THE SIZE OF GOVERNMENT AND ECONOMIC GROWTH IN IRAN; 1971-2008

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ABSTRACT

The aim of this thesis is to explore and study the interaction between the size of government and economic growth in Iran over the 1971-2008 periods. To achieve this aim, the thesis is designed to examine three models. In the first model which is based on Barro's endogenous growth theory, we investigate the interaction between economic growth and government expenditures simultaneously by using Three Stage Least Squares (3SLS).

In the second model, we investigate the impacts of government expenditures and the sources of finance of government expenditures on economic growth. This analysis is based on Autoregressive Distributed Lag (ARDL) model.

In model three, we investigate the effect of the government budget deficit, liquidity (M2) and official exchange rate on price level in Iran.

Over all, the major contribution of this thesis is to show that total government expenditures and current expenditures have a negative and significant impact on economic growth, but that investment expenditures have a positive and insignificant impact on economic growth. In the short run current expenditure have a negative and significant impact but, investment expenditures have positive and significant effect on economic growth. In the long run, investment expenditures have a positive and significant effect but the current expenditures have a negative and insignificant effect on economic growth.

In the short run the interaction term for financing government spending through oil revenues is positive and significant. The impact of tax revenues is positive but insignificant and the impact of borrowing from central bank on economic growth is negative. In the long run the interaction term for financing government spending through oil revenues is positive and significant. The impact of tax revenues is positive and significant and the impact of borrowing from central bank on economic growth is negative.

There is a stable long-run relation between inflation, budget deficit, money supply and exchange rate. Increase in budget deficit has a positive effect on

the inflation rate in long run, but in short run increase in budget deficit does not have a positive effect on the inflation rate. Increase in liquidity (M2) has a positive effect on the inflation rate in long run and increase in official exchange rate has a positive effect on the inflation rate in long run.

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This dissertation is dedicated to my motherland Iran, its great civilisation, history and future, to which I owe my identity.

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Chapter One: Introduction

1.1 Motivation and Background

"The huge difference in per capita income levels across countries is a reflection of the fact that some economies are growing rapidly and have managed to sustain high growth rates for a long period of time, while others are not growing at all." (Barro and Sala-i-Martin, 2004)

Determining the factors that might affect economic growth, have been one of the most important issues in economic literature. Since 1776, Adam Smith's book "The Wealth of Nations", was published, massive studies have attempted to find the sources of differences in economic growth levels. The endogenous growth model has considered the role of government in economic growth and specified the notion of public spending and distinguished between public consumption and public investment. Government expenditure has the most important role in national economy of a country such as Islamic Republic of Iran. Iran is a particular geopolitical country and a regional power in the Middle East. Iran has one of the world's oldest civilisation and culture. It is the 18^{th}-largest country in the world in terms of area at 1,648,195 km^2 with population of 72 million (2008). Iran is a member of Organisation of the Petroleum Exporting Countries (OPEC) and ranks among the world's top three holders of proven oil reserves and second largest gas producer in the world. The exploration and production activities of oil in 1908, led to political, social, cultural and economic changes in Iran. Since 1900, the country has experienced two massive revolutions, two world wars, moves toward modernisation, the nationalisation of Iranian oil leading to the coup d'etat of August 1953*, and a long war with Iraq (1980-1988). In view of economic performance, Iran suffers from high inflation rate, unemployment rate, budget deficit, reliance on oil revenues, fluctuation in oil

prices and lack of institutions for improvement of private sector activities, inefficient public sector and rent seeking[1].

Following oil price increases, Iran experiences significant growth in the size of its government and the Iranian economy is affected by government activities. High world oil prices have raised export revenues and oil revenues have influenced on economic growth through government expenditures. The definition of government size in this research is the ratio of government expenditures to GDP. During almost four decades (1971-2008), the condition of Iranian economy has been worsened due to poor government policies, bureaucratic allocation of resources, mismanagement and high dependency on oil revenues. The future view of the Iranian economy is very critical. Even a fundamental analysis according to recent theoretical and empirical economic studies is vital. This dissertation is an attempt to gain a better understanding of government size and the relation between the size of government and economic growth in Iran.

1.2 Aims and Objectives

As we stated above, this study represents an investigation of the impact of government size on economic growth. There are three main objectives of this study. The first is to undertake a review of the Iranian economy, through analysis of the macroeconomic performance. The aim of this is a better understanding of Iranian economic conditions and finding the problems and challenges that policy makers are facing such as high inflation and unemployment. We will review several periods of history in Iran with a view to changing relation between government spending and the economy before and after the 1979 Islamic Revolution of Iran and to discover how successful the policy makers were in obtaining substantial economic growth in the economy.

The second objective is to carry out an analysis of budgeting and planning and highlighting budgeting process in Iran.

[1] ***Note:**** *The 1953 Iranian Coup d'état was the take-over of the Prime Minister of Iran (Mohammad Mosaddegh) on 19 August 1953, arranged by the United Kingdom and The United States (Tauris,2007), Clandestine Service History(1954).*

The final objective is to find out the impact of government expenditures on economic growth. More specifically:

- To examine the impact of total, current and investment expenditures on economic growth.
- To investigate the long term and short term effects of government expenditures (current and investment) on economic growth.
- To test the impact of financing government expenditure, (oil revenues, tax revenues and borrowing from central bank) on economic growth.
- To examine the effects of the government budget deficit, liquidity and official exchange rate on the price level.

1.3 Methodology

On the basis of the endogenous economic growth model augmented with broader measures of capital, such as human capital, Research and Development (R&D) expenditures, we will focus on the empirical link between government size and the level and growth rate of income per capita for a complete data series available over the period 1971-2008. In order to investigate the interaction between economic growth and government expenditures we estimate two equations simultaneously by using Three-Stage Least Squares (3SLS) method.

We investigate the impacts of government expenditures and the sources of financing these expenditures on economic growth based on Autoregressive Distributed Lag (ARDL) model. The first step in the analysis will be to test for the existence of a unit root in the variables entering the analysis. We can estimate the equation by Ordinary Least Squares (OLS) in order to test the long run relationship among the variables by conducting F- statistics through Wald Restriction Test. At this stage, the calculated F-statistic is compared with the critical value; we can obtain the short-run dynamic parameters by estimating an Error Correction (EC) model associated with the long –run estimates normally present in long-run economic relationships.

Iranian government has experienced a budget deficit between 1971 and 2008, in Iran the Central Bank is often required to automatically finance budget deficit. We have observed high growth of liquidity M2 and double-digit inflation rates in the last three decades in Iran. However, as the relationship between budget deficit and inflation is not always certain, we investigated the long-run relationship and causality between inflation, budget deficit, liquidity M2, official exchange rate and political factors on inflationary process in Iran during 1971-2008, the Vector Error Correlation (VEC) model specifically was deployed to determine the long-run behavior and the causal relation among the variables.

1.4 Organisation of the Thesis

The thesis is organised as follows. The current chapter introduces the aims, objectives, methodology of the study as well as research problems. In chapter 2, we will review the Iranian economy. Some important characteristics of Iranian economics are: high inflation rate, high unemployment rate and budget deficit, especially in the years since the revolutionary. The reasons for instability in macroeconomic performance are dependence on oil exports and the size of government combined with mismanagement. In order to explore the structure of Iranian economy and to find out whether or not the economy of Iran has been successful in achieving its macroeconomic targets, we will briefly review Gross Domestic Product (GDP) growth, inflation and unemployment in Iran. In order to have a better understanding of Iranian economy, we will consider four periods of Iranian history including Safavid (1501-1722), Qajar (1785-1925) and the first and second Pahlavi dynasties (1925-1979). The Safavids are very important because they established the country with a powerful central government and an efficient bureaucracy. In the time of Qajars dynasty, Iran suffered from many social, political and economic problems. Meanwhile the government was unable to manage the country and there was, in any case, little or no expenditure on public services and the budget was always in deficit. In the time of the first Pahlavi dynasty, Iran experienced a modern government with oil revenue, which was the largest single source of income for government and modernisation of the country. The main characteristic of

this period is existence of high degree of government interference in the economy of Iran. Considering the periods of the second Pahlavi dynasty 1971-1979 and the Islamic Republic of Iran 1979-2008, late in this chapter we will focus on benchmarking analysis of Turkey and Algeria. We will consider some economic indicators including GDP economic growth, GDP per capita, Gross National Income (GNI) per capita, inflation, budget deficit and unemployment of Iran, Turkey and Algeria for period 1971-2008.

