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YÜKSEK LİSANS TEZİ

CAUSALITY BETWEEN PUBLIC EXPENDITURE AND ECONOMIC GROWTH: THE TURKISH CASE

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ABSTRACT

CAUSALITY BETWEEN PUBLIC EXPENDITURE AND ECONOMIC GROWTH: THE TURKISH CASE

Oguzhan DURDU

The argument regarding the relationship between economic growth and public expenditure has been subject to many studies with varying results. Whether the way of causality differs during the crisis period however, is a new strand in the literature. In this study, Wagner's Law and Keynes' Hypothesis were empirically tested employing quarterly time series data for the Turkish economy covering the period 1987-2017. In addition, by considering the effects of economic crises which Turkey has faced throughout the subject period (1994, 2001 and 2008 crises), a new perspective to the existing literature was provided.

In this study, Johansen cointegration and VECM methods were used to find the relationship between GDP and public expenditure. In addition, dummy series were employed to represent the economic crises. It was determined that the variables are non-stationary in levels, but stationary in first differences. Johansen cointegration test without any dummies, indicated a negative long-run relationship among the variables. However, only in 2 out of 4 versions with dummies, cointegration relationship has been found. In 2 cases with no cointegration (1994 and 2001 crises), Granger Causality test was utilized to find the causality. The way of causality in these cases was from economic growth to public expenditure. VECM results in all cases, found a long-run causality from public expenditure to economic growth. 2008 global financial crisis alone and all crises (1994, 2001 and 2008 crises) together were found to have negative effect on Turkey's GDP while having no significant effect on public expenditure. Since the long-run relationship between two variables was negative in the Johansen equation, we concluded that neither Wagner's Law nor Keynes' Hypothesis is valid for Turkey.

Keywords: Economic Growth, Public Expenditure, Economic Crises, Co-integration, Granger Causality Analysis, Wagner's Law, Keynes' Hypothesis.

ÖZ

CAUSALITY BETWEEN PUBLIC EXPENDITURE AND ECONOMIC GROWTH: THE TURKISH CASE

Oguzhan DURDU

Ekonomik büyüme ve kamu harcamaları arasındaki ilişki üzerine tartışmalar, değişken sonuçlara sahip birçok akademik çalışmanın öznesi olmuştur. Nedenselliğin yönü üzerine tartışmalar günümüzde dahi devam etse de, nedenselliğin kriz zamanlarında nasıl değiştiği literatürde yeni bir bakış açısıdır. Bu çalışmada, Türkiye'de Wagner Yasası ve Keynes Hipotezinin geçerliliği üçer aylık veriler kullanılarak, 1987-2017 periyodu için ampirik olarak test edilmiştir. Ayrıca, Türkiye'nin çalışma dönemi boyunca başından geçen ekonomik krizlerin (1994, 2001 ve 2008) nedensellik üzerindeki etkileri bulunarak, var olan literatüre yeni bir bakış açısı sunulmuştur.

Bu tezde, Johansen eş-bütünleşme ve VECM teknikleri değişkenler arasında ilişkiyi belirlemek için kullanılmıştır. Ayrıca, ekonomik krizlerin temsili için kukla serilerden de yararlanılmıştır. Değişkenlerimiz, GDP ve kamu harcamalarının seviye değerlerinde durağan olmadığı fakat birinci farklar düzeyinde durağanlığa ulaştığı belirlenmiştir. Kukla değişkenler eklenmeden, ana veriler üzerine uygulanan Johansen eş-bütünleşme testi değişkenler arasında negatif bir eş-bütünleşme ilişkisi olduğuna işaret etmiştir. Ancak, kukla değişkenlerin kullanıldığı 4 versiyondan sadece 2'sinde eş-bütünleşme ilişkisi bulunmuştur. Eş-bütünleşme ilişkisine rastlanmayan 2 vakada (1994, 2001) nedenselliğin bulunması için Granger Nedensellik testi uygulanmıştır. Bu vakalarda nedensellik, ekonomik büyümeden kamu harcamalarına doğru olmuştur. VECM sonuçları her vakada kamu harcamalarından ekonomik büyümeye doğru bir uzun dönem nedensellik ilişkisi bulmuştur. 2008 küresel finans krizinin tek başına ve Türkiye'nin başından geçen tüm krizlerin (1994, 2001 ve 2008) kolektif etkisi ise GDP üzerinde negatif, kamu harcamaları üzerinde ise anlamsız olarak bulunmuştur. İki değişken arasındaki uzun dönem ilişki Johansen denkleminde negatif bulunduğundan, ne Wagner Kanunu ne de Keynes Hipotezi Türkiye için geçerli bulunamamıştır.

Anahtar Kelimeler: Ekonomik Büyüme, Kamu Harcamaları, Ekonomik Krizler, Eş-bütünleşme, Granger Nedensellik Analizi, Wagner Kanunu, Keynes Hipotezi.

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I would like to dedicate this study to my late grandmother who passed away during the writing of this thesis. I hope this will make you proud.

Oguzhan DURDU

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LIST OF ABBREVIATIONS

AD Curve	**:** Aggregate Demand Curve
ADF	**:** Augmented Dickey-Fuller
AS Curve	**:** Aggregate Supply Curve
BRSA	**:** Banking Regulation and Supervision Agency
ECM	**:** Error Correction Model
ECT	**:** Error Correction Term
EU	**:** European Union
GCC	**:** Gulf Cooperation Council
GDP	**:** Gross Domestic Product
GNP	**:** Gross National Product
IMF	**:** International Monetary Fund
IS Curve	**:** Investment - Savings Curve
LM Curve	**:** Liquidity Preference - Money Supply Curve
OECD	**:** Organization for Economic Co-operation and Development
PSBR	**:** Public Sector Borrowing Requirement
RBC	**:** Real Business Cycle
SCT	**:** Special Consumption Tax
TCMB	**:** Central Bank of the Republic of Turkey
TSEP	**:** Transition to the Strong Economy Program
VAR	**:** Vector Autoregression
VECM	**:** Vector Error Correction Model

INTRODUCTION

There are two fundamental approaches which contradict each other with their answer on the question of optimal scale of governmental activity in economy. First one of these approaches is the Classicals and according to their belief, any governmental activity in the economy would drastically spoil the equilibrium. On the contrary, different group that emerged in the 1930's who considered themselves as Keynesians, claimed that government intervention in the market would cause a positive effect on the economy, thus they supported government involvement in the economy.

In a similar fashion to what the Keynesians have been suggesting, from 1930's to this date, government's role in the economy has been gradually increasing. Correspondingly, increases in the governmental activity have been showing itself as in the form of increases in public expenditure.

While the governmental activity in the economy was increasing, classicals suggested that constant increases in the public expenditures would cause decreases in the efficiency of expenditures and that would slow the economic growth. They explained this decrease with the inefficient policies of the government and the high costs of employing regulatory policies in the system. On the other hand, according to the Keynesian way; state involvement is a driving factor for the economy and it can be said that the public expenditures have a key role in the economic growth and development (Ram, 1986:191). When we look at this two rival opinions, they both foresee an intimate relationship between economic growth and public expenditures, albeit while one of them supports the government involvement and the other discourages and shuns the government activity in economy.

In the last century, the amount of public expenditures in the economy have drastically increased both for the the countries which employ Keynesian policies and for the countries which use Classical policies. The question of whether the increases in the public expenditures are a result of the economic growth or they are just a tool to achieve economic growth was the basis of the many studies in the recent years. In the literature, the relationship between economic growth and public expenditures has been subject to various explanations by different approaches. However, among these

approaches, Wagner's Law and Keynes' hypothesis while contradicting each other, gained the most attraction among economists.

German economist Adolph Wagner with his work in 1883 set the milestone for the future debate regarding the relationship between economic growth and public expenditure. Adolph Wagner claimed that with the economic growth, there would be an increase in the government involvement and public expenditure. According to him, industrialization was the source of this increase. While the industrialization causes an increase in the economic growth, economic growth itself causes increases in the basic public services which needed to be provided by the state. In this situation, government has to allocate more money for the public expenditures in order to fulfill its obligation as the authority figure and to provide the required services for its citizens. In other words Wagner suggest that there is a causality relationship that runs from economic growth to public expenditure. Wagner's thoughts on the subject, quickly gained popularity among economists and started to be referred as Wagner's Law (Wagner and Weber, 1977:59-67).

Contrary to Wagner, John Maynard Keynes argues that the increase in the public expenditure is not a result of the economic growth but a cause to economic growth itself. While in the Wagner's Law public expenditures were seen as an internal factor and the causality direction was accepted from economic growth to public expenditures, according to Keynes, public expenditures were determined as a reason for economic growth and correspondingly, the causality direction was accepted from public expenditures to economic growth.

The emergence of neoclassicals with the endogenous growth theories presents an important foundation for the role of public expenditure in achieving long term economic growth. According to this, government provision of public capital to the production process assists directly to growth by contributing to the already existing capital stock. In addition to this, it also indirectly stimulates growth by raising the marginal productivity of privately supplied factors of production (Barro, 1990:103-125). Although the concept of productive public spending still has not been fully defined (due to the conflicting views), there seems to be a consensus that government

investment in basic services does stimulate growth. Investments on roads, transportation and communication can be considered as growth increasing investments.

In endogenous growth models, governments can achieve continued growth without the assumption of decreasing returns to capital. According to this model, this continued growth is achieved with learning by doing (for example R&D or human capital accumulation) (Romer, 1990:71-102). Therefore, it can be said that public expenditure may also increase the stock and quality of human capital through government investments on education and healthcare and these investments in turn, increases the output in the long run.

The concept of optimal public expenditure level in the endogenous growth theories is one of the reasons why these theories gained rapid popularity among economists. According to this, even before achieving an economic efficiency, it is possible for government to stimulate growth through the mobilization of additional resources which could not be provided by the private sector. However, when the economy reaches this production possibility frontier, increasing public expenditure could cause a crowding out effect on private investment. Barro (1990), argues that the growth rate which can be achieved, depend on the share of public expenditure in output. According to him, the relationship between economic growth and public expenditure relies on the current expenditure amount. If the public expenditure is below the growth maximizing share it will stimulate growth. However, if the public expenditure exceeds the optimal point, higher public expenditure will reduce economic growth.

After the turbulent years of 1970's (both economically and politically), Turkey abandoned her inward-oriented industrialization model which made her rely heavily on foreign sources in favor of an export oriented industrialization policy. Throughout the 1980's, Turkish economy has seen various structural reforms, however these structural reforms did not deliver the desired results due to the unstable state of Turkey in 1990's and early 2000's. Turkish economy was only able to reach to a relatively stable point after the 2002 general elections. Thanks to the implementation of

necessary economic policies between the years of 2002-2008, Turkey was able to survive during the 2008 global financial crisis with relatively minor damage.

There are three economic crises which had fundamental effect on the Turkish economy and its functioning; 1994, 2001 and 2008 crises. While the first two of these economic crises were caused by domestic instabilities, the 2008 financial crisis was a global one which affected the whole world. Although there are many studies on the relationship between economic growth and public expenditure, very few of them investigated the effect of an economic crisis on the relationship. Ageli (2013), in the study which he confirmed the validity of Wagner's Law for Saudi Arabia's 1970-2012 period, used several dummy variables to determine the effects of economical and political instability during the subject period. According to the results, 1973 Oil Crisis and 2006 Saudi stock market crash was found to be statistically significant and having considerable effect on the government expenditures. Pata and Tutuncu (2017), in their study which they examined the relationship between economic growth and public expenditure for Turkey's 1960-2015 period, by utilizing Maki cointegration analysis determined 1997 East Asian financial crisis' negative effect on Turkey's economy. Hasnul (2015), in his study covering 1970-2014 period of Malaysian economy, utilized a dummy series representing the 1975, 1985, 1998 and 2008 financial crises. According to the results, collective effect of the crises was found statistically significant and negative. Altunc and Aydin (2012), investigated the validity of Armey's Curve (optimal share of public expenditure in GDP) for Turkey's 1975-2010 period. In the study, five different dummies were utilized to determine the effects of crises which Turkey has faced but none of the dummies were found statistically significant. As it can be observed, number of studies on the effects of the economic crises on the relationship are limited and the results of these studies are also quite varied. Therefore, with this study, we aim to provide a new perspective by determining the effects of 1994, 2001 and 2008 crises the relationship between economic growth and public expenditure.

1994 Turkish currency crisis was mainly sourced from the Turkey's transformation process to open market. Turkey, after adopting an outward economic model, started to face excessive money entrance problem. During this period, the value of Turkish Lira

along with interest rates and domestic demand increased dramatically. Increases in already high inflation figures, public debt and income inequality sparked the 1994 currency crisis. While the government put the April 5 Stabilization Measures into practice, it was not enough. Consequences of this crisis were very bad for Turkish economy; record high levels of inflation and public debt, major unemployment problem and most importantly the loss of reputation in both domestic and international markets. After the crisis, from mid-1995 to mid-1998 Turkey entered into a rapid growth period partly due to Customs Union Agreement with the EU and Erbakan's "miracle" balance budget plan. Nevertheless, this growth period has ended due to political instabilities and Russian and East Asian financial crises which led Turkey into even more political and economic instabilities.

Although there are other precursors (such as November 2000 crisis), the argument between the Prime Minister and the President during the National Security Council triggered the biggest financial crisis Turkey has ever seen. Banking sector was the main victim of this crisis as several banks went bankrupt due to the crisis. Interest rates on the interbank market have seen record figures, the central bank was forced to burn record amount of reserves and the exchange rate was left to fluctuate after dollar's 40% increase. Developments occurred during this crisis made the people and the economic authorities even more suspicious towards IMF guided 'Disinflation Program'. Under the leadership of Kemal Dervis who was transferred from World Bank, the 'Transition to the Strong Economy Program' was adopted. However, adoption of this new program did not save Turkey from ending the year with negative economic growth, high inflation, unemployment, domestic and foreign debt.

2008 global financial crisis, compared to the other two economic crises which will be investigated in this study, is different in terms of its source. On September 2008, an American investment bank, Lehman Brothers went bankrupt and world economies one by one started feel the effect of the biggest economic crisis since the Great Depression. Although, Lehman Brothers' bankruptcy is considered as the starting point, the crisis had long roots even before that. In order to cope with the increasing property prices, economic agents relied on borrowing. However, this huge reliance on borrowing widened the gap between income and debt. The rise in the inflation figures which was

generated by the increasing cost of energy, was the biggest contributor to widening between income and debt. Because of the gap between income and debt, borrowers started to struggle to pay the mortgages and consequently property prices started to fall. The decrease in the value of the assets owned by the financial institutions sparked the financial crisis in the U.S and spread into Europe and whole world.

Starting from the last quarter of 2008, due to the contractions in global economy, Turkish economy entered into a slowdown period. Up until the global financial crisis, the growth figures of Turkish economy have always been positive (2002-2008). Even in the first three quarters of 2008, the growth figures were 7,3 percent, 2,8 percent and 1,2 percent, respectively. However, in the last quarter of 2008, Turkish economy contracted 6,2 percent. And this downward trend continued throughout the 2009. By the end of 2009, 4,7 percent contraction in the Turkish economy was observed (Uygur, 2010:3). One of the biggest problem of Turkish economy during this crisis was the increasing unemployment. During the crisis unemployment rose by 4% compared to its 2007 figure. Turkish economy experienced sharp increases in her imports, budget deficit, public debt, PSBR's share, etc... It is important to emphasize the impressive performance displayed by the Turkish banking sector (which was the weak point in 2001 crisis). Only after 2009, Turkey economically started to grow again and in 2010 she became the fastest growing European country.

The study which will investigate the relationship between economic growth and public expenditure and the effect of economic crises on the relationship consists of 5 sections. Introduction section presents an overview and outlines the purpose of the study. This section is concluded with organization of the study. Chapter one provides an in depth explanation of the Keynesian and Neoclassical views regarding the relationship between economic growth and public expenditure. In this chapter, the role of government and public expenditure in the economy will be explored. The traditional Keynesian and Neoclassical endogenous growth theories will be investigated. The first chapter is concluded with the empirical studies made on the relationship between economic growth and public expenditure. Chapter two, provides an in depth review of the Turkish economy between the years of 1980 and 2017. In this chapter, developments during this era will be outlined and the effects of implemented policies

are discussed. The chapter is concluded with the presentation of figures related to the development of economic growth and public expenditure throughout the years. Chapter three, presents the model of the study and explains the methodology and dataset which will be employed in the study. Since it is the application section of the study, several econometric methodologies (such as unit root test, cointegration test and error correction model) will be explained and utilized on the data belongs to subject period. This chapter determines whether the Turkish economy has Keynesian or Wagnerian characteristics and provides the results which will allow us to interpret the effect of economic crises on the relationship between GDP and government expenditure. Summary and conclusion is the section which the general assessment and the conclusion of the study is presented. In this section, findings obtained from the econometric tests will be interpreted and the significance of these results on the Turkish economy will be discussed.

In the study, we first conducted Johansen cointegration test on our base data and found that there is a negative relationship between GDP and public expenditure. Then, we added dummy series representing the crises (1994, 2001 and 2008 crises) which Turkey has faced throughout the subject period to find effect of these crises on the relationship between the variables. Cointegration relationship has been found only in 2 out of 4 versions with dummies. In 2 cases with no cointegration (1994 and 2001 crises), Granger Causality test was utilized to find the causality. The way of causality in these cases was from economic growth to public expenditure. For the cases with cointegration, VECM procedure was employed. Long-run causality, in all cases, was found from public expenditure to economic growth. The long run estimation concluded that increases in government expenditure was found to have negative effect on economic growth. Also, short-run causality from government expenditure to economic growth was determined in both cases which dummy series are employed. Furthermore, dummy series included into VECM were found negative and statistically significant which mean that 2008 global financial crisis alone and all crises jointly (1994, 2001 and 2008 crises) have significant negative effect on Turkey's GDP.

CHAPTER ONE

RELATIONSHIP BETWEEN PUBLIC EXPENDITURE AND ECONOMIC GROWTH

1.1. Role of Government in the Economy

Over the past two centuries, different opinions emerged on the subject of "What a government should do in the process of economic development?". First, Adam Smith (1776), suggested a limited role for the government in his book called 'The Wealth of Nations'. He discouraged government from meddling in to the economy in an attempt to show how competition and profit motive can lead people to pursue their own interests. He believed that this private interests would serve the public interest. According to him, the profit motive of these individuals would lead them to supply the goods that are demanded by the people. He argued that the economy is being led by an 'invisible hand'. This invisible hand would supply the goods that are demanded by the people in the best possible way; without needing any government intervention. According to him, a government should not intervene, control or regulate private sector. Adam Smith's ideas gained massive acceptance in the industrialized countries. The rapid popularization of Smith's ideas showed itself in the form of limited state regulations in the economy in these countries.

On the contrary to Smith, Adolph Wagner was the first economist to determine a positive relationship between public expenditure and economic growth. This correlation that he discovered is called Wagner's Law (1883) now in the literature. Wagner attributed the positive link between economic growth and public expenditure to the increasing demands for regulatory policies and protective functions during economic development. Demand for education, healthcare and social services can be given as examples for this type of demand. According to him, even more intervention from the government would be needed during the economic development since financing of natural monopolies and maintenance of well-functioning market can only be achieved with government intervention (Bird, 1971:1-26).

In public economics, the first fundamental theory argues that reaching a 'Pareto optimal' allocation of resources can be achieved through a perfectly competitive market economy. We can describe this Pareto optimal level as the point that is not possible to make the conditions of one individual better off without making other persons worse off. The second fundamental theory offers a different approach. According to this different theory, the only thing that should be done by the government is redistribution of wealth, because reaching Pareto efficient resource allocation is only possible if the wealth is distributed efficiently in the competitive market (Stiglitz, 2000). Nevertheless, in most situations, pareto efficiency is not being achieved by economies mainly due to market failure. Period between the Great Depression (1930s) and the 1960s, is being considered by economists as the period which has many market failures. During this Great Depression period, the unemployment rate in the US increased by 25 percent, while national output decreased by 30 percent. Even if we assume that the economy is efficient, distribution of wealth among individuals does not exist in the economy. Thus, one of the goals of government operation in the economy should be adjusting this imbalance between individuals. However, this policy also, has been a target of criticism by various economists. Economists who believe the notion of noninterventionist government in the economy criticized this policy, by suggesting that the government operations can be constrained by the government's own failure (Stiglitz, 2000).

Since the Great Depression, a different opinion about increasing the public expenditure has emerged. According to this opinion, public expenditure should not be increased solely for achieving necessary resource allocations, but also for achieving economic stability and economic growth as well. Musgrave (1959), argues that there are three main goals of public expenditure in economy; achieving economic efficiency, efficient distribution of wealth and resources and reaching macroeconomic stability. Achieving three objectives are still being considered as the main goal of fiscal policy in the western countries. Naturally, increasing popularity of this type of government involvement in the economy introduced various reforms to economics as well. In industrialized countries, economic operations of governments have drastically increased since the Second World War. As a matter of fact, governments have been

arguing about whether they should increase their budgets to produce more public goods which can enhance public welfare. While this argument has been going on, some economists showed their concerns about such growth of government activity, thinking that this kind of growth could cause unwanted effects on the long term growth of economies. These two different opinions on governmental activity in economy are based on contradicting views of these two groups about the role and objective of government in the process of economic growth. For example when the 2008 financial crisis struck the world economy, some countries with high government debt tried to protect themselves from the crisis by reducing public expenditure. This was done in order to reduce government debt. However, these budget cuts which were planned by the government, comprised mainly of welfare expenditures. Education expenditure, public health expenditure etc. can be given as examples of this kind of spending. Some countries however, decided to increase their public investments in infrastructure to create growth enhancing effects in the economy in the short run and payback their debts in the long-run.

1.2. Keynesian Approach to Public Expenditure

After the financial crisis in 2008, Keynesian economic theory became a focal point in solving the problems lurking around public expenditure. Since then, its effect on the role and objective of public expenditure has been drastic. The objective of Keynesian economic policy when a recession occurs is avoiding the recession by increasing aggregate demand in the market through the usage of fiscal policy. According to this theory, the optimal way to handle a recession is boosting the aggregate demand during a recession. And to achieve this, governments should increase public expenditure and decrease taxes. Correspondingly, if the stimulation of aggregate demand is successful, the higher demand will create incentive for firms to increase their production and this incentive will force firms to hire more workers in order to meet the expectations. Ultimately this will result in an increase in the household income. So, by stimulating aggregate demand, government may influence aggregate employment, output and price levels in the economy (Snowdon and Vane, 2005:68). The traditional theory of Keynesian approach argues that positive public expenditure should boost the economic growth via the effect that is called ‘income multiplier effect’. This concept can be

explained in more depth as; the public expenditure will stimulate the economy by creating aggregate demand enhancing effects which should in turn, boost the employment. And due to positive changes in capital stock, profits will increase and the increasing profits will lead to a higher investment point for the short run.

One of the most important source of economic growth is private investments. The influence of public expenditure on private investment is important due to its enhancing effects on economic growth. Crowding out effect can described as the economic effect which occurs when the government demand is increased via taxes or borrowing. If this effort is unsuccessful to increase the economic activity in the market, private sector investment is considered to be crowded out by public expenditure. The crowding out effect is one of the problems in the economy that helps us differ Monetarists from Keynesians. Keynes due to its dependence on the interest rate argued that monetary policy would be inadequate to force economy out of a depression. According to Keynes and his followers, when an economy enters a depression state, interest rate would be already close to zero. On the other hand, increasing public expenditure would not just enhance aggregate demand directly, but it also increases the demand from workers and producers whose incomes had been increased due to public expenditure. Likewise, if a tax cut is put into practice, this would also increase the disposable income of the households, which would in turn, also cause an increase in the demand (Nelson, 2006:2).

