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THE IMPACT OF FISCAL POLICY ON OUTPUT: A CASE STUDY OF EGYPT

Master's Thesis

Supervisor: Professor Karsten Staehr

Tallinn 2017

I declare I have written the master's thesis independently.

All works and major viewpoints of the other authors, data from other sources of literature and elsewhere used for writing this paper have been referenced.

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ABSTRACT

The thesis investigates the short – term effects of fiscal policy shocks including government spending and tax revenue on real gross domestic product in Egypt. We applied Structural vector autoregressive model (SVAR) model and impulse response function (IRF) using annual data for the period 1985-2015. We started with a three variables SVAR model, then we analyzed a five variables SVAR model. The main findings are that 1) Government spending shock has a negative impact on real gross domestic product. 2) The impact of taxation seems to be less efficient as it has a positive but weak impact on real gross domestic product (GDP). Nevertheless, the impulse response functions were statistically insignificant.

Keywords: Fiscal policy, Spending, Taxation, VAR, GDP, Egypt.

INTRODUCTION

Fiscal policy is the tools that governments use to influence the economy. The first tool of fiscal policy is taxation which presents the revenue side of the government's budget. The second tool of fiscal policy is government spending which presents the expenses side of government's budget.The debate between economists regarding whether fiscal policy stifles or pursue GDP hasn't been resolved so for. IS-LM theory predicts that a positive shock to government spending will raise the consumption (Fragetta and Melina, 2010). In contrast, Neoclassical real business cycle theory suggests that a positive shock to government spending will have a positive effect on investment and negative effect on consumption and wages (Baxster and King, 1993).

Fiscal policy can have short-run and long run impact on the economy. In the short run, fiscal policy can move the output from its potential level through affecting the demand of goods and service. In the long run, fiscal policy can affect the output by affecting the quantity and quality of labor force or other input factors or through changes in the total factor productivity (Barro 1991).

The role of fiscal policy took much attention in the economic theory. Classical economic theory suggests that carefully designed fiscal policy can affect economic growth in the long run (Hemming, et al.2002). There are two most common views regarding the impact of fiscal policy on economic growth in the long -run, the Keynesian view and Non- Keynesian view. The Keynesian view suggests that fiscal expansion will have a positive effect on economic growth in the short-term while fiscal consolidation will have a negative effect on economic growth. Contradictory, non-Keynesian view suggests that the impact of fiscal expansion is likely to be small while fiscal consolidation can have a positive impact on economic growth (Pereira and Roca-Sagalés, 2011).

The effects of fiscal policy on economic activity in Egypt haven't got enough attention in litrature.Egyptian economy has witnessed many changes and challenges in the last decades.After 25th of January revolution , it has sufurd a lot due to political instability.The aim

of the thesis is to investigate the impact of fiscal policy shocks including government spending and tax revenue on output in Egypt by using annual data for the period 1985-2015 and applying structural vector autoregressive model (SVAR). The research problem can be summarized into two question:

1-What are the effects of a government spending shock on real output.
2- What are the effects of a tax revenue shock on real output.

The reasearch hypothesis can be formalised as follows:

1. H0: there is no relationship between government spending and real output.
   H1: there is a relationship between government spending and real output.
2. H0: there is no relationship between tax revenue and real output.
   H1: there is a relationship between tax revenue and real output.

The rest of the thesis is structured into three chapters ; the first chapter focuses on a brief overview of theoretical litrature. The second chapter focuses on overview about empirical literature ,methods used and its implication about fiscal policy and output . The third chapter focuses on emprical analysis and conclusions.

1. THEORITICAL LITRATURE

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The debate about the effectiveness of fiscal policy in pursuing economic growth encourages many economists to give more attention to that topic nowadays. Everybody attempts to prove his point of view, however, the way seems to be very long to do so. In this study, the author wants to contribute to this debate using Arab Republic of Egypt as a case study .Before going through the empirical literature, the author would like to present briefly the theoretical debate about fiscal policy.This chapter will be divided into two parts; the first part will give an overview about fiscal policy in the long-run. The second part will focus on fiscal policy the short run .

1.1. Fiscal policy and the long-run growth rate

According to Halkus and Paizanos (2015), the main analytical tool to examine the long run effects of fiscal policy is the endogenous growth theory. In literature, there are two main views regarding the long-run relationship between fiscal policy and economic growth.one

opinion suggests that fiscal policy can support the growth (e.g. Easterly and Rebelo1993; Romer, 1986; Barro, 1990). On the other hand, the other view suggests that fiscal policy may stifle economic growth (e.g. Gwaterny, 1989; Armey, 1995; kirzner, 1979.)

1.1.1. Factors that support long run economic growth

According to IMF (2015), the endogenous growth theory determines four main instruments through which fiscal policy can enhance the long- run growth as follows:

Enhance fiscal capital:

When the government increases its spending on infrastructures such as spending on roads and bridges, it may improve the productivity of public sector because of these facilities. The increase of productivity may lead to an increase in the rate of return on both corporate and individual levels, and thus, the increase of the public-sector productivity may lead to an increase in the long run growth rate (Sanchez-Robles, 1998). The same thing may happen when the government cuts taxes. According to Rebelo (1991), tax cuts in capital income may encourage individuals and businesses to increase savings. This increase in savings may lead to an increase in the long-term growth rate.

Enhance human capital

Several studies showed the important role that human capital plays in stimulating economic growth (e.g. Barro, 2001; Mankiw, 2000). Government spending in the Human capital such as education and health can affect the long-run growth directly and indirectly. The direct effect of human capital is being a component in the production function. The indirect impact of human capital comes through promoting ideas and technological progress (Jones, 2001). When it comes to the revenue side, King and Rebelo (1993) suggests that an appropriate tax reform may enhance human capital accumulation and thus stimulate the long-run economic growth.

Total factor productivity

According to Baier and Glomm (2001), public investment has the potential to increase the public sector productivity. The government can invest directly in research and development and indirectly by investing in human capital through education and health spending. This may increase the productivity of private sector and thus promote the long run growth rate. Also, the

government can increase the private sector productivity by increasing spending in physical capital and giving incentives to increase R&D by cutting taxes.

Labor supply

Fiscal policy can affect labor supply through the tax system. Halkus and Paizanos (2015) state that individual's decision whether to work or not depend on the tax benefits. The more taxes he pays, the fewer incentives to work he has.When the government makes tax cuts, it increases the income tax of the worker and thus encourages him to work . On the other hand, when the government increases taxes, it may discourage individuals's desire to work. According to OECD (2011), the impact of the tax system on work decisions is greater for some specific groups than the others.

1.1.2. Factors stifle the long run growth:

In spite of the positive effects of fiscal policy on the long-run growth, some economists suggest that fiscal policy can also be harmful for the growth.Gwaterny et al. (1998) categorized the harmful effects of fiscal policy into three elements as follows:

Hindrance effects of higher taxation and government borrowing:

When government spending grows, more taxes and borrowings are needed in order to finance it. The increase in borrowing will have a crowding out effect on private investment as it causes an increase in interest rate, and thus, this crowding out effect may obstacle the long run growth. Also when government increases taxes, it affects both individuals and corporate levels. For individuals, an increase in taxation will decrease their disposable income and this will discourage them to take part in the labour market.Therefore, the labour market will fall. For the corporate level, an increase in taxation will reduce the rate of return of private investment, and thus, it will lower the private sector productivity.

Diminishing returns of government spending

The law of diminishing returns applies as the the level of government size grows.At low size of government, government spending goes to high productivitiy activities, however, at bigger sizes of governemts, government spending will go to less productive activities, and thus, government spending could be harmful for the economic growth rather than suuporting it.

Slowing of the discovery and wealth creation process

The private sector has a better ability to discover and improve technologies than government (kirzner,1979). In private sector, the decision is driven by free market, however, the government decision is driven by political system which is less dynamic than private sector.In private sector, entrepreneurs take decisions that maximize the profits and lower the cost. The reaction of private sector to changes in the market is faster than the reaction of government. According to Armey(1995), the relationship between government size and growth rate takes a U-shaped curve as it is shown in Figure 1.

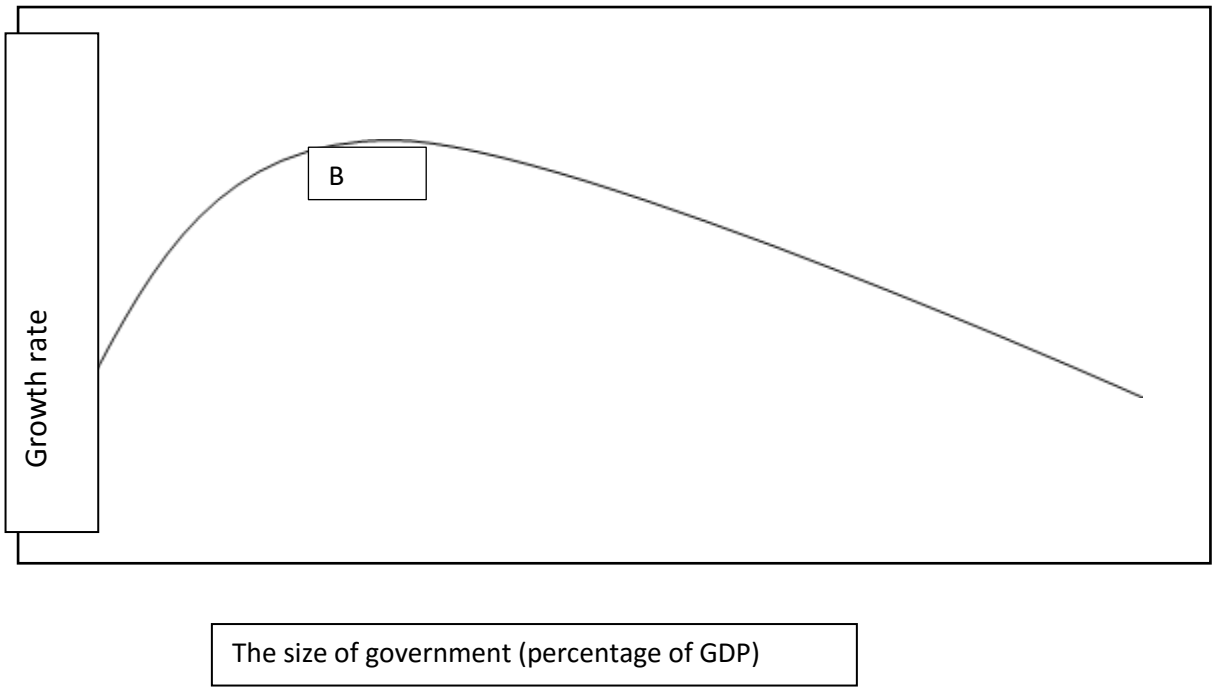

Figure 1: The size of government and long-term growth

Source: Gwartney et al. (1998, p. 5)

We can see from Figure 1 that at small levels of government size, an increase of government spending will increase the growth rate until it reach point B. After that point, any increase in government spending will decrease the growth rate as the government spending will be directed to less productive activities therefore, the growth rate will decline.

1.2 Fiscal policy in the short-run

The short- term fiscal policy focuses on stabilizing business cycles by affecting the demand side. Fiscal policy has both direct and indirect impact. The direct effects consist of changes in purchases of goods and services by individuals and organizations because of government spending increase or tax cuts. The indirect effect of fiscal policy can either enhance or stifle the direct effects. The indirect effects depend on the demand multiplier.

1.2.1. The classical model

The classical theory's roots come from the writing of Adam Smith, David Ricardo and Jean Baptist Say in the 18th century. The classical theory is based on the assumptions of perfect competition in the market, prices and wages are flexible and the classical supply curve is vertical and inelastic to nominal wages and prices. With a classical supply curve, every one-dollar increase in government spending will be cancelled out by a one-dollar decrease in private spending therefore, the crowding out effect is complete (Dornbusch et al. 1998). The main implications from these assumptions regarding fiscal policy are that fiscal policy would have no impact on employment and output. When the government increases its spending, it has to borrow from the private sector to finance the increase. This would increase the interest rate and thus, would decrease the consumption and investment of private sector. According to Halkos and Paizanos (2015), the crowding out of private sector will neutralize any positive effects of the implemented policy. Blinder and Solow (2005) state that before Keynes, it was a commonplace to assume that government spending and taxation were powerless to affect the aggregate levels of spending and employment in the economy.

1.2.2 Fiscal policy in Keynesian theory

1n 1936, Keynes published his book "The general theory of employment, money and interest rate". He attacked the classical thinking regarding the neutral role of government and balanced budget. According to Keynes, monetary policy is powerless during recession because it depends on reducing the interest rate which is already very low. Also, the price adjustment mechanism is powered by income adjustment mechanism. During recessions, the individuals's income falls so, they will tend to decrease their both consumption and saving and the same for businesses. They will tend to decrease investment and production. As a result, the price adjustment mechanism will take the economy to more recession rather than to full employment.

Keynes provides a solution for government to pull the economy out of recession .He believes that government can implement some policies that can positively affect the economy .In other words, Keynes believes that government should have bigger role in the economy .The economy cannot be left to the price adjustment mechanism which is powerless in his point of view. He states that waiting for eventual recovery is fruitless because in the long run we all dead.

The key concept of Keynesian analysis is" aggregate demand" which is affected by public and economic decision in both private and public level. The public decision includes both monetary and fiscal policy. According to Keynes, the aggregate demand has a short run effect on output, income and employment. During business cycle, active stabilization policy is the best way to cure the economy. During recession, government should run a deficit budget by increasing spending or cutting taxes. This will increase the individuals and businesses disposable income so, they will have more motivation to consumption and investment.

The Keynesian model is based on the assumption of price rigidity, excess capacity and the existence of a sizeable rate of unemployment. According to keynes, the aggregate demand, including fiscal policy can affect the output and employment.The total effect of fiscal policy depends on the magnitude of fiscal multiplier and the crowding-out effect(Mankiw 2000).An increase in government would increase the private income and investment and thereby increase the level of output Also, a tax cut would increase the disposable income of individuals the investment return for corporate, however, there is a crowding out effect of the expansionary effects of fiscal policy. The increase of government spending and tax cuts would force the government to borrow and this would increase the interest rate and decrease the private investment.

Keynesian point of view about the role of fiscal policy in enhancing economic growth faced crticism from many economists:

Firstly, increasing government spending and cut taxes would affect output negatively due to crowding out effect. According to (Gallawy and Vender,1998), Increasing government expenditure discourage households willing to invest .Also when government cut taxes and increase expenses , it will need to borrow from the market to cover this tax cut. This borrowing affects private investment negatively because it transfers funds from private sector to government and this will deprive both individuals and firms from using these funds to invest and consume.

Secondly, The continued expansion in government spending makes it too large and less productive , and that obstacles the growth rather than pursuing it.According to Sjöberg(2003), when government provides private goods such as food, there is no reason to expect the provision or allocation to be done more efficiently than market sector.Thirdly, there is a large probability that people save government transfers rather than spending it in goods and services .This obstacles economic growth rather than pushing it.

Finally, there are three time lags in fiscal policy implementation .first; there is a lag between the problem incidence and recognizing it from Government. Second, government needs some time to take the right decision. Third, the policy implementation effect takes some time to appear. These time lags make it difficult for government to use fiscal policy as a counter-cyclical instrument.

1.2.3 Fiscal policy in the neoclassical theory

In the neoclassical models, prices and wages are flexible, workers can adapt their expectations at the level where real prices equal to expected prices, there is a perfect competition and full employment in the market and the supply curve has a negative slope in the short run. The main implication from the aforementioned assumptions is that we cannot rely on fiscal policy for the stabilization of the economy. According to Lucas (1975), there is no effect of fully anticipated fiscal policy ether in the short run or in the long run, however, an unanticipated fiscal policy resulting from surprise of the government or imperfect information can affect the short – term growth. In other words, the fluctuations of the output occur as a result of supply side shocks and not because of aggregate demand shocks. Perotti (2007) suggests that fiscal expansion has a negative wealth effect on individuals because they reduce their private consumption and increase the labor supply in order to counterbalance the negative impact on their permanent income.

The non -Keynesian effects of fiscal policy

There are some non-Keynesian effects of fiscal policy arise from the neoclassical theory. According to Hemming et al. (2002), even though the neoclassical models emphasize on the supply side effects of fiscal policy, there are some demand side implications as follows:

Rational expectations

The assumption of rational expectations makes the distinction between temporary and permanent fiscal expansion more important. During fiscal expansion, if the households have rational expectations about the future, they will anticipate that interest rate will rise more in the future as the government will issue more debt to finance the increase in government spending or to compensate the tax cut, therefore the crowding out effect will become even larger (Krugman and Obstfeld, 1997).

The Ricardian equivalence

Mankiw (2000) states that Ricardian equivalence is the theory according to which forward-looking consumers can perfectly anticipate the future taxes implicit by government debt so that government debt today coupled with a future tax increase to compensate the debt has the same impact on the economy as a tax increase today. The neoclassical theory implies that there is a Ricardian equivalence between taxes and debt. Ricardian households are aware of the government's intertemporal budget constraint therefore they have the ability to anticipate that if the government makes a tax cut today, it will issue debt to finance it. This will lead to higher taxes in the future and eventually there will be no effect on the permanent income (Barro, 1975).

Consumption smoothing

The Ricardian equivalence behaviour will force the households not to spend the increase of their current income rather they will save it to face the tax increase in the future as their permanent income is unaffected.

Interest rate premier and creditability

When the government makes a fiscal expansion, it has to issue more dept to finance it. More debt will lead to an increase in the interest rate and that means the risk premia including inflation and default risk will also rise.

Uncertainty

The general environment of the economy can affect the mechanism of fiscal policy. During fiscal expansion, if there is uncertainty in the market, the individuals will tend to save the increase in their income rather than consuming it. Incorporate levels, firms will tend to delay their investment plans; therefore, private investment and consumption will decline and the expansionary fiscal policy will have a negative impact on growth instead of a positive impact (Caballero and Pyndick, 1996). And thus, uncertainty will counter- cycle the fiscal multiplier mechanism.

