الحكومية في فلسطين، وحساب نسبة كل مكون من هذه المكونات النفقات الحكومية (الجارية والتطويرية) من إجمالي النفقات الحكومية، ومقارنة تأثير كل منها على النمو الاقتصادي. وتناقش الدراسة بعض المضامين لسياسات قد تهم كل من وزارة المالية ، ووزارة العمل ، ووزارة التخطيط، وغيرها من الجهات التي يمكنها الاستفادة من هذه الدراسة في تحسين أثر هذه النفقات على النمو الاقتصادي.

تقوم هذه الدراسة بتحليل إحدى أدوات الاقتصادية المالية المتبعة وهي النفقات الحكومة. وقد تم اختيار هذه الأداة لأن معظم أدوات السياسة النقدية لا يمكن تطبيقها في فلسطين كونها دولة محتلة ولا يوجد عملة وطنية. كما أن الضرائب والتي تعتبر الأداة المالية الأخرى التي يمكن استخدامها تتأثر بشكل كبير بممارسات الاحتلال، مما يحد من خيارات الحكومة الفلسطينية في اختيار السياسات الاقتصادية التي يمكن اتباعها لتحسين الاقتصاد. ومن هنا، تم اختيار تحليل النفقات الحكومية كإحدى هذه الأدوات. تكتسب هذه الدراسة أهميتها من استخدامها لطريقتين غير شائعتي الاستخدام في الدراسات المحلية. الأولى هي صيغة ليسمان وساندي (Lisman and Sandee) لتحويل البيانات السنوية إلى ربعية. أما الثانية، فهي اتباع طريقة نسبة رأس المال للناتج الاجمالي المتزايدة (Incremental Capital Output Ratio) لحساب قيمة رأس المال، حيث أن البيانات غير متوفرة حول هذا المتغير الهام.

لتحليل أثر النفقات الحكومية، تقوم هذه الدراسة باستخدام التحليل الإحصائي الوصفي بالإضافة إلى التحليل الإحصائي الاستدلالي. ويستخدم الأسلوب الوصفي في وصف بعض المؤشرات الاقتصادية كالعمالة، و رأس المال، والنفقات الجارية والتطويرية، إضافة لإجمالي النفقات. تعتمد الدراسة على البيانات الثانوية الربعية ، حيث تم الحصول على البيانات المتعلقة بالناتج المحلي الاجمالي والعمالة ورأس المال من الجهاز المركزي للإحصاء الفلسطيني. أما البيانات الخاصة بالنفقات الحكومية (أساس نقدي)، فقد تم الحصول عليها من بيانات وزارة المالية بالإضافة الى تقارير سلطة النقد الفلسطينية المبنية على بيانات وزارة المالية.

تحلل الدراسة البيانات باستخدام نموذج الانحدار الذاتي للإبطاء الموزع (Autoregressive Distributed lag) من أجل بحث إمكانية وجود علاقة طويلة الأمد بين المتغيرات قيد الدراسة. كما تستخدم نموذج متجه الانحدار الذاتي (Vector Autoregression) بالإضافة إلى استخدام اختبار جرانجر للسببية في بيئة الانحدار الذاتي للإبطاء الموزع (Granger Causality Test in VAR Environment) من أجل دراسة وجود علاقات سببية بين متغيرات الدراسة. وتقدر الدراسة نموذجين، حيث يشكل الناتج المحلي الاجمالي المتغير التابع في كل منهما، في حين أن العمال ورأس المال وإجمالي النفقات الحكومية تشكل العوامل المستقلة في النموذج الأول، مكونات بينما يسخدم النموذج الثاني النفقات الحكومية (الجارية والتطويرية) بالإضافة للعمال ورأس المال كعوامل مستقلة. وقد عانت هذه الدراسة من قصر السلسلة الزمنية قيد الدراسة بسبب حداثة إنشاء السلطة الفلسطينية ووزاراتها وعدم توفر البيانات قبل ذلك خاصة البيانات الربعية التي تستخدمها عليها الدراسة.

تشير نتائج التحليل إلى أن المعامل المقدر لرأس المال هو المعامل الوحيد الذي يتمتع بمعنوية ذات دلالة إحصائية، بالإضافة الى معاملات المتغيرات الوهمية المستخدمة في هذه الدراسة. اعتمدت هذه الدراسة على إضافة عاملين وهميين من أجل التعبير عن الأحداث السياسية والأمنية التي قد يكون لها تأثير على الاقتصاد الفلسطيني كعوامل مستقلة اضافية في كلا نموذجي الدراسة. وهذا يعني وجود تأثير إيجابي للكل من رأس المال والأحداث السياسية والأمنية على النمو الاقتصادي الفلسطيني. ويتفق هذا مع معظم الدراسات النظرية والتطبيقية حول العالم. أما بالنسبة للمعامل المقدر لكل من العمالة والنفقات التطويرية والنفقات الجارية والتكنولوجيا، فقد وجد أن جميع معاملات هذه المتغيرات لا تتمتع بأي معنوية ذات دلالة إحصائية. ولذلك، فإن هذه المتغيرات لا تختلف احصائياً عن الصفر وهذا يعني أنه لا تأثير لكل من العمالة والتكنولوجيا و النفقات الحكومية بمكوناتها على النمو الاقتصادي.

وبناء على هذه النتائج، فقد تم مناقشة بعض المضامين لسياسات اقتصادية. أولاً: الحرص على رفع إنتاجية العمال عن طريق تدريب الأيدي العاملة وزيادة كفاءاتها من أجل الإسهام في دفع العجلة الاقتصادية. ثانياً: يمكن أن تقدم الحكومة بعض التسهيلات من أجل إتاحة الفرصة لاستيراد التكنولوجيا الحديثة وتحسين دورها في الإنتاج والنمو الاقتصادي. ثالثاً: يمكن لصناع القرار الاستثمار في المشاريع الحكومية ذات العوائد المالية والاقتصادية التي تسهم في النمو الاقتصادي. رابعاً: يمكن للحكومة تشجيع الاستثمار في القطاع الخاص، وتقديم تسهيلات من أجل تشجيع الفلسطينيين خارج الأراضي الفلسطينية على الاستثمار في داخل الأراضي الفلسطينية. وأخيراً: يمكن العمل على إعادة توزيع النفقات الحكومية واتجاهاتها بالشكل الذي يخدم الاقتصاد الفلسطيني بصورة أفضل، وزيادة نسبة النفقات التطويرية التي لها دور كبير في تحقيق النمو الاقتصادي.