Furthermore, Keynesians see the public expenditure as a tool for increasing the private investment in certain areas. For example, Aschauer (1987:12-15), believes that if the public investment expenditure and public consumption expenditure are increased by the same amount, multiplier impact of increasing public investment expenditure on private output should be much higher than the effect of the public consumption expenditure on private output. Particularly, public investment stimulates an increase in the rate of return on private capital, and hence increases private investments as well.

Keynesian economic theory failed to explain the developments in 1970's, particularly the existence of both high inflation and unemployment, a thing which was achieved by Lucas. In order to fix shortcomings of their theory, Keynesian theory has undergone

a change and new Keynesian models adopted the rational expectation theory of Lucas (1972). Nevertheless, even with the integration of national expectation into their new models, Keynesians did not really changed the role of public expenditure in economic stability and welfare (Krugman, 1998). Next section will present the approach of Keynesian economic theory to the effect of public expenditure on aggregate demand and output.

1.2.1. Analysis of the AS-AD Model

The Keynesian economic theory has been an important asset to analyze and determine the effects of public expenditure on output. Keynes (1936) in his famous 'General Theory' suggested national income as a function of level of employment. While developing this theory, he particularly focused on the demand side of economy. He believed that the national income would increase 'K' times of the increase in public expenditure (Keynes, 1936:115). The Keynesian economic theory accepts the existence of less than full employment and low correlation between interest rates and investment in the market. Thus, level of output in the economy is completely determined by the aggregate demand. According to their theory, increasing the public expenditure in this market, should end up increasing the income and output while affecting interest rates little to none. This increased state of public expenditure has also positive effect on the consumption level in the market. If these increases in the public expenditure are successful in changing the expectations in the market for the better, it should create crowd-in effect for private consumption and investment, rather than crowding them out.

The aggregate supply curve (AS) at the aggregate level, represents the total supply provided by producers at every price level. Traditional Keynesian economic theory accepts wages as sticky, and believes that economy cannot maintain constant full employment. Philips (1958) in his study regarding the relationship between United Kingdom's unemployment rate and inflation, determined a negative link between these two variables. Thus, since there is a certain trade-off between these variables, the governments have to make an important decision regarding if they should focus on achieving unemployment rate or low inflation figures.

The traditional AS curve can be presented as below:

$$P_{t+1} = P_t [1 + \lambda (Y - Y^*)] \quad \textbf{(1.1)}$$

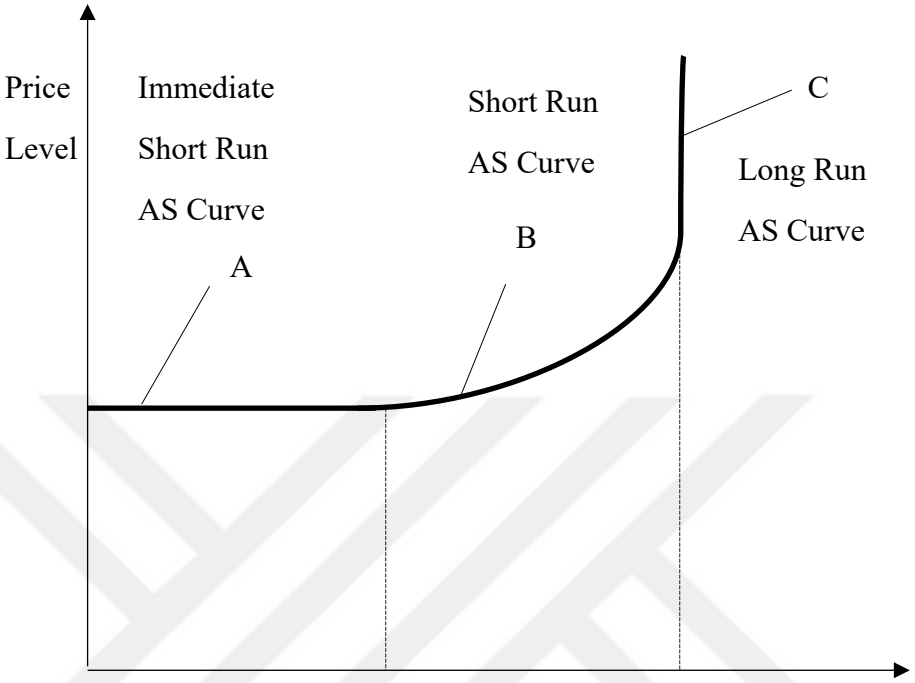
$$\lambda = \varepsilon / Y^* \quad \textbf{(1.2)}$$

In equation, 'Y*' corresponds for the potential output level while 'ε' represents the response level between wage and unemployment. According to this, if the response level between wage and unemployment, 'ε' is zero, then the price level in the market should be $P_t = 0 = P$ and this creates the extreme Keynesian horizontal AS curve situation in the market. Vertical AS curve (classical) however, occurs when the obtained output in the market is equal to potential output level (Y*) due to $\varepsilon \rightarrow \infty$. Hence, it can be said that aggregate supply curve determines aggregate demand changes' effect on output and inflation. In other words, in a situation where the AS curve is vertical, only inflation will increase. On the other hand if we assume AS curve to be horizontal, only output will increase. Moreover, if a positive relationship between output and inflation exists, both output and inflation will increase (Romer, 2006:197-203).

The aggregate supply curve presents us the relation between price levels and the real domestic output in the economy. The relationship between these variables differs depending on the time and level of output and input prices at that time. Graph 1.1 presents three different potential AS curves; first one is immediate short run AS curve (curve A), the second is the short run AS curve (curve B) and the third one is the long run AS curve (curve C).

Curve A reflects the extreme Keynesian view, according to which both input and output prices are fixed. An increase in the aggregate demand in this situation will not cause an inflation increase in the economy. The immediate AS curve is accepted horizontal and the markets are assumed to have price rigidity (Romer, 2006:197:203). An increase in the aggregate demand will present incentive for firms to increase their output. And in order to meet the expectations, firms will hire more workers. Therefore, we can say that demand increases in the immediate short run AS curve will end up increasing both output and employment.

Figure 1.1. Three types of AS curve



Source: McConnell et al, (2011)

The short run Keynesian aggregate supply curve (curve B) starts after an imperfect market period where the sticky price level is in effect. Because of the fact that this imperfection exists in these models, the economy is not able to reach the potential output level, thus never achieving the classical view. As a result of this failure, curve B is upward sloping, not vertical (classical) (Mankiw, 2012:290-291). For this reason, in this model, an increase in aggregate demand only causes output to digress from its natural path.

The long run aggregate curve, unlike the other two, is vertical and economy is at full employment output level regardless of the price levels. Friedman (1968) in his famous 'natural rate hypothesis' argues that, real output and unemployment in the long run cannot be influenced with nominal variables (e.g. money supply). For this reason, according to him, level of prices and wages are flexible in the long run and aggregate demand changes do not have any effect on output or unemployment. In the new Keynesian model, monetary shocks are accepted as non-neutral in the short run, however this changes in the long run, since the money maintains its neutrality. Even

though the new Keynesians have recognized the importance of new classical micro foundations, their objective still is forming a compatible theory of aggregate supply in which the price and wage stickiness can be explained (Snowdon and Vane, 2005:361).

In brief, the immediate short run aggregate supply curve, the short run aggregate supply curve and the long run aggregate supply curve are all substantial in foreseeing what we can expect from an economy in certain situations. These three curves may have appropriate situations in an economy to determine the flexibility of wages and prices in these certain situations. According to the immediate short run supply curve, there is a positive relationship between public expenditure and output and employment. Meaning, if the public expenditure is increased, output and employment increases as well. Price levels are assumed to be constant in this curve. On the contrary, new classicals' long run curve implies an economy with full employment where the output cannot be influenced with public spending increases in the long run.

1.2.2. The Effect of Public Expenditure in IS-LM Model

In Keynesian theory, increasing public expenditure will cause a demand enhancing effect in the economy and because of this effect, first output, then the income will increase. Since the output increases will end up causing an upward shift for the demand for money, the level of real interest rates will also increase. In addition to this, the increases in the interest rates can cause a decrease in the private investments as well. The magnitude of this decrease depends on the interest elasticity of investment. Thus, it can be said that the effects of public expenditure on output and employment depends on the shape of the IS and LM curves.

This part of the study will examine the effect of public expenditure on the IS-LM model. In this model, IS represents the equilibrium in the goods market while LM stands for the equilibrium in the market for capital market. Slope of the IS and LM curves determine the level of interest rate and national income in the short run when the sticky price level is in effect (Mankiw, 2012:316-325). If we assume the consumption function as:

$$C = \overline{C} + c\,(Y + \overline{TR} - tY),\ c>0 \qquad \textbf{(1.3)}$$

In this function autonomous consumption is represented with $\overline{C}$ and the marginal propensity to consume is denoted with *c*. National income is depicted as *Y*, transfer payment is represented with $\overline{TR}$ and tax rate is represented with t. *c>0* implies a positive relationship between disposable income and consumption.

The investment function can be written as:

$$I = \overline{I} - bi \qquad b > 0 \qquad \textbf{(1.4)}$$

In this function, i represents the interest rate, b determines the interest elasticity of investment, while $\overline{I}$ is the autonomous investment. By taking both consumption and investment function into account, we can form the aggregate demand function as:

$$AD = C + I + G + NX = [\overline{C} + c\overline{TR} + c\,(1 - t)\,Y] + (\overline{I} - bi) + \overline{G} + \overline{NX}$$

$$= \overline{A} + c\,(1 - t)\,Y - bi \qquad \textbf{(1.5)}$$

From this, autonomous spending level can be extracted as: $\overline{A} = \overline{C} + c\overline{TR} + \overline{I} + \overline{G} + \overline{NX}$ and if we take goods market clearing condition into account, we can reach:

$$Y = AD = \overline{A} + c\,(1 - t)\,Y - bi \qquad \textbf{(1.6)}$$

Ultimately, the IS curve can be derived as:

$$i = \frac{\overline{A}}{b} - \frac{[1 - c(1 - t)]Y}{b} = \frac{\overline{A}}{b} - \frac{Y}{a_G b} \qquad \textbf{(1.7)}$$

In the equation (1.7), $\frac{Y}{a_G b}$ is the slope of the IS curve, and $a_G = \frac{1}{1 - c\,(1 - t)}$ represents the public expenditure multiplier. The determinants of the slope of IS curve are, a_G(multiplier of public expenditure) and b (interest elasticity of investment). If both a_G and b are bigger than zero, slope of the IS curve is negative. And if both a_G and b are negative, this time slope takes a much steeper form. In other words, if both multiplier of public expenditure and interest elasticity of investment are negative IS curve will be steeper. On the contrast, if the extreme Keynesian view is in effect,

meaning, in a situation where the investment is perfectly interest inelastic, IS curve will be vertical.

The equilibrium in the capital market is represented by LM curve. LM curve, presents us a set of output and interest level in situation where money demand is equal to money supply. Here, money supply is assumed as exogenous and provided by a central bank (Mankiw, 2012:317-319).

Real stock of money is considered as:

$$L=kY-hi, \qquad k, h>0 \qquad \textbf{(1.8)}$$

Here in the equation (1.8), determinants of real money stock are clearly presented. According to the equation, real income level (Y), interest rates (i), the income sensitivity of demand for money (k), and the interest rate sensitivity of the demand for money (h) collectively, helps us to determine the real money stock. If we observe the relationship between these variables in the equation more intimately, we can see that both (k) and (h) are bigger than zero, meaning, relationship between real money demand and income is positive, meanwhile the relation between real money demand and interest rate is negative. To understand the relationship between these variables fully, we can present an example; for instance, if the national income increases, the demand for money in the market will also increase. And the magnitude of this increase in the money demand will be determined by the amount of increase in the income and the interest rate sensitivity of the money demand.

As it is said above, money supply in this model is accepted as determined by central bank and it is denoted with $\overline{M}$. We also know that the price level is $\overline{P}$. So we can determine the real money supply by solving $\overline{M}/\overline{P}$. And if we take money market clearance condition into account, the money demand or in other words the 'liquidity preference' (L), has to be equal to money supply ($\overline{M}/\overline{P}$).

Thus we can write the LM curve as:

$$\mathrm{i}=\frac{1}{\mathrm{h}}\left[\mathrm{kY}-\frac{\overline{\mathrm{M}}}{\mathrm{P}}\right] \qquad \textbf{(1.9)}$$

The goods market and the capital market has to be equal to each in the short run. Thus we can find the intersection point of IS-LM curves by combining equations (1.7) and (1.9)

$$\frac{\overline{A}}{b} - \frac{Y}{a_G b} = i = \frac{1}{h}\left[kY - \frac{\overline{M}}{P}\right] \quad \textbf{(1.10)}$$

If we extract *Y* from equation (1.10) and write on the left side:

$$Y = a_G\left[\overline{A} - \frac{b}{h}\left[kY - \frac{\overline{M}}{P}\right]\right] \quad \textbf{(1.11)}$$

If we simplify the equation, we get:

$$Y = \gamma\overline{A} + \gamma\frac{b}{h}\frac{\overline{M}}{P} \quad \textbf{(1.12)}$$

Here, $\gamma = \frac{a_G}{1 + k a_G \frac{b}{h}}$ and $\overline{A} = \overline{C} + \overline{cTR} + \overline{I} + \overline{G} + \overline{NX}$

From the equation (1.12), we can extract, $\frac{\Delta Y}{\Delta G}$. Thus, $\gamma = \frac{a_G}{1 + k a_G \frac{b}{h}}$ is considered as the fiscal policy multiplier and in a situation where the money supply remains constant. And this multiplier allows us to determine the magnitude of the change in national income when the public expenditure level is shifted by the government.

It is important not to mistakenly think the fiscal policy multiplier we get from the equation (1.12) and public expenditure (a_G) as two similar things. These two multipliers have significantly different functions. Fiscal policy multiplier, unlike public expenditure multiplier, also accounts the changes in the interest rates when the public expenditure is increased in the money market. The traditional public expenditure multiplier is taken from goods market and it is built on the assumption that increases in the national income do not affect interest rates. Thus, the fiscal policy multiplier is smaller than public expenditure multiplier since, $a_G = \frac{1}{1 - c\,(1-t)} > 0$ and $\frac{1}{1 + k a_G \frac{b}{h}} < 1$.

If we act with the assumption of constant interest rates, then the public expenditure increases should only increase aggregate demand and output levels. However, due to the increases in both income and money supply, interest rates will also increase. And this new level of interest rates will cause decreases in both output and aggregate demand. Higher interest rates will also affect private consumption and investment by crowding them out. Ultimately, the equilibrium output demanded in the goods market will be less than the increase in public expenditure (Romer, 2006).

Hence, we can reach the output increase as:

$$\Delta Y = Y'_O - Y_O = \gamma.\Delta G = \frac{a_G}{1+k a_G \frac{b}{h}}.\Delta G \qquad \textbf{(1.13)}$$

And the crowding out effect can be derived as:

$$Y''_O - Y'_O = (a_G - \gamma).\Delta G = \left[a_G - \frac{a_G}{1+k a_G \frac{b}{h}}\right].\Delta G > 0 \qquad \textbf{(1.14)}$$

From the equation (1.14), we can see that a_G , k , b and h are the determinants of crowding out effect, meaning, sensitivity of real money demand on income levels, interest rates and the interest elasticity of investment determines the crowding out effect. The magnitude of this effect will be greater when the determinants are larger.

Figure 1.2. The effect of increasing public expenditure in IS-LM model

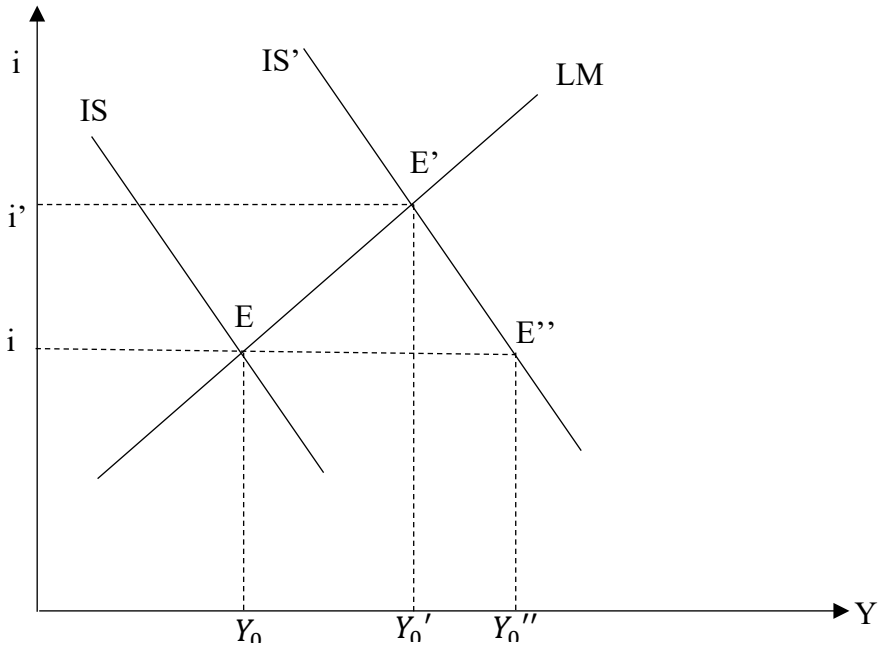


Figure (1.2) presents the effect of expansionist public expenditure policy on output, in the context of equations 1.13 and 1.14. In the beginning, the economy is in equilibrium (IS and LM curves intersects each other) at point E. It is also important to note that economy is at less than full employment point according to Keynesians. So, an increase in the public expenditure changes the location of IS curve, it moves IS curve from IS to IS'. Consequently the intersection point of IS and LM curves also changes from *E* to *E'*. At this new point of equilibrium, both income and the interest rates are higher than they were at point *E*. However, the equilibrium point *E'* provides less output than point *E''*. Reason for this less output is the fact that increased state of interest rates creates crowding out effect on the private investments (the magnitude of the crowding out effect is presented in equation 1.14). In conclusion, increasing public expenditure will shift output to a higher point in the short run. However, expansionist public spending policy will inevitably cause an increase in the interest rates as well. And the new state of interest rates, by creating crowding out effect for the private investment, will reduce the amount of private investment in the economy.

1.2.3. The Post Keynesian Growth Theory

In Neoclassical economic theories the economy is assumed be in full employment state due to the market clearing condition. Contrary to Neoclassicals, Keynesians accept the employment as a factor that is determined by effective demand. The biggest common ground among Post Keynesian studies is their emphasis on realism, uncertainty, social and institutional factors. Rational expectations however, is denied by Post Keynesians. Source of this rejection can be found in Keynes' work. Keynes argues that explanations to human decisions, be it personal or economical, cannot be explained in mathematical fashion since basis of that kind of calculation does not exist (Keynes, 1936:162).

Output level in Post Keynesian theories is determined by factors such as aggregate private consumption demand, aggregate investment, public expenditure and net exports (Stockhammer et al, 2009:142-143). In post Keynesian theories, investment factor is accepted as independent from the savings. This independent investment and effective demand can be described as the factors which determine the income (Pasinetti, 1962). Income distribution is another factor emphasized by Post Keynesians

in achieving the economic growth. For instance, wage increases are accepted as having growth enhancing effect (via raising the capacity utilization) on the economy by Post Keynesian economists. According to them, these wage increases can even lead to a higher investment and profit level due to its 'accelerator effect'. Hence, it can be said that the existence of income inequality in economy can cause an economic instability according to the Post Keynesians (Stockhammer and Onaran, 2012:191-203).

Bhaduri and Marglin (1990), in their research, studied the effects of the changes in income distribution on aggregate demand. They found wages and profits as the factors which can enhance economic growth. According to them, question of whether the economic growth is led by an increase in profits or wages is determined by the reaction of savings and investments to the changes in profit share. If the changes in profit share have more effect on the savings than it has on investment, then they concluded that the economic growth is led by wage. However, if the contrary is in effect, meaning, changes in profit share have more effect on investment, rather than savings, then the growth is accepted as led by profit. Nevertheless, it is important to note that, Bhaduri and Marglin still considered wages as the most important factor since it is the source of income for most of the population, it determines the production costs in an economy and it has substantial effect on aggregate demand.

Bhaduri and Marglin's (1990) study on the effects of the changes in income distribution on aggregate demand has inspired for many empirical studies on the subject. For example, Stockhammer et al. (2009), have found a relationship between the wage share decline and growth and employment rate decline among Euro zone countries since 1981. According to their research, in Euro zone countries wage share has a positive influence on the output growth and a negative effects on the aggregate demand. Hein and Vogel (2008), investigated the relationship between functional income distribution and economic growth in six different countries. According to the result of the study, which was also consistent with Bhaduri and Marglin's paper, if the effects of income distribution on foreign trade are taken into account, the notion of wage led growth becomes less viable.

Bhaduri (2006), provides an endogenous growth theory where the labor productivity in determined by the conflict over income distribution between workers and employers. The growth in this model, is determined by the real wage growth rates and labor productivity. In this demand sided endogenous growth model presented by Bhaduri, determinants of steady growth rate in the long run are growth of labor, investment, and saving decisions. According to the result of study, endogenous increases in the labor productivity create growth enhancing effects for the long run output level. The growth rate both for the real wage and labor productivity is determined by the conflict over income distribution between workers and job holders. In this model, wage stays constant in the long run. Because of this, technological progress stays unchanged in the long run and increases in the aggregate demand and output level sucks up the increases in labor productivity level.

1.2.4. The Critique of Keynesian Theories

The Neoclassical economists have been criticizing Keynesians and their aggregate demand models for its inability to demonstrate some important effects of fiscal policies in developed economies. The source of these criticism is going back to even late 1970s. For example, according to Lucas and Sargent (1978:6), the stagflation effect which was apparent in the markets throughout 1970s due to the trade-off between unemployment and inflation, was not successfully explained by the Keynesians and their demand driven models. According to Friedman (1977), if the normal circumstances are in effect in the economy, usage of monetary policy should be much more efficient in achieving economic stabilization compared to fiscal policy in the long run. He even suggested a rule-based framework for policy makers to follow when deciding for macroeconomic policies. This rule based framework which was proposed by Friedman for macroeconomic policies, has also managed to gain the support of Lucas (1972). In addition to this, 'rational expectations' theory was proposed by Lucas. He suggested that the expectations and the actions of rational individuals who follow the government throughout its policy choosing process, can influence the results of the stabilization policy decided by the government. For instance, according to him, investment might actually drop to even below the point that is intended by the government, due to the rational agents' expectations of receiving an investment

incentive in the future. Similarly, reducing the income taxes in order to achieve a higher consumption level, might not turn out as it was intended if the wealth gained from this tax reduction is perceived small and the reductions are regarded as temporary.

After the period of 1970s and 1980s, where governments spent much more than what their revenues were, many developed economies decided to end this fiscal profligacy era by reducing their debt with respect to GDP. Furthermore, contrary to what Keynesians and their demand driven models suggested, the fiscal contractions, even in the very short term, were linked together with higher growth rates in the developed countries. All these findings allowed the phenomenon called 'non-Keynesian effects of fiscal policy', to gain attraction in the economics world, especially due to its ability to explain the reaction of private consumption to major fiscal changes (Alesina et al, 2002).