1.2.4. The New-Keynesian models

In the new Keynesian models (e.g. Leith and Thaden, 2008; Devereux, 1996.) a positive fiscal policy shock increases the aggregate. This will cause an increase in the labor demand. The real wage will increase and finally increase the consumption. Perotti (2007) divided the new Keynesian models into three categories as follows:

Countercyclical markups

According to Rotemberg and Woodford (1992), the main reason behind countercyclical markups is the existence of imperfect competition; therefore, both hours and real wages will increase as a result of an increase of government spending. During a positive demand shock, the output and marginal cost increase and the mark-up will fall because prices cannot adjust immediately. Ramey et al. (2013) states that in the New Keynesian model, sticky prices linked with procyclical marginal cost denote that an expansionary monetary shock or government spending shock boosts output by lowering the mark-up.

Nominal rigidities

According to Linnemann and Schabert (2003), a positive government shock increases the aggregate demand therefore, firms will increase the output as a reaction to the demand increase. The labor demand and real wages will increase in spite of the shift of labor supply.

Increasing returns

A positive government shock increases the productivity of goods sector through increasing the number of intermediate firms and despite the negative wealth effects on labor supply, the real wage will increase (Devereux, 1996).

2. PREVIOUS STUDIES OF FISCAL POLICY: METHODS USED AND EMPIRICAL RESULTS

Fiscal policy can have short-run and long- run impact on the economy. In the short run, fiscal policy can move the output from its potential level through affecting the demand of goods and service. In the long run, fiscal policy can affect the output by affecting the quantity and quality of labor force (Barro 1991). The recent literature can be divided into two groups: the first group depends on time series data and focus mainly on the short run. The second group depends on cross-section data and focuses on medium and long run relationship (Kneller and Misch, 2011).

This chapter discusses the results and conclusions of the previous studies related to fiscal policy and summarizes the findings. We will start our analysis with presenting the studies that focused on the impact of fiscal policy on the long-run growth rate, and then we will move to the studies that focused on the short-run impact of fiscal policy on output fluctuations.

2.1. Fiscal policy and long-run growth rate.

There is no clear answer for the question whether fiscal policy stifles or pursues long-term economic growth. There is a theoretical and empirical debate between economists regarding the answer to this question. Although endogenous growth theory (e.g. Barro 1990; Mendoza et al. 1997) supports the idea that fiscal policy has both permanent and temporary effect on economic growth, the empirical studies showed mixed results. Some studies focused mainly on government spending as a proxy of fiscal policy (e.g. Barro, 1991; Gwartney et al. 1998; Folster and Henrekson, 2000; Bajo-Rubbio, 2000; Gallaway and Vedder, 1998). The others focused on taxation as a proxy of fiscal policy (e.g. Easterly and Rebelo 1993; and Agell, Lindh, and Ohlsson 1997), while recent studies used a composition of government spending and taxation (e.g. Hervey et al. 2008; Folster and Henrekson, 2001).

Empirical studies reported different signs for the same variables. Some studies find a positive relationship between fiscal policy variables and economic growth, some studies found a negative relationship, while some studies reached inconclusive results. According to Benos

(2005), the reason behind that is the absence of acceptable theoretical framework to guide empirical studies.

Nijkamp (2004) explored the relationship between fiscal policy and economic growth using a meta –analysis of previous studies. He found that among 41 studies, only 17 percent showed a positive relationship. In contrast 29 percent of the studies showed a negative relationship while 54 percent showed inconclusive results. Kneller et al. (1999) indicated that there is prejudice in previous studies concerned to incomplete specification of the budget constraint of the government.

Bergh and Henrekson (2011) categorized the recent literature according to the methods used to examine the impact of fiscal policy on economic growth into four groups of studies:

- Early cross-country studies (e.g. Cameron,1982; Landau,1983; Agell et al.1997)
- Fixed effects panel studies (e.g. Fölster and Henrekson,2001; Afonso and Furceri, 2010)
- Disaggregation spending and tax revenues (e.g. Widmalm, 2001; Bergh and Öhrn, 2011)
- Bayesian average of classical estimates (e.g. Bergh and Karlsson ,2010)

2.1.1 Government spending and economic growth

In this section, the author will present some previous studies that focused mainly on government spending as a measure of fiscal policy. Some studies reported a positive relationship between government spending and Economic growth (e.g. Ram, 1986 ; Colombier, 2009). Some reported a negative relationship (e.g. Grier and Tullock, 1989; Alfonso and Furceri, 2010) while others reported inconclusive results (e.g. Durevall and Henrekson 2011; Levine and Renelt, 1992).

Cameron (1982) made a cross- country study for the period 1960- 1979.The study found a negative bivariate correlation between the percentages of GDP that government spends and the long run real growth rate. Landau (1983) made a cross- section study of over 100 countries for the period 1961-1976.The study found that there is a negative relationship between the share of government consumption expenditure in GDP and the growth rate of real GDP per capita. In contrast, Ram (1986) reported a positive influence of government size on economic

growth in a cross-section study of 115 countries by using a two-sector model for the period 1960-1980.

Alper and Demiral (2016) concluded that social expenditures including government spending on education, health and social expenditures significantly contribute to economic growth by using the feasible generalized least square (FGLS) estimators. The study depended on panel data from 18 OCED countries covering the period 2002-2013.

Volkov (1998) examined the long run and short run effects of government spending on economic growth using error correction model and data for 69 developing countries for the period 1970-1990. The sample includes 29 low incomes, 31 middle income low level and 9 middle income upper level developing countries. The study found that both total and current government spending have a significant impact on economic growth in the short run, however, government capital spending has a positive and statistically significant impact on economic growth.

Grier and Tullok (1989) made an empirical analysis of cross national economic growth using pooled cross -section data of 113 countries for the period 1951-1980.The study found that the growth of government consumption is negatively correlated with the economic growth in the long run. Barro (1991) reported a positive relationship between public investment and per capita growth. By contrast, he reported a positive relationship between government consumption expenditure and per capita growth, using cross-section data of 98 countries for the period 1960-1985.

Dar and AmirKhalkhali (2002) used random coefficients model and panel data for 19 OECD countries for the period 1971-1999.The study reported a significant negative effect of total government spending on economic growth. Nevertheless, when the study was divided into two periods, it showed no significant effects of total government spending on economic growth in 1990s.Wu et al. (2010) studied the long run impact of government spending on Economic growth using panel data of 182 countries for the period 1950-2004.The study found that government spending is helpful for the economy regardless the way of measuring economic growth and government size. The study reported a bidirectional causality between government activities and government growth.

Bose et al. (2007) examined the long run effect of government expenditure by using a panel of 30 countries for the period1970-1980.The study found that the share of government capital expenditure in GDP is positively and significantly correlated with GDP, however, the

share of government current expenditure is statistically insignificant. In addition, the study found that both government investment on education and the total expenditures in Education are significantly associated with economic growth when we take into account the budget constraint and omitted variables.

Alfonso and Fulcari (2010) examined the effects of government spending and revenue on economic growth in terms of size and volatility. The study reported that both government consumption expenditure and investment expenditure have a sizeable, negatively and statistically significant impact on Growth.

Alam et al. (2010) used panel data analysis to examine the long run relationship between social expenditure and economic growth in Asian developing countries, including Bangladesh, India, Indonesia, Korea, Pakistan, The Philippines, Singapore, Thailand, and Sri Lanka. The study found that expenditures in social sectors enhance economic growth through enhancing productivity.

Alsharani and Alsadiq (2014) examined the effects of different kinds of government spending on economic growth by applying vector error correction model and using annual time series data for the period 1969-2010.The study found that both private and public investment as well as government spending in healthcare pursue the growth in the long run while trade openness and spending in housing sector stimulate the growth in the short run.

Joharji and Star (2010) examined the short and long run relationship between government and non- oil GDP in Saudi Arabia using times series dates for the period 1969-2005 by applying co-integration approach and estimating vector error correction model(VECM). The study found that government spending has a positive and significant long-run effect on economic growth.

Acosta et al. (2012) examined the effects of public expenditure relocations on long- run growth using dynamic (GMM) estimator and panel date for the period 1970-2010 for 56 countries. The study found that an increase in education spending has a positive effect on economic growth. The study concluded that capital expenditure has a stronger impact on growth than current expenditure.

Baffes and Shah (1989) examined the composition of public spending and its implication for economic growth using time series data for 25 countries. The study concluded

that reshaping the priorities of public spending by giving more attention to economic growth might have a positive influence on economic growth.

Levene and Renult (1992) concluded that the share of government spending was negatively correlated with output growth rate. In contrast, Aschauer (1989) reported a positive impact of government capital expenditure on productivity growth. Devarajan et al. (1996) found no significant effect of total public spending on economic growth although the study found that economic growth is positively correlated with public consumption and negatively correlated with public investment. The study depended on data from 43 developing countries for the period 1970- 1990.

Engen, and Skinner (1992) found that a balanced -budget increase- in government spending and taxation reduces output growth rate, using data from 107 countries for the period 1970- 1995.In contrast, Eastrley and Rebelo (1993) found a strong and positive impact of investment in transportation and communication using cross-section data of 100 countries.

Al-Yousef (2000) found that the relationship between government size and economic growth depends on the used measure of government size. He reported a positive relationship between the size of government and economic growth if the size of government is measured as a percentage of change of government expenditure. In contrast, he reported a negative relationship if the size of government is measured as ratio of government spending to GDP.

Regarding the studies related to Egypt, Mansouri (2008) selected three North African countries including Egypt, Tunisia, and Morocco using annual data for the period 1975-2002 for Egypt, 1972-2002 for Tunisia, and 1975-2002 for Morocco. The study found that public investment has a positive effect on economic growth in the long-run for Egypt and Tunisia, and only in the short –run for Morocco. Also, the study found that Consumption expenditure has a negative effect on economic growth in short and long –run in Morocco and Tunisia. However, this impact is only in the short-run in Egypt. Abdel Fattah (2016) examined the relationship between fiscal space and economic growth using VAR model and annual data over the period 1982-2015.The results showed that economic growth responds positively to shocks from government investment spending and fiscal space. However, it responds negatively to a shock from government consumption spending.

2.1.2. Taxation and Economic Growth:

According to Halkos and Paizanos (2015), the impact of taxation on long-run growth rate is less ambiguous than the impact of government spending and it tends to be negative as it is reported in the majority of the studies.

On the connection between taxation and economic growth, some studies found a strong relationship (e.g. Skinner, 1987; King and Rabelo, 1990; Kneller and Sanz, 2011; Arnold, et al. 2011). Skinner (1987) concluded that sales and consumption taxes have a less negative impact on growth than income, import and corporate taxes, using pooled- cross section time series data for 31 Sub-Saharan countries for the period 1965-1982.

Dowrik (1992) found a strong negative impact of taxation on economic growth, however, he found that income taxes have no impact on economic growth. Arnold et al. (2011) by using annual data for 21 OECD countries for the period 1971-2004 and applying error correction model , found that moving the tax base from towards consumption and property would have a positive impact on economic growth.

Lee and Roger (2005) explored how tax policies can affect economic growth rates using regression model and depending on a cross- country data covering the period 1970- 1997.The study concluded that a cut in the corporate tax rate by 10 percent would raise the annual growth rate by one or to two percent, meaning that corporate taxes have a negative impact on economic growth.

On the contrast, some studies reported a weak relationship between taxation and growth (e.g. Esterly and Rabelo, 1993; Slemrod, 1995; Gemmel and Au, 2012; Agell, et al. 1997). Agell et al. (1997) found that there is no evidence of the existence of the relationship between grow and tax share, using a cross country regression from OECED countries.

Recent studies focused on long run effects of taxation on economic growth although they included both short and long run in the models they used. Acosta, et al. (2012) concluded that increasing consumption taxes while decreasing income taxes can affect economic growth positively. In addition, a shift from income taxes to property taxes has a strong and positive effect on growth. The study depended on a panel data of 69 countries for the period 1970-2009, and applied vector error correction model (VECM).

Gemmell et al. (2011) concluded that the distortionary taxes effect on GDP tended to be persistent in the sort run using panel data for 17 OECD countries for the period 1970 -2004 and applying error correction model. Abdon et al. (2014) examined the impact of changing in composition of taxation on the log run on economic growth. The study found that property taxes has a kinder impact on economic growth than direct taxes, using data for 13 developing Asian economies, 25 high income OECD economies and 33 economies from other regions, for the period 1970-2011.

Obreja and Braşoveanu (2008) examined the correlation between fiscal revenues and economic growth in Romania by applying Ordinary Least Square(OLS) method and using annual data over the period 1990-2007. The study concluded that there is a negative causality between fiscal revenues and economic growth.

Cashin (1995) reported a positive relationship between public investment, government spending and economic growth. In contrast, the study reported a negative relationship between distortionary taxes and economic growth busing a panel data for 23 developed countries for the period 1971-1988.

Poot (2000) made a survey of published articles during the period 1983-1998. He found that empirical studies support the idea of a negative relationship between taxation and growth while he found a positive relationship between spending in education and growth. Also he found that there is no conclusive evidence about the relationship between government spending and growth. Auteri and Costantini (2004) found that public investment has a positive impact on economic growth taking the 20 Italian regions as a case study by applying OLS estimators with cross- section dummy variables, using a standard growth model for the period 1970-1995.

Harvey et al. (2008) studied the relationship between fiscal policy and economic growth in Ghana, using time series data for the period1964-1998. The study found a positive relationship between government current expenditure, taxes on international trade and economic growth, while the study found a negative relationship between government capital expenditure and economic growth. Kneller et al. (1999) found that both distortionary taxes and current government expenditure stifle economic growth. In contrast, both government capital expenditure and non-distortionary taxes pursue economic growth, using panel data of 22 OECED countries for the period 1970-1995.

Osuala, and Jones (2014) found that both government current and capital expenditure have a positive and significant impact on economic growth. However, non- oil taxes and

government total debt have a no impact on economic growth. The study depended on time series data for the period 1986-2010 and took Nigeria as a case study.

2.1.3. Budget balance and economic growth

According to Adam and Bevan (2005), the effect of fiscal deficit relies on the initial size of the deficit and how the government will finance it. Particularly, deficit can enhance the growth if it is financed by seigniorage, and it can stifle the growth if it is financed by domestic debt. Alesina and Perotti (1996) examined how a composition of fiscal adjustments affects the long run deficit reduction using a sample of 20 OECD countries for the period 1960-1994 depending on Blanchard's measure and sensitivity analysis. The study found that fiscal adjustments which depend mainly on spending cuts on government transfers and wages have a better chance of being successful and have expansionary implications on the economy. Conversely, fiscal adjustments which depend mainly on tax increases and public investment cuts tend not to last and have Contractive implications on the economy.

Abo Shihab (2014) found a causal relationship between fiscal policy and economic growth in Jordan, using time series data for the period 200-2012. The study used the budget deficit as a proxy for fiscal policy stance. It concluded that economic growth causes fiscal policy and not vice versa. And finally, the study suggested that Jordanian government should focus on policies that support private investment in order to decrease the budget deficit.

Leibfritz et al. (1994) examined the implications of fiscal policy and government indebtedness on economic growth in OECD countries. The study suggested that the impact of fiscal policy on economic growth depends heavily on interest rates. The study found that an expansionary fiscal policy tends to increase both real and nominal interest rates would slowdown economic growth due to its adverse impact on the private sector confidence.

Gupta et al. (2002) concluded that fiscal consolidation doesn't have a harmful impact on economic growth for both short and long run. The study found also that fiscal adjustment which based on cutting current government expenditures is likely to have more positive effect on economic growth that those adjustments which depend on tax increases or capital expenditures cuts. Herd (1989) examined the impact of different fiscal policy scenarios on economic growth using data from 5 OECD countries. The study found that deficit reductions have positive effects on economic growth in the long run. A fall of government spending should increase the national savings and leads to a higher private sector investment that would

compensate the short run negative impact of the cuts of government spending on economic growth.

2.2. Fiscal policy and short-run output fluctuations

So far, there are no clear stylized facts regarding the impact of fiscal policy shocks (Perotti, 2007). IS-LM theory predicts that a positive shock to government spending will raise the consumption (Fragetta and Melina, 2010). In contrast, Neoclassical real business cycle theory suggests that a positive shock to government spending will have a positive effect on investment and negative effect on consumption and wages (Baxster and King, 1993). In literature, many studies tried to examine the short-term effects of fiscal policy on output using different econometric approaches. Caldara and Campus (2008) categorized these approaches into four different categories including; 1) Recursive approach (e.g. Sims, 1980; Fatas and Mihov,2001.), 2) Structural VAR approach (e.g. Blanchard and Perotti, 2002; Perotti, 2007; Fragetta and Melina, 2010.) ,3) Event-study approach (e.g. Ramey and Shapiro,1998; Ramey,2011; Edelberg et al.1999) and finally iv) Sign restrictions approach (e.g. Faust, 1998; Mountford and Uhlig, 2009).

Blanchard and Perotti (2002) examined the dynamic effects of government spending and taxes on economic activity in the US using quarterly data for the period 1957- 1997. By applying Structural vector autoregressive model (SVAR), the study found that there is a positive and significant effect of both positive spending shock and negative tax shock on GDP and consumption. However, the study found that private investment responds negatively to a government spending shock and positively to a tax shock.

Perotti (2004) applied the same methodology using 5 baseline VAR models for 5 OECD countries including the United States, Canada, Australia, the United Kingdom and Germany. Using quarterly data for the period 1960-2001, the study found that fiscal policy has a small effect on output. The effects of fiscal components are different between periods and between countries as well.

Fatas and Mihov (2001) used a five variables SVAR model and quarterly data for the period 1960-1996 to examine the short term impact of government spending on output in 20 OECD countries. The study found that a positive shock from government spending has a positive and persistent effect on output, consumption and employment. Gali et al. (2006) used a four variables VAR model for the US economy and quarterly data over the period 1954-

2003. The study reported a positive impact of government spending on output, consumption and labor supply. However, it reported a negative impact on private investment.

Caldara and Campus (2008) found that there is a strong dispute in the literature regarding both quantitative and qualitative effects of fiscal policy shocks. By applying VAR model and using quarterly data for the US over the period 1955- 2006, the study showed that real GDP, real consumption, real wage responds positively to a shock from government spending. In contrast, the study showed complex results regarding the effects of tax revenue.