In chapter 3, we will discuss a number of growth theories since Adam Smith (1723) such as classical growth theories, neoclassical growth theory e.g. exogenous growth models and endogenous growth models. We will consider the model of Robert Barro (1990) which provides the most significant model of government spending and endogenous growth. Barro has also discussed a theory of the long-term effects of government policies on economic growth. In this chapter, we will discuss the size of government, then will explain the theories of public sector growth in both sides of supply and demand. In the final part, we will review the literature on the relationship between economic growth and government size followed by analysis of these relationships in Iranian economy.

In chapter 4, we will investigate the interaction between economic growth and government expenditures simultaneously by using 3SLS method. We will try to investigate the effects of current and investment expenditures on economic growth.

In the next chapter, we will examine the impacts of government expenditures and the sources of finance the expenditures on economic growth. This analysis is based on Autoregressive Distributed Lag (ARDL) model.

In chapter 6, we will estimate the relationship between budget deficit and inflation and we will investigate the long-run relationship and causality between inflation, budget deficit, liquidity M2, official exchange rate and political factors on inflationary process in Iran during 1971-2008.

In Chapter 7, we will summarise all of our findings from this research and briefly discuss our empirical results. We will also point out the policy implications and suggest extensions for further research.

Chapter Two: The Structure and Performance of Economy of Iran

2.1 Introduction

Iran's economy is marked by a bloated, inefficient public sector, over-reliance on the static policies that create major distortions throughout the economy. Most activities are controlled by the government. Private sector activity in the country is typically in small-scale manufacturing, farming and services. In spite of relatively high oil prices in recent years and massive oil revenues, the country has not avoided economic hardships such as volatility of economic growth, high unemployment, inflation, and budget deficit.

Since the mid-1970s four factors have been most responsible for economic change in Iran: the rise and fall in oil prices, the revolution, the Iran –Iraq war (1980-1988) and Structural Adjustment Programme (SAPs) (1990-2004). Iran's economy is a combination of central planning, government ownership of oil industry and other large industries, village agriculture, and small-scale private trading and service enterprises. Iran holds 10% of the world's total proven oil reserves and is the second largest producer (after Saudi Arabia) within the Organisation of Petroleum Exporting Countries (OPEC, 2005) and has the world's second largest proven gas reserves after Russia. The Iranian economy is heavily dependent on production of oil and gas, representing about 90% of total export earnings and on average 70% of government revenues in annual budget. The share of oil by value added in the GDP of Iran averaged about 20% between 1971 and 2008. Thus Iran influences world oil prices and is in turn broadly affected by it. Some important characteristics of Iranian economics are: high inflation rate, high unemployment rate and budget deficit, especially in the years after revolutionary period. The reasons for instability in macroeconomic performance are dependency on oil exports and the size of government combined with mismanaging.

The aim of this chapter is to explore the structure of Iranian economy, to find out whether or not the economy of Iran has been successful in achieving its

macroeconomic targets. In the first section we focus on Iranian history including Safavid (1501-1722) Qajar (1785-1925) and the first and second Pahlavi dynasties (1925-1979). The Safavids are very important because they established the country with a powerful Shia central government and an efficient bureaucracy. In the time of Qajar's, the government was unable to manage the country and there was, in any case, little or no expenditure on public services and the budget was always in deficit. One of the main reasons for the constitutional revolution was the weakness of government in providing social welfare for people. The Constitutional Revolution of Iran took place in 1906. Budgeting and planning in Iran began with the Constitutional Revolution.

From 1920 oil production and oil revenues became an important and most major factor of the Iranian political economy: it was the increasing oil revenue that supported and enhanced the power of government. Iran experienced a modern government with oil revenue which was the largest single source of income for government and modernisation of the country. This period marks the beginning of heavy government interference in the economy of Iran.

In the next section we briefly view GDP growth, inflation, unemployment and planning in Iran. In order to have a better understanding of Iranian economy, in the last section we focus on benchmarking analysis of Turkey and Algeria. There are some reasons for choosing these countries; firstly, in 1970s all three countries Turkey, Algeria and Iran belonged to upper middle income countries group. Secondly, Iran and Turkey had many similar features regarding their geographic, demographic and socio-economic size. Iran and Algeria are members of OPEC as oil and gas exporters and both have economies reliant on oil and gas revenues. These common economic characteristics give us a comparative analysis to explore the economic condition of Iran since 1970s. We have chosen economic indicators including GDP economic growth, GDP per capita, GNI per capita, inflation, budget deficit and unemployment of Iran, Turkey and Algeria for period 1971-2008.

2.2 Safavid Dynasty

The period of 1501-1722 under Safavid dynasty ruling, was a remarkable turning point in the history of Iran, because the whole of Iran was reunited by a Persian king for the first time after Arab conquest, and Iran acquired a high level of centralisation and prosperity. The Safavid established a unified Iranian Shia state with an efficient central bureaucracy, the provincial government and army. The administrative organisation of Safavid was vertical both formal authority and informal power defined the political and economic relations of the provincial administration with the central government. Before the Safavid Dynasty, there was no actual Shia government as a central government. In some parts of Iran and for a short time Shia government ruled as a local government.

Shiasm as a national integrating ideology played an important role in supporting Iran in front of the Ottoman Empire and the Western Powers. Iranians were able to retain their national identity with the encouragement of Shiasm (Adamiyat, 1970). Shiasm is largely tied to Iranian national identity, particularly since Iran is the only Shia state as well as the only Iranian one. At this period of the Safavid, Iran experienced economic reforms by transforming the economic principles of Shi'ite Islam into a powerful state, and understanding of Islamic values and considering religious principles such a responsiveness to people's demands, administrative regulation of the people's social wellbeing.(Lambton,1980).The alliance between the merchants and the Ulama (clergymen) linked landownership to trade (both international and domestic) (Savory, 1980).The Islamic character of the Safavid Empire was consolidated by the rise of these religious classes, the Ulama (Clergymen), who became the main administrators of Vaqf* lands and they managed the collection and disbursement of a large amount of money Infaq**(alms) and Zakat***(a form of taxation) for social benefits of people.[2]

[2]Note: Vaqf*, is an inalienable religious endowment in Islamic Law, typically denoting a building or plot of land or even cash for Muslim religious or charitable purposes. The beneficiaries of the Vaqf can be person (the founder's family, entire community, only the poor people, and travellers) and public utilities (mosques, schools, bridges, graveyards and drinking fountains). The Vaqf trust institutions

The economy was developing due to trade relations with European countries. The trade was going on the Silk Road and Persian Gulf, at the same time the domestic economy was growing based on agricultural production. The Safavid started a large number of reforms and financed them by cash from raw silk exports. The state in the seventeenth century was ruled by the King, high ranking bureaucrats, military commanders and provincial governors.

The Safavid took the initial steps toward creating a separate Islamic Shia identity for Iranian state as opposed to the Ottoman Empire which represented a major regional rival for hegemony in Islamic world. At the same time the Safavid built a firm foundation for the political economy of Iran on the basis of Shia principles. Their rule created an image of Iran that complemented positively the achievements of the ancient Persian Empire and enabled Iran's transition to more advanced forms of government. In the eighteenth century the Safavid dynasty faced economic, political and ideological crisis and collapsed. The Afghan invasion of Iran in 1722 and the collapse of the Safavid Dynasty plunged Iran into a long period of socio-political disorder. The Afghans were overthrown by the Afsharid Dynasty 1736-1747 after which the Zand Dynasty came to power 1750-1794.In 1794 the Qajar Dynasty was established.

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funded hospitals and schools in Iran.[Encyclopaedia of Islam]. In the end period of Sasani Empire, for the spirit salvation, some charitable foundations were established. These foundations aims were to help poor people and invented beneficence installations. Later foundations became a model of Islamic Vaqf, [Daryaee, 2005].

Infaq** its meaning is a charity and original aim is to please God without asking for any favour.

Zakat***, is the giving of a fixed portion of one's wealth to charity, generally to the poor and needy. It is one of the five basic acts in Islam. There are eight categories of people who qualify to receive *zakat* funds: 1- Those living in absolute poverty. 2- Those who were restrained because they cannot meet their basic needs. 3- The zakat collectors themselves. 4- Non-Muslims who are sympathetic to Islam or wish to convert to Islam. 5- People whom one is attempting to free from slavery or bondage. Also includes paying ransom or blood money. 6- Those who have incurred overwhelming debts while attempting to satisfy their basic needs.7- Those working in God's way. 8- Children of the street and travellers.