Since popularization of Keynesian economics, usage of discretionary fiscal policy to achieve equilibrium between the supply and the demand side of the economy became the norm by replacing the Classical economic theory. However, Keynes' successful theory, after being the most influential theory for decades, has now been kicked out of its throne by yet another theory with classical undertones (Garnaut, 2005:524-531). Since the 1980s, many economists have been investigating the effects of public expenditure in a newly generated dynamic equilibrium model. This new model was essentially built upon the foundations of Neoclassical growth model with constant returns to scale. The studies on this model show a negative relationship between public expenditure and real wages and private consumption.

The Neoclassicals suggests governments to refrain from interventionism by using fiscal policies. According to them, if the government decides to intervene, the time it takes to design and implement the suitable policy would make chosen policy useless (Auerbah et al, 2010:142-143). The Neoclassical movement supposes a full employment and a competitive market which can function without any government intervention. In a scenario where the public expenditure is increased, the interest rate also has to increase to maintain the balance in the capital market. According to them,

this new state of interest rates will cause a decline in the private investment (Kustepeli, 2005). In addition to this, The Real Business Cycle (RBC) model suggests a negative relationship between public expenditure and private consumption. According to this model, due to increased public expenditure's depressing effect on the present value of net income, increasing the public expenditure should cause a decrease in the private consumption of Ricardian households (Furceri and Sousa, 2009:1-13).

Ultimately all of these developments in the economics literature forced Keynesians to make some changes in their models. In order to stay relevant, the new Keynesian models had to incorporate the assumption of rational expectations for firms and individuals and they also had to include some sort of price rigidity in their models. This price rigidity generally was incorporated into their theories as in the form of staggered prices or wages. These new additions also changed the focal points of Keynesian models. After the changes, the focal points in Keynesian models were: explaining the importance of an imperfect and incomplete market, wage and price rigidity, maximizing behaviour and rational expectations of economic agents (Gordon, 1990:1137). If we examine both the new and traditional Keynesian models, we can see that the concept of market clearing condition was not accepted by either of them. Due to the absence of market clearing condition, adjustment speed of prices and wages should be slow in the economy. And based on this information, we can assume that the shocks from either demand or supply side will have drastic effects on output and employment in the economy (Snowdon and Vane, 2005).

Study by Aschauer (1989) has sparked a new discussion point on the subject and intensified the dispute regarding the effects of public expenditure. Aschauer (1989), in his study on US time series data, found that the increases in public investments crowds out private investments and increases the marginal productivity of private capital. It is important to note that, increase in the marginal productivity of private capital can create crowding in effect for private capital.

Giavazzi and Pagano (1996)’s study was essentially conducted in order to find an answer to the long lasting question of whether public expenditure has Keynesian or non-Keynesian effects on the economy. Results of their study shown that there are

several determinants which can affect a fiscal policy's impact on economy. These determinants are: type of the fiscal policy (budget cut or expansion), size and duration of fiscal policy, conditions that are in effect in the market before the implementation of fiscal policy (e.g. growth of public debt, changes in the exchange rate and money supply) and the composition of the fiscal policy (whether it is tax change, transfer spending change, public investment change, government consumption change etc.).

Hemming et al, (2002), presented in depth research regarding the effect of public expenditure on economy by using both theoretical and empirical sources from the literature. According to the result of their investigation, when the multiplier effect is comparatively small, public expenditure generates Keynesian effects on the economy. However, the results also recognizes the existence of non-Keynesian effects on the economy.

Ramey (2011), in her cross country analysis regarding the public expenditure's multiplier effect on economy, found out that financing the public expenditure from budged deficit can allow governments to achieve a multiplier figure that can range from 0.8 to 1.5. Thus, she practically recognized the existence of Keynesian effects on the economy.

In the last years, developing countries were started to be included into the investigations regarding the effect of fiscal policy on economy. Inclusion of developing countries into the studies, have also allowed economists to get a different perspective on the subject. Schclarek (2003), in his study regarding the effect of fiscal policy on private consumption in both developed and developing countries, came across results that support both the existence of Keynesian and non-Keynesian effects on private consumption. According to the results, the question of whether the private consumption will be affected by Keynesian or non-Keynesian effects, is determined by the initial condition of the economy. While a fiscal contraction in the market generally creates decreasing effects for interest rates, it also increases the aggregate demand for stocks, bonds and real estate. It is also accepted that, in general, an expansionary public spending policy in the market has non-Keynesian effects in industrializing countries (Giavazzi et al, 2000).

In summary, if we compare the effect of government expenditure multiplier in traditional Keynesian models to the new Keynesian ones, we find that the size of multipliers in new Keynesian models are rather small compared to traditional ones. However, that does not change the fact that both the traditional Keynesian and new Keynesian models accept expansionary public spending as an important tool for increasing output and employment. Nevertheless, since the macroeconomists are still divided on the subject, the argument over the effects of public expenditure is still going on. Sources of this division ranges from errors of calculation in empirical studies to disputes over which methodology or theoretical framework should be employed for empirical studies.

1.3. The Role of Public Expenditure in Neoclassical Growth Models

The Neoclassical growth models presents a different perspective on the relationship between public expenditure and economic growth. Prominent neoclassical economist Solow (1956), in his exogenous growth model argues that with no technological progress, the effects of diminishing returns would prevent economy from growing of per capita income. Thus, he also implies the existence of positive relationship between technological progress and economic growth in the long run. In Solow's exogenous growth model, economic growth in the steady state is assumed to be determined exogenously by factors such as population growth and technological development. According to the model, only during the economy's transition period to steady state, public expenditure can have an effect on the growth. And this shows the expansionary fiscal policy's ineffectiveness at stimulating economic growth in the long run. (Easterly and Rebelo, 1993).

In the exogenous neoclassical growth model, function of public expenditure is different. In these models, public expenditure does not have positive effect on the long-run per capita income. While governments cannot have any effect on the steady growth rate with public expenditure, it can influence factors such as saving rate or investment incentives through the usage of tax or expenditure as a tool. Meaning governments can influence the equilibrium factors (Kneller et al, 1999:172).

Arrow and Kurz (1970), presented a neoclassical growth model in which, private consumption and capital stock provide the 'utility' that consumer needs. Public capital stock aside from providing 'utility' for consumers, has also positive effects on private production. Arrow and Kurz (1970), in their research suggest that there is no ineffective government investment in the economy, and assumes every investment made by government is beneficial for the society. Regardless, the traditional neoclassical growth model assumption of government's not being able to effect the economic growth with the usage of public expenditures in the long run, does still exists in the model.

Emergence of endogenous growth models in the 1980s, unlike exogenous neoclassical growth models, granted ability to fiscal policy to significantly affect the long run economic growth. In this new endogenous model, public expenditure is accepted as an important tool which can have significant effect on economic growth. Similarly, public expenditures were accepted as having ability to influence the output levels and steady growth rate. In these models, changes in public expenditure, be it positive or negative, can have long term effects on the growth period and these accumulated effects during the transition state can even reach to a point where it can have impact on steady state growth rate (Turnovsky, 2004:883-902).

After the growing popularity of endogenous growth models throughout the 1980's, many economists started to emphasize the importance of human capital R&D in endogenous growth models. While Lucas (1988) argued that the governments can stimulate long run economic growth by increasing the human capital level through public investments in education, the others such as Barro (1990) and King and Rebelo (1990), suggested an even bigger role for investments in human capital. According to them, these investments made on human capital does have positive effects on the steady state growth figures. For instance, according to the studies from Barro (1990) and Kneller et al, (1999), in the newer endogenous models, governments with the help of fiscal policy can boost the long term economic growth even without counting on the exogenous factors (e.g. technology, population). The main characteristic of these newer models are their inclusion of constant or increasing returns in the factors.

The endogenous growth models claim that in a scenario where the public expenditure level is increased, total factor productivity in the market should increase as well. Meaning, a public expenditure increase in the market may create boosting effects for the factors such as output, employment, wages and consumption. And since the endogenous and the exogenous growth models assign different roles for the public spending factor, we can say that the exogenous models and the endogenous models are contradictory to each other. Aschauer (1989), in his study where he incorporated endogenous constant return of capital assumption to his model, found that public spending made on the infrastructure can create substantial positive effects on the economic growth. Investments made on roads, highways, ports, airports can be given as example for these kind of investments. He also determined an indirect positive relationship (oriented from investments to human capital) between infrastructure investments and human capital factor. Be it taxation or building infrastructure or through the usage of regulations in the markets, governments have a lot opportunities to reach its goal of achieving its designated long term growth rate figures (Temple, 1999:137-152).

In the neoclassical growth models (with constant returns to scale), public expenditure changes have no effect on the factors such as private consumption and real wages. However, in the endogenous growth model with increasing returns, if the labor supply is adequately elastic, there is a positive relationship between public spending, steady state real wages and private consumption. Thus, it can be said that the public expenditure in endogenous growth models does not create crowding out effect for private consumption factor (Devarajan et al, 1996:313-344). In general, expenses made on services like roads, airports, docks, law and order and R&D are grouped into a package called ‘public capital’. Every factor’s reaction to an increase in the public spending is different in this package. While increasing the transportation investments can yield positive results for private factors, investments on law and order has completely different effects. For example, in a scenario where the law and order is neglected and the country is without a police force, high rate of crime would not be surprise. And in a country where the theft is rampant, while the act of stealing may work as a wealth redistribution tool in the short run, due to the future theft expectations,

it might be able to also cause reductions in the return rate of investments (Glomm and Ravikuman, 1997:196).

1.4. Endogenous Growth Models: The Role of Public Expenditure and the Optimal Size of Government in Economy

In the neoclassical growth model of Solow (1956), the rate of technological progress can stimulate long-run growth rate. Although governmental tools such as distortionary taxation and productive government expenditures can provide incentives to invest in human or physical capital, the effect of this is only seen in equilibrium factors, not in the long-run growth rate of the economy.

Cass (1965) and Koopmans (1965) by taking endogenous savings rate from Ramsey-Cass-Koopmans model and adopting the overlapping generation model from Diamond (1965), updated the Solow's Nobel Prize winner neoclassical growth model. However, this updated version has also left little to no place for public economic policies. Government policies were ineffective in the long-run since the long-term growth is assumed to be exogenous. Both the traditional and the updated Solow model failed to take the economic effects of public capital into account.

Arrow and Kurz (1970), by including public capital as an economy influencing factor into their model, became the inspiration for endogenous growth models. First, Romer (1986) devised a model that allows long-run economic growth to be achieved endogenously. While this study caused economists to re-visit the effect of public policies on economic growth, the results were not very different from exogenous growth models.

The real breakthrough in this area was achieved with the Barro (1990)'s model. Contrary to the exogenous neoclassical growth models, governmental tools such as distortionary taxation and productive public expenditure are accepted to have an effect on the long-run growth rate. Barro (1990), by accepting public expenditure's ability to increase private capital marginal productivity (infrastructure etc...), found a positive relationship government expenditure and long-run economic growth. In other words, in a scenario where the government expenditure is able to boost the real output growth

rate, the amount of public spending made can be a crucial determinant in identifying the source of different long term growth rates among different nations.

Barro, in the model which the relationship between economic growth and government expenditure is investigated, employed the assumption of constant returns both for private and public capital factors. Barro discovers two different effects of a public expenditure increase. At first, the public expenditure increase creates a crowding out effect on private investments which in turn decreases the growth rate of economy. Then, the increase in the ratio of public expenditure to output allows private capital to be more efficient and economic growth increases.

Barro (1990) also proposes an optimal public expenditure share which can allow governments to maximize their growth rates. According to him, the current expenditure level determines the relationship between economic growth and public spending. If the current spending level is below the point of growth maximizing share, then the relationship between economic growth and public spending will be positive. On the contrary, if the spending level is above the growth maximizing share, then direction of relationship between the same variables will be negative. Ultimately, only in a situation where the current spending level is below the growth maximizing amount, increasing the public spending level will create growth enhancing effects in the economy. According to Barro, optimal size of government is achieved when the marginal productivity of public expenditure is one. In this natural efficiency point, marginal costs and marginal benefits are equal to each other.

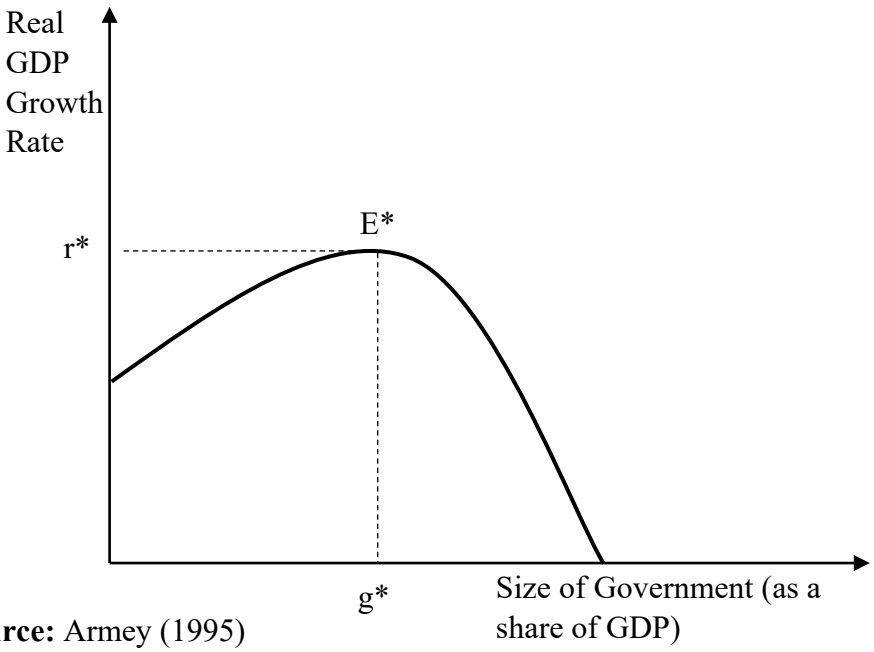
Barro's highly influential 1990 model regarding the relationship between economic growth and public expenditure, can be summed as follows:

- Productive public expenditure that are financed from lump-sum taxes create long-run growth stimulative effect on economy,
- An inverted U-shape between the long-run economic growth and tax rate is generated if government decides to finance productive government expenditure from flat-rate tax on output,

- Flat-rate tax has to be equal to output to public expenditure elasticity ratio in order for government to achieve growth maximization.

Armey (1995), presented his own perspective on the debate regarding the optimal size of public spending in the economy by introducing Armey Curve to the economic literature. In Armey's study, expansionary public spending policy is only effective when the size of government in the economy is satisfactory. Meaning, according to Armey, if the existing public spending level in the economy is under the specific threshold, then government can create stimulating effects on output by increasing their public expenditure further. It is important to note that, according to Armey, continuous public expenditure increases in the economy decreases the productivity of other projects funded by the state. If we observe the Figure (1.3), presented optimal size for the government by Armey is at point *E**. After a certain time in point *E**, the marginal benefits provided by raised public expenditure level decreases to zero. And at that point, if the public expenditure is above (in terms of its share in output) the optimal threshold (*E**), further public spending in the economy decreases the real economic growth.

Figure 1.3. Relationship between Economic growth and Public expenditure (Armey Curve)



Source: Armey (1995)

1.5. Empirical Studies on the Relationship between Economic Growth and Public Expenditure

The relationship between gross domestic product (GDP) and government expenditure has been subject to many academic studies for decades now however due to differences in results, it is hard to talk about the existence of an agreed result of the interaction between economic growth and government expenditure. In this section, first international, then the studies on Turkey will be presented and the results of these studies regarding the relationship between economic growth and government expenditure will be discussed.

1.5.1. International Studies on the Relationship between Economic Growth and Public Expenditure

In this section international studies regarding the interaction between economic growth and public expenditure will be presented. The studies which will be shared in this section, in terms of obtained results, can be categorized into 5 groups; *1- Studies that support Wagner's Law, 2- Studies that support Keynes' Hypothesis, 3-Studies that indicate bi-directional relationship, 4-Studies that find mixed results, 5- Studies that find no relationship between public expenditure and economic growth*. A fair number of studies on the relationship between disaggregated public expenditure and economic growth are also presented in this section.

1.5.1.1. Studies that support Wagner's Law

Ram (1986), conducted several studies on the relationship between economic growth and government expenditure. First one was conducted in 1986 for 63 developed and developing countries, then he expanded his research in 1987 by adding 52 more countries. In both studies, he investigated the existence of a relationship between the variables for the period 1950-1980. A limited support for Wagner's Law was found in both studies.

Rehman, Iqbal and Siddiqi (2010), searched for a potential causality relationship between public expenditure and national income in Pakistan. While utilizing the dataset of 1971-2006 period, they employed Johansen's cointegration and Toda-

Yamamoto's causality tests. At aggregate level, they found a long run causality relationship running from national income to public expenditures which proved the Wagner's Law for Pakistan.

Srinivasan (2013), examines the relationship between economic growth and public expenditure for India. In the study, Johansen Cointegration test and Vector Error Correction Model was employed on India's 1973-2012 period. According to the results, for both long and short-run, a one-way causality relationship running from economic growth to public expenditure was detected. Therefore, he confirms the existence of Wagner's Law in Indian economy.

Musgrave (1969), by utilizing time series data, investigated the relationship between economic growth and public expenditure for the United Kingdom, Germany and the United States. He picked the countries' 1890-1960 periods for his investigation and found a solid relationship between per capita real income and public expenditure (as a percentage of GNP) in all three countries. With these results, he indirectly confirmed the validity of Wagner's Law in Germany, the United Kingdom and the United States for the subject period.

Ageli (2013), conducted a research to determine a possible existence of the displacement effect in Saudi Arabia's economy. For the research, he used Saudi Arabia's 1970-2012 period and utilized Johansen cointegration and Error Correction model analyses. He also introduced some dummy variables to account the effect of disturbances which Saudi Arabia has faced (Gulf wars, oil and economic crises). According to the results, dummies representing the disturbances which occurred in 1973, 1976, 1983 and 2006 were supporting the Wagner's Law while disturbances occurred in 1991, 1997, and 2001 were not. In conclusion, the Saudi economy during subject period was found supporting the existence of Peacock and Wiseman's displacement effect.

Arora and Verma (2010), investigated the validity of Wagner's Law for India's 1950-2008 period. In their research, they utilized Johansen cointegration and Error Correction Model as their methodology. They also introduced two dummy variables which represents the two liberalization periods (1980 to 1991 and 1991 and onwards)

in Indian economy. According to results, the first liberalization period does not cause any significant changes in the growth elasticity of public expenditure, while the second liberalization period does significantly effects the outcome. Nevertheless, the validity of Wagner's Law for India's 1950-2008 period was still verified.

Sudarsono (2010), conducted a study on OIC countries (Organization of Islamic Cooperation) to examine the interaction between economic growth and public expenditure. Study was conducted on the 1970-2006 period and Granger Causality test was utilized. The empirical results were varied; while economies of countries such as Iran, Nigeria and Tunisia had Keynesian features, the others such as Algeria, Burkina Faso, Saudi Arabia, Morocco, Indonesia, Libya and Malaysia implied the existence of Wagner's Law. In addition, for most countries, economic growth was found more influential on public expenditure.

1.5.1.2. Studies that support Keynes' Hypothesis

Lahirushan and Gunasekara (2015), investigated the impact of government expenditure on economic growth for 9 developed and developing Asian countries. Pedroni and Kao panel cointegration and Granger causality methodologies were employed for the data belong to 1970-2013 period. According to the results, economic growth and public expenditure were found to be cointegrated. Furthermore, a causality relationship from government expenditure to economic growth was discovered. In other words, the validity of Keynesian hypothesis for 9 Asian countries (Singapore, Thailand, Bhutan, China, Japan, South Korea, Malaysia, Sri Lanka and India) is proven.

Abu-Bader and Abu-Qarn (2003), examined Syria, Egypt and Israel for a possible causality relationship government expenditure, military spending and economic growth. In the research they picked Egypt's 1975-1998, Syria's 1973-1998 and Israel's 1967-1998 periods and utilized multivariate cointegration and variance decomposition techniques. They also employed dummy variables for Egypt for the year of 1991 and for Israel for the year of 1985 to find the effect of the economic reforms occurred during these years. However, dummy variables were found to cause no significant change in the results. First, they tested for causality within a bivariate system of public

expenditure and economic growth and as a result, they found negative long term relationship and a bi-directional causality from government spending to economic growth. However, when they repeated the process within a trivariate system, they found that military spending in all countries have negative effect on the economic growth while civilian public expenditures have positive effect in Egypt and Israel.

Easterly and Rebelo (1993), examined for existence of a relationship between the variables in one hundred countries. Period subject to investigation was 1970-1988 and the countries selected for the investigation were picked both from developed and third world countries. According to the results, there was a positive correlation between expenditure reserved for education and economic growth. The results they obtained provided a solid proof regarding education expenses' importance and its enhancing effect on the economic growth.

1.5.1.3. Studies that indicate bi-directional relationship

Dritsakis and Adamopoulos (2004), investigated the relationship between economic growth and public expenditures in Greece. In their research, they utilized Greece's 1960-2001 period and employed error correction model to determine the direction of the relationship. According to the results, a bi-directional causality relationship between government expenditure and economic growth was found in Greek economy.

1.5.1.4. Studies that find mixed results

Anwar et al (1996), investigated the relationship of national income and public expenditure in 88 countries for the period of 1960-1992. In their study, they utilized the Granger Causality and Johansen's Cointegration tests. The results they got were varied. While in 29 countries no relationship was found between the variables, in 23 countries an indirect causality relationship and in 33 countries direct relationship between national income and public expenditure was found. Only for 13 countries, Wagner's Law was confirmed.

Loizides and Vamvoukas (2005), examined the relationship between economic growth and public expenditure in Greece, Ireland and England over the period 1950-1995. The Granger Causality method was utilized in their study regarding the existence of a

relationship between the variables in three countries. In England and Ireland causality relationship was detected from public expenditure to economic growth. In other words, Keynesian Hypothesis was proven in these countries. On contrary, Greece was found to be supporting the Wagner's Law since a causality relationship running from economic growth to public expenditure was detected.

Barro had conducted two studies regarding the relationship between economic growth and public expenditure. First, Barro (1989) investigated the existence of the relationship in 72 countries during 1960-1985 period. By utilizing a basic correlation technique, he reached to the conclusion of there being a negative relationship between public consumption expenditure and per capita growth and investment rates. However, he also found a positive relationship between public investment expenses and economic growth. Two years later, Barro (1991), reconducted the same investigation (with same methodology and period) regarding the relationship between economic growth and public expenditure, but this time for 98 countries. The results he got from the second research were also the same; negative relationship between public consumption expenses and economic growth, positive relationship between public investment expenses and economic growth.

Sattar (1993), in his study where he investigated the relationship between economic growth and public expenditure for 24 OECD and 31 developing countries, utilized the data of 1950-1984 period. According to the results he found, a negative relationship between economic growth and public expenditure in OECD countries and a positive one in the low income developing countries. He also concluded that the scale of government activity in economy for developed countries does not cause significant growth enhancing effects. On the contrary, he acknowledged the benefit of large government activity in economy for developing countries since he believed this can lead to growth boosting results.

1.5.1.5. Studies that find no relationship between public expenditure and economic growth

Aleksandrovich and Upadhyaha (2015), examined the effect of government size on economic growth in three OECD countries (USA, Canada and United Kingdom). The

countries' 1975-2012 period was selected as the study subject. For the US, a negative relationship between tax revenue and economic growth was determined while government expenditures effect on growth was found statistically insignificant. In Canada, government expenditure and tax revenue's effects were found insignificant. As for UK, the government expenditure was found negatively affecting the economic growth. Tax revenue's effect on the growth was found insignificant. They concluded their study by suggesting a restructuring in taxes and expenditure to achieve growth maximization.