De Castro (2010) used a five variables VAR model and quarterly data for the period 1980- 2001 to examine the macroeconomic effects of fiscal policy in Spain. The study found that fiscal shocks seem to have a small and significant effect on output, private consumption, private investment, interest rates and prices. However, the study showed insignificant response from output and interest rates to fiscal shocks when it was restricted to 1990s.

Using quarterly data over the period 1980-2001 for the four largest countries in the Euro Area (France, Germany, Spain, and Italy) and by imposing contemporaneous restrictions to include a wide set of macro variables in the VAR model, Marcellino (2002) found no homogenous response to fiscal policy shocks among the four countries. However, he found a positive impact of public investment on output in the case of Spain.

Von Hagen et al. (2001) used a panel of OECD countries to examine the effects of fiscal consolidation for the period 1973-1998.The study showed negative and significant effects of fiscal policy on output. In addition, the study concluded that in some countries the non-Keynesian effects have reimbursed the traditional Keynesian effects of fiscal policy on output.

Lozano and Rodriguez (2009) applied SVAR model by using quarterly data for the period in Colombia. The results of the study are consistent with the Keynesian theory and real business cycles models regarding the smoothing rule of fiscal policy on output fluctuations. Fragetta and Melina (2010) got the same results by applying the graphical model theory to examine the fiscal policy shocks in SVAR models of the US economy. Mountford and Uhlig (2008) applied sign restrictions approach to identify the effect of government shock as well as tax revenue shock in the US using quarterly data over the period 1955- . The study found that deficit financed by tax cuts is the best way to improve the output.

Vladimirov and Neicheva (2008) examined the stabilizing role of fiscal policy in Bulgaria using quarterly data for primary government spending and tax revenue for the period

1998-2004, and applying the Hodrick-Prescott filter (HP) with a smoothing parameter to isolate the endogenous changes from the discretionary movements of the budget's categories. The study found that both taxes and government spending have a negative impact on economic growth. This leads to conclude that budgetary expenditures have a non-Keynesian impact on economic growth.

Siwińska and Bujak (2003) concluded that households tend to behave in non-Keynesian way when the fiscal situation of the country is bad while the act in a Keynesian manner when the fiscal situation of the country is good. In addition, consumption function reacts in a linear way to fiscal policy changes. The study used VAR model and panel data from OECD countries over the period 1975-2001.

Chibi et al. (2014) examined the short term impact of fiscal policy on economic activity in Algeria by applying Markov Switching Vector Autoregressive (MSVAR) models and using quarterly data over the period 1970-2011. The study found that Firstly, there is an evidence of the existence of asymmetric effects of fiscal policy across the regimes. Secondly, there is a weak impact of both government spending and revenue on output. Thirdly, the impact of fiscal policy shocks in the times of economic stress is stronger than in the times of expansion. Finally, fiscal policy decision makers act in an anti-Keynesian manner.

Schalck (2007) applied Markov-Switching approach to examine the effects of fiscal policy shocks in four European countries including France, Germany, Netherlands, and Belgium. The results showed that the effects of fiscal policy shocks are different beyond countries and depend on the dominant regime. In Germany and Belgium, there are non-Keynesian effects of fiscal policy during expansion and anti-Keynesian effects during recession. Contrarily, Netherlands has non-Keynesian effects during recession and anti-Keynesian effects during expansion. And finally, France tends to keep Keynesian effects regardless the current regime.

On the other hand, Liyong and Gao (2011) concluded a non- linear effect of fiscal policy on private consumption in china. The results showed that both tax and investment expenditure has non-Keynesian effects on private consumption in the periods 1978- 1998 and 1984-1997.In addition, investment expenditure linear but asymmetric effects on private consumption.

Afonso and Souza (2009) used Bayesian structural VAR approach and recursive scheme to investigate the macroeconomic effects of fiscal policy in four advanced countries including the U.S., the U.K., Italy, and Germany during the period 1970:3-2007:4, in the case

of the U.S.; 1971:2-2007:4, in the case of the U.K.; 1986:2-2004:4, in the case of Italy; and 1979:2-2006:4, in the case of Germany. The results showed that government spending shocks have a small impact on GDP due to the crowding -out negative effects on housing prices, stock prices, and the real effective exchange rate. Government revenue shocks have a small and positive effect on both housing prices and stock prices.

Hoppner (2011) studied the effects of fiscal policy on output in Germany using structural VAR approach and quarterly data for the period 1970-2000. The findings showed that GDP responds negatively to tax shocks and positively to spending shocks. Furthermore, private consumption responds negatively to taxation shocks and positively to spending shocks.

Krusec (2001) examined the effects of government spending and tax shocks on GDP in EMU Countries including Austria, Finland, Germany and Italy. In addition, four non EMU countries including the U.S., the U.K., Australia, and Canada, using structural vector error correction (SVECM) model. The results showed that GDP responds positively to government spending shocks have insignificant impact on GDP. Kirsten et al. (2006) did the same analysis for Germany for the period 1974-2004 using structural VAR model. The results showed that direct government spending shock increases output and private consumption while it decreases private investment. Furthermore, tax revenue has no impact on output.

Saibu and Oladeji (2008) studied the openness and effects of fiscal and monetary shocks on real output in Nigeria by using vector error correction model (VECM) model and annual data for the period (1960-2003). The results showed that anticipated and unanticipated fiscal and monetary shocks have insignificant positive impact on real output.

Ocran (2011) studied the effects of fiscal policy shocks on output in South Africa using SVAR model and quarterly data for the period 1990-2008. The results showed that fiscal policy variables including government consumption spending, government investment spending, and net tax revenue and budget deficit have a small but persistent effects on real GDP. The direction of the effects was positive for shocks from budget deficit and tax revenue. Nevertheless, it was negative for the shocks from government spending. Contrary, Jouste et al. (2013) found that output responds positively to government spending and negatively to tax revenue in the short run.

Baum and Kester (2011) analyzed the effects of fiscal policy on economic activity over the business cycle in Germany by using threshold VAR model. The results showed that fiscal multiplier for both revenue and spending was 0.7 in a linear model. Nevertheless, when talking

into account the aspect of business cycle, the spending multiplier was around 0.36 in recession. Furthermore, they found deviate results regarding tax revenues whether in the phase of business cycle or in the type of the implemented business cycle.

Rukelj (2009) used structural vector error correction model (SVECM) to investigate the interactions between fiscal and monetary policy in Croatia. The study used monthly data of government spending, money aggregate demand (M1) and GDP. The results showed that the impact of both monetary and fiscal policy cannot be reached.

Depending on the analysis of literature review, we can conclude that the impact of fiscal policy on economic activity is inconclusive as different studies found different results for the same variables and even for the same country. The omitting of important factors that shape the relationship between government size and economic growth may lead to make this relationship ambiguous (Angelopoulos et al. 2008). Furthermore, the lack of theoritical models in the litratre that can analyse the ground of the relationship between fiscal policy, output and growth aspects such as the level of environmental degradation may be additional reason (Halkus and Piazanos, 2015).

3. EMPIRICAL ANALYSIS

The Egyptian economy has witnessed many changes and challenges in the last decades. It has been fighting against low productivity, high debt and low growth rates. Many policies have been implemented to improve the economic performance however, about 26 % of the Egyptians are living under the poverty level according to Egypt's central agency of public mobilization and statistics. Unfortunately, this percentage is expected to increase due to the effects political and economic disturbances after 2011 revolution. The current government is carrying out an economic reform plan with the cooperation of the international monetary fund (IMF). The main factors of this plan are cutting government spending, improving the tax system and floating the Egyptian currency (The Egyptian pound).

The macroeconomic indicators have witnessed many peaks and booms over the last decades. Although Egypt achieved a very high economic growth rate in 1976 (about 14.6 %), the growth rate decreased dramatically to be only about 1% in 1991, then it started to increase again after that until it reached 7.15 % in 2008. Due to the political and economic disturbances in addition to security threats, the growth rate dropped dramatically to reach 1.8 % in 2011. Since that time, the government tried to stabilize the economic and political situation. As a result, the growth rate started to increase until it reached 4.2% in 2015.The total government spending was 30.2 % of GDP in 2015. However, the total revenue was only 19.1 % of GDP for the same year. The net government domestic debt increased from 45.3% in 2001 to reach about 77% of GDP in 2014.

The government final consumption spending increased from 10.28 % of GDP in 1994 to 11.82 in 2015. The gross fixed capital formation reached 13.47 % of GDP. The government consumption expenditures contributed only in 3.1 % of GDP annual growth in 2015.The government investment spending contributed 1.2% of annual growth for the same period. The tax revenue as a percentage of GDP decreased from 23.10 % GDP in 1991 to reach only 12.59% GDP in 2015.The inflation Rate at consumer price index decreased from 12.1 % in 1985 to reach 10.3 % in 2015. The Real interest rate decreased from 5.4% in 1985 to reach only 0.61%

in 2015. This chapter presents the empirical part of the thesis including the data, the model specification and estimation as well as the main findings:

3.1. Data Issues

The aim of this thesis is to examine the short -run impact of fiscal policy components including tax revenue and government spending on real output in Egypt. To do so, we will use annual data for the period 1985- 2015 and will apply structural vector autoregressive (SVAR) model with impulse response function(IRF) tool. The data was collected from the world bank and central bank of Egypt. Due to the lack of data, the author used annual data instead of quarterly data. We can present the variables of the study with its definitions using table 1.

Table 1.Definition of variables

Varaible	**Diffinition**
GE	Government Spending on goods and services %GDP
INF	Inflation rate %
NTR	Tax revenue % GDP
LGDP	Log of Real gross domestic product
RIR	Real interest rate %

3.2. Methodology

At the first brief look, VAR seems to be simple multivariate generalizations of univariate autoregressive models. At the second glance, they turn to be one of the most important tools in modern macroeconomics (Del Negro and Schorfheide, 2011). In this thesis, we will estimate the impact of fiscal policy shocks on output depending on recursive SVAR approach used by Fatas and Mihov (2001) and developed by Caldara and campus (2008). We will start our analysis by estimating a 3 variables SVAR model including LRGDP, TR and GS, then we will extend our SVAR model to be a 5 variables SVAR model by adding RIR and INF. According to Caldara and Campus (2008), the first step is that we suppose the reduced form VAR model can be written as follows:

$$x_t = \mu_0 + \mu_1 t + A(l)x_{t-1} + u_t \qquad (1)$$

Where:

x_t denotes the $K-$ dimentional vector

μ_0 *is the constant*

t denotes the time trend

A(L) Denotes the lag polynomial

u_t Denotes a K-dimensional vector of the reduced form disturbances.

The second step is to transform the above reduced form VAR equation to a structural model by multiplying equation (1) by $(k \times k)$ matrix (A0)

$$A_0 X_t = A_0\mu_0 + A_0 \mu_1 t + A_0 A(L) X_{t-1} + Be_t \qquad (2)$$

Where:

$Be_t = A_0 u_t$ Denotes the relationship between reduced form disturbances u_t , and the structural disturbances e_t

A_0 Describes the contemporaneous restrictions among the variables collected in the vector X_t

The third step is to obtain the variance covariance matrix according to recursive approach by restricting B to a k – dimensional matrix and A_0 to a unit diagonal triangular matrix. Then we set the order of variables according to Cholesky ordering. To test the effects of government spending, we assume that spending does not react contemporaneously to shocks to other variables in the system (Caldara and campus, 2008) therefore, we will order the variables as follows: we start with government spending, then real GDP then taxes then inflation and finally real interest rate. When we test the effects of tax shocks, we assume that tax revenue does not react contemporaneously to shocks to other variables in the system, therefore we will order the variable as follows: taxes then real GDP then government spending then inflation and finally real interest rate.

3.3. Estimation of Model

3.3.1 Descriptive statistics

Table 2. Discriptive statistics

	LGDP	GE	TR	INF	RIR
Mean	11.99074	11.98625	15.27992	10.74929	3.287949
Median	11.99651	11.35099	14.61230	10.14580	2.944894
Maximum	12.25571	17.24013	19.40000	23.86429	11.99073
Minimum	11.72424	10.28571	12.40000	2.269757	-11.28948
Std. Dev.	0.170393	1.628129	2.015567	6.023537	4.938710
Skewness	0.037724	1.833818	0.725965	0.426354	-0.517275
Kurtosis	1.703212	6.213847	2.406393	2.253880	3.883858
Jarque-Bera	2.179496	30.71631	3.178107	1.658251	2.391518
Probability	0.336301	0.000000	0.204119	0.436431	0.302474
Sum	371.7128	371.5736	473.6776	333.2279	101.9264
Sum Sq. Dev.	0.871009	79.52412	121.8753	1088.490	731.7257
Observations	31	31	31	31	31

Source: Author calculations

Table 2 presents the average value of each variable. The mean, maximum and minimum number is presented above as well. For each variable, there are only 31 observations for the analysis. The Jarque-Bera statistics is used to test whether each variable has normal distribution or not. The null hypothesis for this test is that each variable has normal distribution. Looking at the probability of each of the variable, we can see that at 1% and 5% level of significance, except GE and TR all variables follow the normal distribution. At 10% level of significance, we can reject the null hypothesis that INF, REALGDP and RIR follows a normal distribution and accept the alternative hypothesis that they do not follow a normal distribution.

Appendix 6,7,8,9 and 10 present the correlogram for the five variables of interest. We are trying to test the auto covariance and autocorrelation structure in order to know whether they are moving average process, auto regressive process or a combination of both processes. The selected lags for the chronogram were 16 lags. Basically, the number of spikes of the partial autocorrelation (PAC) determines the order of the AR process with a geometrically decaying auto correlation. Also for a moving average process, the number of spikes of the AC determines the order of this process with a geometrically decaying PAC. When looking at the

chronogram of all the variables, we can see that there is a common trend of a decaying autocorrelation and a significant spike of the partial autocorrelation. Therefore, we can conclude that all the variables display an AR process of order one, that is, an AR (1) process.

The Ljung-Box Statistics, with its corresponding probability value, is a test statistic with null hypothesis of no autocorrelation for a specified order of autocorrelation lags. It can be concluded from the above figures that all the autocorrelation coefficients of all the variables are significant under this rule; the first PAC of LGD, INF, GE, TR and RIR are significant. Since the first ACFs of all the variables are highly significant, the Ljung Box joint test statistics rejects the null hypothesis of no autocorrelation at the 1%, 5% and 10% level of significance.

3.3.2 Unit root, stationary and co-integration test

Here we have to make sure that all our variables of interest are stationary. According to (Granger and Newbold, 1974), using non- stationary variables may cause a spurious regression or a fake relationship between the variables. The test criterion to be used for this shall be the **Augmented Dickey fuller** and it shall be at 5% level of significance. The null hypothesis is that there is a unit root in the variables and the alternate hyp**oth**esis is that the variables are stationary; meaning that past shocks will die out completely. The importance of this test is that the effect of past shocks won't last longer and would disappear completely. The choice criterion shall be the Schwarz information criterion.

Table 3. Augmented Dickey Fuller test.

VARIABLE	P-VALUE	UNIT ROOT	STATIONARY
levels			
REALGDP	0.9920	YES	NO
GE	0.0017	NO	YES
TR	0.0420	NO	YES
INF	0.2114	YES	NO
RIR	0.0312	NO	YES
First difference			
REALGDP	0.004	NO	YES
GE	0.0070	NO	YES
TR	0.0025	NO	YES
INF	0.0000	NO	YES
RIR	0.000	NO	YES
Second difference			
REALGDP	0.0010	NO	YES
GE	0.000	NO	YES
TR	0.000	NO	YES
INF	0.001	NO	YES
RIR	0.000	NO	YES

Source: Author calculations

From Table 3 above, we can see that the associated P-value of the ADF test at the levels, first difference, and second difference. For the levels, the P-Value of the ADF indicates that some of the variables have large values which are enough to not reject the null hypothesis of unit roots, while some of them do not at 5% level of significance. As such, some of the variables in levels have unit roots and are not stationary while some do not have unit roots and are stationary.

For the first difference part, we can see that the associated P-value of the ADF test for all the variables is so small to show that the null hypothesis of unit roots can be rejected because their p-values is zero or close to zero. As such for all these variables, we can reject the null hypothesis and accept the alternative hypothesis of being stationary.

Coming to the second difference Part, we can see that all the variables are stationary at second difference. The P-Value is adequately small enough to not accept the null hypothesis of the presence of unit roots and to not reject the alternate hypothesis of being stationary. At 1%, 5% and 10% level of significance, we can conclude that all the variables of interest for this analysis at second difference is stationary. In addition, one can observe from the table that GE, TR and RIR are integrated of order 0, that is, I (0). These set of variables do not need to be differenced before being integrated. INF and LGDP are integrated of order 1, which means that they have to be differenced once before they become stationary. The Durbin Watson statistics of the level, first difference and second difference data are close to 2 indicating that there is no autocorrelation in their error terms. In conclusion for this section on unit root, stationary and autocorrelation test, we can see from table 3 that all the variables completed all the conditions at the first and second difference evaluation.

Table 4. Lag selection criteria test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-238.5225451392362	NA	13.53677	16.79466	17.03040	16.86849
1	-92.29564362845896	231.9461*	0.003264*	8.434182*	9.848626*	8.877169*
2	-77.31641891884407	18.59490	0.007714	9.125270	11.71842	9.937412

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author calculations

Based on the lag selection criteria in table 4, the lower the value of the criteria to be selected, the better the model. All the criterias in this analysis are good enough to consider for the lag structure decision but for the sake of the thesis analysis, Schwarz information criterion will be used. This is because the criterion has been made use of while we analyzed the correlogram of the variables of analysis. The number of lags for this analysis will be 1 lag .

For our variables of interest , In order to be able to comply the Johansen test, it has to be non-stationary at levels and this was established in the unit root test section of the statistical analysis. Some variables were not stationary at levels . When we took the first difference of the variables, we found that they have no unit roots and are stationary at first difference and therefore we can run Johansen test of co-integration to determine the lag structure and the number of co-integrating equation(s) because all the variables are integrated of order 1. The Schwarz criteria select one lag to be used in estimating the VAR and the linear intercept trend shall be used as well. We can reject the null hypothesis of no cointegration among the variables at 5% level of significance. Therefore, we can conclude that there is co-integration among all the variables and we can estimate the VAR model.