2-3 Qajars Dynasty

The Qajars dynasty ruled in Iran during the years of 1785 to 1925. Iran suffered from more anarchy before the coming of power of Qajars, but the Qajars brought internal peace and stability to the country. The Qajars period experienced many social, political and economic changes. Issawi, Bharier and Keddie have emphasized "relative economic stagnation and very slow development," especially compared with Egypt and the Ottoman Empire. Foran believed that Iran's development was dependent, in that it was shaped from abroad, and severely limited in both form and extent. The Qajars attempted to revive the Safavid Empire and in many ways patterned their administration after that of the Safavids. But they failed to establish strong central control. From early in the nineteenth century, the Qajars began to face pressure from two great world powers, Russia and Britain. In two disastrous wars with Russia, which ended with the Treaty of Gulistan 1812 and the Treaty of Turkmanchay 1828, Iran lost all its territories in the Caucasus north of the Aras River. Meanwhile, Britain twice landed troops in Iran to prevent the Qajars from reasserting a claim to Herat, lost after the fall of the Safavids. Under the Treaty of Paris in 1857, Iran surrendered to Britain all claims to Herat and territories in present-day Afghanistan. The two great powers also came to dominate Iran's trade and interfered in Iran's internal affairs. They enjoyed overwhelming military and technological superiority and could take advantage of Iran's internal problems.

Iran during its long history has been an arbitrary state and society, based on the state monopoly of property rights, centralised bureaucratic and military power. The state monopoly of properties was in certain types of land and merchant capital. The state owned large amounts of agricultural land and granted the remaining lands to individuals as a privilege. The merchant property was at risk, and there was no long-term accumulation of commercial capital which might have led to the accumulation of physical capital in agriculture and manufacturing. (katouzian1997)

The economy of the country was in a kind of traditional situation known as a subsistence economy. The state had limited bureaucracy and its main roles

were internal security, maintenance and guarding the borders. Rivalry between imperial England and Tsarist Russia for influence in Iran grew steadily to the point where these two European powers came to dominate Iran's foreign trade, along with their considerable military and political influence. By 1914 Russia provided 56% of Iran's imports and took 72% of her exports, to Britain's 28% and 13%. (Issawi 1971: 71-72, 263-64, Keddie 1955: 60). The half-century from 1863 to 1914 witnessed a further growth in trade, to which was added a series of "concessions" to exploit or monopolise raw materials or infrastructural development in Iran, granted to both English and Russian subjects.

In late 19th century and early of 20th century, Iran experienced social and economic change: increasing population, increasing trade, increasing rate of inflation, declining value of domestic currency. The sources of government revenue were: land tax, income tax, customs duties, and direct foreign loans, sales of trade concessions to foreigners and sales of public offices. The heavy tax imposed by the government on agriculture was one of the most important sources of governmental income.

During the nineteenth century there had been very little industrial and technical progress in domestic production (Katouzian, 1981). In addition, in the wake of Iranian-British trade relations and the increase of foreign imports, a number of domestic industries collapsed and consequently most of the factories were closed (Nazari,1990).

During the Quajar reign in Iran some social movements occurred, the Tobacco Régie had been the most significant incident. In 1890, Nasir al-Din Shah granted a concession to Major G. F. Talbot for a full monopoly over the production, sale, and export of tobacco for fifty years. Latter in 1890 the concession had been sold to the Imperial Tobacco Corporation of Persia, a company that some had speculated was essentially Talbot himself as he heavily promoted shares in the corporation. A Tobacco Régie (monopoly) was subsequently established and all the producers and owners of tobacco in Persia were forced to sell their goods to agents of the Régie. At the time of the concession, the tobacco crop was valuable in domestic and foreign

markets. In essence the concession threatened benefits of Persian tobacco producers and tobacco sellers and also threatened the job security of a major section of the population. In 1891 mass protests against the Régie began to emerge in major Iranian cities and the most important religious authority in Iran by issuing a declaration prohibited the use of tobacco. In 1892 the king of Iran cancelled the concession. The tobacco movement had a great implication because Iranian people have found out that it was possible to win against the King and foreign interests.

This achievement was a part of the background that led to the Constitutional Revolution a few years later. Also there were some others factors which led to the Constitutional Revolution and then the development of modernisation in nineteenth century Iran. Contacts with the new civilisation of Europe, at the level of military and diplomatic relations, advisors and experts, foreign travellers such as religious missionaries, merchants and occasional travellers who visited and lived in Iran were established. Indeed they played an important role in bringing the new Western ideas of science, technology, and knowledge to Iran, and establishing new schools in Iran such as Dar al-Fonun, in which the main subjects were modern science. All students after their graduation occupied high positions in the country. These students created the new middle class, known as the educated or bureaucratic class. The economic and political relationship with the West, which resulted in the emergence of the new social group in Iran mainly Iranian politicians and intellectuals, brought the reformist ideas into Iran and this class played a vital role in the onset of the Constitutional Revolution. (Foran, 1993)

2.4 The Constitutional Revolution

The traditional situation of the country was changing through the changes in the socio-political and cultural realms. Due to social, political and economic problems and the big gap between Iran and Western countries, the Iranian people demanded a government with new institutions through which people could benefits from social equality, legal framework and economic development. These tendencies and factors led up to the Constitutional Revolution.

The Constitutional Government did not solve any of the economic problems in Iran, nor improve the social conditions, or achieve a minimum standard of living for the people. The national budget, which failed to balance, caused Iran to be in a worse financial situation after the Constitutional Revolution.

2.5 The Role of Oil in Iranian Economy

In the period 1900-18 oil was discovered, produced and exported, this new factor acquired a leading role in the political economy in the following decades. Oil therefore became the engine of growth; its revenues were directly received by the government. Government revenue, apart from oil, consisted of the traditional land tax, customs revenue and indirect taxation. Reza Khan, who entered the government after a coup d'etat in I921 and became shah in 1925, established a system of modern government and introduced radical socio-economic reforms, reorganising the army, government administration and finances. Meanwhile, oil production and oil revenues became an important and major factor of the Iranian political economy by determining the level of domestic demand, state expenditure, and imports. The oil exports revenues which accrued to the government increased its economic and political power as it was responsible for the receipt and the distribution of oil revenues. Any increased in oil revenue made the power of government greater. Oil revenue was a form of rent, because the cost of production of crude oil is small compared with its revenues. The revenue accrued to the government after converting foreign currency to national currency.

From 1919 the physical output and export of oil increased every year until 1926, when it was over four times the 1919 level (Katouzian 1981). The oil revenue was the largest single source of income for government. The government expenditures were spent on the extension, centralisation and modernisation of the military and bureaucratic networks and expenditures on infrastructural services.

During 1941-1951, the country was occupied by allied nations. The occupation resulted in devaluation of Iranian currency, high inflation,

unemployment and poverty rates and more in-efficient government`s industrial and commercial activities.

The freedom after the fall of Reza Shah, focused attention on oil resources and oil revenues by Iranian people and Dr Mosaddeqh tried to pass the Nationalisation of the oil industry which was approved by the Iranian parliament in 1951. Later in 1952 the Western government boycotted Iranian oil, the loss of oil revenues resulted in unemployment, inflation and devaluation of national currency.

Oil nationalisation was a popular movement in Iran but it failed by the coup d'etat of August 1953.The failure of the popular movement was a historic catastrophe concerning the social, political and economic fate of the Iranian people. They lost the hope of sovereignty and national democracy.

The overthrow of the nationalist government in 1953 by an American-British supported coup changed the Iranian situation as following: an international oil consortium in 1954 took over the running of oil industry, followed by flows of American military, economy and social aid programmes. In the next few years there was a growing interest in modernising and westernising Iran`s economy and society. All these new programme resulted in more economic dependency on West. (keddie, 2003)

2.6 Planning in Iran 1948-2008

The Plan and Budget Organisation (PBO), was established in 1948, as one of the largest governmental establishments responsible for preparing the country's budget. After Islamic Revolution (1979) the name of organisation was changed to the Management and Planning Organisation of Iran (MPO).The MPO had a variety of goals and duties, including the evaluation of the country's resources, the preparation of its medium and long term development plans and policies, the preparation of annual budgets, and the monitoring and evaluation of work done under the implemented plans. In July 2007, the MPO was dissolved after a direct order from the President of Iran. Although the MPO was a state body whose head was appointed by the president, it was a relatively independent organisation.

In 1949 the First Seven-Year Plan 1949-56 had been set up. Compared with other countries to establishing of development plan including China 1953, The Netherland 1961, Turkey 1963, Iran has a longer history in planning. The first development plan allocated a quarter of purpose led expenditures to agriculture, 32% to industrial and mining projects, the sources of funds for financing the projects were oil revenues and foreign loans, the plan was stopped due to the Anglo- Iranian oil dispute. The economic development depended on oil revenues and foreign loans and later American aid and oil revenues. As mentioned above international consortium was established and began negotiation with government. This agreement was prepared to give a huge amount of income to the government; Iran was able to undertake economic development and social reforms (Plan and Budget Organisation, 1948).