Study conducted by Ansari et al, (1997), investigated the relationship between the variables for three African countries. For Ghana they used the data of 1963-1988 period, for Kenya they examined data from 1964-1989 period and finally they South Africa was analyzed for the period 1957-1990. The results they got were showing no signs of a relationship between public expenditure and national income in these countries.

Courakis et al, (1993), in their study on Greece and Portugal, investigated the relationship between aggregate income and public expenditures for the period 1958-1985. According to the results, they found permanent income, relative prices, stabilization policies and sociopolitical factors as the main determinants for public expenditures. However, they observed significant differences in the responses which public expenditure gave to these determinants. Therefore, no significant support for Wagner's Law was found in both Portugal and Greece.

Fasano and Wang (2001), investigated the relationship between disaggregated public expenditure and non-oil economic growth in Gulf Cooperation Council countries. As for their methodology; they utilized cointegration and error correction model on the dataset of 1980-1999. It is important to note that, Kuwait was excluded from this research due to lack of data for 1990 and 1991 (Gulf War). According to the results, there was no relationship between disaggregated public expenditure and non-oil growth in GCC countries during 1980-1999 period.

Gwartney et al (1997), conducted two different studies on the relationship between economic growth and public expenditure. First, they investigated the relationship in

OECD countries for 1960-1996 period. Then, by utilizing the dataset of 1980-1995 period, this time they examined the relationship for 60 countries around the world. In their cross-sectional study, they utilized basic regression model on time series data. In both of the studies, the results encountered were the same. Negative relationship between economic growth and public expenditure was found in both studies for their respective periods. They warned governments to be careful when deciding scale and composition of the public expenditure since they found that excessive public expenditure affects economic growth negatively.

The international literature on the relationship between economic growth and public expenditure seems to be much more varied in terms of results (compared to studies on Turkey). Results on the subject varies from supporting Wagner's or Keynes' hypothesis to not finding any relationship at all.

1.5.2. Studies on Turkey

In this section studies on Turkish data regarding the relationship between economic growth and public expenditure will be given. The studies which will be shared in this section, in terms of obtained results, can be categorized into 5 groups; *1- Studies that support Wagner's Law, 2- Studies that support Keynes' Hypothesis, 3-Studies that indicate bi-directional relationship, 4-Studies that find mixed results, 5- Studies that find no relationship between public expenditure and economic growth*. A fair number of studies on the relationship between disaggregated public expenditure and economic growth are also presented in this section.

1.5.2.1. Studies that support Wagner's Law

Yamak and Kucukkale (1997), searched for a potential relationship between economic growth and public expenditure for the period 1950-1994. In the study, they employed the Granger Causality and Johansen Juselius cointegration tests. According to the results, there was a positive long term relationship between economic growth and public expenditure during the subject period. The direction of the relationship was observed as from economic growth to public expenditure.

Isik and Alagoz (2005), analyzed the Turkish economy from 1985 to 2003 to find a potential relationship between economic growth and public expenditure. In the study, they adopted Johansen cointegration and Granger causality tests as their methodology. The results of the study indicated a long term relationship between economic growth and public expenditure in Turkish economy. The direction of the relationship was found precisely how Wagner suggested; from economic growth to public expenditure.

Gunaydin (2000), using the annual dataset of 1950-1998 period, examined the relationship between national income and public expenditure. In his study regarding the validities of Wagner and Keynes' hypotheses for Turkish economy, he found results supporting the validity of Wagner's Law, in other words the direction of the relationship between the variables was found as oriented from national income to public expenditure.

Oktayer (2011), tested the validity of Wagner and Keynes' hypotheses in Turkey for the period of 1950-2009. In this study, five interpretations of Wagner's Law were tested and cointegration and VECM were utilized. According to the results, public expenditure and economic growth were found cointegrated in all models. In addition, causality test was employed to find the direction of the relationship between the variables. As a result, a causality relationship from economic growth to public expenditure was determined. Thus, the validity of Wagner's Law in Turkish economy was proven for the subject period.

Uluturk et al (2016), investigated the validity of Wagner's Law in Turkey, by testing the 5 versions of Wagner's Law for the period 1980-2014. In the study, ARDL Bounds test was utilized. According to the results, out of 5 versions of Wagner's Law, 3 versions indicate the presence of Wagner's Law for Turkey while for the other two, sufficient results regarding the validity of the Law were not encountered.

Arisoy (2005), investigated the relationship between economic growth and public expenditure in Turkey. In his research, he employed Engle-Granger and Johansen cointegration and Granger causality tests on the annual data which spanned from 1950 to 2003. Although findings did not indicate a long term relationship between aggregate public expenditure and economic growth, it determined a one-way causality

relationship from economic growth to disaggregated public expenditure (current, transfer and non-transfer expenditure).

1.5.2.2. Studies that support Keynes' Hypothesis

Yuksel and Songur (2011), in their study where they analyzed the effect of total public expenditure, current spending, investment spending, debt interest payments and transfer expenses on economic growth, utilized Engle-Granger cointegration and the Granger Causality test. They analyzed Turkish economy for the period 1980-2010. They determined a long term relationship between economic growth and all variables (except debt interest payments). In addition to this, a one way causality relationship directed from total public expenditure and current expenditure to economic growth was detected.

Artan and Berber (2004), investigated a potential relationship between the scale of government activity in economy and economic growth. In the research, they utilized Johansen-Juselius cointegration test and Error-correction model. According to the results, they determined two long term positive relationships and one long term negative relationship. First of these positive relationships was found between economic growth and public expenditure, the second was between investment spending and exports and the negative relationship was found between economic growth and imports. In addition to this, one way causality relationship from public expenditure to economic growth was determined, meaning validity of Keynes' hypothesis in 1987-2003 period was proven.

1.5.2.3. Studies that indicate bi-directional relationship

Kanca (2011), analyzed the relationship between economic growth and public expenditure by using the dataset of 1980-2008 period for Turkish economy. For this purpose, the Granger Causality test was employed. The results obtained from the test determined a bi-directional causality relationship between economic growth and public expenditure. In other words, the validities of Wagner's Law and Keynes' hypothesis were proven for Turkey's related period.

1.5.2.4. Studies that find mixed results

Dunne et al (1998), investigated for a causality relationship between defence expenditure and economic growth in Turkey and Greece. In the research, they utilized the 1960-1996 period of both countries and employed Johansen cointegration and Granger causality (both the standard and the extended version) techniques. They also used dummy variables for the both countries to capture the effect of important changes during the subject period. Turkish 'occupation' of Cyprus (1974) was picked as dummy variable for Greece and Turkey's 1975-1978 economic crisis period was selected as dummy variable for Turkey. For Greece, they managed to find a positive effect caused by defence expenditures on economic growth with standard test, but failed to find a significant result with the extended test. Dummy variables for each country had no significant impact on the outcome and the only significant result they got was a negative causality running from defence expenditure to economic growth in Turkey.

Kar and Agir (2002), in their study, investigated the relationship between public education expenditure and public health expenditure expenses and economic growth by using the yearly dataset of 1926-1994 period. They utilized the Granger Causality test in order to determine the direction of a possible interaction between the variables. According to the Granger Causality test's results, a causality relationship directed from public education expenditure to economic growth was identified. On the other hand, when the relationship between public health spending and economic growth was analyzed, the causality identified was from economic growth to public health spending.

1.5.2.5. Studies that find no relationship between economic growth and public expenditure

Halicioglu (2003), investigated the relationship between economic growth and public expenditure in Turkey. He selected Turkey's 1960-2000 period to examine the effect of public expenditure on economic growth. In the study where he used cointegration techniques on time series data, he could not find results supporting the validity of Wagner's Law for Turkey's 1960-2000 period.

Bagdigen and Cetintas (2003), examined the validity of Wagner's Law in Turkey over the period of 1965-2000. In their investigation, they made use of Engle-Granger cointegration and the Granger Causality tests. According to the results, they found no long term relationship between economic growth and public expenditure during the period of 1965-2000. In addition to this, they also could not find any causality relationship between the variables. In other words, neither Keynes' hypothesis nor Wagner's Law was apparent in Turkish economy during the subject period.

Demirbas (1999), investigated the relationship between economic growth and public expenditure in Turkish economy for the period of 1950-1990. In the study, Engle-Granger cointegration and Granger Causality tests were used. The results, were showing no signs of cointegration relationship between the variables during the subject period. Furthermore, Granger causality test also failed to find a short run causality relationship between the variables, which meant that neither public expenditure nor economic growth had positive effect on one another during the period of 1950-1990.

In this section, studies on Turkey regarding the relationship between economic growth and government expenditure were presented. Economic literature (especially the older ones) in general, seems to favor Wagner's Law rather than Keynes' hypothesis. In addition, there are also fair number of studies that indicate no relationship or bi-directional relationship between economic growth and government expenditure. In the next chapter, a review of Turkish economy will be presented and the developments in Turkish economy will be discussed.

CHAPTER TWO

REVIEW OF THE TURKISH ECONOMY (1980-2017)

2.1. Economic Stability Program (1980)

In 1970's, due to the government's slowness in implementing the necessary macroeconomic measures in economy, imbalance between national savings and investments increased. Correspondingly, continuous increases in the imports with respect to exports, also caused increases in the trade deficit of the government. Ultimately, all of these reasons contributed to the sharp increases in inflation figures. After these developments, the government tried compensate the public and foreign trade deficits with private foreign capital and national reserves. However, this type of financing led the economy into an even higher point of foreign debts and changed the structure of borrowings of the country completely (Bayar and Oguz, 2003:25).

On top of all these, 1973's 'Oil Crisis' devastated the supply-demand balance of Turkish economy and the new, higher level of oil prices caused increases in the need of foreign exchange reserves for the government. In addition to these, due to discontinuation of foreign credits, input importation became more difficult for the producers. Imbalances in the supply and demand, even for the basic human needs, increased. Thus, the import substitution policy which was in use since 1950 was ended by 'January 24 1980 Decisions'.

'January 24 1980 Decisions' and the economic stability program which followed it, were designed to solve the problems that were stated above. Reasons which forced the government to design this kind of program can be given as; high inflation figures, foreign exchange and energy bottleneck, decreases in the exports and demand pressure. Within the scope '1980 Stability Program', Turkey has undergone structural changes. Planned reforms of this stability program can be examined under five major titles (Uygur, 1993:8):

• Reducing the inflation rates permanently without hurting the dynamics of economic growth (Price Stabilization),

• Abandoning the import substitution growth strategy in favor of an export led growth strategy and under this context providing incentives to potential exporters and liberalization of imports in the country (Improving the Balance of Payments),

• Ensuring the financial liberalization,

• Liberalization of foreign exchange movements and within this context, changing the foreign exchange rate policy in order to improve the convertibility of Turkish Lira. (Ensuring an outward-oriented economy),

• Decreasing the public sector activity in the economy and acceleration of privatization endeavours,

In order to implement these reforms, economic policies listed below were used (Sahin, 2007:194-196):

• Tight monetary policy,

• Positive real interest rate policy,

• Realistic exchange rate policy,

• Incentives for foreign investors,

• Liberalization of foreign trade by decreasing government interventions,

• Allowing market to establish its own prices for goods and services.

Under these circumstances, Turkish economy has undergone fundamental changes. Foreign trade and balance of payments regulations were liberalized, various incentives and subsidies were granted for exporters, import regulations were liberalized and flexibility of exchange rates was adopted. Capital Markets Law was abandoned and instead Capital Market Board was established, interest rates were liberalized, Istanbul Stock Exchange (BIST) was founded. Within the structure of Central Bank, interbank money market was founded and accordingly a new Banking Law was accepted. In addition to these, taxes were also reformed and Value-Added Tax (VAT) was started to be used. Various measures were put into use to make state-owned enterprises more

efficient and correspondingly capital movements were liberalized in 1989 (Yenturk, 1999:3). It is important to note that 'January 24 1980 Stability Program' was tried to be implemented by the 44th government of Turkey in an environment in which the democracy was interrupted by military coup. Because of the 1980 military coup, any type of union activities and strikes were banned and price and wage increases in the economy were regulated heavily. Also, in order to gain control over the money supply and to decrease the public expenditure, contractionary fiscal and monetary policies were utilized (Bozkurt, 2014:99).

2.2. Economic and Political Developments before the 2001 Economic Crisis

In 1983, 'Motherland Party' which was supporting the notion of a more liberalized and outward oriented economy for Turkey, managed to came into power. And, Turgut Ozal who can be considered as the architect of 'January 24 Decisions', formed the government alone. After coming into power, Ozal presented the two major problems which they will be focusing on throughout their period. First of those problems was the goal of decreasing the inflation figures and the second was resolving the balance of payments problem. In order to achieve these goals, government interventions were decreased to minimum and virtues of free markets were adopted. New economic policies that were implemented during this era are presented below (Rodrik, 1990:4-5):

• Tight monetary policy,

• Liberalization of foreign capital (in terms of its ability to enter Turkish markets),

• Privatization of state-owned enterprises,

• Concentrating the public investments mostly on infrastructure,

• Adopting daily, changing exchange rates model,

• Liberalization of foreign exchange transactions,

• Switching into a more liberal import model and abolishing the restrictions on the quantity of imports,

• Providing major incentives for potential exporters,

• Liberalization of importation or exportation of gold

• Establishment of Istanbul Stock Exchange (BIST)

Main target of the policies that were presented above was the acceleration of the adoption process of 'market economy'. However, the government has failed in implementing and following the policies fully. Due to the compromises during the policy implementation process, the government could not control the money supply level and especially after 1987, public sector borrowing requirement substantially increased. While the growth rates of Turkish economy have increased during 1984-1987 period, increases in the inflation also accelerated. During 1988-1991 period, Turkish economy experienced a lot of fluctuations in her growth figures. In this period, the task of regulating and controlling the interest rates was given to Central Bank of Turkey. Domestic borrowing was utilized in order to compensate the public debt. All of these developments were indicating an upcoming public finance crisis for Turkey.

If we examine what was targeted and what was achieved with January 24 1980 Decisions, we can observe that the structural causes of economic instability in Turkey could not be resolved. Especially, equilibrium in public sector finance could not maintained and the gap between expenses and revenues in Turkish economy continually increased. Privatization of state-owned enterprises could not be realized at a desired level, and these state-owned enterprises continued to be a headache for the state. Furthermore increases in public debt forced the government to take loans continuously. Government, in order to increase its borrowing potential, raised the level of interest rates in the economy. Naturally, continuous increases in interest rates caused transfer expenses to rise and this became the precursor of Turkey getting stuck in a vicious cycle of debt-interest-debt (Demircan, 2004:9).

Apart from the developments stated above, the frequency of elections during this era can also be considered as a reason for Turkey's macroeconomic struggles. Due to the frequency of elections, instead of designing efficient long term economic policies which can benefit the country more, politicians mostly focused on short term policies

that can win the elections for them. Between the years of 1980-1990, Turkey has seen 5 different governments. These 5 different governments during this 10 year period, are one of the reasons of Turkey's macroeconomic inconsistency (Celasun and Rodrik, 1989:193-211).

Turkish economy during this era, was also affected by the regional developments. Turkey by stating its neutrality and focusing on her trade, benefited from the war between Iraq and Iran and was able to increase its foreign trade (Barlow and Senses, 1995). However, contrary to Iran-Iraq war, Turkish economy was affected negatively from the First Gulf War. Chaotic environment created by this war cost much on Turkey. The war made trading with the region so difficult that the trade with the region nearly came to a stopping point. During the war, oil pipeline could not be utilized and accordingly energy costs increased. In addition to this, due to the authority gap in Northern Iraq, terror attacks in Turkey's Southeastern Region increased. All in all, nearly everything that came out of this war affected Turkey negatively. It is also important to note that increases in defence expenses due to terror threats can be considered as one of reasons which accelerated the inflation rate increases during this era (Sayari, 1997:46).

Ozal, after becoming the president, left his position as prime minister in 1989 November. Yildirim Akbulut became the new prime minister of Turkey. Economy of Turkey, between the years of 1990 and 1996 (excluding 1991 and 1994), virtually transformed into an open market and faced with excessive money entry. As a consequence, increasing value of Turkish Lira and increases in the interest rates and domestic demand caused negative effects on the economy. Up until this point, Turkish economy has already been struggling with high inflation, however sharp increases in inflation after 1990 made the situation even worse. Due to the increases in inflation figures, income distribution worsened, revenues melted and public debt increased. These developments in the economy became the precursor of 1994's financial crisis. Under these circumstances, increases in the interest rates, by accelerating hot money flow into Turkey, caused Turkish Lira to gain even more value. And this, combined with the increases in the cost of labor and decreases in the incentives to indirect export, caused Turkish economy to lose its competitive capacity rapidly.

Ultimately, domestic instability generated from high public debt, also affected the foreign trade negatively. During this period, exports decreased and imports increased and correspondingly imbalances in the balance of payments became a source of major headache for the government (Aktan, 1999:459-462).

All these developments stated above, led Turkish economy into a major economic crisis in 1994.

Coalition government of the period (50th government or First Ciller Government), in order to fight the crisis and gain the support of people, was forced to announce stabilization measures on 5th of April. Objective of this measures can be presented as follows (Ayliffe, Dubin and Gawthrop, 2003:996):

• Reducing the inflation and maintaining a level of price stability,

• Implementation of structural changes to the economy in order to achieve sustainable growth,

• Rapidly decreasing public debts and keeping the need of borrowing at a minimum level,

• Privatization of state-owned enterprises,

• Accelerating the growth of exports and decreasing the gap between imports and exports to a minimum level

Measures utilized in order to reach the objectives of the stabilization program are listed below (Kose, 2002:119):

Measures implemented for increasing the revenues, reducing the debts and the need of borrowing: All expenses (except defence expenditure) were decreased by the government. Prices of the state owned enterprises' products increased substantially. In addition to these, new taxes were introduced and duties and levies were also increased. Some public facilities were also sold.

Measures aimed for ensuring stability and confidence in the foreign exchange markets: Export figures were increased with the help of devaluation of Turkish Lira.

Measures aimed for adjusting the dynamics of domestic market: By increasing the prices of the products manufactured by the state-owned enterprises and stating that there won't be any price changes until the end of year, an attempt was made to influence the inflation expectations of people. The government also tried to decrease aggregate demand by making civil servant's wages stationary. And the market was allowed to form its exchange rates freely. Furthermore, in order to prevent excessive foreign exchange demands and increases in the exchange rates, interest rates were raised.

Measures consisted of structural adjustments: One of the most important structural problems which Turkish economy struggling with was the imbalance between revenues and expenditure in the economy. Unnecessary public expenses, inefficient tax collection and the weak control over taxes can be considered as sources for this problem. Especially, increases in the transfer expenses due to the ever increasing interest payments, increased the severity of the situation even more. In order to solve these problems, privatization, agricultural support programs, rationalization of public sector employment and tax reform were proposed as measures. In addition to this, in order to fix the financial balance problems of social security institutes economic measures were designed.

As a result of the developments mentioned above, in 1994 Turkish economy experienced a negative economic growth. Due to this financial crisis, prices have seen all-time high levels. Inflation rate reached to almost 150%, the stock of domestic debt from being 2.4% of GDP in 1990, rose to 20%. Throughout the crisis at least 600 thousand people lost their jobs. Trade deficit of Turkey during 1994, rose to levels never seen before. It is also important to note that, Turkey was also able to reach record high levels in exports during this period by devaluating Turkish Lira. Nevertheless, due to the political and economic instabilities in the country, Turkey was forced hold snap elections on 24th of December. As a result of this decision to hold snap elections, 'election economy' was in effect throughout the last 3 months of 1995. And in this period, monetary and fiscal discipline of the country was lost. Public expenses increased uncontrollably, and correspondingly, Turkey, rapidly started lose her

reputation in both domestic and international markets and the cost of borrowing rose sharply (Yeldan, 1998:397).

One of the most important events occurred in this period was the signing of Custom Union Agreement with European Union. This agreement was signed by Turkey on 6 March 1995. Even though this treaty was able to create temporary positive effect on the economy, this positive effect could not be converted into something continuous.

As a result of the snap election held on December 24 1995, the coalition of The True Path Party and Republican People's Party have lost the lost majority of parliament. In 1996, Turkey struggled to form a new coalition government. Even after the foundation of new government under the name of 'Anayol' government, problems could not be solved and this coalition government could not work efficiently. On June 28 1996, under the leadership of Erbakan, a new government was formed by the coalition of The Welfare Party and True Path Party. Not long after his coming into power, Erbakan announced his miracle 'balanced budget' plan on October 18 (Weitzman, 1999:747-748). This plan was based on increasing the non-tax income of the government. Developments in the first year of both the '7th National Development Plan' and 'Customs Union Agreement' can be summed up as follows(Central Bank of Turkey, 1996):

• Turkish economy had grown 7.1 percent, a figure even higher than what was expected at the time,

• As of the end of 1996, inflation was recorded as 84,5 percent. Government's inability to take total expenses under control can be considered as a reason for this high inflation figure,

• Turkey implemented 'zero-tariff policy' on the industrial products she imports from European Union,

• Both the ratio of external debt to GDP and the ratio of domestic debt to GDP increased by 44 percent and 21 percent respectively.

• Public expenditure, compared its former level in the previous year, increased by 130 percent. Interest payments were the biggest factor of these increases in the public expenditure of Turkey.

In conclusion, short term governments period between the years of 1996 and 1998 increased the uncertainty in Turkish economy. From 1995 to mid-1998, Turkish economy experienced a rapid economic growth period. However, due to domestic political instability and the Russian and Southeast Asian financial crises, this rapid growth period ended. In addition to this, under the leadership of Mesut Yilmaz, 55th Government's inability to present solutions for the Turkey's economic and political problems worsened condition of Turkey. As a result of this, 55th Government of Turkey has lost its grip on the power on November 23 1998 elections.

After the fall of 55th Government, Turkey needed another one. This time, by taking the support of Motherland Party and True Path Party, Bulent Ecevit managed to form government and get the vote of confidence on January 16 1999. The task of 56th Government of Turkey was administration of Turkey until the snap elections. As a results of the snap election, a tripartite coalition government under the leadership of Bulent Ecevit was formed. This new 57th Government of Turkey was approved by the president on May 28 1999. First step taken by this newly formed 57th Government was signing a 'Stand-By' agreement with International Money Fund. Scope of this program can be listed as below (Arpac and Bird, 2009:140).

• Utilization of tight monetary policy to combat the high inflation figures,

• Adjusting the amount of money that is going to be used on civil servant wages and agricultural support programs according to the expected inflation figures of the year,

• Elimination of Social Security Institutes' vulnerabilities (paying off debts, regulation of excessive expenses),

• Strengthening of the banking system, particularly by limiting the amount of debt which can be owned by banks,

• Utilization of privatization revenues, in the fight against inflation,

Turkey, sent her letter of intent to International Monetary Fund on 9 December 1999. This letter of intention was accepted by IMF on 22 December 1999 and a 3-year implementation period spanning from 2000 to 2002 was foreseen. In this context, 'Disinflation and Stabilization Program' consisting of monetary and exchange rate policies and structural transformation measures in the banking sector, was started to be used in January 2000. The main goals of this disinflation program can be listed as follows (Yeldan, 2001:3-4):

• Reduction of consumer inflation with coherent implementation of consistent, strong, reputable and sustained fiscal, income, monetary and exchange rate policies. According to the program inflation was expected to fall to 25% at the end of 2000, to 12% at end of 2001 and 7% at the end of 2002,

• Reduction of real interest rates to reasonable levels,

• Enhancing the growth potential of the Turkish economy,

• More efficient usage of resources in the economy and ensurance of a better income distribution,

Considering the main topics of the program, it can be said that the objective of this program is reducing the inflation and the real interest rates while providing economic growth. However, due to the earthquake on the 17th of August 1999 Turkey has suffered 10 billion dollars in economic damage. This devastation caused major damage to the country's industry sector, unemployment has reached to record levels and the country experienced a -6.1 percent economic growth. In order to cover the economic losses caused by the earthquakes, on 26 November 1999, 'Earthquake Tax Law' was enacted.