Table 5. Johansen co-integration test.

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Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.708253	95.77108	69.81889	0.0001
At most 1 *	0.643941	60.04693	47.85613	0.0024
At most 2 *	0.532021	30.09980	29.79707	0.0461
At most 3	0.238186	8.079175	15.49471	0.4570
At most 4	0.006518	0.189638	3.841466	0.6632

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table .4. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.708253	35.72415	33.87687	0.0298
At most 1 *	0.643941	29.94713	27.58434	0.0244
At most 2 *	0.532021	22.02063	21.13162	0.0374
At most 3	0.238186	7.889537	14.26460	0.3900
At most 4	0.006518	0.189638	3.841466	0.6632

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author

Table 5 above shows that our variables of analysis are co-integrated, that is, there is long run association between them. Based on the trace test and the maximum eigenvalue test, the number of co-integrated equations specified is the same and we will have at the least minimum, 3 co-integrated equations. The null hypothesis of no co-integration is rejected from both tests, with a p-value of 0.001 for trace test and 0.0298 for maximum eigenvalue.

3.3.3. Impulse response functions

A three variables SVAR model

We will start our analysis by running impulse response function by using a three variables structural vector autoregressive (SVAR) model including GDP, tax revenue and real interest rate. Following the cholesky ordering, we will firstly test the response of taxation and GDP to a government spending shock therefore, the ordering will be as follows: Government spending then output then tax revenue. Secondly, we will test the response of GDP and government spending to a tax shock therefore, we will change the ordering of the variables to be as follows: we will start with tax revenue then output then government spending.

(A) Response to a government spending shock:

Figure1 shows the impulse response functions to a government spending shock. From the impulse responses above, we can see graphs showing the response of each variable to each other and to themselves. The impulse response test was conducted for 10 periods and since our data is annual in nature, we can say that it was conducted for a 10 years' period ahead. Looking at the response of LGDP to GE shock, we can see that LGDP responds negatively to a one standard deviation shock from GE starting from the first year until we reach the fifth year then becomes fairly constant until the tenth year. Looking at the second panel, one standard deviation shock government spending to itself produces a negative reaction starting from the first year until the end of the fifth year. For the third panel in the box, one standard deviation shock of government spending to tax revenue produces a negative but week reaction starting from the first year, however, instead of decreasing further, it becomes fairly constant from the fourth to the tenth year.

(B) Response to a taxation shock:

Figure 2 shows the response functions to a tax revenue shock. From the impulse responses above, we can see graphs showing the response of each variable to each other and to themselves. The impulse response test was conducted for 10 periods and since our data is annual in nature, we can say that it was conducted for a 10 years' period ahead. Looking at the response of LGDP to tax revenue shock, we can see that LGDP responds positively to a one standard deviation shock from tax revenue until the second year, however, it becomes fairly constant after that. Therefore, we can conclude that tax revenue shock has a negative but weak impact on output. Looking at the second panel, one standard deviation shock of tax revenue to government spending produces a fairly constant reaction. For the third panel in the box, one standard deviation shock of tax revenue to itself produces a negative reaction starting from the first year, however, instead of decreasing further, it becomes fairly constant from the second year to the tenth year.

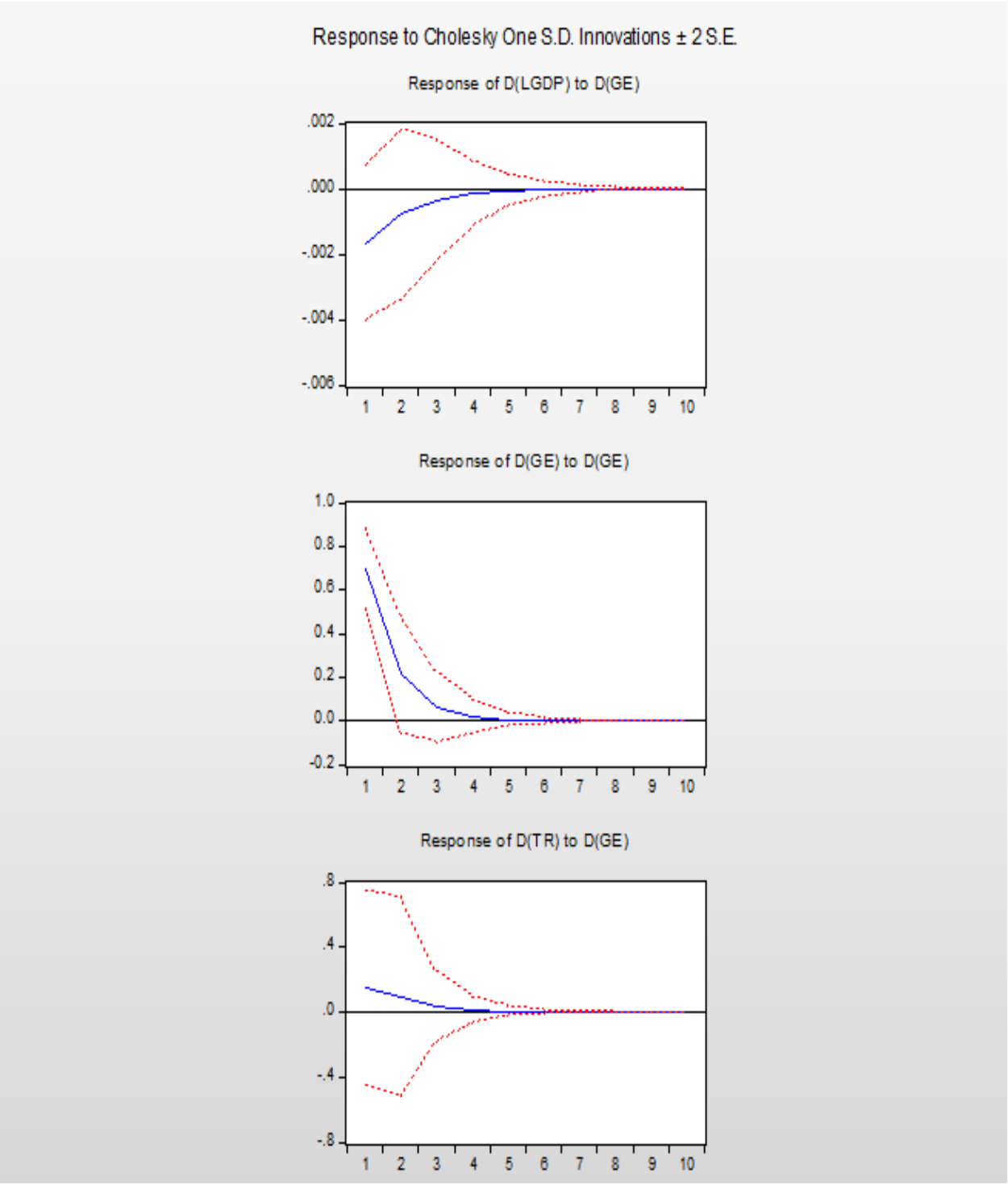


Figure 1. Response to a spending shock

Source: Author

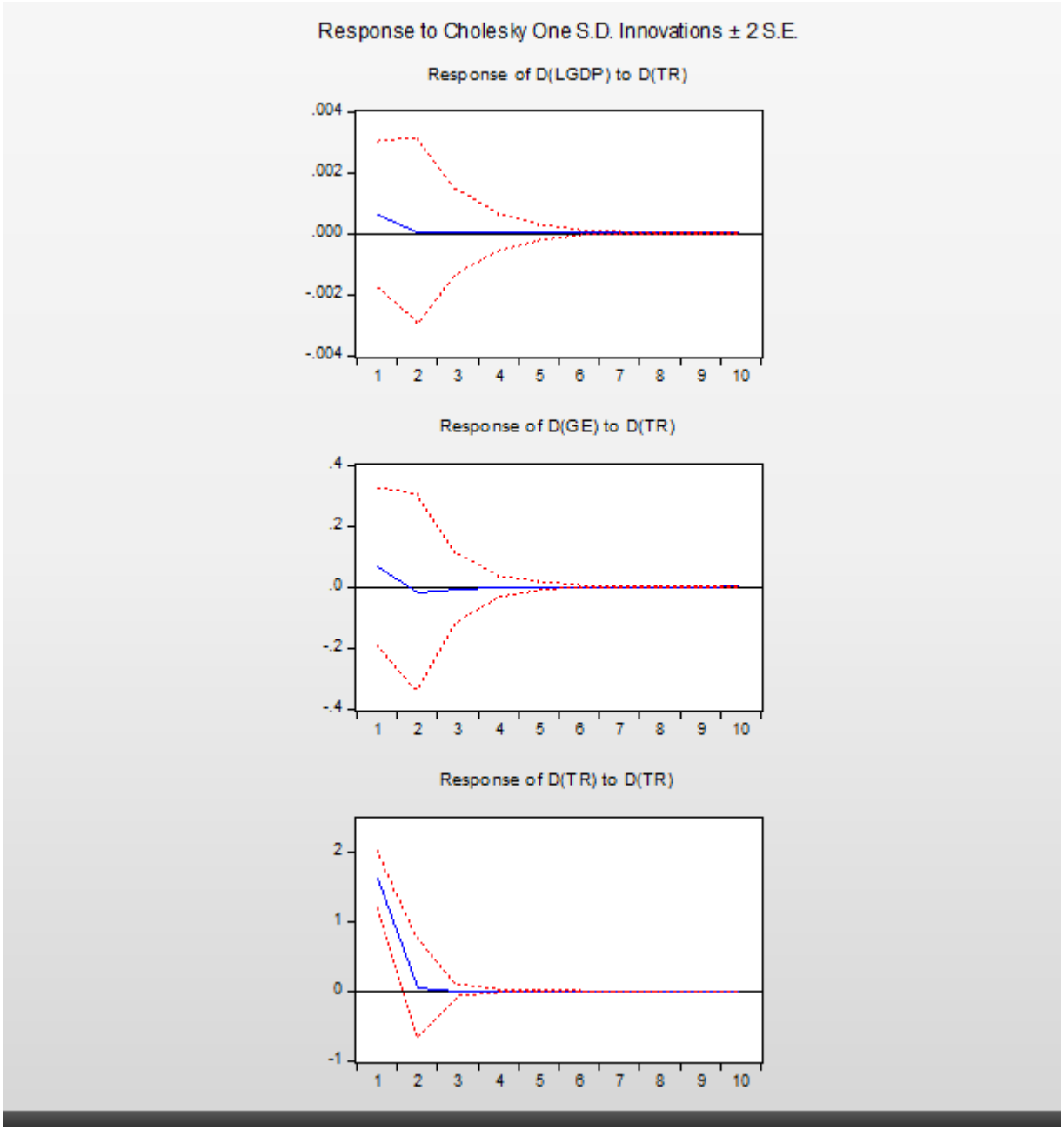


Figure 2. Response to a tax shock

Source: Author

A five variables VAR model

Here we will add two more variables to our baseline SVAR model including inflation rate and real interest rate. Firstly, we will test the response of the variables to a government spending shock. Following Caldara and Campos (2008), the ordering of the variables will be as follows; we start with government spending then GDP then tax revenue then inflation then real interest rate. Secondly we will test the response to a tax revenue shock by changing the

ordering of the variables to be as follow: we start with taxation then GDP then government spending then inflation then real interest rate.

(A) Response to a government spending shock:

Figure 3 shows the response functions to a government spending shock. From the impulse responses above, we can observe graphs showing the response of each variable to each other and to themselves. The impulse response test was conducted for 10 periods and since our data is annual in nature, we can say that it was conducted for a 10 years' period ahead. Looking at the response of LGDP to GE shock, we can see that LGDP responds negatively to a one standard deviation shock from GE. Looking at the second panel, one standard deviation shock government spending to itself produces a negative reaction starting from the first year until the end of the fifth year. For the third panel in the box, one standard deviation shock of government spending to tax revenue produces a positive but week reaction starting from the first year, however, instead of increasing further, it becomes fairly constant from the fourth to the tenth year. Looking at the fourth panel, the response of inflation to government spending produces a positive reaction starting from the first year to the third year however it becomes negative until the fourth year and finally, it becomes constant starting from the fourth year till the tenth year. Finally, the fifth panel indicates the reaction of real interest rate to a shock from government spending. A one standard deviation shock of government spending to real interest rate produces a negative reaction, however, it becomes positive after the second year until the fourth year, and after that it becomes constant.

(B) Response to a taxation shock

Figure 4 shows the response functions to a tax revenue shock. From the impulse responses above, we can observe graphs showing the response of each variable to each other and to themselves. The impulse response test was conducted for 10 periods and since our data is annual in nature, we can say that it was conducted for a 10 years' period ahead. Looking at the response of LGDP to tax revenue shock, we can see that LGDP responds positively to a one standard deviation shock from tax revenue until the second year, however, it becomes fairly constant after that. Therefore, we can conclude that tax revenue shock has a positive but weak impact on output. Looking at the second panel, one standard deviation shock of tax revenue to government spending produces a fairly constant reaction. For the third panel in the box, one standard deviation shock of tax revenue to itself produces a negative reaction starting from the first year, however, instead of decreasing further, it becomes fairly constant from the second

year to the tenth year. Looking at the fourth panel, the response of inflation to tax revenue produces no reaction in the whole period. In other words, tax revenue shock has no impact on inflation. Finally, the fifth panel indicates the reaction of real interest rate to a shock from tax revenue. A one standard deviation shock of tax revenue to real interest rate produces a negative reaction, however, it becomes positive after the second year until the third year, and after that it becomes constant.