In 1955 the Plan Organisation was charged with the preparation and execution of the Second Seven-Year Plan 1955-62. In the proposal of plan about 26% expenditure was allocated to agriculture, 33% to communication and transport, 15% to industry and 26% to social services. The total projects expenditures were three and a half times more than the First Plan. In fact, the total expenses have been more than what had been predicted (Plan and Budget Organisation, 1958). By reviewing of Iran balance of trade and payments during years of 1955-1962, we can find some remarkable points about national economy, for instance the imports of goods grew very rapidly and exports of non-oil goods declined; meanwhile, a constantly increasing balance-of-trade deficit levelled off, even though oil revenues grew very fast.

In the Third Development Plan 1962-67, the function of the plan was directed towards the achievement of 8.5% growth in gross national product (Bharier, 1971). In this plan, economic development has no tendency toward inflation experienced in the second plan, but there was an increase in the consumption products of domestic private industry. Disposable income of people started increasing continuously (Plan and Budget Organisation, 1997).

In the Fourth Development Plan 1967-72, the overall strategy concentrated on imports substitution, economic growth, stable prices and investment. An attempt had been made to increase the oil and gas exports. Although the fourth plan unlike first and second plan, did not consider economic development at par with economic growth (Plan and Budget Organisation, 1973)

In the Fifth Development Plan 1973-1978, following the increase in oil prices in July 1974, the plan was revised and its credit was increased from RLs. 1560 billion to RLs. 2626 billion. Between 1963 and 1973 oil revenues began to increase first of all because of the rapid growth in the volume of oil exports and then because of price increases (Plan and Budget Organisation, 1983).

The uncertainties of Islamic Revolution initiated a decline in real GDP, which was worsened by the war with Iraq 1980- 1988. The oil production declined sharply from 1977 to 1981. By 1981, the share of oil production to GDP had fallen to less than 10%, from around 50% in early 1970s. Post-war and reconstruction-related necessities had urged the government to develop a more diversified and efficient economic structure. And then in 1989, the national planning system introduced the first post-revolution five-year plan for the period 1989-1993.

The extent of macroeconomic imbalances induced the government to embark on a stabilisation and economic reform programme. The First Five-Year Plan (First Socio-Economic and Cultural Development Plan of Islamic Republic of Iran) started in1989, whose key elements of the plan were following:

- Increasing output and employment and reducing inflation,
- Privatisation and smaller role for the government,
- Unification and liberalisation of the exchange rate system,
- Managing the external debt arrears,
- Attracting more foreign investment to Iran,
- More opening up the economy
- Raising the efficiency of the tax system,

- Establishing The Oil Stabilisation Fund to cushion the economy and the government budget against fluctuations in oil proceeds.

The overall strategy of the plan concentrated on providing support to domestic industries, substitution of imports and reduction of dependence on oil. The government planned to liberalise the economy through partial privatisation of industries and services. The public investment programmes focused on infrastructure, the increase in expenditures resulted in fiscal deficits which were financed by central bank deficit financing and external borrowing. In 1991 after decrease in oil prices, external debt reached 50% of GDP in 1993. Not only did the government not achieve its privatisation goals, but also the public sector grew by 3% (Management and Planning Organisation 1990),

The Second Five-Year Plan 1995-1999 with an interval of 2 years was approved in 1995.This plan aimed to reverse the macroeconomic imbalances created by the first plan. The overall strategy of the plan comprised of sustained growth and development, reduction of dependence on oil income and substitution of imports. Government was unable to overcome structural shortcomings, including heavy dependency on oil revenues, a weakness in production sector and an unstable national budgeting system. In general, the liberalisation and privatisation policy faced political, economic, administrative, and legal barriers (Management and Planning Organisation 1994).The period of the second plan was characterised largely by low economic growth and macroeconomic instability, mainly because of low oil prices in 1997–99. The government responded by increasing direct control of economic activities. A success of this period was in regulating and managing the external debts.

The Third Five-Year Plan 2000-2005 tried to restore market-based prices, reduce the size of the public sector, and encourage private sector investment. Iran experienced growth of capital formation, improvement of the balance of payments, and reduction of the unemployment rate. But the economy suffered from high liquidity growth, a high inflation rate, a large government sector, and unsuccessful privatisation. Iran's Oil Stabilisation Fund (OSF) was established in 2000 to achieve two objectives: to stabilise

the government's annual budgets, and to provide loans to private and cooperative entities.

The Fourth Five-Year plan 2005-2010 had a record of reasonably good performance Indicators, including unemployment and poverty reduction. But achieving fiscal consolidation, targeting of subsidies, and further privatisation and liberalisation of the economy, did not proceed according to the plan.

Despite the relatively strong oil export revenues in the Fourth Five-Year Plan 2005-2010, Iran continues to face budgetary pressures, a rapidly growing young population with limited job prospects; high unemployment; heavy dependence on oil revenues; significant external debt (including a high proportion of short-term debt); expensive state subsidies on many basic goods; a large, inefficient public sector and state monopolies and international isolation. To cope with these economic problems, Iran's government has proposed a variety of privatisation and other restructuring and diversification measures. Furthermore; the recent rise in Iran's oil revenues has allowed the government to increase imports in the past five years, fiscal policies also contributed to a rise in inflation and government spending.

To conclude , These national development plans before and after revolution were not successful in achieving any of its major targets including rapid growth, price stability, high employment, increased investment and reduced reliance on oil-export receipts, and never attained their targets according the expectation of plans (Amuzgar, 2009).

2.7 Economic Performance of Iran

2.7.1 GDP Growth

In 1970s, the increasing oil revenue led to rapid GDP growth. From 1973 to 1979 the average GDP growth was about 3.4%, with its peak at 18% in1976. The positive wealth and saving effects of the mid 1970s did not have a long lasting effect on economic growth. During the revolution of 1979, the growth rate decreased and became negative. These low and negative figures continued between 1979 and 1983, because of the Iran–Iraq war. In 1988

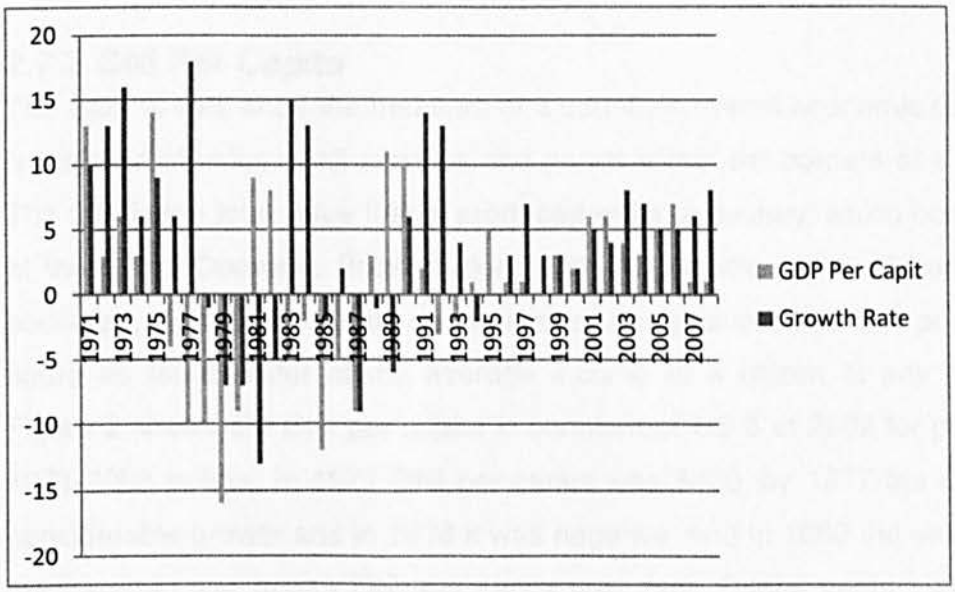
Iran emerged from the 8-year war with a highly centralised economy .At this point in time Iran initiated an adjustment programme to deal with the highly centralised economy. In 1991, the rate of growth had reached about 14%. During 1995-1999, the economy was characterised by low economic growth mainly because of low oil prices in 1997-1999 periods. From 2000 to 2008, the average rate of annual growth has been about 5.5%, economy entered a period of rapid decline, GDP was falling and inflation was on the rise.