The 57th Government, which succeeded in achieving political stability, introduced the Eighth Five-Year Development Plan on 1 January 2001. However, the targeted policies could not be implemented due to the crisis in November 2000. Reason of this was government's focus on daily issues and populist practices instead of necessary policies needed by Turkey (Tokgoz, 2001:280). The government's reluctance in fulfilling the agreement by implementing the planned reforms, can be considered a

major kickstarting factor for November 2000 and February 2001 crises (Arpac and Bird, 2009:140-141). The limitation imposed upon central bank regarding its net domestic assets (which took away central bank's function of being the last money lender) and the implementation of fixed exchange rate policy were the reasons which sparked the economic crisis and made its control difficult. Thus, the central bank lost its ability to influence the market through open market transactions. Absence of enough foreign exchange in the banking sector and rising current account deficit, by creating a panic environment in the markets led Turkey into a liquidity crisis on November 2000. In the first two days of the crisis (27-28 November), 3 billion U.S dollars were withdrawn from Turkey's central bank. Due to the shortage of Turkish Lira in the markets, overnight repo rate rose to 200 percent in the Interbank Money Market. The crisis stemming from the poor functioning of the banking system and its weak structure, got even worse and continued until the end of December. Finally, the IMF announced that it is going to be providing further support for the disinflation program. The third letter of intent sent to IMF in exchange for new loans, was accepted by the markets as an indication that the crisis had been overcome (Ertugrul and Yeldan, 2011:53).

In summary, Turkish economy in the period between 1996 and 2000, failed to achieve the expected annual growth figures. Turkey, in her battle to achieve price stabilization, was only able to succeed in 2000 and the 'nominal anchor' used for this purpose distorted the balance of economic relations with foreign countries. Uncontrollable increases in the current account, forced Turkey into searching loans from foreign countries. Furthermore, due to the Customs Union Agreement made with European Union Turkey has suffered major tax losses during this era (Yeldan, 2001:6).

2.3. Turkish Economy during the 2001 Financial Crisis

On February 9 2001, three months after the November crisis, the argument between the Prime Minister Bulent Ecevit and the President Ahmet Necdet Sezer during the National Security Council, sparked probably the biggest financial crisis Turkey has ever experienced. On the 21st of February, the overnight interest rates on the interbank money market have seen all time high figures like 6200% and it was only able to settle

at 4019%. During this crisis period, the Central Bank has suffered a large reserve loss, losing $ 5.36 billion in one week (between 16-23 February). Due to the rapidly increasing demand for foreign exchange, TCMB on the night of 21 February, was forced to announce that the exchange rate was left to fluctuate. The market price of 1 dollar, by increasing 273,5 thousand Turkish Liras from its 19 February level, has experienced 40 percent increase within 10 days (Uygur, 2001:1-41).

The February 2001 crisis, reduced the foreign exchange reserves of 28 billion dollars to 18 billion dollars in May 2001. In addition to this, the ratio of the domestic debt stock to the GNP increased to 68%, and the domestic debt interest payments' ratio to the GNP, from being 2% at the time, increased to 22% (Voyvoda and Yeldan, 2002:2).

The magnitude of the crisis best showed itself in GNP figures. During the crisis, real GNP decreased by 9,4 percent and per capita income decreased from $2,986 to $2,110. Over the course of crisis, unemployment figures of the country were also affected severely. Over 1 million people joined the army of the unemployed and unlike the 1994 crisis, this time, much of the people who lost their jobs were highly skilled and educated employees. The impact of the crisis on small and medium sized businesses was drastic. Among these businesses, bankruptcies and layoffs were widespread. The fact that this crisis illuminated the weaknesses of long used development model can be considered as a consolation. Indeed, the problems such as the chronic inflation, corruption in the administration and massive domestic and external debt were all results of Turkey's development model. Another 'positive' result of this crisis was its indirect help in starting a new reformist era. The severity of this crisis, prompted the government to strengthen the role and the autonomy of Banking Regulation and Supervision Agency. Since then, BRSA has been assuming an important role in the reconstruction and the reform of banking sector (Onis and Rubin, 2005:14-16).

The financial structure of private and public banks were affected negatively by the rapid rise of interest rates and because of this, financial actors started to lose their confidence in disinflation program. Especially, excessive liquidity demand of banking sector, by disrupting payments, caused Turkish economy to suffer another foreign exchange crisis on February 2001. As a result of these developments, 'Disinflation

Program' was dropped and instead 'Transition to the Strong Economy Program' was started to be used.

Under to leadership of Kemal Dervis and within the guidelines of 'TSEP', various stability reforms were implemented. The objective of these changes was implementation of structural and institutional reforms which would allow Turkish economy to regain economic stabilization, competitive power and the dynamics of a sustainable economic growth. In this context, structure of financial sector was re-adjusted, measures related to strengthening the public finance, competition in the economy and its efficiency were implemented. In addition to these, regulations regarding real economy were put into effect; public expenditures were reduced, policies towards increasing the government income and decreasing the public debt were designed. However, all these reforms could not save Turkey's transition program from being a failure to achieve its purposes (Egilmez and Kumcu, 2006:397). By the end of 2001, economic figures of Turkey were looking grim, a negative economic growth by -9,4 percent, 68,5 percent inflation, 8,4 percent unemployment, 84,9 billion dollars of domestic debt, 38,7 billion dollars of foreign debt stock and 41,4 billion dollars of imports... The year 2001 was not going to be remembered as a good one.

2.4. Turkish Economy from 2002 to 2007

After the snap elections on November 2002, Justice and Development Party has managed come to power alone. After being ruled by coalition governments for so long, this development was presenting a turning point for Turkey. The new government decided to follow the transition program without any compromises. The government, due to its success in implementation of the transition plan, was able to receive considerable support from organizations such as IMF and World Bank. On the other hand, during this period, Turkey renewed his intention to join European Union and implemented several social and political adjustment laws. In this context, it can be said that Kemal Dervis' 'Transition to the Strong Economy Program' was implemented exactly as it was intended.

Turkish economy's macroeconomic performance for the period 2002-2007 can be summed as follows (Macovei, 2009:9-16):

Between the years of 2002 and 2007, the growth rate of Turkish economy has increased continuously. GNP, which was 180 billion dollars in 2002, has exceeded the level of 400 billion dollars in 2007.

Over the period of 2002 through 2007, major increases in Turkish economy's exports were observed. Exports, which were 36 billion dollars in 2002, jumped to 107 billion dollars by the end 2007. On the other hand, positive environment in Turkey's foreign trade affected the imports as well. Imports, being 50 billion dollars in 2002, increased to 170 billion at the end of this period. Correspondingly, due to the imbalance in the import and export figures and various other factors, rapid increases in country's current account deficit and external debt were observed. It is also important to note that, in this period, increasing prices of energy have also contributed to current account deficit by affecting negatively.

In this period, Turkey was also able to reduce the level of her inflation to one-digit. Usage of tight fiscal policy, monetary policy implementations under the guidance of implicit inflation targeting and the absence of any duality in the management of economy have all contributed to the inflation being under 10 percent threshold (Kara, 2008:9-11).

Unemployment can be considered as an aspect of the Turkish economy which could not be improved during this period. Unemployment figures were recorded as in between 9,5 percent and 11 percent throughout the period. If the exact unemployment figures are to be given: in 2002 10,3 percent, in 2003 10,5 percent, in 2004 10,8 percent, in 2005 10,6 percent, in 2006, 10,2 percent and in 2007 it was 10,3 percent.

Privatization is another aspect of the Turkish economy that was improved substantially during this period. While the revenue acquired from privatization in between 1985 and 2002 was around 8 billion dollars, the acquired revenue from privatization between 2002 and 2007 has reached to 33 billion dollars.

In this period, domestic debt figures of Turkish economy experienced major increases. Domestic debt from being 91,7 billion dollars in 2002, jumped to 219 billion dollars in 2007.

The economic policies implemented by the government since 2002 had shown a positive effect and the balance between revenues and expenditure was improved. As a result of this, efficiency in the budget was achieved, increases in the savings were observed and government revenues were affected positively. In addition to these, the ratio of interest expenses in the budget were reduced and major decreases in the ratios (with respect to GDP) of central administration budget, public sector borrowing requirement and public debt stock were observed. The ratio of budget deficit with respect to GDP from being 11,5 percent in 2002, was reduced to 1,6 percent by the end of 2007. Correspondingly, PSBR's ratio in GDP was also reduced from 9,8 percent in 2002 to 0,07 in 2007.

In order to guarantee a country's macroeconomic stability, debt burden of the country had to be at reasonable levels and it had to be maintained at those levels. Taking solely gross debt stock into account, usually does not provide sufficient results for the evaluation of a country's debt burden. In order to evaluate the debt burden of a country, factors such as public sector's fiscal obligations and its financial holdings also need to be taken into account. Net public debt stock and its ratio with respect to GDP can be considered as the tools which can allow us to determine a country's indebtedness level. While the ratio of net public debt stock with respect to GDP was 61,4 percent in 2002, it was reduced to 29,5 percent in 2007. External debt stock of public sector was also reduced from 38,4 percent in 2002 to 20,6 percent in 2007 (Ministry of Finance, 2009).

Ultimately, the implementation of IMF supported transition program was successful in achieving the targeted inflation figures. And it also enabled government to reduce Turkey's budget deficits considerably. However, contractionary fiscal policy used for reducing the budget deficits, caused negative effects on the several areas in the Turkish economy. Reduced state of investment expenditures during this period, caused unemployment figures to stay relatively high (Simsek, 2007:66). During the implementation process of 'Transition to the Strong Economy' program, budget cuts were also introduced to discipline the budget. On the other hand, especially after the end of the implementation process of the transition program (2004), increases in transfer expenditure were observed and major increases in the spending regarding agricultural support programs and social security were recorded. Another important

development in this period was in Turkey's currency. Turkey, on January 2005, by dropping six zeros from her currency, adopted a new Turkish Lira.

In 2006, positive environment in inflation and domestic debt figures were yet to be seen in expenditure figures of the country. In the second half of the year, influenced from the fluctuations in exchange rates, a slowdown was experienced in the growth of Turkish economy. Even though the Justice and Development Party was considerably more reformist and bold compared to former governments in implementation of necessary policies, they still were not able to solve the unemployment problem of Turkey. In terms of implemented policies and targeted goals in this period, it can be said that Justice and Development Party was successful. However, as it was explained above, their success in some areas of the economy was limited. As a result of these successes, by taking 47 percent of the votes on 22 July 2007 elections, they have managed to get the chance of ruling Turkey for the second time.

2.5. 2008 Global Financial Crisis and its Aftermath

Starting from the last quarter of 2008, due to the contractions in global economy, Turkish economy entered into a slowdown period. Correspondingly, this situation led to a decrease in the indirect taxes revenues (due to it being more sensitive to global contractions) of Turkish economy. In order to protect Turkish economy from this global financial crisis, various measures were taken by the government. However, global financial crisis which began in 2008, intensified its impact on the world economies in 2009. By the end of 2009, some signs of life from world economies were observed, and throughout the 2010 these signs of recovery continually increased. It is important to state that, the speed of recovery from global financial crisis was varied from country to country. (ICOC, 2010:17)

As a result of the implemented structural reforms and efficient economic policies, Turkish economy was able to survive the 2008's global financial crisis with relatively minor damage. It is important to note that banking sector, which was a weak element of Turkish economy for a long time, displayed an impressive performance during the global financial crisis (Macovei, 2009:26-27). Up until the global financial crisis, the growth figures of Turkish economy have always been positive (2002-2008). Even in

the first three quarters of 2008, the growth figures were 7,3 percent, 2,8 percent and 1,2 percent, respectively. However, in the last quarter of 2008, Turkish economy contracted 6,2 percent. And this downward trend continued throughout the 2009. By the end of 2009, 4,7 percent contraction in the Turkish economy was observed (Uygur, 2010:3). In 2010, Turkish economy, by growing 8,9 percent, became the fastest growing economy in Europe. Likewise, this growth trend continued in 2011 as well, a growth by 8,5 percent was recorded in 2011.

In this period, one of the biggest chronic problem of Turkey was her growing unemployment problem. According to data collected by Turkish Statistical Institute, unemployment rates in this period were, 10,6 percent in 2007, 14 percent in 2008, 13,5 percent in 2009 and 11,4 percent in 2011 (Rodrik, 2012:58). As it can be seen, during the global financial crisis period, a growth trend in the unemployment was recorded and only after the end of the crisis the unemployment figures were able to return to relatively reasonable numbers.

Throughout this period, fluctuations in the inflation figures of Turkish economy can be observed. Figures of consumer price index were 8,4 percent in 2007, 10,1 percent in 2008, 6,5 percent in 2009, 6,4 percent in 2010 and 10,5 percent in 2011. On the other hand, inflation figures in terms of producer price index were 5,9 percent in 2007, 8,1 percent in 2008, 5,9 percent in 2009, 8,8 percent in 2010 and 13,3 percent in 2011.

The global financial crisis affected many areas in the Turkish economy negatively. For example, due to the contraction caused by the global crisis, major decreases were experienced in the public revenue of the state. Likewise, this crisis caused a major disruption in the budget and debt indicators as well. In 2008, share of budget deficit in GDP increased to 1,8. Correspondingly, PSBR's share in GDP also rose up to 1,6. During the crisis, several stimulative financial measures were put to use, however due to these measures, ratio of budget deficit with respect to GDP increased to 5,5 percent in 2009. Only after the recovery process following the crisis and increases in the domestic demand, government was able to take the disruptions in the budget balance under control. On the contrary, 2011 was a positive year in terms of budget performance. This performance can be explained with the changes in several factors;

decreases in the interest expenses (this decreases was related to the real interest being low), slowdown in the transfer spending increases and the increases in the revenues collected from taxes (especially VAT and SCT). Turkey has been fulfilling Maastricht Criteria in a consistent manner since 2004. While public debt to GDP ratio was recorded as 59,6 percent in 2004, it was reduced to 39,8 percent level before the global crisis. In this period, extended maturity of borrowing, increases in the Turkish Lira denominated debt amount and decreases in the ratio of public debt with respect to GDP, are the indicators which proves the achieved successes in the economy (TUSIAD, 2011). In addition to these, the ratio of EU defined debt stock with respect to GDP, from being 73,7 percent in 2002, was reduced to 39,5 percent in 2008. Although this number has gone up in the later years due to global financial crisis (45,5 percent in 2009, 41,6 percent in 2010 and 39,4 percent in 2011), Turkey was still able to fulfill the Maastricht Criteria.

Between the years 2007 and 2010, PSBR's share in GDP increased. While this figure was 0,1 percent in 2007, first it rose up to 1,6 percent in 2008 and one year later, the figure has experienced its record by reaching up to 5,1 percent in 2009. In 2010, PSBR's share in GDP was relatively recovered and it was recorded as 2,29 percent.

In the aftermath of the global financial crisis, gradual decreases were experienced in the interest rates. Liquidity shortage that was apparent during the crisis, was eliminated and an acceleration in the credit flow into real sector was observed. Correspondingly, share of loans in banks' total assets increased and the ratio of non-performing loans to total loans decreased.

Foreign trade was another area in Turkish economy that was affected negatively by the global crisis. After the crisis, there were major changes in the foreign trade figures. Both imports and exports increased, however increases in the imports were much larger compared to the increases in exports. Because of the decreasing demand from European countries, Turkey tried to diversify her export locations by focusing on West Asian and Middle Eastern countries. While this strategy was able to limit the decreases in export figures, due to the huge imbalance between import and export figures, foreign trade deficit has reached to record levels. Imports, from being 170,1 billion dollars in

2007, increased to 185,5 in 2010 and 241 billion dollars in 2011. Likewise, exports, from being 107,3 billion dollars in 2007, increased to 113,9 in 2010 and 135 billion dollars in 2011. From the figures presented the imbalance between imports and exports can clearly be observed (Kara, 2012:4).

Throughout the crisis, factors such as decreasing prices of energy and crisis' negative effect on investment and consumption demand, caused positive effects on Turkey's current account deficit. While the current account deficit's share in GDP was 5,7 percent in 2008, it fell to 2,3 percent in 2009. However, starting from the last quarter of 2009, due to recovery of world economies and increased prices of energy, this figure started to increase again. Current account deficit of Turkey, from its 9,2 billion dollars level in the last quarter of 2009, jumped to 35,7 billion dollars in the next year. Maintaining its trend, it managed to double itself in 2011 by reaching up to 77,09 billion dollars.

One of the most important development regarding Turkish economy's future in 2011 was the elections which were held on 12th of June. As the result of this election, Justice and Development Party was able to maintain its throne by taking 49 percent of the votes. Republican People's and Nationalist Movement parties formed the opposition by coming in second and third respectively. Ultimately, the outcome of this election was presenting an opportunity for Turkey to maintain both her political and economic stability.

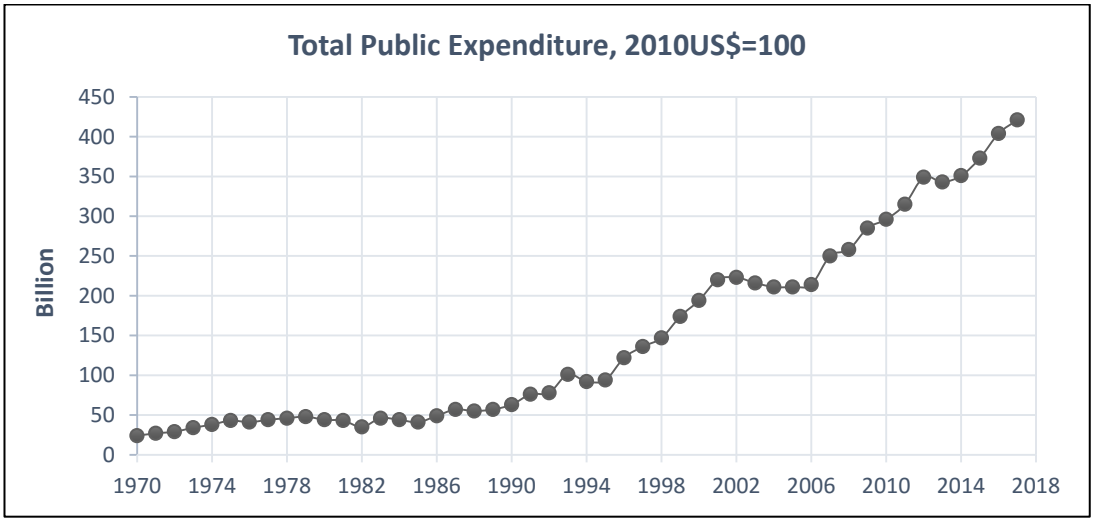
After an economically stable 4 year period, a general election for Turkey was held on June 7, 2015. The election results suggested that the domestic instabilities were much more influential compared to the economic slowdown. Especially the "Solution Process" with the PKK terrorist organization caused Justice and Development Party to lose vote against Nationalist Movement Party. In the end, Justice and Development Party which had been taken 49% of the votes in 2011 obtained 40% of the votes in 2015 which meant that a coalition was needed to form a government. After an unfruitful coalition negotiation period which resulted in a hung parliament, a snap election was held on November 2015. This time, Justice and Development Party took

49% of the votes and solidified its position. The main reason of this increase in votes was the abandonment of the "Solution Process" with the PKK terrorist organization.

2.6. Development of Public Expenditure and Economic Growth in Turkey

One of the best ways to determine the size of government activities in economic markets is to measure the amount of money spent on public expenditures. Public expenditure and economic growth figures have always fluctuated in Turkish economy. However, even after these fluctuations, it is easy to observe a growth trend for public expenditure in Turkish economy. Therefore, it is also natural for us to state that the public expenditure amount have always been influential on the economic growth of Turkey, be it negative or positive. Before we get on with our empirical analysis regarding the relationship between public expenditure and economic growth, we think that it is helpful to take a glance at the development of public expenditure in Turkey. Hence, in Figure 2.1, we present the development of real public expenditure in Turkey between years of 1970 and 2017.

Figure 2.1. Development of Real Public Expenditure (1970-2017)



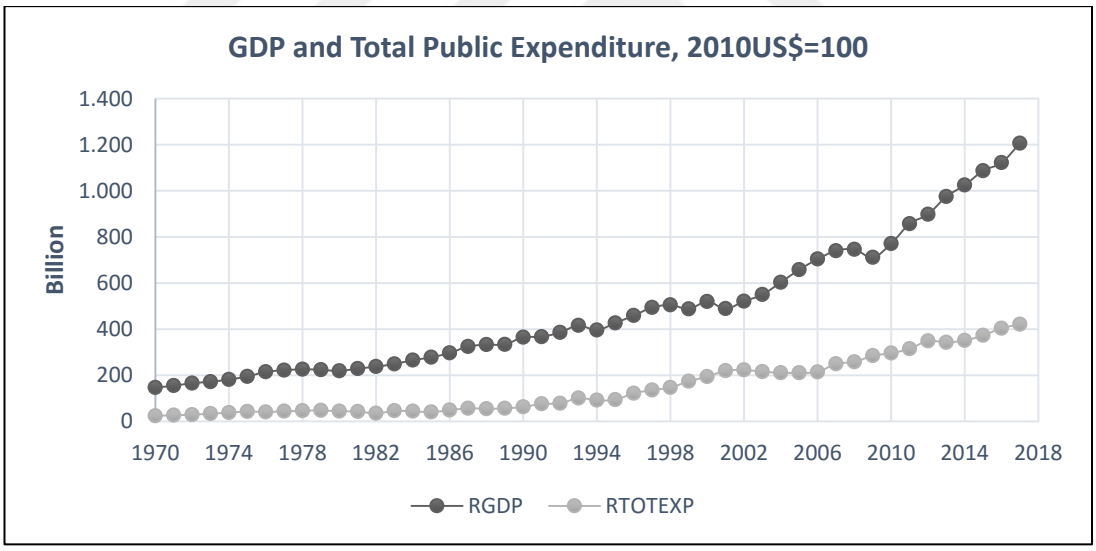
Source: World Bank, Bumko.

From Figure (2.1), the growth trend of public expenditure throughout the years can clearly be seen. Even though this trend has been going on for a long time, the most significant increases in the public expenditure has been achieved after the 1980's. Even

though there are many reasons for this growth trend, we can find the most influential factors regarding the emergence of this trend, in the previous part of study. Adoption of an outward oriented economy model, implementation of more liberal policies, privatization efforts in the economy and increasing importance of the social state concept can be accepted as the prominent factors in this growth trend for public expenditure. Especially after 2006, we see nearly uninterrupted increases in the public expenditure and it reaches 450 million dollars in 2017.

So far, only the developments in the public expenditure amount of Turkey is given. However, in order to understand the relationship between economic growth and public expenditure better, developments in the both of these factors needs to be presented. In Figure (2.2), developments of real public expenditures and real GDP are presented.