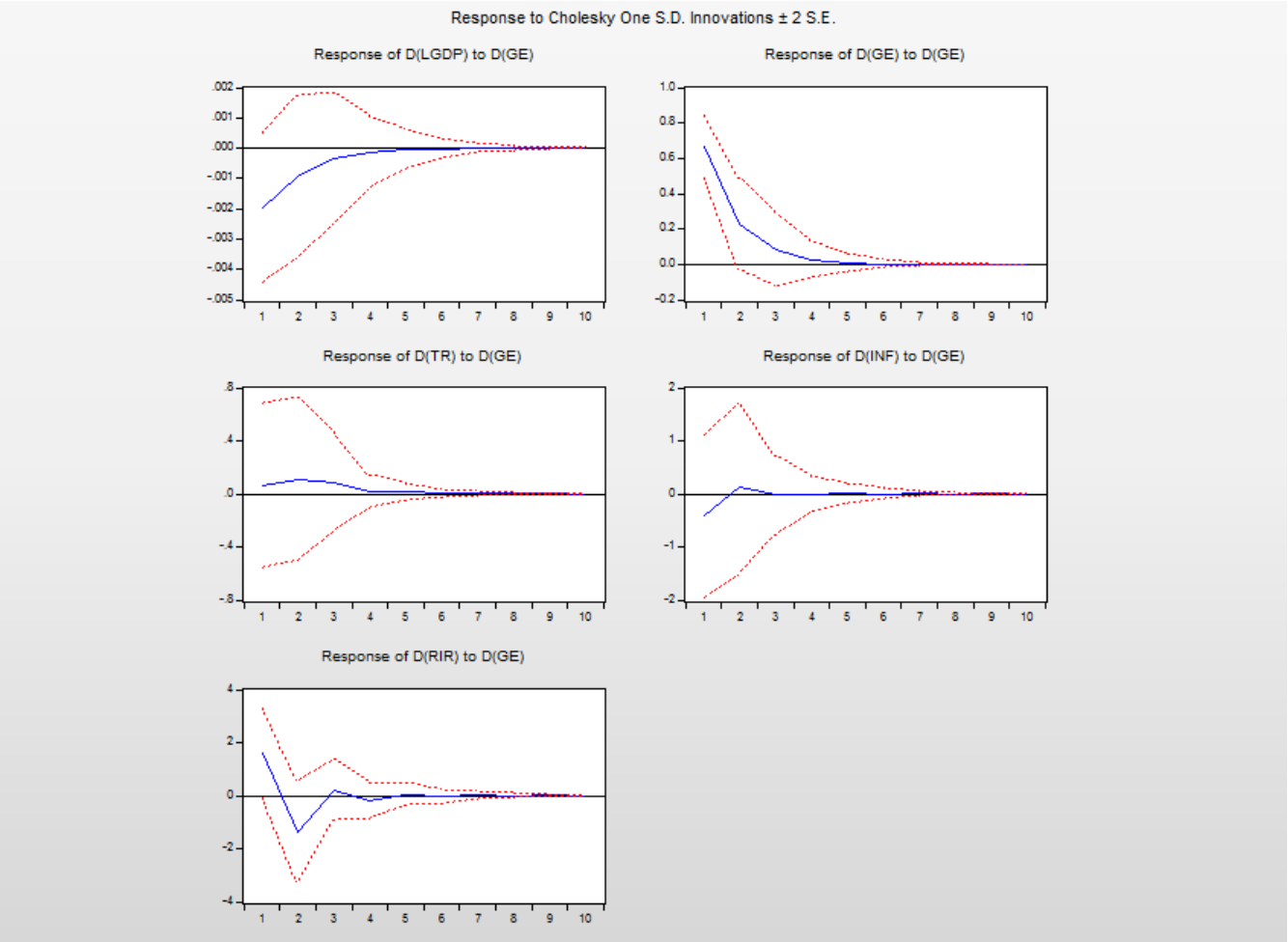


Figure 3. Response to a spending shock

Source: Author

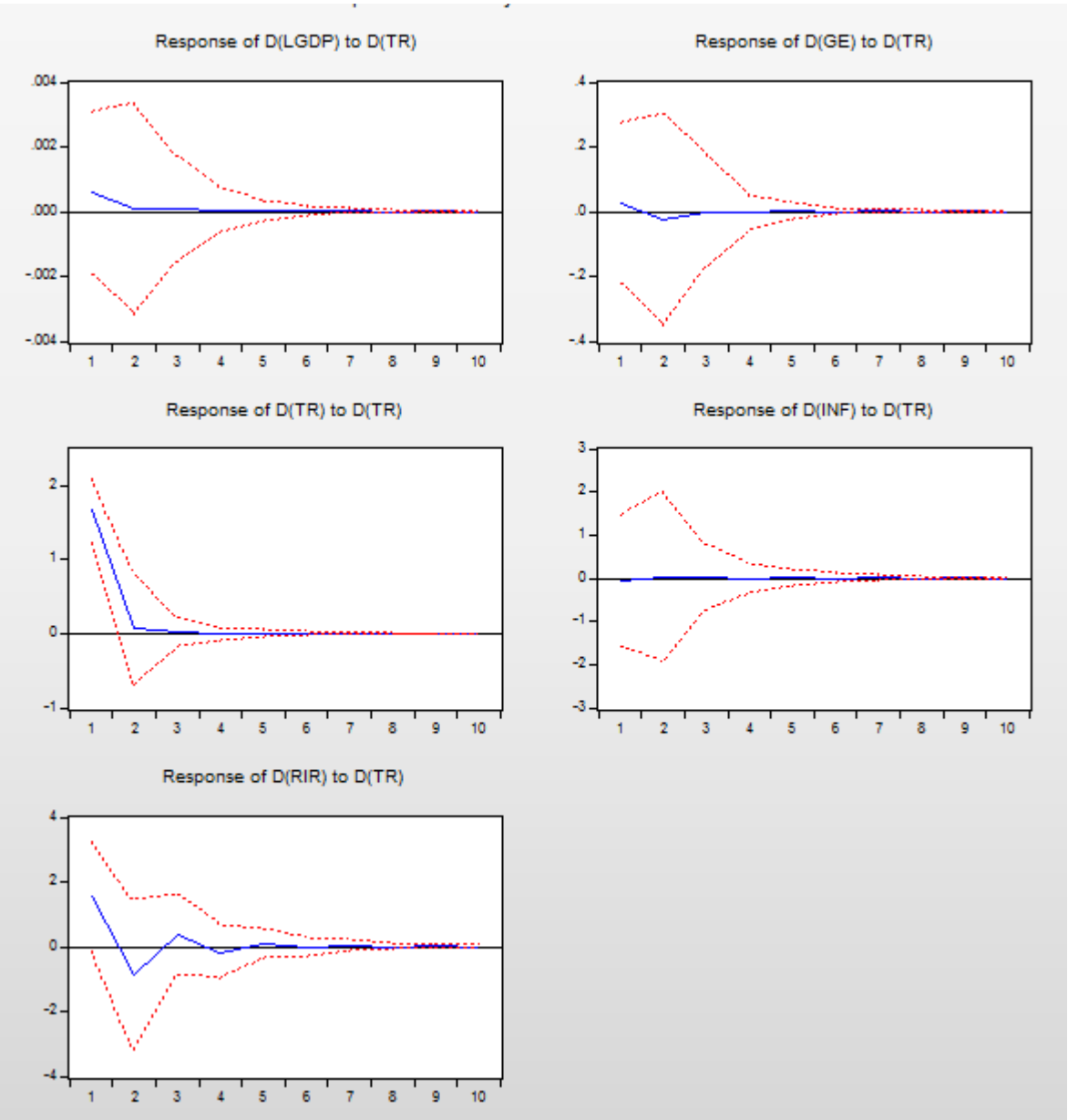


Figure 4. Response to a tax shock

Source: Author

CONCLUSION

Fiscal policy is the tools that governments use to influence the economy. The first tool of fiscal policy is taxation which presents the revenue side of the government's budget. The second tool of fiscal policy is government spending which presents the expenses side of government's budget.The debate between economists regarding the impact of fiscal policy on econmic activity is still unsolved so far. The aim of this master's thesis is to contribute in this debate by examining the effects of fiscal policy shocks including government spending and tax revenue on real output.The following research questions were formulated and answered:

1. H0: there is no relationship between government spending and real output.
   H1: there is a relationship between government spending and real output.
2. H0: there is no relationship between tax revenue and real output.
   H1: there is a relationship between tax revenue and real output.

To acheive this goal, the study applied structural vector autoregressive (SVAR) model following the recursive ordering approach used by Fatas and Mihov(2001) and developed by Caldara and Campus (2008).Due to the lack of quartely data , we used annual data for the period 1985-2015.Our basline model is a three variables SVAR model including log of real gross domestic product (GDP), government spending on goods and services , and total tax revenue.Furthermore, we extended our basline model to be a five variables SVAR model by adding real interest rates (RIR) and inflation rate (INF).

When we used a three variables SVAR model, the main findings of the thesis were that GDP responds negatively to a one standard deviation shock from GE starting from the first year until we reach the fifth year then becomes fairly constant until the tenth year. However, it responds positively to a one standard deviation shock from tax revenue until the second year, then, it becomes fairly constant after that. Therefore, we can conclude that tax revenue shock has a positive but weak impact on output. Nevertheless, the impulse response functions were statistically insignificant.

Furthermore, when we used a five variables SVAR model, the main findings were that GDP responds negatively to a one standard deviation shock from government spending. Meaning that government spending shock has a negative impact on output. The response of inflation to government spending produces a positive reaction starting from the first year to the third year however it becomes negative until the fourth year and finally, it becomes constant

starting from the fourth year till the tenth year. Finally, a one standard deviation shock of government spending to real interest rate produces a negative reaction, however, it becomes positive after the second year until the fourth year, and after that it becomes constant. Nevertheless, the impulse response functions were statistically insignificant.

In the light of the response of our variables to a tax shock, we can conclude that GDP responds positively to a one standard deviation shock from tax revenue until the second year, however, it becomes fairly constant after that. Therefore, we can conclude that tax revenue shock has a positive but weak impact on output. The response of inflation to tax revenue produces no reaction in the whole period. In other words, tax revenue shock has no impact on inflation. Finally, when looking at the reaction of real interest rate to a shock from tax revenue. A one standard deviation shock of tax revenue to real interest rate produces a negative reaction, however, it becomes positive after the second year until the third year, and after that it becomes constant. Nevertheless, the impulse response functions were statistically insignificant. The results of this thesis may imply that fiscal policy has no impact on output in the short run as the impulse response functions are statistically insignificant. This is maybe because of ineffective tax and government spending system or maybe this result is because pf the low quality of the data.

In conclusion, the author achieved the aim of the thesis as the study managed to show the existing relationship between fiscal policy tools (including government spending on goods and services and total tax revenue) and real gross domestic product (GDP). The main limitations of this thesis are the lack of quarterly data and using a small sample therefore, we recommend upcoming studies to use quarterly data and bigger sample.

REFERENCES

Abdel Fattah, E. (2016). The Impact of Fiscal Space on Economic Growth in Egypt. International Journal of Business and Social Science.. 7, No. 10.

Abdon, A., Estrada, G., Lee, M., Park, D. (2014). Fiscal Policy and Growth in Developing Asia. ADB Economics Working Paper Series. No. 412. Manila: Asian Development Bank.

Abo Shihab, R. (2014). The Causal Relationship between Fiscal Policy and Economic Growth in Jordan. International Journal of Business and Social Science, 5 (3).

Acosta-Ormaechea, S., Morozumi, A. (2013). Can a Government Enhance Long-Run Growth by Changing the Composition of Public Expenditure? IMF Working Paper 13/162. Washington, DC: International Monetary Fund.

Acosta-Ormaechea, S., Yoo, J. (2012). Tax Composition and Growth: A Broad Cross-country Perspective. IMF Working Paper 12/257. Washington, DC: International Monetary Fund.

Adam, C., Bevan, D.L. (2005). Fiscal Deficits and Growth in Developing Countries. Journal of Public Economics, 89, 571-597.

Afonso, A., Sousa, R. M. (2009). The macroeconomic effects of fiscal policy. ECB Working Paper Nº. 991.

Agell, J., Lindh, T., Ohlsson, H. (1997). Growth and the Public Sector: A Critical Review Essay. European Journal of Political Economy. 13 (1), 33–52.

Alam, S., Sultana, A., Butt, M.S. (2010). Do social expenditures promote economic growth? A multivariate panel co integration analysis for Asian countries. European Journal of Social Sciences, 14(1), 44-54.

Alesina, A., Perotti. R. (1996). Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects. Washington, DC: IMF. American Economic Review, 82, 942–963.

Alfonso, A., Furceri, D. (2010). Government Size, Composition, Volatility, and Economic Growth. European Journal of Political Economy, 26 (4),517–532.

Pereira,A., Roca-Sagalés, O. (2011). Long-term effects of fiscal policies in Portugal. Journal of Economic Studies, 38 Issue: 1, 114-127

Alper, F., Demiral, M. (2016), Public Social Expenditures and Economic Growth: Evidence from Selected OECD Countries, Research in World Economy, 7, No. 2.

Alshahrani, S., Alsadiq, A. (2014). Economic Growth and Government Spending in Saudi Arabia: An Empirical Investigation. IMF Working Paper WP/14/3.

Al-Yousif, Y. (2000). Do Government Expenditures Inhibit or Promote Economic Growth: Some Empirical Evidence from Saudi Arabia. The Indian Economic Journal, 48, 92-96.

Angelopoulos K., Philippopoulos A., Tsionas M. (2008). Does public sector efficiency matter? revisiting the relation between fiscal size and economic growth in a world sample. Public Choice, 137(1-2), 245-278.

Armey D. (1995). The Freedom Revolution, Regnery Publishing, Washington, DC.

Arnold, J. M., Brys, B., Heady, C., Johansson, A., Schwellnus, C., Vartia, L. (2011). Tax Policy for Economic Recovery and Growth. The Economic Journal, 121, F59–F80.

Auerbach, Y., Alan J. (2012). Measuring the Output Responses to Fiscal Policy. American Economic Journal: Economic Policy 4 (2), 1–27.

Autri, M., Costantini, M. (2004). Fiscal Policy and Economic Growth: The case of the Italian Regions. The review of regional studies, 34, 27-94.

Baffes, J., Shah, A. (1998). Productivity of Public Spending, Sectoral Allocation Choices and Economic Growth. Policy Research Department. The World Bank.

Baier S.L., Glomm, G. (2001). Long-run growth and welfare effects of public policies with distortionary taxation, Journal of Economic Dynamics and Control, 25(12), 2007-2042.

Bajo-Rubio, O. (2000). A further generalization of the Solow growth model: the role of the public sector, Economic Letters, 68, 79-84.

Barro, R. (1990) Government Spending in a Simple Model of Endogenous Growth. Journal of Political Economy. 98 (5), S103–S125.

Barro, R. J. (2001). Human Capital and Growth. American Economic Review, 91(2), 12-17.

Barro, Robert J. (1991). Economic Growth in a Cross-section of Countries. Quarterly Journal of Economics 106: 407-44.

Barro, R. J. (1975). Are Government Bonds Net Wealth? Journal of Political Economy, 82, 1095-1117.

Baum, A., Koester, J.B. (2011). The impact of fiscal policy on economic activity over the business cycle – evidence from a threshold VAR analysis. Deutsche Bundes bank Discussion Paper Series 1: Economic Studies. No 03/2011.

Baxter, M., King, R. (1993). Fiscal Policy in General Equilibrium. American Economic Review, 83, 315–334.

Benč, M. (2008). Analysis of Fiscal Policy Impacts of the Business Cycle. National Bank of Slovakia Working Paper, Bratislava, National Bank of Slovakia, 30.

Benos, N. (2005). Fiscal Policy and Economic Growth: Empirical Evidence from OECD Countries. University of Cyprus Department of Economics Working Paper, 1- 51.

Bergh, A., Henkerson, M. (2011). Government Size and Growth: A Survey and Interpretation of the Evidence. Journal of Economic Surveys. 25 (5), 872–897.

Bergh, A., Öhrn, N. (2011). Growth Effects of Fiscal Policies: A Critique of Colombier. Mimeo. Stockholm Research Institute of Industrial Economics.

Bergh, A., Karlsson, M. (2010). Government Size and Growth: Accounting for Economic Freedom and Globalization. Public Choice 142 (1–2), 195–213.

Blanchard O.J., Perotti R. (2002). An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output, Quarterly Journal of Economics, 117 (4), 1329-1368

Blinder, A. S., Solow, R. M. (2005). Does Fiscal Policy Matter? In: A. Bagchi, ed. Readings in Public Finance. New Delhi: Oxford University Press, 283-300.

Bose, N., Emranul, M., Osborn, D. (2007). Public Expenditure and Economic Growth: A Disaggregated Analysis for Developing Countries. The Manchester School. 75 (5), 533–556.

Cabaliero, R. J., Pyndick, R.S. (1996). Uncertainty, Investment, and Industry Evolution," International Economic Review, 37, 641-62.

Caldara, D. Kamps C. (2008). What are the Effects of Fiscal Policy Shocks? A VAR based Comparative Analysis. ECB Working Paper No. 877, European Central Bank, Frankfurt/Main.

Cameron, D. (1982). On the Limits of the Public Economy. Annals of the Academy of Political and Social Science 459 (1), 46–62.

Cashin, P. (1995). Government Spending, Taxes and Economic Growth; IMF Staff Papers ,42(2), 237-269.

Chibi, A., Benbouziane, M., Chekouri, S. (2014). The impact of fiscal policy on economic activity over the business cycle: An empirical investigation in the case of Algeria. Economic research forum. No.845.

Nekarda, C.J., Ramey, V. (2013). The Cyclical Behavior of the Price-Cost Markup. NBER Working Paper No. 19099.

Colombier, C. (2009). Growth Effects of Fiscal Policies: An Application of Robust Modified M-Estimator, Applied Economics, 41(7), 899–912.

Dar, A., AmirKhalkhali, S. (2002). Government Size, Factor Accumulation, and Economic Growth: Evidence from OECD Countries. Journal of Policy Modeling 24 (7–8), 679–692.

De Castro, F. (2006). The Macroeconomic Effects of Fiscal Policy in Spain. Documento de Trabajo, No. 0311, Banco de España.

Del Negro, M., Schorfheide, F. (2008). Bayesian Macroeconometrics. The Oxford Handbook of Bayesian Econometrics, 293–389.

Devarajan, S. Swaroop, V., Zou, H. (1996). The Composition of Public Expenditure and Economic Growth. Journal of Monetary Economics. 37 (2). 313–344.

Devereux, M.B., Head, A.C. Lapham, B.J. (1996). Monopolistic Competition, Increasing Returns, and the Effects of Government Spending. Journal of Money, Credit and Banking, 28(2), 233-254.

Dornbusch, R., Fischer, S. Startz, R. (1998). Macroeconomics. USA: The McGraw-Hill Companies, Inc.

Dowrick, S. (1992). Technological Catch Up and Diverging Incomes: Patterns of Economic Growth 1960 – 1988. Economic Journal Royal Economic Society, 102(412), 600 – 610.

Durevall, D.m., Henrekson, M. (2011). The Futile Quest for a Grand Explanation of Long-run Government Expenditure. Journal of Public Economics. 95 (7–8), 708–722.

Easterly, W., Rebelo, S. (1993). Marginal Income Tax Rates and Economic Growth in Developing Countries, European Economic Review, 37(2-3), 409-417.

Easterly, W., Rebelo, S. (1993). Fiscal Policy and Economic Growth: An Empirical Investigation. Journal of Monetary Economics, 32: 417 – 458.

Engen, Eric M., Skinner, J. (1992). Fiscal Policy and Economic Growth, Q NBER Working Paper No 4223.

Fat´as, A. Mihov, I. (2001). Government Size and Automatic Stabilizers: International and International Evidence. Journal of International Economics, 55, 3-28.

Faust J. (1998). The Robustness of Identified VAR Conclusions about Money. Carnegie-Rochester Conference Series on Public Policy, 49, 207-244.

Feldstein, M. (1974). Tax incidence in a growing economy with variable labor supply Quarterly Journal of Economics 88,551-73.

Folster S., Henrekson, M. (2001). Growth Effects of Government Expenditure and Taxation in Rich Countries, European Economic Review, 45 (8), 1501–1520.

Fragetta M., Melina, G. (2010). The Effects of Fiscal Shocks in SVAR Models: A Graphical Modelling Approach. Birkbeck Working Papers in Economics and Finance 1006, Birkbeck, Department of Economics, Mathematics & Statistics.

Galí, J., López, S. J., Vallés, J. (2006). Understanding the Effects of Government Spending on Consumption. Journal of the European Economic Association.

Gallaway, L., Vedder, R. (1998). Government Size and Economic Growth. Joint Economic Committee, Washington, DC.

Gemmell, N., Au, J. (2012). Government Size, Fiscal Policy and the Level and Growth of Output: A Review of Recent Evidence. Working Paper in Public Finance 10/12. Wellington: Victoria Business School.

Gemmell, N., Kneller, R., Sanz, I. (2011). The Timing and Persistence of Fiscal Policy Impacts on Growth: Evidence from OECD Countries. Economic Journal. 121 (550), F33–F58.

Halkos, G., Paizanos, A. (2015). Fiscal policy and economic performance: A review of the theoretical and empirical literature. MPRA Paper No. 67737, posted 9.

Giordano R., Momigliano, S., Neri S., Perotti. R. (2005). The Effects on the Economy of Shocks to Different Government Expenditures Items: Estimates with a SVAR Model", Paper presented at the 7th Workshop on Public Finance, Banca d'Italia.

Granger, C., Newbold, P. (1974). Spurious regressions in econometrics. Journal of Econometrics, 2, 111-120.

Grier, K., Tullock, G. (1989). An Empirical Analysis of Cross-National Economic Growth, 1951-80, Journal of Monetary Economics. 24, 259-276.

Gupta, S., B. Clements, E., Mulas, G. C. (2002). Expenditure Composition, Fiscal Adjustment, and Growth in Low-Income Countries. Washington, DC: IMF.

Gwartney J., Lawson R., Holcombe R. (1998). The size and functions of government and economic growth, Joint Economic Committee, Washington, D.C., April.

Hemming, R., Kell, M., Mahfouz, S. (2002). The effectiveness of fiscal policy in stimulating economic activity: a review of the literature. IMF Working Paper 02/208, Washington D.C.: International Monetary Fund.

Heppke F. K., Tenhofen, J., Wolff, G. (2006). The macroeconomic effects of exogenous fiscal policy shocks in Germany: a disaggregated SVAR analysis. Discussion Paper Series 1: Economic Studies No 41.