Economic growth in Iran has been relatively volatile and highly dependent on intensive use of natural resources, mainly oil and gas. The growth potential in the Iranian economy is limited due to misplaced incentives, uncertainties and lack of some specific institutions for efficient allocation of resources (Jalali-Naini, 2003, 2004). In the period 1971–2008, the average real GDP growth in Iran was 4.2% a year and 1.1% in per capita terms. During 1971–76, Iran enjoyed one of the fastest growth rates in the world, the economy growing at an average rate of 10% in real terms, and real GDP per capita grew by 5.8% on average. Both oil output and oil prices increased significantly during the period.

The growth trend was reversed during 1977–88, reflecting the fallout of the 1979 revolution, the eight-year war with Iraq, the international isolation of Iran, the increased government control of the economy, and the dropping in oil output and revenue, all these resulting in real GDP growth of 0.25% year on average. With the reconstruction effort and a recovery in oil output, the real rate of economic growth increased during 1989–2002 to an average of 4% per year. This period, however, was marked by sharp fluctuations in the growth rate, as the postwar economic boom 1989–93 was followed by the stagnation of 1993–94, when the economy was hit by lower oil prices, lack of external financing and heavy burden of foreign debt. The debt crisis together with inappropriate macroeconomic policies had an adverse impact on growth, which growth rate reached around 3.2% during 1995–2000. In the more recent period 2000-2008, real GDP growth picked up to 5.2% due to significant progress in economic reforms such as the exchange rate unification, trade liberalisation, the opening up to Foreign Direct Investment

(FDI), and financial sector liberalisation, plus high oil prices and expansionary fiscal and monetary policies. In figure 1, we can see the trend of GDP per capita and growth rate in 1971-2008. Iran has recorded low annual GDP per capita based on constant local currency. Economic performance has been influenced by oil revenue volatility. Economic growth, even the growth of non-oil output, has tended to pick up during periods of high oil prices and slow down when prices have fallen. The oil exporting countries have not performed as well as counties with much poorer endowment of natural resources.

Figure 1: GDP Per Capita and Growth Rate in Iran 1971-2008



Source: World Development Indicators, World Bank.

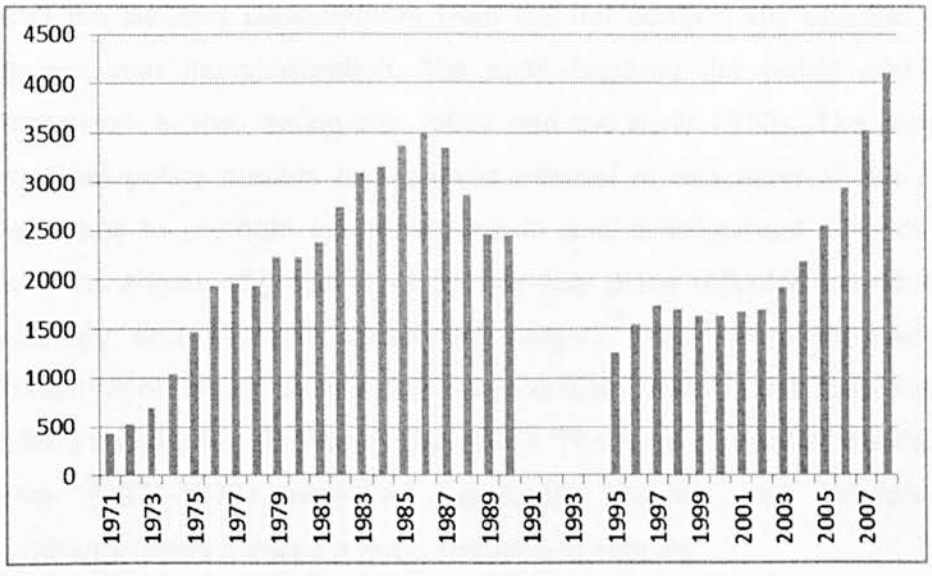
In 1973 oil prices increased and GDP per capita has reached its peak in 1976 which was about 64% of the average for 12 Western European countries (Salehi-Isfehani, 2009) Of course, that high level of income did not fully translate into improving for standard of living for the typical Iranian household because, over a third of that income was due to oil exports, which were not gained through productivity increases. Besides, those revenues were controlled by the government that had focused on overall economic growth with little view for income distribution. The first reaction to these increasing revenues was doubling the planed government expenditures.

Although a significant proportion of the increased revenue was directed towards investment the economy overheated and started experiencing high and rising inflation in the mid-1970s. Increased economic instability led to sharp declines in investment and GDP. Following the Revolution of 1979, the economy entered a period of rapid decline. Except for a brief period during 1983-1984, investment and GDP were rapidly falling and inflation was on the rise. At its through in 1988, real GDP per capita had dropped to only 54% its peak in 1976, but it was still only 63% its 1976 peak. As a result, by 1988 the per capita income in Iran had dropped which was only 23% of per capita income in Western Europe and fell behind many comparable developing countries. During 1989-2008, the Iranian economy has not experienced the high GDP per capita of the 1970s.

2.7.2 GNI Per Capita

The GDP is said to be the measure of a country's overall economic output. It is the market value of all services and goods within the borders of a nation. The GNI is the total value that is produced within a country, which comprises of the Gross Domestic Product along with the income obtained from other countries, such as dividends and interests. Analysts use this GNI per capita figure as an indicator of the average income of a citizen in any country. Figure 2 shows the GNI per capita in constant of US $ of 2002 for period of 1971-2008 in Iran. In 1971 GNI per capita was $420, by 1977 the rate had considerable growth and in 1978 it was negative, and in 1980 the year when the Iran-Iraq war began GNI per capita was zero. During years 1982-1986 the growth of GNI per capita was gradually increasing, but in years 1987,1988,1989, 1995 and 1998 the growth was negative. After 1986, GNI per capita was decreasing year by year, this trend was continuing until 2007 ($3520). On the other hand, after 20 years the GNI per capita returned to its amount in year 1986 ($3490). GNI per capita reached $4100 in 2008 with population of more than 72 million.

Figure 2: GNI per capita (constant of US $, 2002) in Iran 1971-2008



Source: World Development Indicators, World Bank.

2.7.3 Background of Economic Growth in Iran

Maddison (2007) provides estimates of GDP per capita for the years 1870 and 1913 for Iran and suggests that Iran must have had a per capita income which was less than a third of the average income prevailing in Western European countries and below one fourth of that in North America. The bulk of income came from land and manufacturing was by and large confined to carpet weaving, textiles, and handicraft (Bharier, 1971). Pamuk (2006) also offers estimates for the same years, which are about 20% lower than those reported by Maddison (2007) and places Iran at the lower end of income spectrum in the Middle East at the time. It was still above the average among developing countries and only about 20% short of the average per capita income prevailing at the time in Latin America and in Japan (Maddison, 2007). Although population of Iran at the time was only about 9 million, three quarters of which lived in urban areas, Iran's economy was among the largest 30 economies in the world in terms of population and total GDP.

Economic growth in Iran during the late 1950s and the early 1960s began as an oil-based economy. Low forward and backward linkages between the oil sector and the rest of the economy, missing markets, market imperfections, and weak private sector provided the condition of the centrist view that the government should step in directly to replace missing markets and correct

market imperfections. During the 1960s there was no development strategy and the Second Development Plan did not contain any specific model of growth and industrialisation. Big push became the policy and planning framework in Iran during the 1960s and the early 1970s. The bureaucracy and the policy makers had greater interest in allocation of the oil sector revenues to promote economic growth and development. The oil industry was the engine of growth and the five-year plans reflected the development strategy and sectorial investment targets which were followed by the government. Import substitution became main policy in the Third Plan (1963-1967) and the Fourth Plan (1968-1972). The huge oil windfall during the Fifth Plan (1973-1977) increased aggregate demand and cheaper foreign exchange rates allowed a huge increase in imports.

Allocation of surpluses through the government machinery creates rent seeking, which is a common phenomenon in oil-exporting countries. The more limited is the size of the distribution of oil rents through market forces, and the more limited is public access to resources, the greater is the encouragement for groups and individuals to seek rent. The huge increase in oil revenues in the 1973-77 periods had a double effect. The rise in oil revenue was channeled government consumption and investment expenditures. The consequent fiscal and monetary expansion led to a rapid pick up of inflationary pressures and expectations. In spite of large increases in oil revenues, particularly after 1972, government did not follow a comprehensive redistribution programme.

The 1978-1987 period the economy experienced greater government control on prices, extensive nationalisation, and nationalisation of foreign trade and expansion of social subsidy programmes. The war with Iraq helped to further reinforce these conditions. Indeed these conditions were the main reason for failing to deliver sustained growth.