Figure 2.2. Developments of Real Public Expenditure and Real GDP (1970-2017)



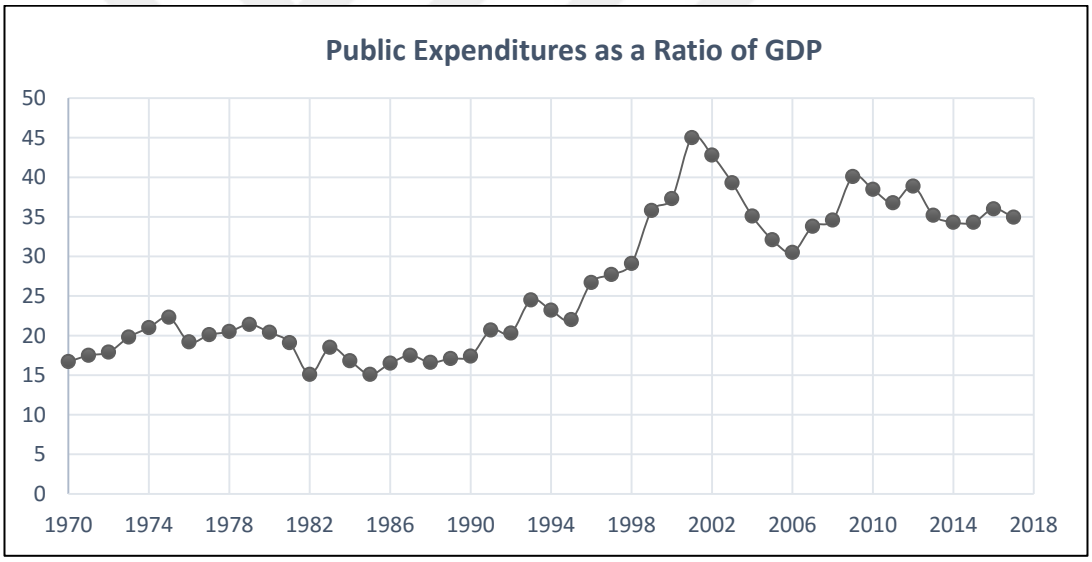
Source: World Bank, Bumko

Similar to public expenditure, a growth trend in the Gross Domestic Product of Turkey has been observed. Throughout the years, GDP of Turkey has been observed as gradually increasing. In Figure (2.2), if the public expenditure (REXP) and gross domestic product (RGDP) are observed and compared to each other, we can see similar increases and decreases in the some dates both for public expenditure and gross domestic product of Turkey. There seems to be very strong, positive correlation among

public expenditure and GDP ($r = 0.97$). While these might suggest an existence of a relationship between public expenditure and economic growth, it would be wrong to assume a relationship basing on one graphic alone. Whether there is a relationship between economic growth and public expenditure or not and the direction of the relationship (if there is) can only be determined with an empirical study.

In order to get a better understanding of how much resources of the whole economy are being reserved for public expenditures, we need to find the public expenditure to GDP ratio. We can find this ratio by utilizing the figures (REXP, RGDP) we presented in Figure (2.2). Public expenditure's share in GDP is presented in Figure (2.3).

Figure 2.3. Public Expenditure Share in GDP (1970-2017)



Source: Turkstat, Bumko

Interpreting the Figure (2.3), we see many fluctuations in the public expenditure's share in GDP between the years of 1970 and 1990. The figure (2.3), suggests sharp increases for public expenditure's share only after the first half of 1990's. While there are many various reasons for these fluctuations, we can essentially relate the fluctuations between 1970 and 1990 to Turkish economy's transition process to open market model. As we have explained before, during 1980's Turkey started her liberalization efforts in her economy and consequently, outward oriented economy model was adopted. The success achieved with these liberalization efforts showed

itself particularly in the 1990's, in the form of rapid increases in public expenditure's share. While the public expenditure's share was fluctuating around 15-25 percent for the most part of 1970-1990 period, this ratio has been chasing the world standards ever since. Public expenditure's share, from fluctuating between 15-25 percent, gone up to 24,5 percent in 1993 and it has reached its record figure by attaining 45 percent in 2001, which was in the range of world standards. Since 2001, public expenditure's share in GDP has been fluctuating between 34 and 45 percent.

Figure (2.3), can also be interpreted by taking averages of public expenditure shares into consideration. If we split the 1970-2017 period into two parts as *pre-2001* and *post-2001* periods, we can discern a clear pattern. As an average, public expenditure's share is much lower in the *pre-2001* term compared to *post-2001* term. We know that Turkey has experienced sharp increases in her GDP per capita and overall GDP in *post-2001* term. In addition, we can also observe significant increases in public expenditure's share in GDP in *post-2001* term. Therefore, the Figure (2.3) suggest that Wagner's Law is valid for Turkey since the income growth seems to be the cause of this public expenditure increases.

Since one of the objectives in this study is to determine the effect of economic crises (1994, 2001 and 2008) on the relationship between economic growth and public expenditure, we can examine the crisis figures presented in the graphics to get a general understanding.

The Figures (2.2) and (2.3) provides the necessary information to interpret effect of 1994 currency crisis on the GDP and government expenditure. According to this, GDP from being 416 billion in 1993 decreased to 396 billion in 1994. A similar decrease was also observed in the public expenditure figures. Public expenditure from being 101 billion in 1993, dropped to 92 billion in 1994. The public expenditure's ratio in GDP however, did not change too much. It dropped from 24,5 percent to 23,2 percent in 1994.

The government expenditure and gross domestic product figures of the 2001 financial crisis, compared to 1994 currency crisis, are rather surprising. As a result of the crisis, Turkish economy in 2001 contracted and its GDP has fallen from 520 billion in 2000

to 489 billion in 2001. Contrary to GDP, public expenditures were increased by the government. Public expenditures from 194 billion in 2000 were increased to 220 billion in 2001. We can also observe the effect of this increase on the ratio of public expenditure in GDP. According to this, the ratio of public expenditure increased from 37,3 percent to 45 percent in 2001.

2008 financial crisis, in terms of its source, is different from the 1994 and 2001 economic crises. While the latter two are national crises that mainly affected the Turkish economy, 2008 financial crisis is a global one that affected the whole world. Since Turkey's economy was hit severely by the 2008 crisis in 2009, we will include figures of this year in our interpretation. According to the figures, GDP of Turkey from 2007 to 2009 were respectively, 740, 746 and 711 billion. Government expenditures however, were on the rise during the crisis and from being 250 billion in 2007, it rose to 258 billion in 2008 and 285 in 2009. Correspondingly the ratio of public expenditure in GDP nearly catched up to 2001's record figures by increasing from 33,8 in 2007 to 34,5 in 2008 and 40,9 in 2009.

The figures which corresponding to the Turkey's public expenditure and GDP during crises allows us to make some interpretations regarding the policies employed during these crises. As it was explained above, we can observe a decline in both the GDP and the public expenditure of Turkey during 1994 currency crisis. However, even though the source of these crises are different, during 2001 and 2008 financial crises, we can see increases in public expenditure of Turkey while her GDP is falling. Correspondingly, the ratio of the public expenditure in GDP during these crises are national record high levels with 45 percent in 2001 and 40 percent in 2009. The behaviour of the government during these crises shows us that in order to decrease the negative effect felt by the people public expenditure was utilized as a government tool.

The debate around the relationship between economic growth and public expenditure has been going on for a long time in economic literature and Turkish case is no exception. There are many contradictory results in the studies made on Turkish case. In this study, we hope to provide a new perspective to the debate with our findings. Ultimately, the goal of this study is to find whether there is a link between economic

growth and public expenditure in Turkish economy. Correspondingly, the validity of Keynes' hypothesis and Wagner's Law in Turkish economy will be tested. In addition, since Turkey faced many economic crises, originating inside and outside in the last 2 decades, these crises should be taken into account in examining the relationship. In the next section, application study regarding the relationship between economic growth and government expenditure in Turkey will be presented.

CHAPTER THREE

METHODOLOGY AND DATA ANALYSIS

3.1. The Model

Adolph Wagner, contrary to Keynes, hypothesized that the causality between economic growth and public expenditure runs from economic growth to government expenditure. He was one of the first economist to establish generalizations about government expenditures and its relationship with economic growth. After his works were started to be translated into English, he and his hypothesis became very popular among academicians. Since then, his hypothesis has been tested and analyzed by many prominent economists such as Peacock-Wiseman (1967), Gupta (1967), Goffman (1968), Pryor (1969), Musgrave (1969), Mann (1980), Ansari et al (1997), etc... While Wagner's hypothesis and its interpretations are preserving its importance in economics literature, it is not a secret that there are significant differences in findings. The results of these studies changes from country to country or even from period to period.

The model we are going to use in our study is one of the interpretations of Wagner's hypothesis. Peacock and Wiseman model (1967), will be the base foundation of our application study. According to this model, government expenditure is a function of national income and when the national income of a country increases, public expenditure amount of that given country will also increase. Aside from Peacock-Wiseman model, there are 5 more interpretations of Wagner's hypothesis that are very popular. These are Pryor (1968)'s model, Goffman (1968)'s model, Musgrave (1969)'s model, Gupta (1967)'s model and Mann (1980)'s model. Functional forms of these interpretations are given below in the Table (3.1):

Table 3.1. Six Interpretations of Wagner's Hypothesis

Equation	Functional Form	Version
3.1*	$\ln TOTEXP = \alpha + b\ln(GDP)$	Peacock-Wiseman (1967)

3.2	lnTOTEXPC = α+$b$ln(GDP)	Pryor (1968)
3.3	lnTOTEXP=α+$b$ln(GDP/POP)	Goffman (1968)
3.4	lnTOTEXP/GDP=α+$b$ln(GDP/POP)	Musgrave (1969)
3.5	lnTOTEXP/POP=α+$b$ln(GDP/POP)	Gupta (1967)
3.6	lnTOTEXP/GDP= α+$b$ln(GDP)	Mann (1980)

Notes: In the table, (*) shows the model which will be employed in this study, "ln" stands for natural logarithm, "GDP" stands for Gross Domestic Product in real terms, "TOTEXP" stands for Total Government Expenditure in real terms, "POP" stands for Population, "TOTEXPC" stands for Real Total Government Expenditure on Consumption, "GDP/POP" means per capita GDP, "TOTEXP/POP" means per capita TOTEXP and "TOTEXP/GDP stands for the Ratio of Real Total Government Expenditure in Real Gross Domestic Product.

Source: Iyare and Lorde (2004:2)

3.1.1. Peacock-Wiseman Model (1967)

The Peacock-Wiseman model sees public expenditure as a variable that should increase at a faster rate than the national income increases. They also link the public expenditures with public service demand by supposing a positive relationship between each other. According to this relationship, public expenditure growth increases the public service demand. Compared to Wagner, Peacock and Wiseman have different opinion about the cause of this relationship. While for Wagner, factors such as, increasing labor efficiency, technology, increasing need of transport and communication are also a factor to the increase in public expenditure amount, in Peacock-Wiseman model this increase is mainly related to population and per capita income growth. The relationship between economic growth and government expenditure can be expressed as below:

$$TOTEXP = f(GDP) \quad \textbf{(3.7)}$$

There are several features of Peacock-Wiseman model which allows itself to separate from other interpretations of Wagner. This model was first one to try to bring Wagner's Hypothesis back to life and it was also one of the first to examine a state's fiscal

activity by using TOTEXP (Total Government Expenditure). In his theory, Wagner assumes an organic state model. According to this model, economic agents are part of an organism and they can influence the economy as part of the organism which they created. This model also, needs some requirements to be satisfied in order to function; increasing per capita incomes, a democratic state, technological and institutional progress. It is also worth to mention that Wagner assumes high income elasticities of demand. Peacock and Wiseman did not include this organic state assumption into their model. There are three main characteristics of Peacock-Wiseman model which makes it unique. These three characteristics are displacement, inspection and concentration effects. The latter two of these effects are linked to the displacements effect.

Peacock-Wiseman model's biggest deviation from Wagner's hypothesis was their 'step-wise' government growth hypothesis which was completely contradictory to Wagner's gradual growth assumption. Wagner, in his theory argues that size of the government in the economy should increase due to ever-increasing public service demand of the people. He assumes this increases in the governmental activities to be both intensive and extensive. According to him, government, correspondingly to the increasing service demand, has to undertake new services and provide the existing ones more efficiently. He assumes all of this to be in a regular basis which in turn causing gradual increases in the public expenditure. Contrary to Wagner, Peacock and Wiseman, after determining step like increases in the British public expenditure behaviour, introduced the concept of displacement effect.

The 'displacement effect' suggested by Peacock and Wiseman occurs during the presence of a social disturbance. The government, in order to deal with the disturbance and to increase public expenditure, is forced to increase the taxes. This situation creates the displacement effect; high tax and high expenditure level replaces the low taxes and low expenditure level. Since the people are now capable of bearing heavier tax burden, they are willing to tolerate the high level even after crisis ends. As a result, public revenue and government expenditure stabilizes unless another disturbance causes another displacement effect. However, this 'displacement effect' which is highly flexible upwards during disturbances, but inflexible downwards after the disturbance's

end, failed to explain the ever increasing public expenditure level in world economies, after the Second World War's end (Bird, 1972).

The 'inspection effect' occurs after the displacement effect. According to this, government, even when there is no new disturbances, does not decrease the level of taxes to its former state due to people's new toleration level regarding the tax level. Instead, government decides to utilize this new revenue for the society. After inspecting the existing services and determining the neglected areas, it uses this revenue to provide the neglected services.

The 'concentration effect' occurs during an economic growth. According to this, when the economy enters into a growth period, the increase in the central government's activity should be higher than the one in the local government's activities.

Peacock and Wiseman, unlike Wagner who did not expressed his law in mathematical format, introduced a functional form of the relationship between economic growth and government expenditure. This equation is presented below:

$$TOTEXP = \alpha + \beta\,(GDP) \qquad \textbf{(3.8)}$$

3.2. Methodology and Data

In this section of our study, we will start by explaining the nature of our dataset and the sources we have used to collect them. Then, we will continue by introducing our methodology and the related tests which will be used in the study.

In the study which we will test the validities of Wagner's and Keynes' hypothesis and the effect of economic crises on the relationship between economic growth and public expenditure, using the quarterly dataset of Turkey's 1987-2017 period. The data figures in our analysis were collectively put together from sources such as: Bumko, TURKSTAT and World Bank.

In the study, the variables are measured in US Dollars and adjusted according to 2010US$=100 to define them in real terms. In order to make the study more comprehensible, logarithmic values of our variables were used.

Methodology is always one of the most important keystones of a study such as this. In order to obtain robust, significant and useful results from any kind of research, correct methodology must be employed. In our research we will first start by checking stationarity in our variables. We will utilize Augmented Dickey Fuller (ADF) test to check if there is a unit root problem in our variables. Then we will continue our study by searching for the existence of the long term relationship between the variables. For this, we will use Johansen cointegration test. Then, by utilizing Vector Error Correction Model (VECM), we will be able to detect if there is a causality relationship between our variables.

The model we will employ in this study is, as we have mentioned before, the traditional Peacock-Wiseman model and this model can be shown in log-regression form as:

$$lnTOTEXP = \alpha_1 + \beta_1\, lnGDP + u \quad \textbf{(3.9)}$$

While one of the purposes of this study is to find the relationship between economic growth and government expenditure in Turkey, the other is to determine the effects of economic crises which Turkey has faced, on the relationship. To accomplish this, a series of dummies had to be introduced into the study. Therefore, dummies representing the 1994, 2001 and 2008 crises were included into the study. In the light of this, we can re-write the Equation (3.9) as:

$$lnTOTEXP = \alpha_2 + \beta_2\, lnGDP + \delta_1 DUMMY1 + u_1 \quad \textbf{(3.10)}$$

$$lnTOTEXP = \alpha_3 + \beta_3\, lnGDP + \phi_1 DUMMY2 + u_2 \quad \textbf{(3.11)}$$

$$lnTOTEXP = \alpha_4 + \beta_4\, lnGDP + \gamma_1 DUMMY3 + u_3 \quad \textbf{(3.12)}$$

$$lnTOTEXP = \alpha_5 + \beta_5\, lnGDP + \delta_2 DUMMY1 + \phi_2 DUMMY2 + \gamma_2 DUMMY3 + u_4 \quad \textbf{(3.13)}$$

Where, *DUMMY1* represents the 1994 currency crisis which takes the value of ones during the crisis period and zeros otherwise. *DUMMY2* represents the 2001 financial crisis which takes the value of ones during the crisis period and zeros otherwise. *DUMMY3* represents the 2008 global financial crisis which takes the value of ones during the crisis period and zeros otherwise.

3.3. Unit Root Test (Augmented Dickey Fuller Test)

The purpose of this study is to find the way of causality relationship between government expenditure and economic growth and how this relationship changes during the economic crises of Turkey. Since the model of our study uses time series data, in order to achieve statistically meaningful results, stationarity of the variables used must be investigated. In a situation where the time series are not stationary on level (in most cases a lot of them are), stationarity sometimes can be achieved by taking differences of the variables.

Due to nature of our study, first thing we have to do before we continue with our investigation is checking the stationarity of our variables (GDP and government expenditure). There are two main reasons to why we are checking stationarity of our variables: 1) In order to utilize cointegration tests in our study, variables we use have to be stationary at the same order. 2) If unstationary time series are the case, *t* and *F* statistics which will be gathered through regression will be meaningless, thus the regression which will be obtained from this will be a spurious regression. Gujarati describes the concept of stationarity as; if the time series is stationary, its variance, mean and covariance will stay unchanged even if they are evaluated at different timeframes (Gujarati, 2008:713).

Before we utilize unit root test to check if our variables are stationary or not, we will first present the graphics of our variables to provide initial information regarding the state of our variables.

The Figures (3.1 and 3.2) provide enough information for us to make some brief interpretations regarding stationarity of our variables (real government expenditure and real GDP). As it can be observed from the graphics, while there are frequent fluctuations in both of the variables, a growth trend can be discerned for both of the variables which implies that the variables are non-stationary. However, in order to empirically prove whether the variables are stationary or not, a unit root test must be employed.

Figure 3.1. Quarterly Real Government Expenditures in Logarithmic Form (1987-2017)

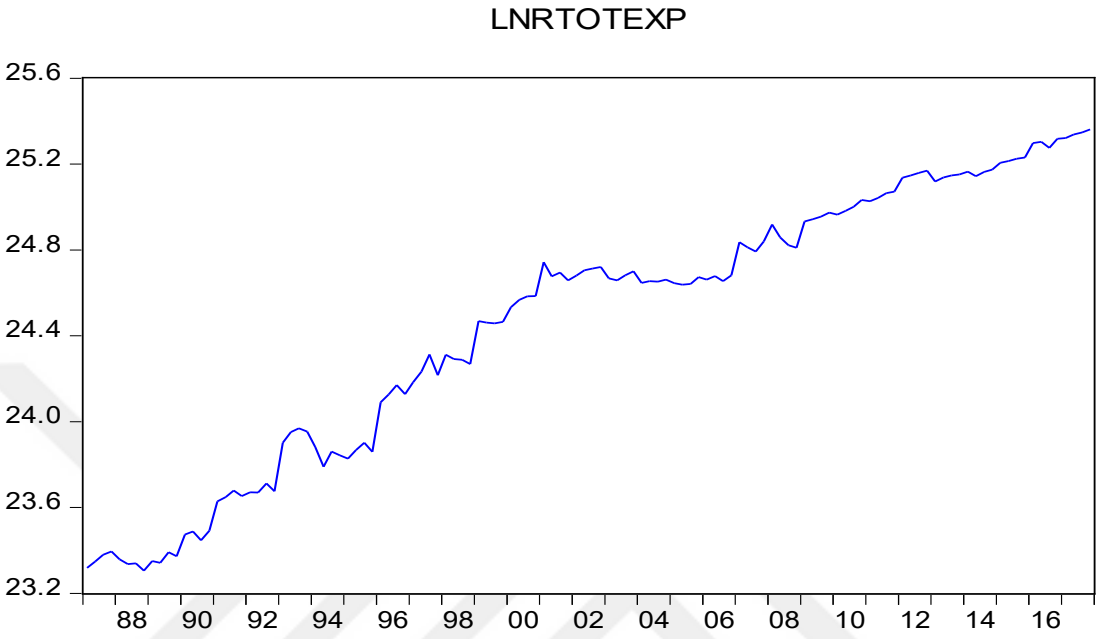
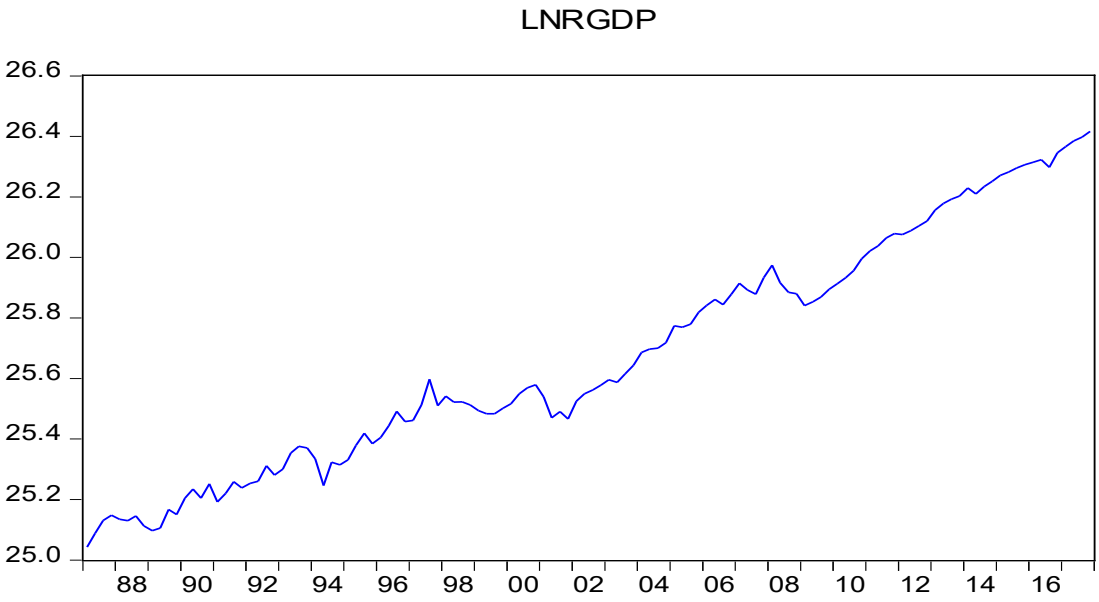


Figure 3.2. Quarterly Real Gross Domestic Product in Logarithmic Form (1987-2017)



In this study, we will employ the Augmented Dickey Fuller (ADF) statistic test (Dickey and Fuller, 1981). While there are other unit root tests such as Phillips-Perron (PP) and Schmidt-Phillips tests, Augmented Dickey Fuller is the most frequently used

test among academic circles. Three versions of Augmented Dickey Fuller test are presented below:

$$\Delta Y_t = \phi^* Y_{t-1} + \sum_{i=1}^{n-1} \phi_i \Delta Y_{t-i} + \varepsilon_t \quad \textbf{(3.14)}$$

$$\Delta Y_t = \beta_0 + \phi^* Y_{t-1} + \sum_{i=1}^{n-1} \phi_i \Delta Y_{t-i} + \varepsilon_t \quad \textbf{(3.15)}$$

$$\Delta Y_t = \beta_0 + \beta_1 t + \phi^* Y_{t-1} + \sum_{i=1}^{n-1} \phi_i \Delta Y_{t-i} + \varepsilon_t \quad \textbf{(3.16)}$$

The first equation (3.14), checks for stationarity without including any deterministic time trend or constant, the second one (3.15) checks for stationarity by including intercept, the third equation (3.16), includes both the deterministic time trend and the constant. In these equations, Y_t is the time series, β_0 represents the constant term, *t* stands for the linear time trend, ε_t corresponds to the stochastic error term and n is the number of lags (i=1, 2, 3, …… n).