Herd, R. (1989). The Impact of Increased Government Saving on the Economy. Paris: OECD.

Hervey, S., Fiador, V., Hagan, E. (2008). Fiscal policy, private investment and economic growth: The case of Ghana. Studies in Economics and Finance, 25, 2.

Höppner, F. (2001). A VAR Analysis of the Effects of Fiscal Policy in Germany. Institute for International Economics, University of Bonn.

International Monetary Fund (IMF). (2015). Fiscal Policy and Long-term Growth, IMF Policy Paper.

Joharji, G.A., Starr, M. (2010). Fiscal policy and growth in Saudi Arabia. Review of Middle East Economics and Finance.

Jones C. (2001). Introduction to Economic Growth (Second Edition), W. W. Norton & Company.

Jooste, c., liu, G., Naraidoo, R. (2013). Analyzing the effects of fiscal policy shocks in the South African economy. ERSA working paper 351.

Kakar, Z. K. (2011). Impact of Fiscal Variables on Economic Development of Pakistan. Romanian Journal of Fiscal Policy, 2(2), 1-10.

King, R., Rebelo, S. (1990). Public Policy and Economic Growth: Developing Neoclassical Implications. Journal of Political Economy, 98(5), 126–150.

Kirzner, I. (1979). Perception, Opportunity, and Entrepreneurship. Chicago: University of Chicago Press.

Kneller, R., Misch, F. (2011). What Does Ex-post Evidence Tell Us about the Output Effects of Future Tax Reforms? Mannheim: Centre for European Economic Research.

Kneller, R., Bleaney, M.F., Gemmell, N. (1999). Public Policy and the Government Budget Constraint: Evidence from the OECD. Journal of Public Economics, Vol. 74, 171-190.

Krugman, P. R., Obstfeld, M. (1997). International Economics: Theory and Policy, 4th ed. (Reading, Massachusetts: Addison-Wesley).

Krusec, D. (2003). The Effects of Fiscal Policy on Output in a Structural VEC Model framework: The Case of Four EMU and Four Non-EMU OECD Countries. European University Institute, Florence, mimeo.

Landau, D. (1983). Government Expenditure and Economic Growth: A Cross-section Study," Southern Economic Journal 49, 783-92.

Lee, Y.M., Roger, H. (2005). Tax structure and economic growth, Journal of Public Economics, Vol 89, 1027–1043.

Leibfritz, W., Roseveare, D., van den Noord, P. (1994). Fiscal Policy, Government Debt and Economic Performance. Paris: OECD.

Leith, C., Von Thaden, L. (2008). Monetary and Fiscal Policy Interactions in a New Keynesian Model with Capital Accumulation and Non-Ricardian Consumers," Journal of Economic Theory, 140, 279—313.

Levine, R., Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions, American Economic Review, 82, 942- 963.

Linnemann, L., Schabert, A. (2003). Fiscal Policy in the New Neoclassical Synthesis. Journal of Money Credit and Banking, 35(6), 911-929.

Linnemann, L (2006). The effect of Government Spending on Private Consumption: A Puzzle? Journal of Money, Credit, and Banking 38 (7): 1715-1736.

Liyong, W., Gao, W. (2011). Nonlinear Effects of Fiscal Policy on Private Consumption: Evidence from China." China & World Economy 19(2), 60-76.

Lopez R., Thomas V., Wang Y. (2010). The Quality of Growth: Fiscal Policies for Better Results, IEG World Bank.

Lozano, I., Toro, J. (2007). Fiscal Policy throughout the Cycle: The Colombian Experience. Borradores de Economía, No. 434, Banco de la República.

Lucas, R. (1975). an Equilibrium Model of the Business Cycle. Journal of Political Economy, 83, 113-44.

Mahaphan, K. (2013). Fiscal policy and macroeconomic variables: The case of Thailand, PhD Thesis, Lincoln University, New Zealand.

Mankiw G. (2000). Macroeconomics, 4th edition.

Mansouri, B. (2008). Fiscal Policy and Economic Growth: Egypt, Morocco and Tunisia Compared. Proceeding in UNECA Conference on: Macroeconomic Policy, Productive Capacity and Economic Growth in Africa. Addis Ababa, 23-25 November.

Marcellino, M. (2002). Some Stylized Facts on Non-systematic Fiscal Policy in the Euro Area. Discussion Paper, No. 3635, Center for Economic Policy Research.

Mirdala, R. (2009). Effects of fiscal policy shocks in the European transition economies. Journal of Applied Research in Finance, 2,141-55.

Mountford, A., Uhlig, H. (2009). What are the Effects of Fiscal Policy Shocks? Journal of Applied Econometrics, 24, 960-992.

Nijkamp, P., Poot, J. (2004). Meta-Analysis of the Effect of Fiscal Policies on Long-Run Growth, European Journal of Political Economy, 20, 91-124

Obreja, B., Braşoveanu, I. (2008). The Correlation between Fiscal Policy and Economic Growth, Theoretical and Applied Economics, 7(524) 19-26.

Ocran, M. (2011). Fiscal policy and economic growth in South Africa, Journal of Economic Studies, 38, 604-618.

Organization for Economic Co-operation and Development (OECD). (2011). The Impact of the 1999 Education Reform in Poland, OECD Education Working Papers, No. 49.

Osuala, A., Jones, E. (2014). Empirical analysis of the impact of fiscal policy on economic growth of Nigeria. International journal of economics and finance. - Toronto, 6, 203-211.

Perotti, R. (2007). In Search of the Transmission Mechanism of Fiscal policy. NBER Macroeconomics Annual, 22, 169-226.

Perotti, R. (2004). Estimating the Effects of Fiscal Policy in OECD Countries. mimeo, Bocconi University.

Poot, J. (2000). A synthesis of empirical research on the impact of government on long-run growth", A journal of Urban and Regional Policy, 31, 516–546

Ram, R. (1986). Government Size and Economic Growth: A New Framework and some Evidence from Cross-section and Time-series Data. American Economic Review ,76, 191-203.

Ramey, V.A. (2011). Can Government Purchases Stimulate the Economy? Journal of Economic Literature, American Economic Association, 49 (3), 673-85.

Rebelo, S. (1991). Long-Run Policy Analysis and Long-Run Growth, Journal of Political Economy, 99(3), 500-521.

Reichling, F. Whalen, C. (2012). Assessing the short-term effects on output of changes in federal fiscal policies Working Paper No. 2012-08. Congressional Budget Office, Washington, DC.

Romer, P.M. (1986). Increasing Returns and Long-Run Growth, Journal of Political Economy, 94, 1002-1037.

Rotemberg, J., Woodford, M. (1999). The Cyclical Behavior of Prices and Costs. In Handbook of Macroeconomics, 1051–135.

Rukelj, D. (2009). Modelling Fiscal and Monetary Policy Interactions in Croatia Using Structural Vector Error Correction Model. Privredna kretanja iekonomska politika, 121, 27-58.

Saibu, M.O., Oladeji, S.I. (2008). Openness and the Effects of Fiscal and Monetary Policy Shocks on Real Output in Nigeria. African Development Review, 20, 529–548.

Sanchez-Robles, B. (1998). Infrastructure Investment and Growth: Some Empirical Evidence, Contemporary Economic Policy, 16 (1), 98–108.

Schalck, C. (2007). Effects of Fiscal Policies in Four European Countries: A Non-linear Structural VAR Approach. Economics Bulletin, 5(22),1-7.

Simon, V. Harvey, E. Hagan, E. (2008). Fiscal policy, private investment and economic growth: the case of Ghana, Studies in Economics and Finance, 25(2), 112 – 130.

Sims, C.A. (1980). Macroeconomics and Reality. Econometrica 48 (1),1.48.

Siwińska, J., Bujak, P. (2003). Short-run Macroeconomic Effects of Discretionary Fiscal Policy Changes." Studies &Analyses. No. 261.Warsaw, Poland: Center for Social and Economic Research.

Sjöberg, P. (2003). Government Expenditures on Economic Growth: The Case of Sweden, Luleal University, Luleal.

Skinner, J. (1987). Taxation and Output Growth: Evidence from African Countries. NBER Working Paper Series No. 2335. Cambridge, MA: National Bureau of Economic Research.

Slemrod, J. (1995). What Do Cross-country Studies Teach about Government Involvement, Prosperity, and Economic Growth? Brookings Papers on Economic Activity. 2, 373–431.

Soli, V., Harvey, K., Hagan, E. (2008). Fiscal policy, private investment and economic growth: the case of Ghana.Studies in Economics and Finance, 25 (2), 112 – 130.

Vladimirov, V., Neicheva M. (2008). The Stabilizing Role of Fiscal Policy: Theoretical Background and Empirical Evidence, IBSU Scientific Journal, 2(1), 7–22.

Volkov, A. (2008). Long Run and Short Run Effects of Government Expenditures on Economic Growth: Are there Lessons for Ukraine? Kyiv, The master research paper.

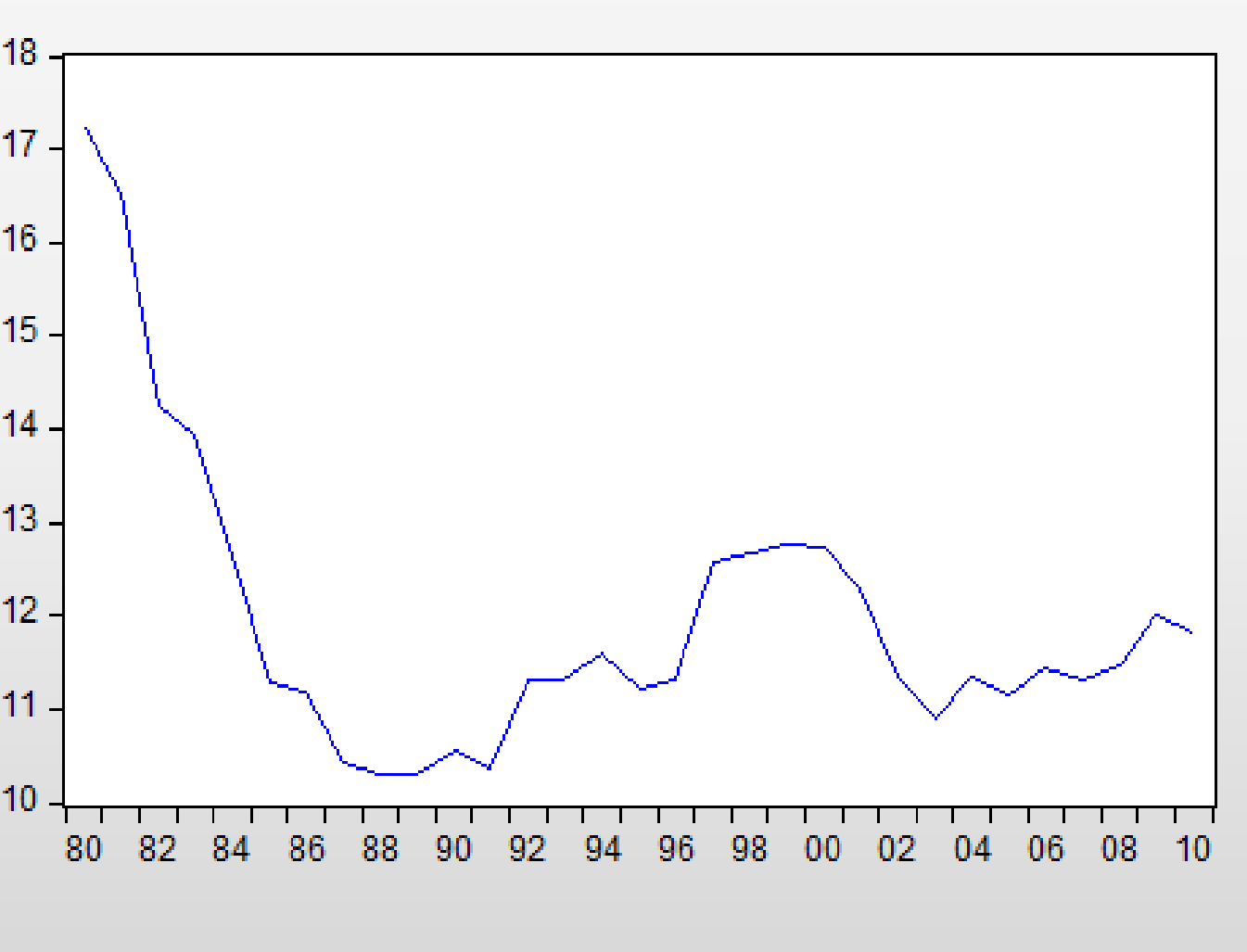
Von Hagen, J., Huges Hallet, A., Strauch, H. (2001). Budgetary Consolidation in EMU", European Communities, Economic Papers 148.

Widmalm, F. (2001). Tax Structure and Growth: Are Some Taxes Better than Others? Public Choice 107 (3–4), 199–219.

Wu, S., Tang J., Lin, E. (2010). The Impact of Government Expenditure on Economic Growth: How Sensitive to the Level of Development. Journal of Policy Modeling, 32 (6), 804–817.