The above-mentioned conditions created several important imbalances in the Iranian economy. The increase in real exchange rates shifted resources out of tradable goods sector whilst due to the war the quantity of oil exports declined. As a result the budget deficits grew, in part due to government

finance of war expenditures, and total private sector investments fell and its composition changed. The inefficient bureaucratic structure and unsustainable fiscal deficits and weak tax systems had reduced growth and raised inflation rates.

In the years following the Iran-Iraq war, growth rate, per-capita income and the investment rate declined. The existing economic structure was heavily controlled by government and it had to be adjusted to accommodate of economic growth. The main view on how a higher economic growth rate is to be achieved can be stylised as less government control, more reliance on the market mechanism, wider private sector participation, and a more open economy. The Structural Adjustment Programmes were considered in the First (1989-1993), Second (1995-1999), and the Third Development plan (2000-2004).The government was unable to generate real economic growth until 2002 when oil revenues recovered again. In 2005, government did not follow the Structural Adjustment Programmes any more.

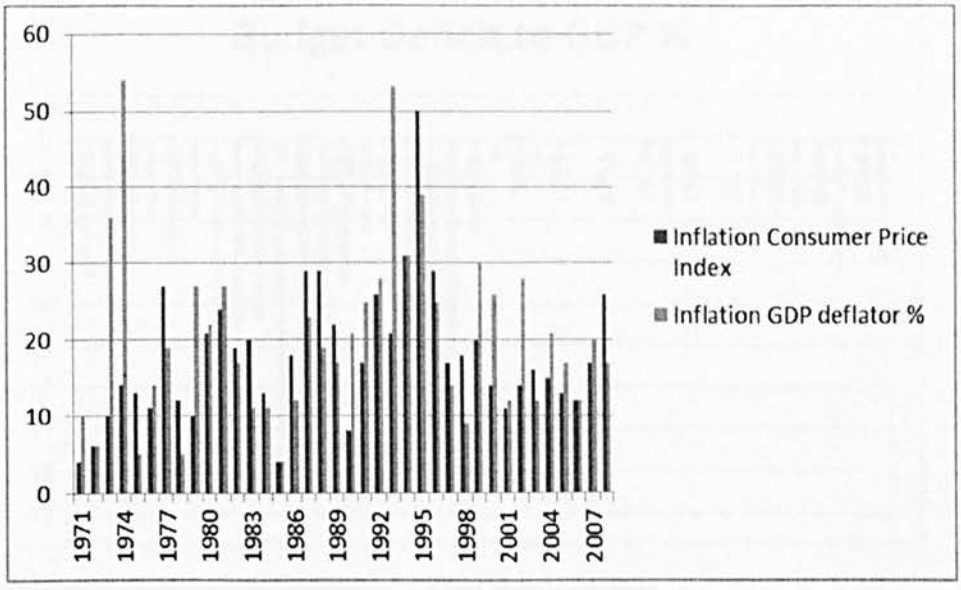
2.7.4 Inflation

It is clear that in the nearly last four decades inflation has been one of the important problems of Iranian economy. Inflation has effects on economic growth, employment, income distribution and social and political condition of the country. During the last three decades rate of inflation of Iran has been in two digits. In the recent decades Iran has experienced several important events in the economic and political fields. These included the three oil shocks of 1972, 1979 and 1986; the Islamic Revolution in 1979 which was followed by nationalisation of major sectors of the economy; the eight-year war with Iraq during 1980-1988; and the Structural Adjustment Programmes. The effects of the oil shocks were particularly profound due to the dependence of the economy and of the macroeconomic policies on oil revenue. After the war the economic reform programme also had major effects through the removal of price controls and government subsidies, currency devaluation, and the deregulation of trade and tariffs. Available evidence supports the view that monetary factors are the main determinates of inflation in Iran. The economy started experiencing high and rising inflation

in the mid1970s. The inflation rates were in single figures from before 1972. Iran for a short time in 1966, 1967and 1969 had deflation rates of -1%, 0% and -1%. The inflation rates were in single figures from 1961 to 1972. After 1972, with the oil price and the quantity of oil exports increasing, the rates of inflation rose sharply and exhibited large fluctuations. The annual average rate of the GDP deflator and Customer Price Index (CPI) inflation was 21.05% and 18.40%, during the period1971-2008. A spike for the GDP deflator inflation appeared in 1974 with a rate of 54%. Indeed, the oil value added is one of the main components of GDP and, through the definition of the GDP deflator (calculated using the ratio of nominal GDP over real GDP), has strongly affected the GDP deflator in 1974. The GDP deflator and CPI inflation rates accelerated to an annual average of 17.3%and18.9 7%, respectively, over the period 1979-1988. This period was full of events that are sources of inflation since the revolution including second oil boom, the war, third oil crisis, over the period of 1989-1993, when the structural adjustment programme was implemented, the average rates of the GDP deflator was 29%while the CPI inflation was 14.8%. The rates of inflation increased further over the period following the Structural Adjustment Programme. The GDP deflator and CPI inflation rates were 31.7%, 36% and 6% respectively over the period 1994-1996. The CPI inflation rate reached a peak of 50 % in 1995.

The average rate of CPI inflation was 21% over the period of 1997-2000. Over the period of 2001-2008 the average rate of CPI inflation was 15.5% the rate of this period is the lowest rate after revolution 79. In 2008, the rate of inflation has reached to 26%. Iran experienced a decline in inflation, particularly after the 2002 exchange rate unification. But the monetary policy in Iran has not been successful in reducing inflation and setting monetary targets.

Figure 3: Inflation Rate % in Iran 1971-2008



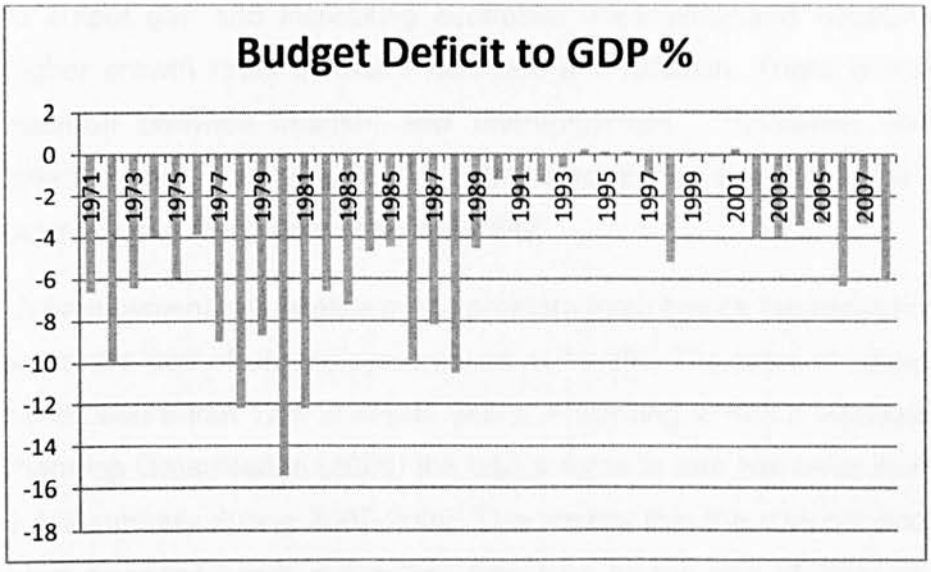
Source: World Development Indicators, World Bank.

2.7.5 Budget deficit

The main problem in deficit financing is borrowing from banking system. Borrowing from banking system causes increasing government debt and in turn, increase supply and liquidity. On the average, budget deficit financing from banking system has been 79% after revolution. The reasons for increasing of government expenditure are:

- Dependency on unreliable oil revenue
- Public sector expansion and high subsidy
- Import goods,
- War with Iraq,
- Loss of government companies,
- Decreasing the share oil revenue in public revenue in 1986,
- Devaluation of Iranian currency.

Figure 4: Budget Deficits to GDP % in Iran 1971-2008



Source: National Accounts, Central Bank of Iran

In years 1975 (5%), 1978 (5%) and 1985(4%) the rate was at 5%, 5% and 4% more, but in 1977, this rate was more than10%. During of war, the ratio has increased very sharply and from 1989 to 1991 the ratio decreased.