In Augmented Dickey Fuller (ADF) test, the hypotheses below are tested:

H_0 : $\phi^* = 0$ (in this case, Y_t time series is not stationary which means there is unit root),

H_1 : $\phi^* < 0$ (Y_t time series is stationary, meaning there is no unit root problem).

ADF tests were run first with only intercept and then with intercept and trend. The results of these tests are presented respectively in the Table (3.2). ADF test with only *intercept*, determines both of our variables (GDP and Government Expenditure) unstationary at level. According to the results, *t-statistic* of LNRGDP is 0.16, which is lower than the critical value (-2.88) in absolute terms. Because of this, the null hypothesis of unit root cannot be rejected for the GDP variable. Similar results are reached when the stationarity of government expenditure is checked. The *t-statistic* of government expenditure was found -1.14, which is again, lower than the estimated critical value in absolute terms. Therefore, the null hypothesis of unit root cannot be rejected for government expenditure.

The results obtained from the ADF test showed us that the variables we use are not stationary at level. In order for us to proceed further with our research we have to prove

that our variables are stationary at the same order. To prove that the variables are I(1), we took the first differences of our variables and applied Augmented Dickey Fuller test once more.

The results obtained from the ADF test after taking first differences are quite different from what we got before. According to the results, LNRGDP's *t-statistic* after taking differences is -12.08 while the critical value is -2.88, since the estimated t-statistic is higher than the critical values in absolute terms, the null hypothesis is rejected. Similar results are reached for government expenditure. Since the estimated *t-statistic* of government expenditure (-13.03) is higher than the 10, 5 and even the 1% critical values the null hypothesis is confidently rejected for government expenditures.

The results achieved with *trend and intercept* determined both of our variables unstationary at level. The *t-statistics* of government expenditure and GDP were estimated as -2.13 and -2.51 respectively. Since these statistics are lower than the critical value of -3.44 in absolute terms, we failed to reject the null hypothesis for the variables. However, with first differenced variables satisfactory results were reached. After taking differences, t-statistics of government expenditure and GDP were determined -13.03 and -12.09 respectively. With these *t-statistics*, the null hypothesis was rejected even at the 1% level. Therefore the stationarity of our variables are proven.

With these results, Augmented Dickey Fuller test is concluded and both of our variables are proven to be stationary at the same order I(1). Since both our variables are stationary at the same order, we can proceed with our research and determine whether these variables are cointegrated in the long-run.

Table 3.2. Augmented Dickey Fuller Test Results

Variables	Augmented Dickey Fuller	
	Level	First diff.
Intercept		1987-2017
lnGDP	0.16 (0)	-12.08 ^{a} (0)
lnTOTEXP	-1.14 (0)	-13.03 ^{a} (0)
Intercept and trend		
lnGDP	-2.51 (0)	-12.09 ^{a} (0)
lnTOTEXP	-2.13 (0)	-13.03 ^{a} (0)

Notes: Superscripts a, b and c indicate the significance level at 1, 5 and 10 %, respectively. Lag lengths are determined automatically by the Schwarz Information Criterion are presented in parentheses. 5% critical test values were determined as -3.44 for trend and -2.88 for non-trend option.

3.4. Cointegration Analysis (Johansen Cointegration Test)

In order to check if the time series move together in the long-run, cointegration analyses are used. In this study, Johansen cointegration test will be utilized to prove if the government expenditure and economic growth move together in the long-run.

The methodology of Johansen cointegration test was developed by Danish econometrician Søren Johansen (1988, 1991, and 1995). Johansen's cointegration, in terms of its foundation, is different from Engle-Granger cointegration test. While the Engle-Granger test is residual based, Johansen cointegration test is VAR based. It is also important to note that Johansen cointegration test is much more popular among today's academic circles. Although there are several reasons to its popularity, the most significant advantage of this method over Engle-Granger's is that its ability to determine the number of cointegrated vectors. For this reason, this method is also much more efficient and useful when there are more than two time series in the study. It also allows users to circumvent the whole dependent variable selection process.

Johansen cointegration test utilizes two different statistic to determine if the time series move together in the long-run. The first one is called 'Trace Test' and the second is 'Maximum Eigenvalue Test'. The null hypothesis for both of these tests is that there

are *r* or fewer cointegration vectors. The alternative hypothesis of trace test is that there are at least *r+1* number of cointegrating vectors in the system. The alternative hypothesis of maximum eigenvalue test however, is that there *r+1* number of cointegrating vectors. It is worth mentioning that Johansen and Juselius (1990), find maximum eigenvalue test to be more robust, if there is a contradiction between the tests. The equations below are presents the differences between two test much clearly (Maddala and Kim, 1998:211-212):

λ_{trace} = - T $\sum_{i=r+1}^{n} ln(1- \hat{\lambda}_i)$ where *T* is a sample size, **(3.17)**

λ_{max} = - T ln (1- $\hat{\lambda}_{r+1}$) where *T* is a sample size, **(3.18)**

The critical values which are going to be used in both the trace and the max-eigenvalue tests were tabulated by Johansen and Juselius (1990). Null and alternative hypotheses which will determine if there are cointegrated vectors are presented below:

H_0 : r = 0 (No cointegration between the series)

Alternative hypothesis for trace test: H_1 : r ≥ 1 (At least *r+1* cointegrating vectors)

Alternative hypothesis for λ_{max}: H_1 : r = 1 (*r+1* cointegrated vectors)

In Johansen methodology there are 5 different models which can be employed. First two of these models assume no deterministic trend while Model 3 and 4 assume linear deterministic trend in the data and the last model assume quadratic deterministic trend in the data. In studies such as this, generally models with linear deterministic trend (Model 3 and 4) are favored by the economists. Through the usage of information criteria (Schwarz, Akaike etc...), the Model 4 (intercept and trend in CE – no intercept in VAR) was determined as the most suitable model for our data. Therefore, Model 4 will be utilized in our Johansen Cointegration and Vector Error Correction Model analyses. In addition to this, optimal lag length which will be used in these analyses was determined as 2 by Akaike Information Criterion.

Johansen cointegration test results without the inclusion of dummy variables are presented in Table (3.3). Starting with the λ-max results, the null hypothesis of r = 0 (no cointegration) is rejected in favor of the alternative hypothesis r = 1 for Turkey.

On the other hand, the null hypotheses of r ≤ 1 cannot be rejected in favor of the alternative hypotheses of r = 2. These results indicate the presence of only one cointegrating relationship for Turkey.

Similar conclusions are obtained from the trace test results. The null hypothesis of r = 0 is rejected in favor of r ≥ 1. Furthermore, the null hypotheses of r ≤ 1 cannot be rejected in favor of the alternative hypotheses of r ≥ 2. The trace test results indicate the presence of only one cointegrating relationship during subject period. The results from both of the tests suggest that there is a long-run equilibrium relationship among government expenditure and economic growth in Turkish economy during subject period.

Table 3.3. Johansen Cointegration Test Results

Null Hypothesis	Alternative Hypothesis	Rank values	Critical values (95%)	Conclusion
λ_{max} rank tests		λ_{max} rank values		
H_0 : r = 0	H_a : r = 1	20.18	19.38	Reject the H_0 at 5%
H_0 : r ≤ 1	H_a : r = 2	3.33	12.51	Accept H_0
λ_{trace} rank tests		λ_{trace} rank values		
H_0 : r = 0	H_a : r ≥ 1	23.51	25.87	Accept H_0
H_0 : r ≤ 1	H_a : r ≥ 2	3.33	12.51	Accept H_0

Notes: Optimal lag length is determined as 2 by the Akaike Information Criterion. Max-eigenvalue test indicates 1 cointegrating equations at the 5% level.

The cointegration relationship presented below in the Equation (3.19) can be interpreted as: a 1% increase in government expenditures causing 0.4 percent decrease in economic growth. This result is against our expectations since the interaction between government expenditure and economic growth in most cases tend to be positive.

Estimated cointegrating equation is presented below:

LNRDP = - 0.41LNRTOTEXP **(3.19)**

In order to determine the effect of 1994 financial crisis on the cointegrated relationship, a dummy series was added as exogenous variable into the model (Table 3.4). The null hypothesis of r = 0 cannot be rejected with the results obtained from the λ-max tests. When the dummy series is employed, the cointegrating relationship between two variables are lost. In other words, the 1994 economic crisis destroys the co-movement of the two variables.

Similar results are reached with the trace test results. Again, the null hypothesis of r = 0 could not be rejected in favor of the alternative hypothesis of r ≥ 1. In other words, trace test fails to determine a cointegration relationship between the variables. In conclusion, in both tests, the 1994 currency crisis destroys the co-movement of the variables.

Table 3.4. Johansen Cointegration Test Results with Dummy Variables (1994)

Null Hypothesis	Alternative Hypothesis	Rank values	Critical values (95%)	Conclusion
λ_{max} rank tests		λ_{max} rank values		
H_0 : r = 0	H_a : r = 1	17.69	19.38	Accept H_0
H_0 : r ≤ 1	H_a : r = 2	4.67	12.51	Accept H_0
λ_{trace} rank tests		λ_{trace} rank values		
H_0 : r = 0	H_a : r ≥ 1	22.36	25.87	Accept H_0
H_0 : r ≤ 1	H_a : r ≥ 2	4.67	12.51	Accept H_0

Notes: Optimal lag length is determined as 2 by the Akaike Information Criterion. Trace test and Max-eigenvalue tests both indicates no cointegration between the variables at the 5% level.

In order to account the effect of the 2001 financial crisis on the cointegration relationship, a dummy series was included as exogenous variable into the VECM. The result of Johansen cointegration test after the inclusion of dummy variable representing the 2001 financial crisis is relatively similar to the case of 1994 dummy. According to the λ-max results presented in Table (3.5), the null hypothesis of r = 0 cannot be

rejected in favor of the alternative one. In other words, no cointegration relationship was found with the max. eigenvalue test.

Similar to λ-max results, trace test also indicates no cointegration relationship between government expenditure and economic growth. In other words, the null hypothesis of r = 0 could not be rejected in favor of the alternative hypothesis of r ≥ 1. In sum, after the inclusion of the dummy series representing the 2001 financial crisis, cointegration relationship between the variables are lost.

Table 3.5. Johansen Cointegration Test Results with Dummy Variables (2001)

Null Hypothesis	Alternative Hypothesis	Rank values	Critical values (95%)	Conclusion
λ_{max} rank tests		λ_{max} rank values		
H_0 : r = 0	H_a : r = 1	18.16	19.38	Accept H_0
H_0 : r ≤ 1	H_a : r = 2	4.77	12.51	Accept H_0
λ_{trace} rank tests		λ_{trace} rank values		
H_0 : r = 0	H_a : r ≥ 1	22.93	25.87	Accept H_0
H_0 : r ≤ 1	H_a : r ≥ 2	4.77	12.51	Accept H_0

Notes: Optimal lag length is determined as 2 by the Akaike Information Criterion. Trace test and Max-eigenvalue tests both indicates no cointegration between the variables at the 5% level.

In order to determine a possible negative or positive effect caused by the 2008 global financial crisis, we again, introduced a dummy series representing the crisis as exogenous variable. The results obtained after the inclusion of the dummy as an exogenous variable are presented below in Table (3.6). According to the λ-max results, the null hypothesis of no cointegration (r = 0) between the variables is rejected at the 5% critical level in favor of the alternative hypothesis of r = 1. However, the null hypothesis of r ≤ 1 cannot be rejected in favor of the alternative hypothesis of r = 2. Ultimately, a cointegration relationship was determined between government expenditure and economic growth during subject period.

Same results are reached with the trace test. According to this, the null of hypothesis of r = 0 is rejected in favor of the alternative hypothesis of r ≥ 1. Conversely, the null

hypothesis of r ≤ 1 could not be rejected in favor of the alternative one. The trace test results indicate the existence of cointegrating relationship during subject period. In sum, both tests indicate presence of a long-run equilibrium relationship between economic growth and government expenditure for Turkey's related period.

Table 3.6. Johansen Cointegration Test Results with Dummy Variables (2008)

Null Hypothesis	Alternative Hypothesis	Rank values	Critical values (95%)	Conclusion
λ_{max} rank tests		λ_{max} rank values		
H_0 : r = 0	H_a : r = 1	29.11	19.38	Reject the H_0 at 5%
H_0 : r ≤ 1	H_a : r = 2	3.56	12.51	Accept H_0
λ_{trace} rank tests		λ_{trace} rank values		
H_0 : r = 0	H_a : r ≥ 1	32.67	25.87	Reject the H_0 at 5%
H_0 : r ≤ 1	H_a : r ≥ 2	3.56	12.51	Accept H_0

Notes: Optimal lag length is determined as 2 by the Akaike Information Criterion. Trace test and Max-eigenvalue tests both indicates 1 cointegrating equations at the 5% level.

The cointegration equation obtained from the test suggesting a rather surprising relationship. According to this negative relationship, a 1% increase in government expenditure causing is 0.39% decrease in economic growth. In other words, even though we were expecting a positive relationship between the variables, what the data suggests is negative.

Estimated cointegrating equations is presented below:

LNRDP = - 0.39LNRTOTEXP **(3.20)**

Finally, all three dummy series are added together as exogenous variables into the VECM equation to determine whether the cointegrated relationship changes due to the crises. The results are presented in Table (3.7). The results obtained with max. eigenvalue test are indicating the rejection of the null hypothesis (r = 0) and acceptance of the alternative hypothesis of one cointegrating equation (r = 1). On the other hand,

the null hypothesis of r ≤ 1 could not be rejected in favor of the alternative hypothesis of r = 2. In sum, λ-max results indicate the existence of cointegration relationship between government expenditure and economic growth during subject period.

Similar results are reached with trace test. The null hypothesis of no cointegration (r = 0) is rejected in favor of the alternative hypothesis of at least r + 1 cointegrated vectors. In a similar fashion to λ-max results, the null hypothesis of r ≤ 1 could not be rejected in favor of the alternative hypothesis (r ≥ 2). In the light of this information we can conclude that trace test indicate a long-run equilibrium relationship between the variables during subject period.

In conclusion, both tests determines the existence of a cointegration relationship between government expenditure and economic growth during subject period.

Table 3.7. Johansen Cointegration Test with Dummy Variables (1994, 2001, 2008)

Null Hypothesis	Alternative Hypothesis	Rank values	Critical values (95%)	Conclusion
λ_{max} rank tests		λ_{max} rank values		
H_0 : r = 0	H_a : r = 1	25.92	19.38	Reject the H_0 at 5%
H_0 : r ≤ 1	H_a : r = 2	5.23	12.51	Accept H_0
λ_{trace} rank tests		λ_{trace} rank values		
H_0 : r = 0	H_a : r ≥ 1	31.15	25.87	Reject the H_0 at 5%
H_0 : r ≤ 1	H_a : r ≥ 2	5.23	12.51	Accept H_0

Notes: Optimal lag length is determined as 2 by the Akaike Information Criterion. Trace test and Max-eigenvalue tests both indicates 1 cointegrating equations at the 5% level.

Similar to the equations observed before, cointegrating equation after the inclusion of the dummies representing the crises which Turkey has faced suggests a negative relationship between two variables. According to this, 1% percent increase in government expenditure causes 0.27% decrease in economic growth.

Estimated cointegrating equation is presented below:

LNRDP = - 0.27LNRTOTEXP **(3.21)**

In sum, Johansen Cointegration test was employed to provide proof for cointegration among variables. First, the procedure was employed on the base data to determine whether a cointegration relationship between government expenditure and economic growth exists. Then, dummy series representing the 1994, 2001 and 2008 crises were introduced into the VECM to find if the cointegration relationship changes due to the effect of these crises. According to the results, while the cointegration relationship persisted in the cases of joint inclusion of dummies and the inclusion of *DUMMY3* alone (2008 global financial crisis), no cointegration relationship was found in the cases of *DUMMY1* and *DUMMY2* (1994 and 2001 crises respectively). Since we found a cointegrated relationship between government expenditure and economic growth using the Johansen cointegration methodology with the 2008 dummy variable alone and all dummy variables together, we can apply VECM procedure to find the existence and or way of causality. However, for the cases which the cointegration relationship was destroyed after the inclusion of the dummy series, Granger causality methodology will be employed to determine the way of causality.

3.5. Granger Causality Analysis

Granger (1969) in the concept he introduced claim that if the past values of another time series are better at predicting the current and future values of a time series, then the former can be considered as the cause of the latter. This concept can be also explained as; x_t fails to Granger cause of y_t if for all $n > 0$ the mean squared error of a forecast of y_{t+n} based on (y_t, y_{t-1}, y_{t-2},…) is the same as the mean squared error of a forecast of y_{t+n} based on (y_t, y_{t-1}, y_{t-2},…) and (x_t, x_{t-1}, x_{t-2},…).

The Granger Causality methodology which will be employed in our study, is presented below:

$$y_t = \alpha + \sum_{i=0}^{n} \beta_i x_{t-i} + \sum_{j=1}^{m} \gamma_j y_{t-j} + u_{1t} \quad \textbf{(3.22)}$$

$$x_t = \mu + \sum_{i=1}^{n} \phi_i x_{t-i} + \sum_{j=0}^{m} \delta_j y_{t-j} + u_{2t} \quad \textbf{(3.23)}$$

Where error terms are denoted with u_{1t} and u_{2t}. The null hypotheses of "x_t *does not cause* y_t" and "y_t *does not cause* x_t" are tested in equations (3.22) and (3.23) respectively. In the first equation, the null hypothesis is tested by checking $\beta_i = 0$ and in the second, it is done by testing if $\delta_j = 0$.

As it can be observed from the previous section, cointegration relationship among government expenditure and economic growth is lost after the inclusion of dummy series representing the 1994 and 2001 financial crises into the model. Because of this, VECM procedure cannot be utilized for these two cases. Instead, Granger causality methodology will be employed for this two cases to determine the causality between government expenditure and economic growth. In order to conduct Granger causality analysis, first we need to re-modify the equations (3.22) and (3.23) for our current case. Since the Granger causality test assumes that series are stationary, first differenced forms of the series are used in the regressions. Updated equations are presented below:

$$DLNRTOTEXP = \alpha_0 + \alpha_1 DLNRGDP\ (-1) + \alpha_2 DLNRTOTEXP\ (-1) + \lambda_1 DUMMY1 + \varepsilon_{t1} \quad \textbf{(3.24)}$$

$$DLNRGDP = \beta_0 + \beta_1 DLNRGDP\ (-1) + \beta_2 DLNRTOTEXP\ (-1) + \lambda_2 DUMMY1 + \varepsilon_{t2} \quad \textbf{(3.25)}$$

$$DLNRTOTEXP = \alpha_3 + \alpha_4 DLNRGDP\ (-1) + \alpha_5 DLNRTOTEXP\ (-1) + \phi_1 DUMMY2 + \varepsilon_{t3} \quad \textbf{(3.26)}$$

$$DLNRGDP = \beta_3 + \beta_4 DLNRGDP\ (-1) + \beta_5 DLNRTOTEXP\ (-1) + \phi_2 DUMMY1 + \varepsilon_{t3} \quad \textbf{(3.27)}$$

In the equations above, *DUMMY1* and *DUMMY2* represent the 1994 currency crisis and 2001 financial crisis respectively. Appropriate lag length was determined by Akaike Information Criterion. It is also important to mention that unlike 2008 global financial crisis, both of these crises are caused by domestic instabilities.

Table (3.8) presents the results needed to interpret the causality between government expenditure and economic growth. The results achieved shows no indication regarding

the causality from government expenditure to economic growth. Conversely, since the variable *DLNRGDP (-1)* is found significant at the 5% critical level, the existence of a causality running from economic growth to government expenditure is proven. In other words, past period economic growth affects the government expenditure.

Table 3.8. Granger Causality Results (1994)

Dependent Variable	Independent Variable	Coefficients	t-statistic (P-value)
$DLNRTOTEXP$	$DLNRTOTEXP$ (-1)	-0.132	-1.401 (0.163)
	$DLNRGDP$ (-1)**	-0.330	-2.004 (0.047)
	$DUMMY1$	-0.060	-2.259 (0.025)
	C	0.024	4.694 (0.000)
$DLNRGDP$	$DLNRTOTEXP$ (-1)	-0.041	-0.738 (0.462)
	$DLNRGDP$ (-1)	-0.092	-0.952 (0.343)
	$DUMMY1$	-0.029	-1.903 (0.059)
	C	0.013	4.447 (0.000)

Notes: *, **, *** represent the significance at ten, five and one percent level, respectively. *DUMMY1* represent the 1994 currency crisis.

In Table (3.9), the causality results between the government expenditure and economic growth are presented. According to the results, no causality exists from government expenditure to economic growth. On the other hand, past period economic growth seems to have an effect on the government expenditure. In other words, albeit only at 10% critical level, a causality running from economic growth to public expenditure was determined.

Table 3.9. Granger Causality Results (2001)

Dependent Variable	Independent Variable	Coefficients	t-statistic (P-value)
$DLNRTOTEXP$	$DLNRTOTEXP$ (-1)	-0.106	-1.106 (0.270)
	$DLNRGDP$ (-1)*	-0.303	-1.782 (0.077)
	$DUMMY2$	-0.008	-0.328 (0.743)
	C	0.021	4.161 (0.000)
$DLNRGDP$	$DLNRTOTEXP$ (-1)	-0.016	-0.292 (0.770)
	$DLNRGDP$ (-1)	-0.118	-1.219 (0.224)
	$DUMMY2$	-0.035	-2.552 (0.012)
	C	0.013	4.629 (0.000)

Notes: *, **, *** represent the significance at ten, five and one percent level, respectively. *DUMMY2* represent the 2001 financial crisis.

In sum, Granger Causality test was employed for the cases which the dummy series of 1994 and 2001 financial crises destroyed the cointegration relationship. In both cases, past period government expenditure observed to have no significant effect on the economic growth. On the contrary, past period economic growth has significant effect on government expenditure in both cases. In other words, past period economic growth Granger causes government expenditure in both cases. In addition, dummies have negative signs indicating negative effect of the crises. In the next section, VECM methodology will be used for the cases which the cointegration relationship among government expenditure and economic growth is determined.

3.6. Vector Error Correction Model

The error correction model technique is used on two or more time series which have long-run stochastic trend, also known as cointegration. Error correction models provide information regarding the short and long-run effects of time series on each other. According to this, significance of the error correction term provides information regarding the long-run dynamics, while the joint significance of the lagged explanatory variables determines the short-run causality. The user, by utilizing the information gathered from the error correction model, can provide long and short-run interpretation depending on the nature of the study. Although the first error correction model methodology was developed by Sargan (1964), since then, several error correction methodologies were introduced including Engle-Granger's two-step approach and Johansen's Vector Error Correction Model. In this research, Johansen (1995), Vector Error Correction methodology will be utilized due to its advantages over Engle-Granger's (1991) method. In Engle-Granger method, the user is restricted with only a single equation between the variables while in Johansen's VECM, multiple cointegration relationship can exist. Moreover, while Engle-Granger's two-step method requires pretesting the variables to determine if they are stationary or not, Johansen's VECM does not require any pretesting. These, and many more advantages made Johansen's Vector Error Correction Model popular among academic circles.

The Vector Error Correction Model can be described as Vector Autoregressive Model with the inclusion of cointegration restrictions. VECM's multivariate maximum likelihood feature allows VEC model to determine the number of cointegrated vectors without even relying on normalization rules like Engle-Granger's two-step method does.