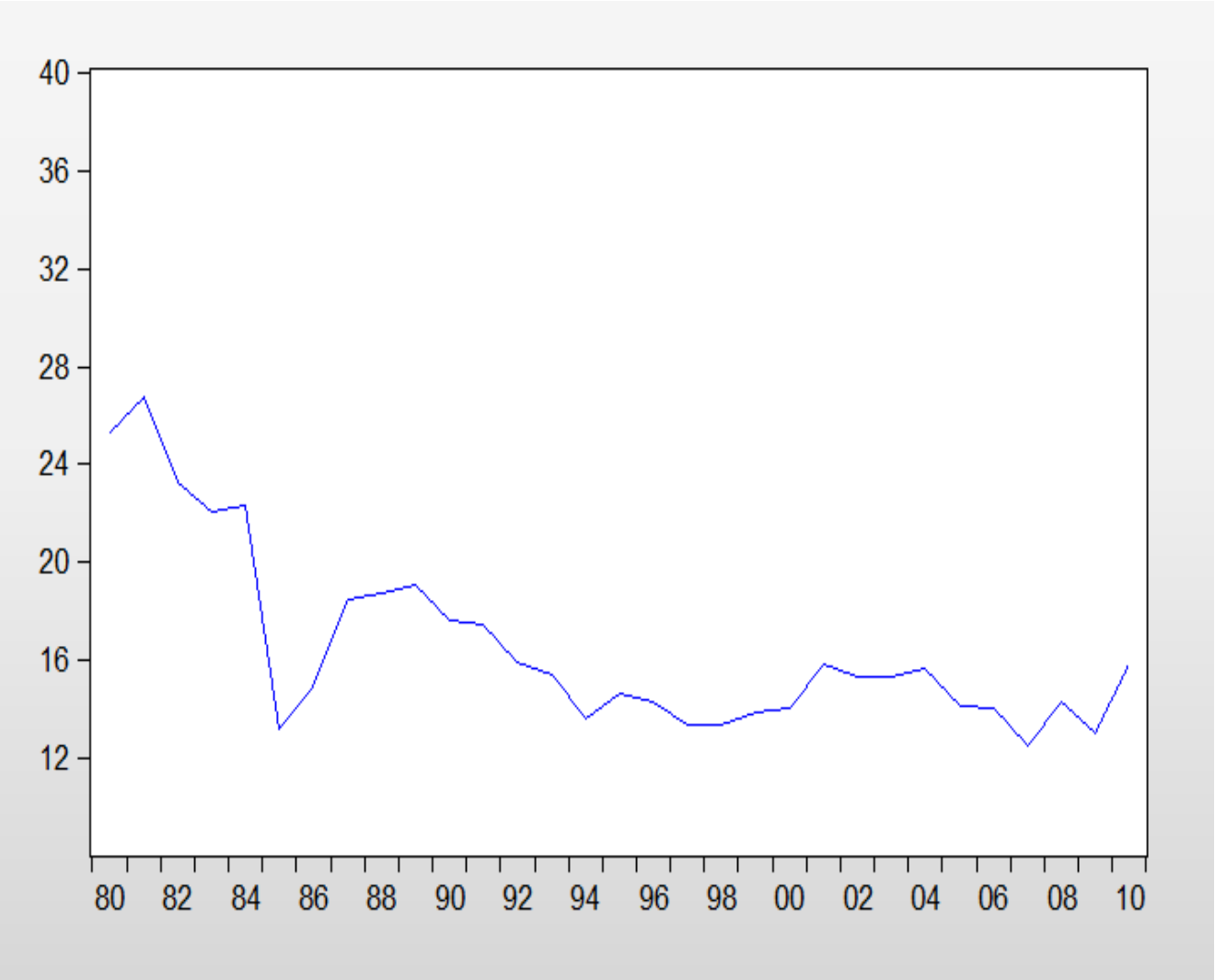
APPENDIXES

Appendix1. Government spending % GDP



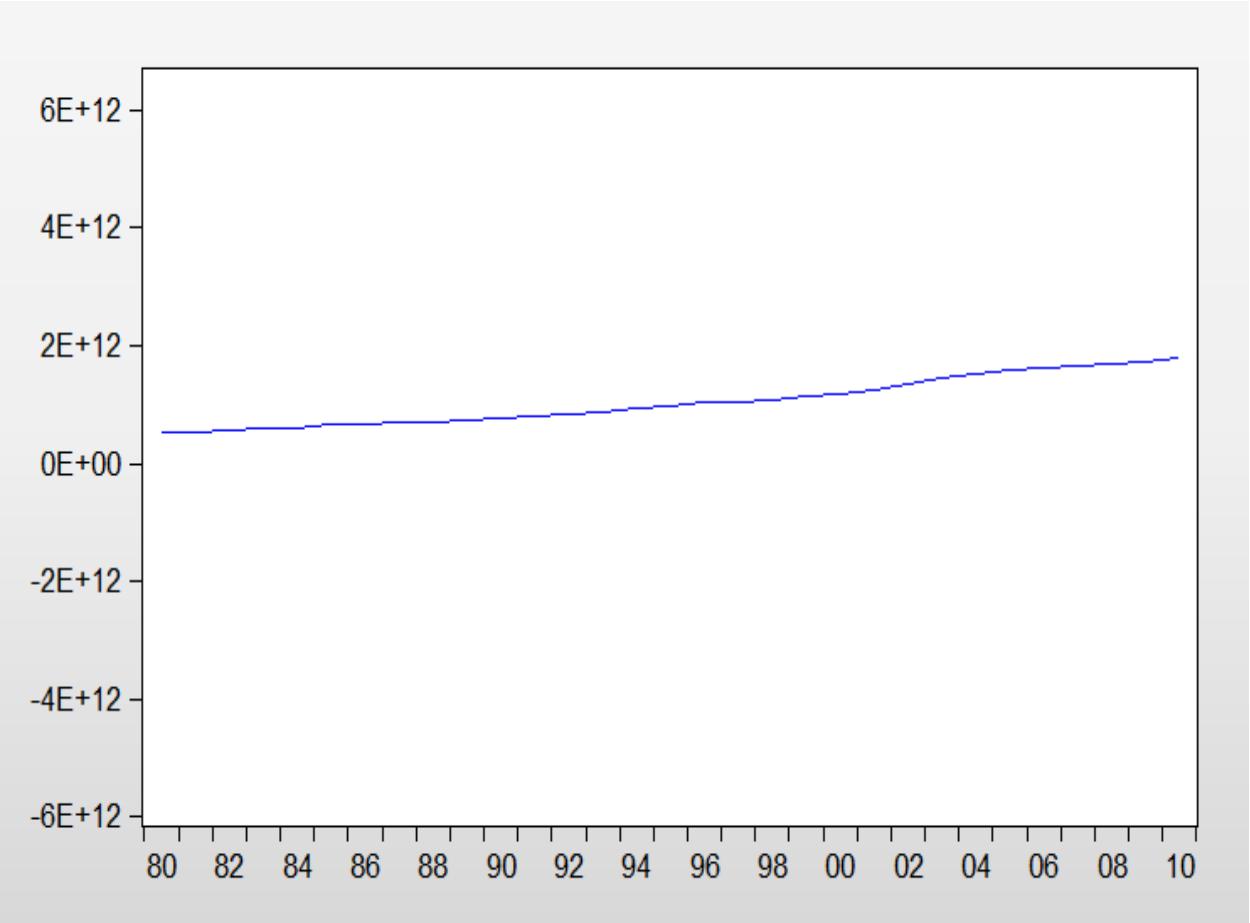
Source: Author

Appendix 2. Tax revenue % GDP



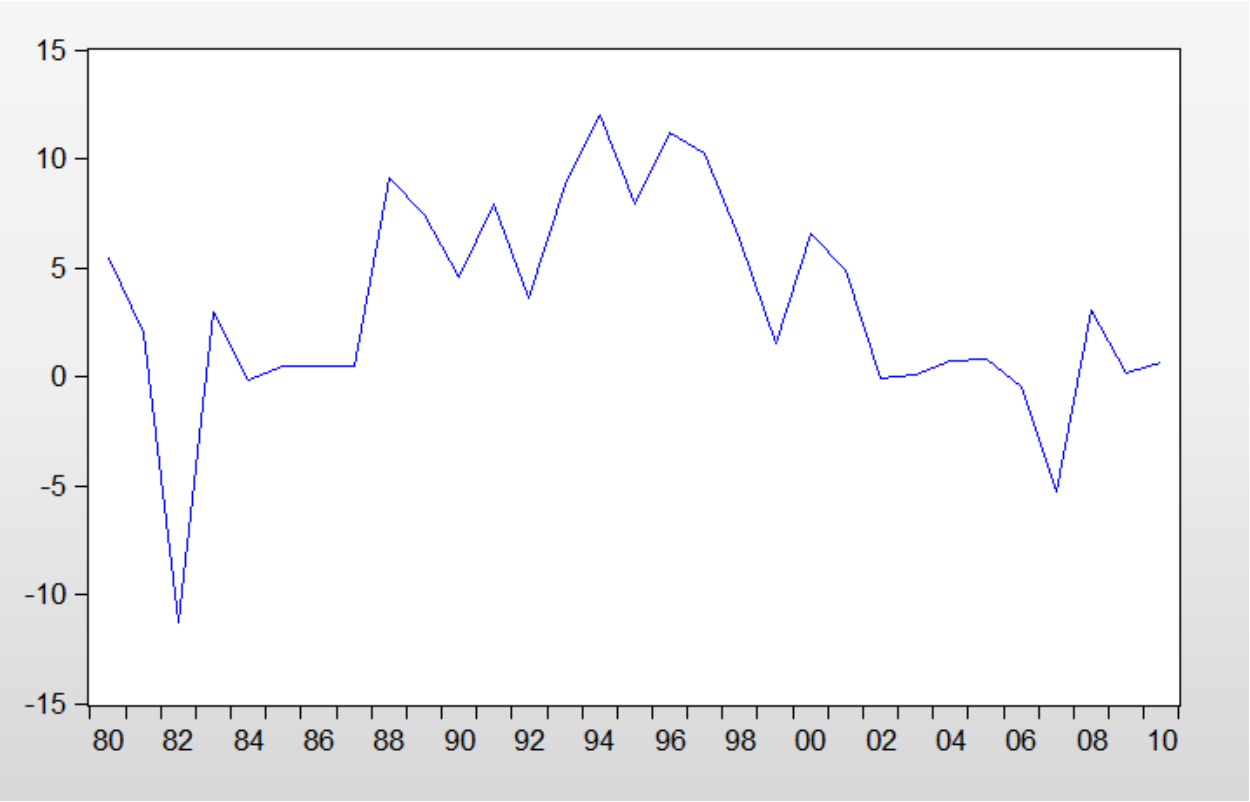
Source: Author

Appendix 3. Real GDP.



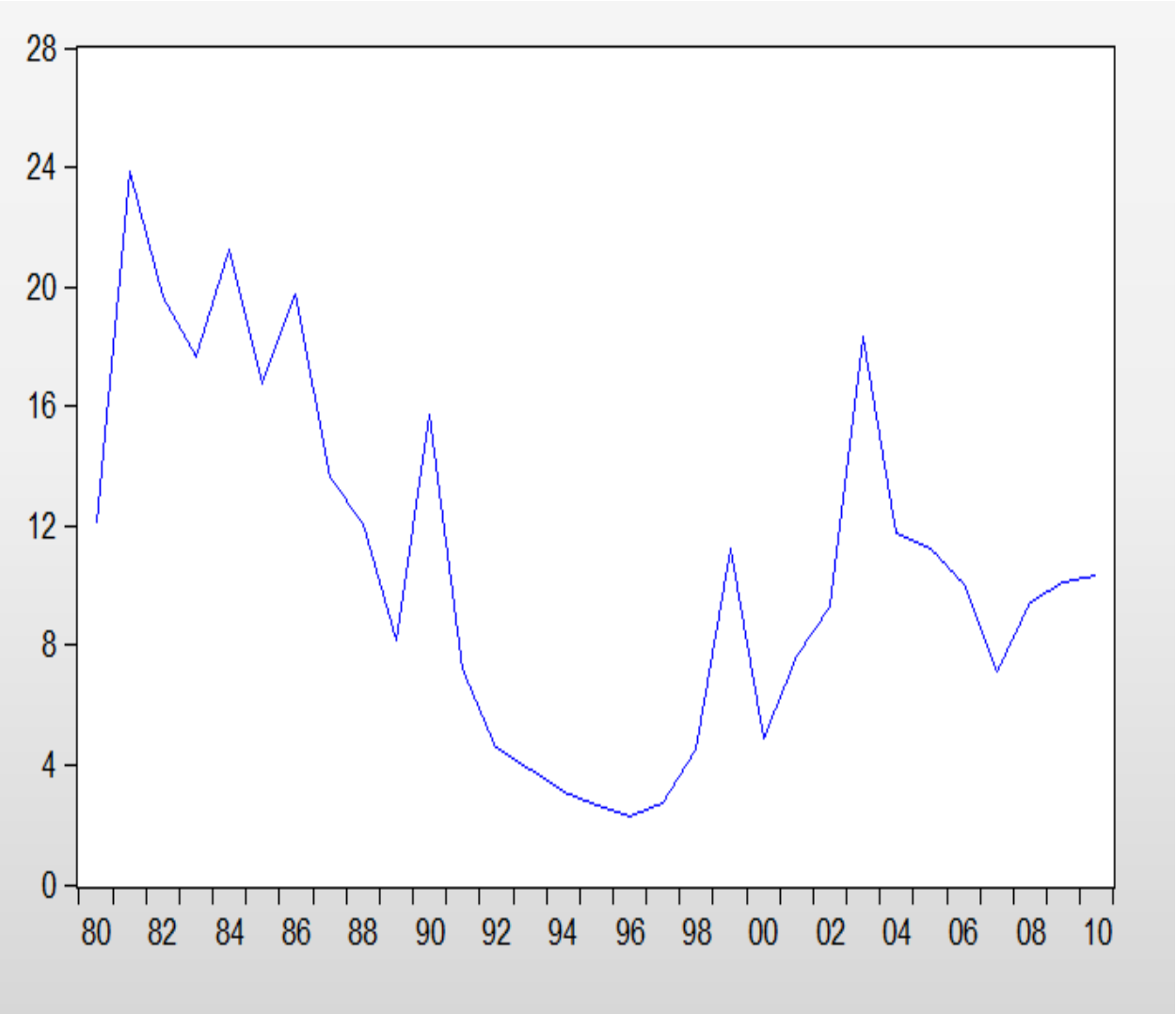
Source: Author

Appendix 4. Real interest rate%



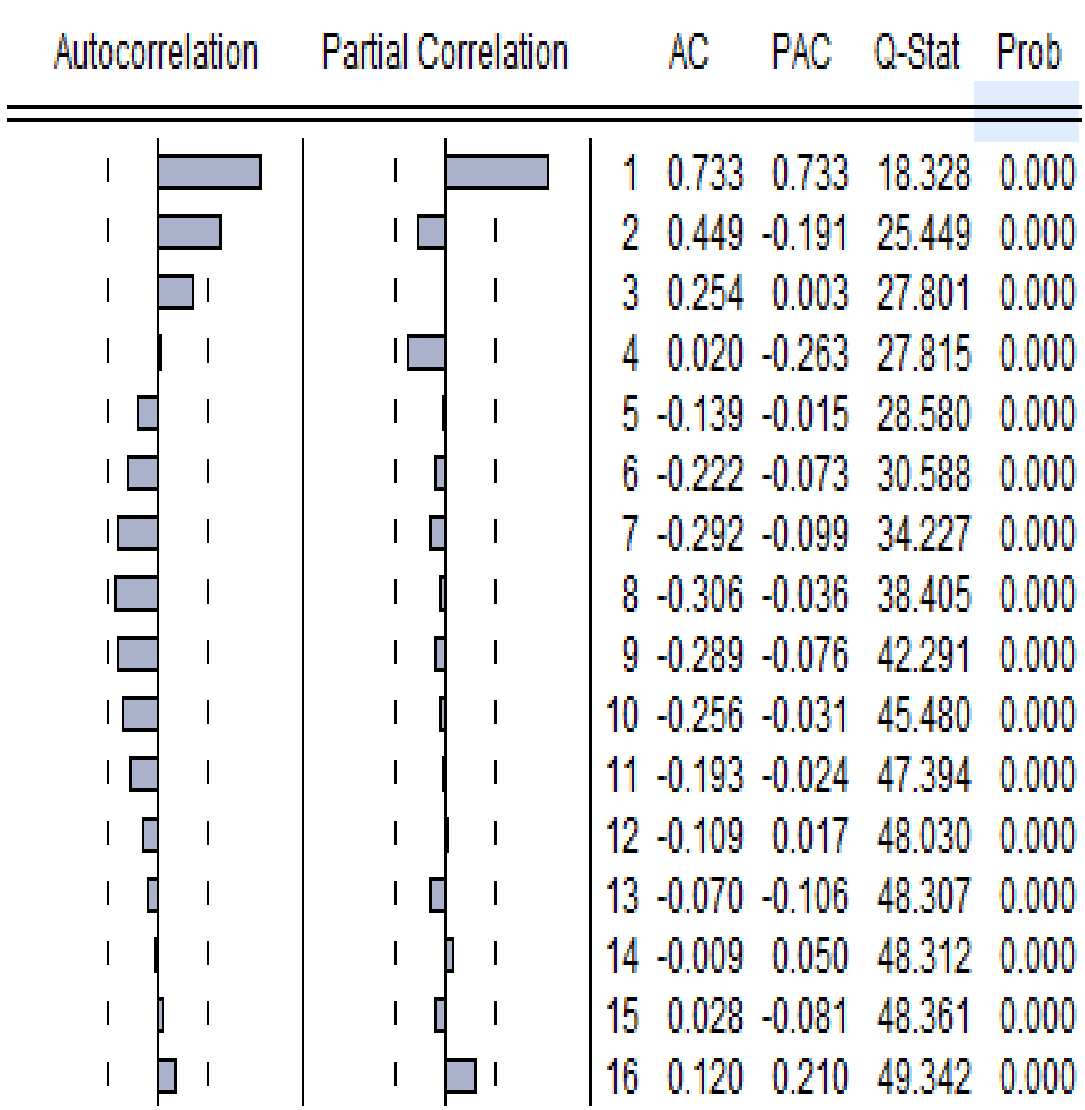
Source: Author

Appendix 5. Inflation rate %



Source: Author

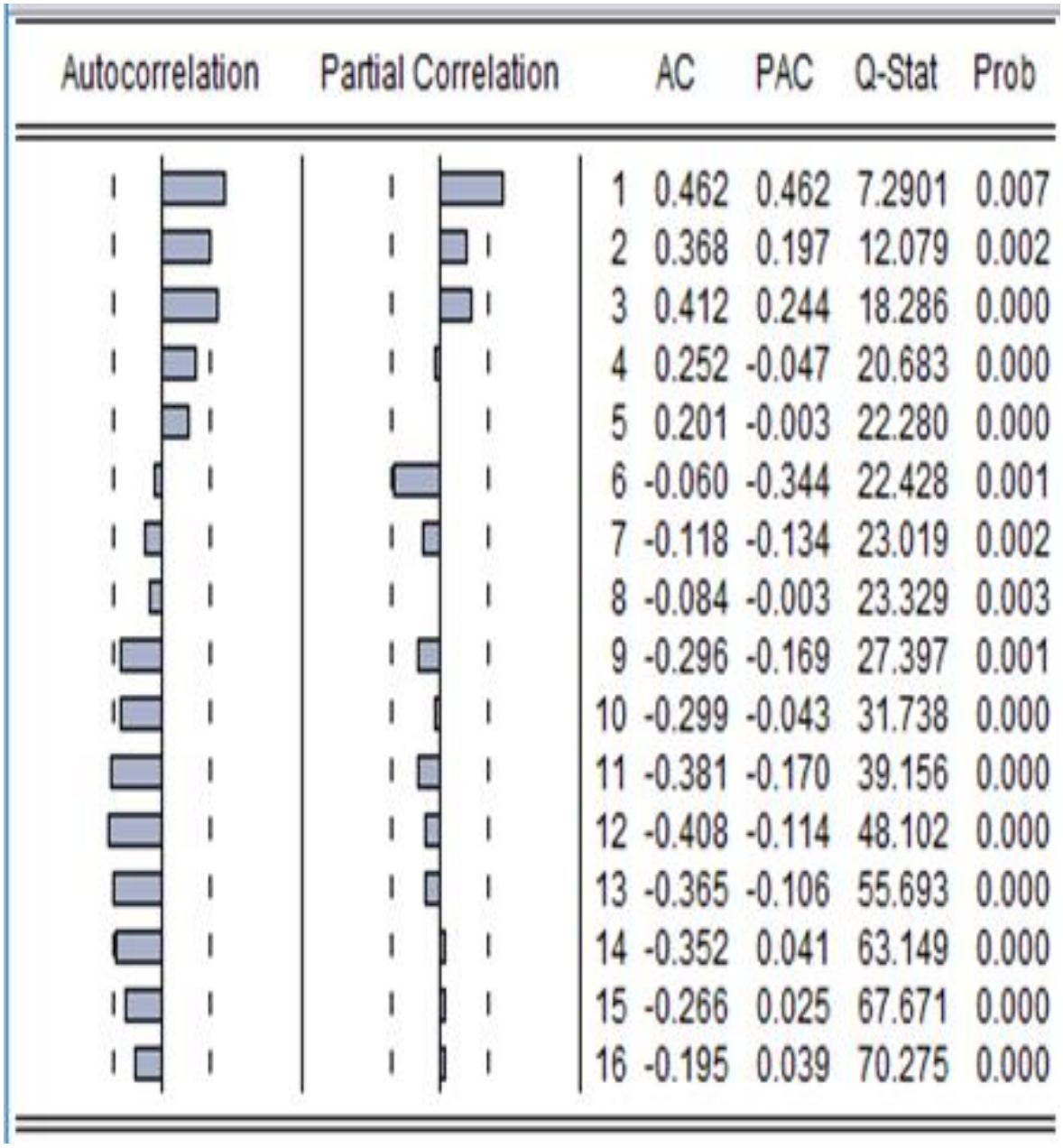
Appendix 6: The correlogram of GE



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.733	0.733	18.328	0.000
		2	0.449	-0.191	25.449	0.000
		3	0.254	0.003	27.801	0.000
		4	0.020	-0.263	27.815	0.000
		5	-0.139	-0.015	28.580	0.000
		6	-0.222	-0.073	30.588	0.000
		7	-0.292	-0.099	34.227	0.000
		8	-0.306	-0.036	38.405	0.000
		9	-0.289	-0.076	42.291	0.000
		10	-0.256	-0.031	45.480	0.000
		11	-0.193	-0.024	47.394	0.000
		12	-0.109	0.017	48.030	0.000
		13	-0.070	-0.106	48.307	0.000
		14	-0.009	0.050	48.312	0.000
		15	0.028	-0.081	48.361	0.000
		16	0.120	0.210	49.342	0.000