2.7.6 Unemployment

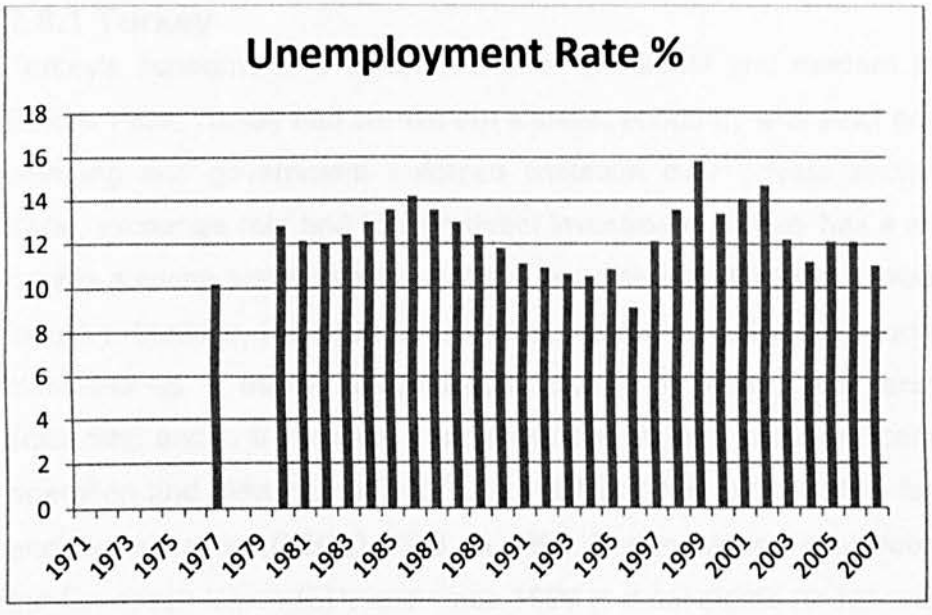
According to classical and neo- classical economic theory unemployment is due to the shocks and market imperfections. Keynesian economists believe that market economy normally will not come into equilibrium at full-employment level without government involvement in the economy. In general unemployment can be caused by population growth, high minimum wage level, rural-urban migration, rapid changes in technology, inflation, recession, shortage of skilled labour and restrictive labour policies. The economy of Iran continues to be encumbered by high unemployment, which totally is harmful to economy.

Unemployment of factors of production leads to lost opportunity costs, which undermines economic growth on the other hand. Labour employment, among others factors of production, can have significant economic, as well as political impact. Iran possesses one of the youngest populations in the world with approximately 49% of its population less than 15 years of age. With this high population growth rate, jobs were not created in proportion to

increased population growth. The rate of unemployment responds positively to output gap and increasing economic uncertainty and negatively to the higher growth rates of real investment and inflation. There is a degree of trade-off between inflation and unemployment. Persistent and soaring inflation rates eventually leads to the chronic depreciation of the domestic currency and rising economic instability.

Unemployment has been a major problem even before the revolution in 1976 when the rate of unemployment was at 10.2%. The rates of unemployment have been about 12% in recent years. According to Iran's Management and Planning Organisation (2005) the labour force in Iran has been increasing by 3.4% annually during 2005-2009. This means that the national economy will have provided nearly 4.5 million new jobs by the end of 2009 to avoid an unemployment crisis. During the period from 1976-1986 the growth of unemployment was very high, but since 1996 it has been increasing again due to baby boom in the 1980s and rising presence of educated women in the labour market. In the late 1980s Iranian government started a Structural Adjustment Programme, which was recommended by the IMF and World Bank. In spite of high growth in private investment and sufficient job opportunities in the industrial sector, but the low productivity of public sector remained strong.

Figure 5: Unemployment Rate % in Iran 1977- 2008



Source: National Accounts, Central Bank of Iran

From 1989 to 2004 (during three Development Plans) despite all effort and employment policies only some parts of the employment goals were achieved.

Since 2004, The Iranian central bank is obliged to use up to 3% of commercial banking reserves for financing employment creating project in private sector. The experiences of the past two decades have shown that financing private sector investment with loans cannot solve the problem of unemployment, and such credit policies are inflationary. In general, the major factors of the growing unemployment rate in Iran are:

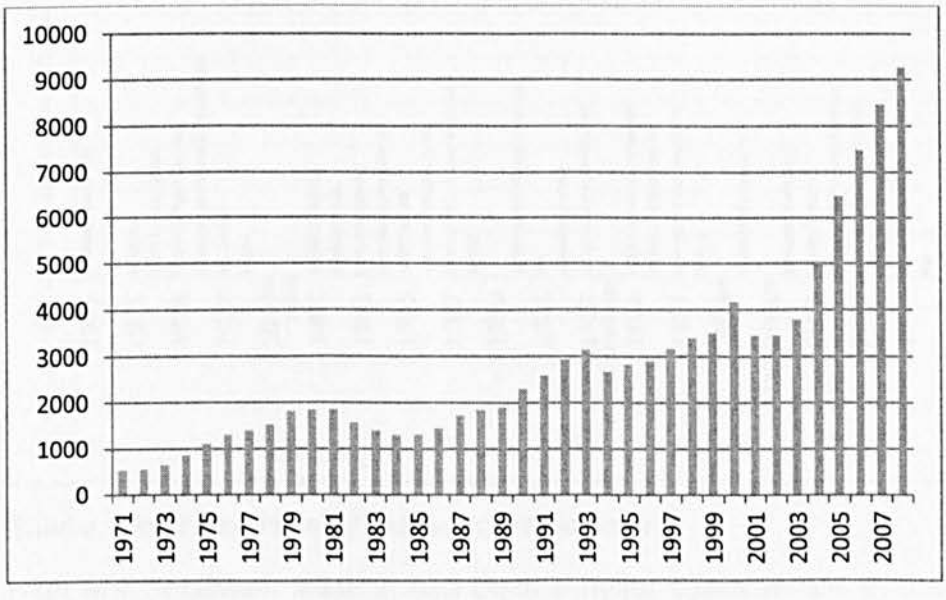
- Inflation,
- Output gap,
- Economic uncertainty,
- Unstable currency,
- Real growth of investment

2.8 Benchmark Analysis

2.8.1 Turkey

Turkey's economy is a complex mix of traditional and modern industries. Before 1984, Turkey had carried out a statist economy with strict government planning and government enforced limitation over private sector, foreign trade, exchange rate and foreign direct investment. Turkey has a strong and rapidly growing private sector, yet the government still plays a major role in industry, banking, transport, and communications. Turkish economy is often classified as a newly industrialised country by economists and political scientists, and is a founding member of the Organisation for Economic Co-operation and Development (OECD) 1961 and the Organisation for Security and Co-operation (OSEC) 1973. In 1995, Turkey signed an agreement with the European Union (EU) and since 1999 is a candidate for full membership of the European Union. Turkey's per capita GDP places it among the upper-middle income countries. Turkey had $ 530 GNI per capita in 1971with more than 36 million people. This figure has been reached to $ 9020 in 2008 with more than 70 million people.

Figure 6: GNI per capita Constant 2002 US $ in Turkey 1971-2008



Source: World Development Indicators, World Bank

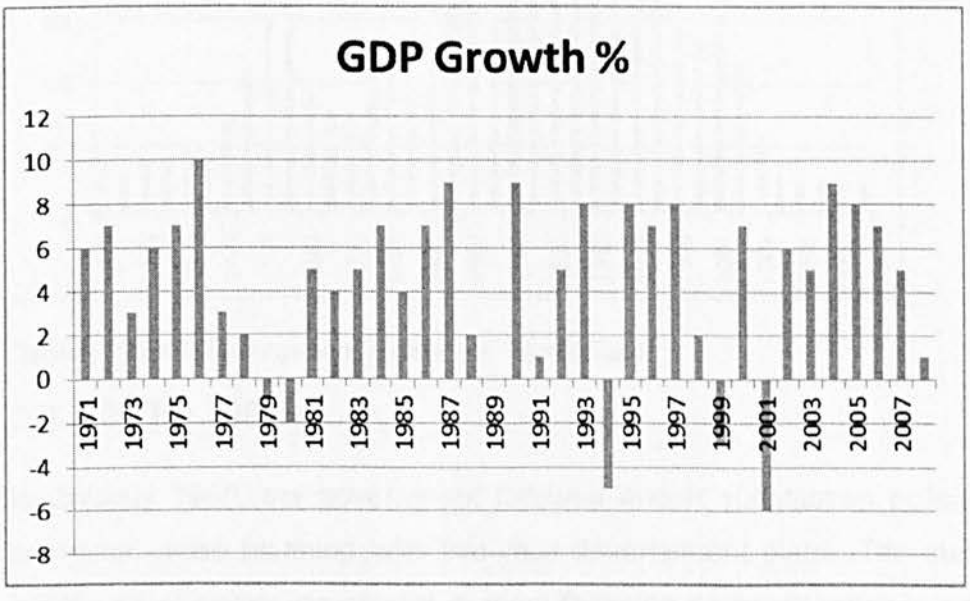
We can review the Turkish macro-economic trends in the four periods: 1970s, 1980s, 1990s, and post 2001. (Akyurek (2006), Bilgin and Kilicarslan

(2008), Dibooglu and Kibritcioglu (2004), Keyman and Koyuncu (2005), Kibritcioglu (2005), Kibritcioglu (2004) and Oins and Rubin (2003)).