In order to utilize VEC model in a study, time series that are being used in the study have to be non-stationary at level but stationary at I(1). Furthermore, these time series have to be cointegrated. Since the results we have gotten so far meets the requirements, we can use Vector Error Correction Model in our study. Through the utilization of this method, we will be able to examine both short-run and long-run dynamics of our series. Conventional ECM (Error Correction Model) for cointegrated series is presented below:

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{m} \beta_i \, \Delta Y_{t-i} + \sum_{i=0}^{n} \alpha_i \, \Delta X_{t-i} + \phi Z_{t-1} + u_t \quad \textbf{(3.28)}$$

Here, ϕ denotes for the ECT (Error Correction Term) and the OLS residuals acquired from the following long-run cointegrating regression:

$$Y_t = \beta_0 + \beta_1 X_t + \varepsilon_t \quad \textbf{(3.29)}$$

and can be defined as:

$$Z_{t-1} = ECT_{t-1} = Y_{t-1} - \beta_0 + \beta_1 X_{t-1} \quad \textbf{(3.30)}$$

The term, error-correction, presents the last period deviation from the long-run equilibrium. This deviation (the error), influences the short-run dynamics of the dependent variable. Therefore, the coefficient of ECT (Error Correction Term), ϕ, can be described as the speed of adjustment, because it measures the speed at which Y returns to equilibrium after a change in X. Since we are finished with theoretical explanations about VECM (Vector Error Correction Model), the study will continue with the presentation of VECM equations of variables and the interpretation of VECM results.

By utilizing the equation (3.28), we can re-write the VECM for our variables (government expenditure and GDP) as below:

$$\Delta LNRTOTEXP_t = \beta_0 + \beta_{1i}\Delta LNRTOTEXP_{t-1} + \beta_{2i}\Delta LNRGDP_{t-1} + \beta_{3i}\Delta LNRTOTEXP_{t-2} + \beta_{4i}\Delta LNRGDP_{t-2} + \lambda_1 Z_{t-1} + u_{1t} \quad \textbf{(3.31)}$$

$$\Delta LNRGDP_t = \alpha_0 + \alpha_{1i}\Delta LNRGDP_{t-1} + \alpha_{2i}\Delta LNRTOTEXP_{t-1} + \alpha_{3i}\Delta LNRGDP_{t-2} + \alpha_{4i}\Delta LNRTOTEXP_{t-2} + \theta_1 Z_{t-1} + u_{2t} \quad \textbf{(3.32)}$$

Starting with the first equation (3.31), if the coefficients of β_{2i} and β_{4i} are determined jointly statistically significant in *F-test*, we can conclude that there is a short-run causality running from economic growth and public expenditure during subject period. In order to determine the presence of a long-run causality from economic growth to government expenditure, λ_1 has to be found negative and statistically significant in *t-test*.

The same procedure applies to the second equation (3.32). If the coefficients α_{2i} and α_{4i} are found jointly significant in F-test, the existence of the short-run causality from government expenditure to economic growth is proven. Moreover, for a long-run causality relationship from government expenditure to economic growth to exist, θ_1 needs to be negative and statistically significant.

Table (3.10), provides the information we need to determine the long and short-run causality relationships between the variables. Starting with the equation (3.31), the coefficients of the short-run causality determinants were found jointly insignificant. In other words, no short-run causality relationship was determined from economic growth to government expenditure. Furthermore, the error correction term was found negative but not statistically significant which means that there is no long-run causality relationship running from economic growth to government expenditure during subject period.

The same procedure was applied to equation (3.32) to check the existence of long or (and) short-run causality among variables. According to the results, the coefficients of α_{2i} and α_{4i} were found jointly insignificant. In other words, during subject period, no evidence of a short-run causality from government expenditure to economic growth was discovered. On the other hand, the error correction term (θ_1) was determined statistically significant at 1% critical level and since the coefficient is also negative,

we can conclude that there is a long-run causality relationship from government expenditure to economic growth in Turkey during subject period.

In sum, with the base data, no short or long-run causality was determined from economic growth to public expenditure. However, although no short-run causality was detected, a long-run causality running from government expenditure to economic growth was encountered during subject period.

Table 3.10. VECM Causality Interpretation

Equation	Dependent Variable	Independent Variable	Coefficients	t-statistic (P-value)
3.31	$\Delta LNRTOTEXP$	$\Delta LNRTOTEXP$ (-1)	-0.072	-0.690 (0.491)
		$\Delta LNRTOTEXP$ (-2)	0.002	0.026 (0.978)
		$\Delta LNRGDP$ (-1)	-0.251	-1.466 (0.145)
		$\Delta LNRGDP$ (-2)	-0.064	-0.376 (0.707)
		ECT (-1)	-0.059	-1.509 (0.133)
3.32	$\Delta LNRGDP$	$\Delta LNRGDP$ (-1)	0.001	0.011 (0.991)
		$\Delta LNRGDP$ (-2)	-0.043	-0.473 (0.637)
		$\Delta LNRTOTEXP$ (-1)	0.053	0.939 (0.349)
		$\Delta LNRTOTEXP$ (-2)*	0.094	1.750 (0.082)
		ECT (-1)***	-0.097	-4.568 (0.000)

Notes: *, **, *** represent the significance at ten, five and one percent level, respectively. Values in the parentheses shows the p-values of the respective variables. Optimal lag length is determined as 2 by the Akaike Information Criterion. Model 4 was selected as the appropriate model.

Table 3.11. Short-run Causality Wald Test Result

Null Hypothesis	F-statistic (p-value)	chi-square (p-value)	Conclusion
C(8)=C(9)=0	1.735 (0.18)	3.471 (0.17)	No short-run causality was determined

Notes: C(9) and C(10) stands for *D(LNRTOTEXP(-1))* and *D(LNRTOTEXP(-2))* respectively.

So far, VECM procedure was only employed on the base data. However, since it is one of the objectives of this study, we also need to check if the existence or the way of causality changes during economic crisis times. Since the VECM procedure can only be applied when the cointegration between the variables is proven, the cases which the cointegration was destroyed after the inclusion of dummy series will not be

included. In other words, we will use VECM with the 2008 dummy alone and all dummies together to check if there is any change in the way or existence of causality during crisis times.

Before we proceed with the VECM interpretations with dummy series, we have to extend the existing VEC models (3.31 and 3.32) with the dummies representing the economic crises which Turkey has faced throughout the subject period. New, updated equations are presented below:

$$\Delta LNRTOTEXP_t = \beta_5 + \beta_{6i}\Delta LNRTOTEXP_{t-1} + \beta_{7i}\Delta LNRGDP_{t-1} + \beta_{8i}\Delta LNRTOTEXP_{t-2} + \beta_{9i}\Delta LNRGDP_{t-2} + \gamma_1 DUMMY3 + \lambda_2 Z_{t-1} + u_{4t} \quad \textbf{(3.33)}$$

$$\Delta LNRGDP_t = \alpha_5 + \alpha_{6i}\Delta LNRGDP_{t-1} + \alpha_{7i}\Delta LNRTOTEXP_{t-1} + \alpha_{8i}\Delta LNRGDP_{t-2} + \alpha_{9i}\Delta LNRTOTEXP_{t-2} + \gamma_2 DUMMY3 + \theta_2 Z_{t-1} + u_{5t} \quad \textbf{(3.34)}$$

$$\Delta LNRTOTEXP_t = \beta_{10} + \beta_{11i}\Delta LNRTOTEXP_{t-1} + \beta_{12i}\Delta LNRGDP_{t-1} + \beta_{13i}\Delta LNRTOTEXP_{t-2} + \beta_{14i}\Delta LNRGDP_{t-2} + \delta_1 DUMMY1 + \phi_1 DUMMY2 + \gamma_3 DUMMY3 + \lambda_3 Z_{t-1} + u_{6t} \quad \textbf{(3.35)}$$

$$\Delta LNRGDP_t = \alpha_{10} + \alpha_{11i}\Delta LNRGDP_{t-1} + \alpha_{12i}\Delta LNRTOTEXP_{t-1} + \alpha_{13i}\Delta LNRGDP_{t-2} + \alpha_{14i}\Delta LNRTOTEXP_{t-2} + \delta_2 DUMMY1 + \phi_2 DUMMY2 + \gamma_4 DUMMY3 + \theta_3 Z_{t-1} + u_{7t} \quad \textbf{(3.36)}$$

Equations (from 3.33 to 3.36) above, presents the VEC models generated with dummy variables. According to these, *DUMMY1* stands for the 1994 currency crisis, $DUMMY2$ corresponds to the 2001 financial crisis, *DUMMY3* shows the 2008 global financial crisis while they together represent the collective effect of the crises on government expenditure and GDP (Equation 3.35 and 3.36).

The results after the inclusion of dummy series representing the 2008 global financial crisis is presented in Table (3.12). Starting with equation (3.33), the short-run causality coefficients of β_{7i} and β_{9i} were found statistically insignificant. In addition, the error correction term (λ_2), albeit negative, was also found insignificant. Furthermore, the dummy series which was added in order to see the effect of the 2008 global financial crisis on the causality relationship was also insignificant. In short, no short or long-run

causality relationship was found from economic growth to government expenditure and the 2008 global financial crisis' effect on government expenditure was determined insignificant.

In equation (3.34), we determined the existence of both short and long-run causality. According to this, the coefficients of α_{7i} and α_{9i} are statistically significant at 5% critical level. Furthermore, the error correction term (θ_2) and the dummy series representing the effect of 2008 crisis are found negative and statistically significant at 1% critical level. In the light of these informations, we can conclude that there are short and long-run causality relationships running from public expenditure to economic growth during subject period and the 2008 global financial crisis has negative effect on GDP.

In sum, similar to the results obtained with the base data, no short or long-run causality from economic growth to public expenditure was found but a long-run causality relationship from government expenditure to economic growth was discovered. In addition, contrary to the base data, the inclusion of the dummy series also allowed us to determine a short-run causality from public expenditure to economic growth. It was also determined that the 2008 global financial crisis had negative effect on Turkey's GDP.

Table 3.12. VECM Causality Interpretation with Dummy Variables (2008)

Equation	Dependent Variable	Independent Variable	Coefficients	t-statistic (P-value)
3.33	$\Delta LNRTOTEXP$	$\Delta LNRTOTEXP$ (-1)	-0.073	-0.686 (0.493)
		$\Delta LNRTOTEXP$ (-2)	0.003	0.030 (0.975)
		$\Delta LNRGDP$ (-1)	-0.264	-1.524 (0.130)
		$\Delta LNRGDP$ (-2)	-0.081	-0.463 (0.643)
		DUMMY3	-0.009	-0.348 (0.727)
		ECT (-1)	-0.056	-1.386 (0.168)
3.34	$\Delta LNRGDP$	$\Delta LNRGDP$ (-1)	-0.027	-0.310 (0.756)
		$\Delta LNRGDP$ (-2)	-0.102	-1.121 (0.264)
		$\Delta LNRTOTEXP$ (-1)	0.078	1.418 (0.158)
		$\Delta LNRTOTEXP$ (-2)**	0.117	2.225 (0.028)
		*DUMMY3***	-0.044	-3.158 (0.002)
		ECT (-1)***	-0.116	-5.548 (0.000)

Notes: *, **, *** represent the significance at ten, five and one percent level, respectively. Values in the parentheses shows the p-values of the respective variables. Optimal lag length is determined as 2 by the Akaike Information Criterion. Model 4 was selected as the appropriate model.

Table 3.13. Short-run Causality with Wald Test (Dummy3 included)

Null Hypothesis	F-statistic (p-value)	chi-square (p-value)	Conclusion
C(9)=C(10)=0	2.982 (0.05)	5.965 (0.05)	Short-run causality at 5% crit. level

Notes: C(9) and C(10) stands for *D(LNRTOTEXP(-1))* and *D(LNRTOTEXP(-2))* respectively.

Finally, we introduce dummy series representing the 1994, 2001 and 2008 financial crises together to determine the collective effect the crises on the causality relationship between government expenditure and economic growth. The results after the inclusion of the dummy series are presented in Table (3.14). According to results, when the dependent variable is government expenditure, the short-run causality coefficients of β_{12i} and β_{14i} are determined statistically insignificant in *F-test*. The error correction term, albeit negative, is also found statistically insignificant. In addition, the dummy series which were added in order to determine the collective effect of the crises, are also jointly insignificant. In conclusion, no short or long-run causality was determined from economic growth to public expenditure for Turkey's related period and the collective effect of the crises on the government expenditure was determined insignificant.

In equation (3.36), we check for the presence of the causality from public expenditure to economic growth and the effects of crises represented with dummies on the causality. According to the results, the short-run causality determinants α_{12i} and α_{14i} are statistically significant at 10% critical level. Furthermore, the error correction term is also found negative and statistically significant at 1% critical level. The dummy series we added indicate a negative effect caused by the crises jointly on GDP. In short, long-run causality at 1% and short-run causality at 10% critical level was determined from government expenditure to economic growth. Also, the crises which Turkey has faced throughout the subject period were found to have negative effect on GDP.

In conclusion, no short or long-run causality was found from economic growth to public expenditure but similar to the case which the 2008 dummy was introduced, short and long-run causality relationships were determined from government expenditure to economic growth. Moreover, while the effect of the crises which Turkey has faced was found insignificant on public expenditure, it was determined significant and negative on GDP.

Table 3.14. VECM Causality Interpretation with Dummy Variables (1994, 2001, 2008)

Equation	Dependent Variable	Independent Variable	Coefficients	t-statistic (P-value)
3.35	$\Delta LNRTOTEXP$	$\Delta LNRTOTEXP$ (-1)	-0.156	-1.481 (0.141)
		$\Delta LNRTOTEXP$ (-2)	-0.060	-0.604 (0.546)
		$\Delta LNRGDP$ (-1)**	-0.369	-2.085 (0.039)
		$\Delta LNRGDP$ (-2)	-0.226	-1.231 (0.220)
		*DUMMY1***	-0.075	-2.600 (0.000)
		DUMMY2	-0.016	-0.649 (0.517)
		DUMMY3	-0.009	-0.356 (0.722)
		ECT (-1)	-0.010	-0.377 (0.706)
3.36	$\Delta LNRGDP$	$\Delta LNRGDP$ (-1)	-0.112	-1.266 (0.207)
		$\Delta LNRGDP$ (-2)**	-0.199	-2.155 (0.033)
		$\Delta LNRTOTEXP$ (-1)	0.042	0.807 (0.421)
		$\Delta LNRTOTEXP$ (-2)*	0.094	1.870 (0.064)
		*DUMMY1***	-0.032	-2.209 (0.029)
		*DUMMY2****	-0.045	-3.612 (0.000)
		*DUMMY3****	-0.048	-3.635 (0.000)
		ECT (-1)***	-0.072	-4.999 (0.000)

Notes: *, **, *** represent the significance at ten, five and one percent level, respectively. Values in the parentheses shows the p-values of the respective variables. Optimal lag length is determined by the Schwarz and Akaike Information Criterions.

Table 3.15. Short-run Causality with Wald Test (All dummies together)

Null Hypothesis	F-statistic (p-value)	chi-square (p-value)	Conclusion
C(4)=C(5)=0	2.609 (0.07)	5.218 (0.07)	Short-run causality at 10% crit. level

Notes: C(4) and C(5) stands for *D(LNRGDP(-1))* and *D(LNRGDP(-2))* respectively.

In sum, VEC model was utilized to determine the causality relationship between economic growth and government expenditure and to check if the causality relationship changes during economic crisis periods. First, with the base data, no short or long-run causality was determined from economic growth to public expenditure. However, a long-run causality relationship running from government expenditure to economic growth was encountered. Then, in order to determine the effect of the economic crises on the causality relationship, dummy series were introduced as exogenous variables into VECM. After the inclusion of *DUMMY3* (2008 global financial crisis) no short or long-run causality from economic growth to public expenditure was determined. However, a short and long-run causality was discovered from public expenditure to economic growth. In addition, the 2008 global financial crisis was found to have negative effect on Turkey's GDP. Then, the dummies representing the 1994, 2001 and 2008 crises were added together into VECM to see if there is any change in the direction of causality. The results indicate no short or long run causality from economic growth to public expenditure. However, the presence of long and short-run causalities running from public expenditure to economic growth are detected. Furthermore, 1994, 2001 and 2008 economic crises (collectively) are determined to have negative effect on Turkey's GDP. In short, the results we obtained with the base data differ to those which we achieved with dummy series, in the sense that after the inclusion of dummy series, a short-run causality from public expenditure to economic was determined.

CONCLUSION

In economics literature, many studies have investigated the relationship between economic growth and public expenditure. However, since the findings of these studies are so varied, it is hard to talk about the existence of an absolute result of this interaction. Turkey is no exception to this phenomena. While some studies determine economic growth as a reason of government expenditure increases, others find the opposite.

The purpose of this study was to find the relationship between economic growth and government expenditure in Turkey and to check if the relationship changes during crisis times. Since there are many researches regarding this relationship in the literature, by determining the effects of the crises which Turkey has suffered throughout the subject period, a different perspective to the existing literature was presented.

Keynesians believe that the public expenditure increases have positive effect on the economic growth. According to them, when the public expenditure is increased, aggregate demand, output and income should also increase. Subsequently to these developments, real interest rate should also increase since the increase in output amount raises the money demand. However, the new increased state of interest rates, can have negative effects on the private investment. The extent of this negative effect depends on the interest elasticity of investment.

Neoclassicals with their endogenous growth theories, became the leading force in the economic circles by presenting an optimal public spending level for the governments to achieve long term economic growth. According to neoclassicals, governments can have positive effect on the growth by increasing their public spending in the production cycle. They link this increase in the growth to the public capital's contribution to the existing capital stock in the production process and to the increases in the marginal productivity generated by this public capital increase.

The opinions of economic schools of thought still differs on the subject of public expenditure usage in achieving higher economic growth rates. However, one thing is

certain, public expenditure has potential to create positive or negative effects on economic growth and real output. The effect of public expenditure is determined by the amount and the location it is spent. Generally, if the investment is able to produce productivity increasing effects in the private sector, it is considered as a growth enhancing one. On the contrary, if the public expenditure amount is excessive, it can lead to decreases in the growth of economy. Thus, we can say that the scale and composition of the public expenditure are the most important factors which determine the direction of the effect. Therefore, governments have to be careful when deciding the amount and composition of the public expenditure.

Turkey, starting from 1980's, by embracing an outward oriented economy model and accelerating her export efforts has entered into a rapid growth period. Adoption of this outward oriented model in the 1980's was successful in attracting foreign investors into country and correspondingly, capital flow into Turkey was increased. Even though most of these resources were in the form of loans, they were utilized in many different areas of Turkey (telecommunication, highways, tourism, infrastructure, etc.). However, these positive developments were not utilized to its full potential due to unsuccessful administration, weak governments and other political instabilities. Especially after 1985, ever increasing national debt, high inflation figures, and populist economic policies prevented Turkey's economy from attaining rapid growth. In addition to these, Southeast Asia's financial crisis in 1997, Russian Federation's financial crisis in 1998, Global financial crisis in 2008 along with national crises such as 1994 and 2001 crises, caused serious problems for Turkish economy and slowed down its development. Justice and Development Party's emergence from 2002 elections as the victor, and their consequent victories in the elections of 2007 and 2011 provided a stable political environment for Turkey. As a result of these, albeit limited, an economic success was achieved.

The results of the empirical studies on the relationship between government expenditure and economic growth varies substantially from country to country or even from period to period. It is hard to talk about an absolute outcome of the interaction between government expenditure and economic growth for Turkey either. The studies

on Turkish economy ranges from supporting Wagner or Keynes' hypotheses to not finding any relationship between government expenditure and economic growth.

There are two main purposes of this study; to find the relationship between economic growth and public expenditure and to check if this relationship changes during crisis times. For these purposes, Johansen Cointegration, Granger Causality and VECM methodologies were employed. In order to determine if the economic crises of 1994, 2001 and 2008 had any effect on the relationship, dummy series representing the crises were also utilized.

The stationarity of our time series was determined with Augmented Dickey-Fuller unit root test. The results from this test indicate that series are non-stationary in levels but stationary in first differences.

Johansen Cointegration analysis was used to determine whether government expenditure and economic growth in Turkey move together in the long-run. The results before the inclusion of dummies indicated a cointegration relationship between economic growth and public expenditure. After this result, dummies representing the 1994, 2001 and 2008 financial crises were included into the model. The cointegration relationship achieved with the base data persisted with the inclusion of 2008 dummy alone and all dummies together. The inclusion of the dummies representing 1994 and 2001 however, destroyed co-movement of government expenditure and economic growth. In all cases which the cointegration relationship was established between the variables, government expenditure is found to have negative effect on GDP.

Granger Causality technique was employed to determine the causality relationship between economic growth and government expenditure for the cases which the cointegration relationship is destroyed. In both of these cases (1994 and 2001), past period public expenditure is found to have no significant effect on economic growth. However, past period economic growth does Granger cause government expenditure.

In order to determine the way of causality or the effect of economic crises on the causality relationship, VECM methodology was used on the cointegrated series. The results with the base data indicate no short or long-run causality relationship from

economic growth to government expenditure but the existence of a long-run causality from public expenditure to economic growth. Dummy series representing the effect of the 2008 financial crisis alone and all crises collectively, were introduced in order to find if the causality relationship changes during crisis times. The results after the inclusion of dummies are similar to those of base data apart from the discovery of a short-run causality from public expenditure to economic growth. In other words, both cases which the dummies are included indicate no presence of short and long-run causality from economic growth to public expenditure but discover short and long-run causality from public expenditure to economic growth. It is also proven that 2008 financial crisis and 1994, 2001 and 2008 financial crises jointly have significant negative effects on Turkey's GDP. On the contrary, they do not have any significant effect on government expenditure.

Overall, the results we obtained from the tests are against our expectations since the relationship between government expenditure and economic growth in most cases is expected to be positive. Nevertheless, the long run relationship has been found negative between two variables.

From the preceding results, we can reach the following main conclusions:

- A long-run causality relationship from public expenditure to economic growth is determined with the base data for Turkey. In both cases which the dummies are employed, a short-run causality, which was not apparent in base data, is discovered from public expenditure to economic growth. Furthermore, the results indicate an inverse relationship between government expenditure and economic growth. According to this, increases in government expenditure seems to have negative effect on economic growth. There are two studies in literature that indicate similar results. Study conducted Altunc and Aydin (2012), investigated the validity of Armey's Curve for Turkey's 1975-2010 period and found the optimal share of public expenditure in GDP to be 16%. Since the optimal share of public expenditure they found for Turkey was way below the level what Turkey has been spending, they suggested government to decrease the excessive public spending in order to prevent a crowding-out

effect. These results are also consistent with the Altay and Altin (2008)'s study. They link this negative relationship they found for Turkey's 1980-2005 period to the public sector's crowding-out effect on private sector. In this case we can say that the crowding-out effect they discovered for Turkey's 1980-2005 period, still persists for the 1987-2017 period of Turkey. However, in the light of these informations, we can conclude that neither Wagner nor Keynes' hypotheses regarding the relationship between economic growth and public expenditure is valid for Turkish economy.

- 2008 global financial crisis alone and 1994, 2001 and 2008 financial crises collectively are found to have significant negative effect on Turkey's GDP. However, the effect of these crises on government expenditure is determined insignificant.

For future studies on the relationship between economic growth and public expenditure, we suggest that economic crises (1994, 2001 and 2008 crises) should be taken into consideration since there seems to be structural breaks in the data caused by these crises (Figure 2.3). Ultimately, we believe that the most robust results were achieved with our last model, when all dummy series were added into VECM together. We think that some of the inconsistent results obtained in this study originated from not including the dummies together.

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