Source: Author

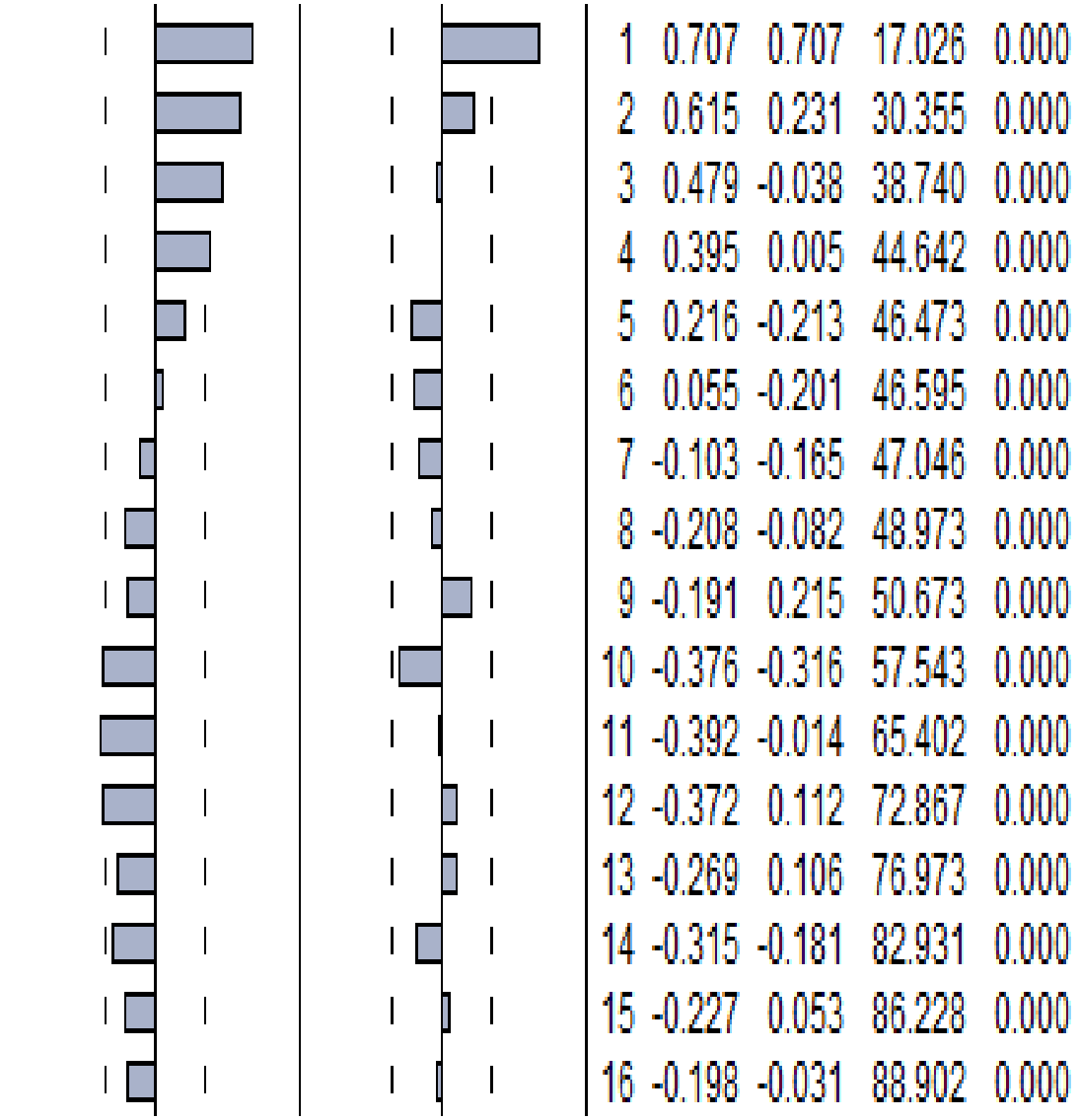
Appendix 7. : The correlogram of RIR



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.462	0.462	7.2901	0.007
		2	0.368	0.197	12.079	0.002
		3	0.412	0.244	18.286	0.000
		4	0.252	-0.047	20.683	0.000
		5	0.201	-0.003	22.280	0.000
		6	-0.060	-0.344	22.428	0.001
		7	-0.118	-0.134	23.019	0.002
		8	-0.084	-0.003	23.329	0.003
		9	-0.296	-0.169	27.397	0.001
		10	-0.299	-0.043	31.738	0.000
		11	-0.381	-0.170	39.156	0.000
		12	-0.408	-0.114	48.102	0.000
		13	-0.365	-0.106	55.693	0.000
		14	-0.352	0.041	63.149	0.000
		15	-0.266	0.025	67.671	0.000
		16	-0.195	0.039	70.275	0.000

Source: Author

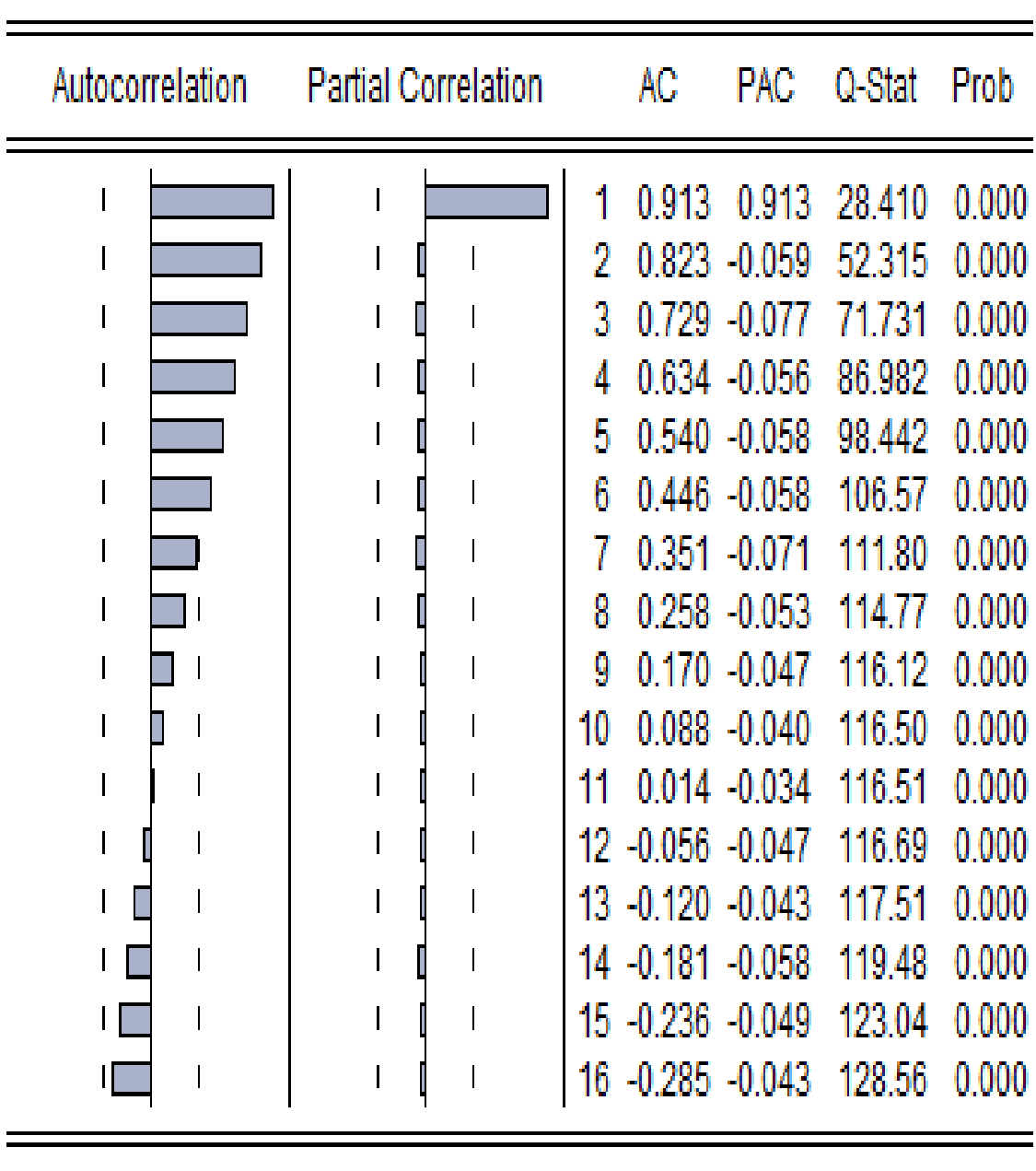
Appendix 8 . The correlogram of INF



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.707	0.707	17.026	0.000
		2	0.615	0.231	30.355	0.000
		3	0.479	-0.038	38.740	0.000
		4	0.395	0.005	44.642	0.000
		5	0.216	-0.213	46.473	0.000
		6	0.055	-0.201	46.595	0.000
		7	-0.103	-0.165	47.046	0.000
		8	-0.208	-0.082	48.973	0.000
		9	-0.191	0.215	50.673	0.000
		10	-0.376	-0.316	57.543	0.000
		11	-0.392	-0.014	65.402	0.000
		12	-0.372	0.112	72.867	0.000
		13	-0.269	0.106	76.973	0.000
		14	-0.315	-0.181	82.931	0.000
		15	-0.227	0.053	86.228	0.000
		16	-0.198	-0.031	88.902	0.000

Source: Author

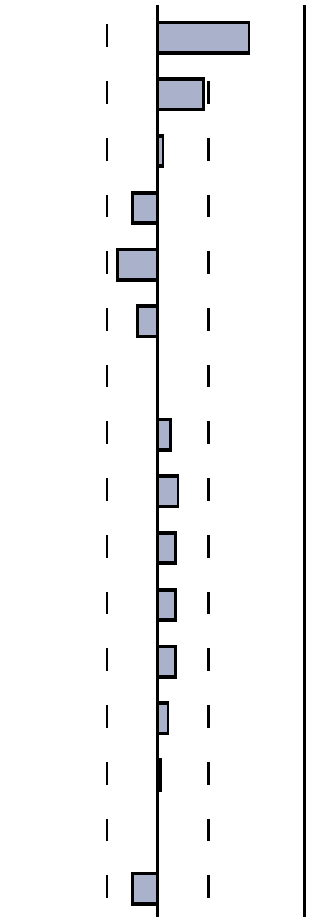
Appendix 9. The correlogram of LGDP



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.913	0.913	28.410	0.000
		2	0.823	-0.059	52.315	0.000
		3	0.729	-0.077	71.731	0.000
		4	0.634	-0.056	86.982	0.000
		5	0.540	-0.058	98.442	0.000
		6	0.446	-0.058	106.57	0.000
		7	0.351	-0.071	111.80	0.000
		8	0.258	-0.053	114.77	0.000
		9	0.170	-0.047	116.12	0.000
		10	0.088	-0.040	116.50	0.000
		11	0.014	-0.034	116.51	0.000
		12	-0.056	-0.047	116.69	0.000
		13	-0.120	-0.043	117.51	0.000
		14	-0.181	-0.058	119.48	0.000
		15	-0.236	-0.049	123.04	0.000
		16	-0.285	-0.043	128.56	0.000

Source: Author

Appendix 10. The correlogram of LGDP



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.654	0.654	14.603	0.000
		2	0.321	-0.187	18.247	0.000
		3	0.029	-0.177	18.279	0.000
		4	-0.172	-0.116	19.403	0.001
		5	-0.284	-0.099	22.575	0.000
		6	-0.146	0.244	23.442	0.001
		7	-0.004	0.010	23.443	0.001
		8	0.089	-0.032	23.796	0.002
		9	0.142	0.026	24.738	0.003
		10	0.118	-0.051	25.413	0.005
		11	0.129	0.208	26.266	0.006
		12	0.120	0.032	27.040	0.008
		13	0.074	-0.065	27.350	0.011
		14	0.024	-0.004	27.383	0.017
		15	0.000	-0.013	27.383	0.026
		16	-0.178	-0.259	29.537	0.021

Source: Author

Appendix 11.AR roots test

Root	Modulus

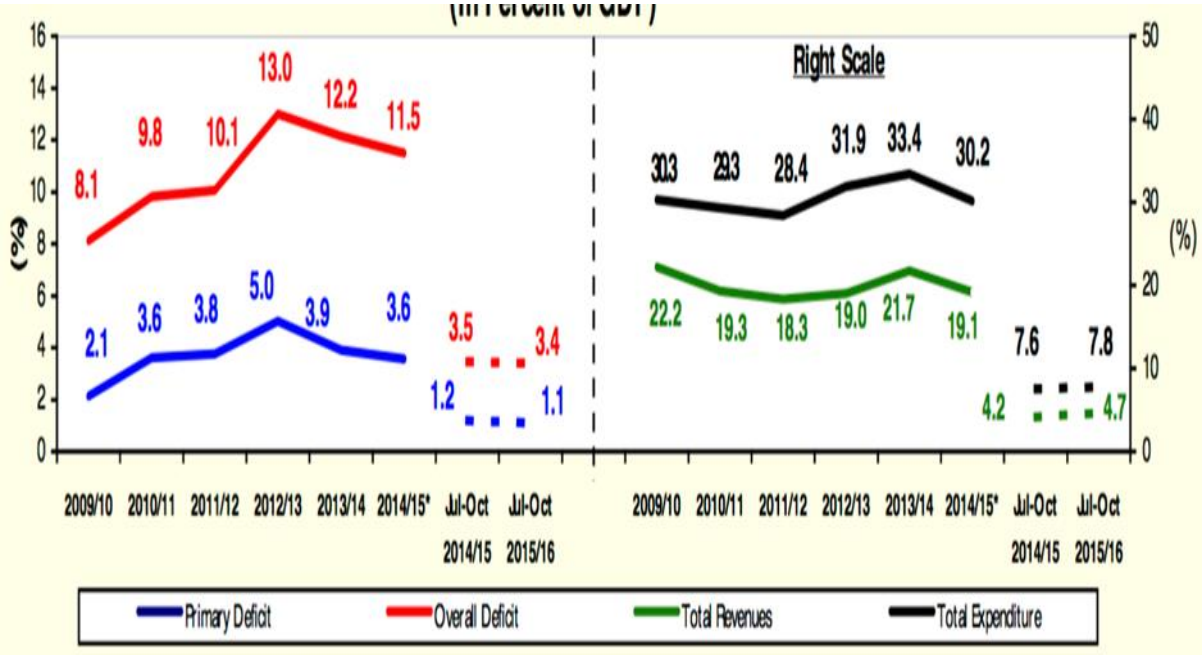
-0.508257	0.508257
0.425708	0.425708
0.331761	0.331761
-0.285429	0.285429
0.085180	0.085180

No root lies outside the unit circle.

VAR satisfies the stability condition.

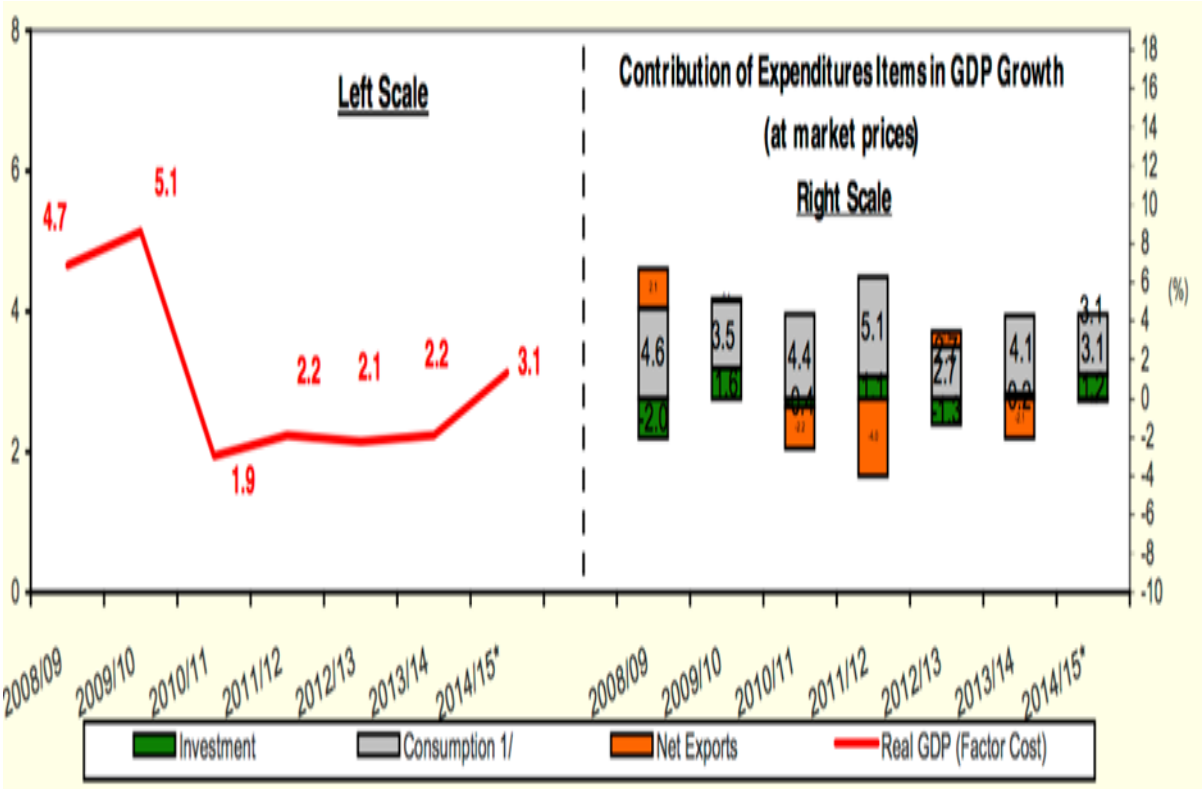
Source: Author

Appendix 12. Main fiscal indicators % GDP



Source: Ministry of finance annual report

Appendix 13. Annual GDP Growth and Contribution of Expenditure Items in Real GDP Growth



Source: Ministry of finance, annual report

Appendix 14. The definitions of the variable s of interest.

Variable	Definition
GDP	GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant local currency.
Tax revenue	Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue.
Government spending	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.
Inflation rate	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.

Real interest rates	Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability.

Source: International monetary fund and World Bank data files