2.8.1.1 The 1970s

By the late 1970s, Turkey's economy had reached its worst crisis, and macroeconomic instability had increased. The main reasons for the rise of the instability were the deterioration of the fiscal balances due to a significant rise in public investment and excessive reliance on foreign borrowing. Turkish government had failed to take sufficient measures to adjust to the effects of the sharp increase in world oil prices in 1973–74 and had financed the resulting deficits with short-term loans from foreign lenders. The late 1970s have been very costly, despite the high and steady growth rate of 1963-1977 period, due to the fact that the economic growth became negative from 1977 to 1980.The Turkish economy faced high inflation rate, high unemployment rate, budget deficits and excessive debt accumulation.

Figure 7: GDP Growth Rate % in Turkey 1971-2008



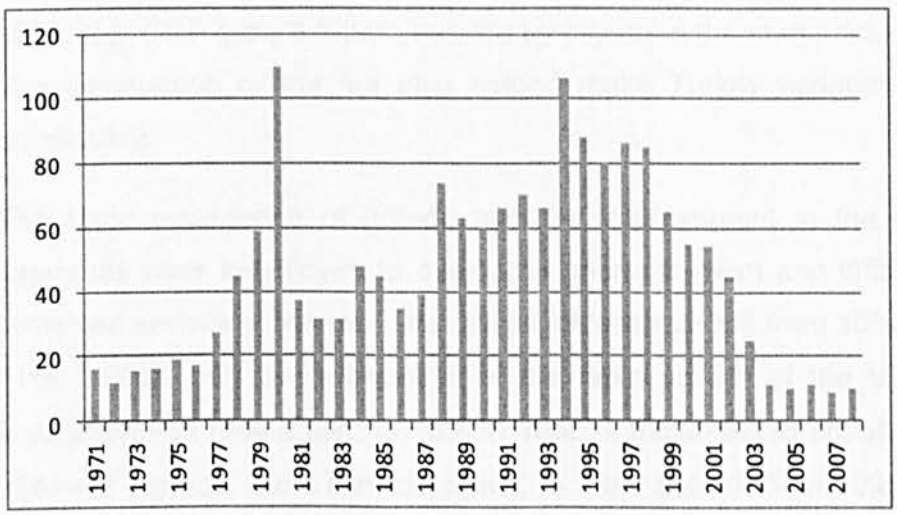
Source: World Development Indicators, World Bank

High and persistent inflation had been a major characteristic of the Turkish economy for more than two decades. The rate of inflation has reached from 22% in 1973 to 93% in 1980. During 1973-1977, the average rate was about

22.4%, but during 1978-1980 this figure had increased to 72.66%. Since the late 1970s high and persistent inflation rates has been fed by:

- High public sector budget deficits
- Monetisation of public sector budget deficits
- High military expenditures
- Political instability
- Inflationary effects of changes in exchange rates
- Increase in the world oil prices
- Increase in regulated prices of public sector
- Rising interest rates resulting from the crowding-out effect of public sector borrowing in domestic capital market

Figure 8: Inflation Rate % in Turkey 1971-2008



Source: World Development Indicators, World Bank

2.8.1.2 The 1980s

In January 1980, the government followed import substitution policies and economy –wide planning with five-year development plans .The state had made use of heavy investment in manufacturing sector in order to advance industrialisation and economic development. Overall, Turkey attained a moderately high rate of growth. The government pursued this growth by means of a comprehensive package:

- Devaluation of the Turkish lira

- Institution of flexible exchange rate
- Maintenance of positive real interest rates
- Tight control of the money supply and credit
- Elimination of most subsidies
- Reform of the tax system
- Encouragement of foreign investment

The liberalisation programme overcame the balance of payments crisis, reestablished Turkey's ability to borrow in international capital markets, and led to renewed economic growth. Foreign investment which had been negligible in the 1970s now has started to grow. The reduction in public expenditures, which was at the heart of the stabilisation programme, slowed the economy sharply in the late 1970s and early 1980s. Real gross national product had declined to 1.5% in 1979 and 1.3% in 1980. Between 1981 and 1985, real GNP grew 3 %per year, led by growth in the manufacturing sector. The devaluation of the lira also helped make Turkey economically more competitive.

The rapid resurgence of growth and the improvement in the balance of payments were insufficient to overcome unemployment and inflation, which remained serious problems. The official jobless rate fell from 15% in 1979 to 11%in 1980, but, partly because of the rapid growth of the labour force, unemployment rose again, to 13% in 1985. Inflation fell to about 25% in the 1981–82 periods, but it climbed again, to more than 30% in 1983 and more than 40% in 1984. Although inflation eased somewhat in 1985 and 1986, it remained one of the primary problems facing economic policy makers. During 1988 and 1989 Turkey established the domestic capital markets and switched the mode of deficit financing to domestic borrowing.

In general after 1980, Turkish economy experienced both stabilisation and structural adjustment programmes. The Turkish neo-liberal experience started in 1980 under the supervision of the World Bank and IMF. The programme rapidly reached its initial targets in terms of reducing inflation, achieving higher growth rates and taking steps towards trade and financial liberalisation. This pattern appears to be a rather typical feature of Turkish

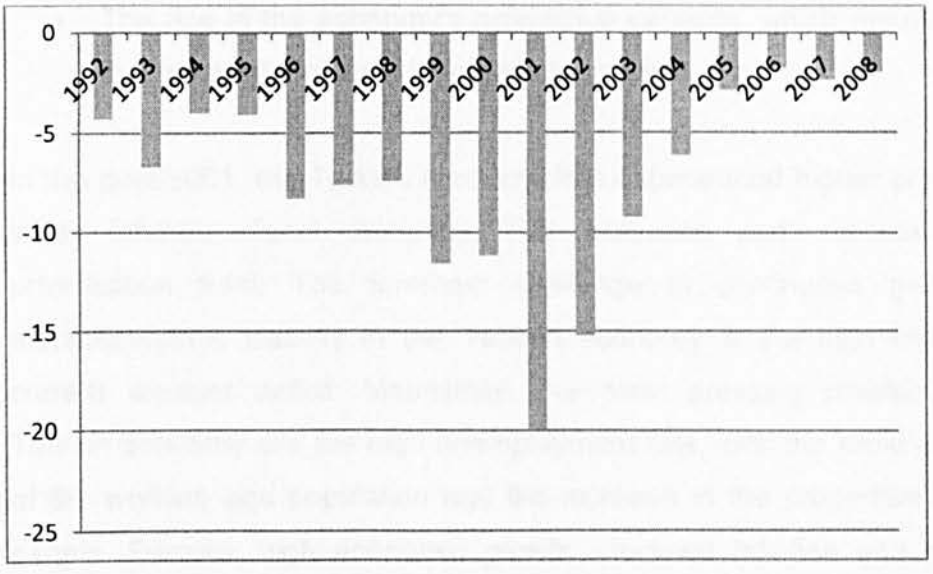
economic development. However, it tended to be relatively short-lived., starting from the late of 1980s macroeconomic instability rose again.

2.8.1.3 The 1990s

The second phase of Turkish neo-liberalism in the 1990s was characterised by high degree of macroeconomic and political instability, lower growth rates, chronic inflation and weak budgetary performance. Turkey experienced a very severe financial crisis in the early 1994 mainly due to unsustainable fiscal balances and the collapse of the domestic debt market. Macroeconomic instability continued until the late of 1990s. In 1992 and 1993 the central government moved to grant large salary increases to civil servants and increase transfers to state enterprises, leading to a rise in the rate of inflation. The resulting rise in the real exchange rate translated into increased imports and slowed the expansion of exports agencies. In 1992 and 1993, the government attracted funds to cover its budget deficits. These capital flows helped maintain the overvalued exchange rate. Commercial banks borrowed at world interest rates and lent to Turkey at higher domestic rates without fear of a depreciating currency. As a result, Turkey's foreign short-term debt rose sharply.

At the end of 1999, the policy was accompanied by inflow of capital and it was successful in reducing inflation However, lower interest rates and exchange rate appreciation fuelled consumption and investment, resulting in a large current account deficit of up to 5% of GDP. External and internal confidence in the government's ability to manage the impending balance of payments crisis waned, compounding economic difficulties.

Figure 9: Budget Deficit to GDP % in Turkey 1992-2008



Source: Central Bank of Turkey

2.8.1.4 The post-2001

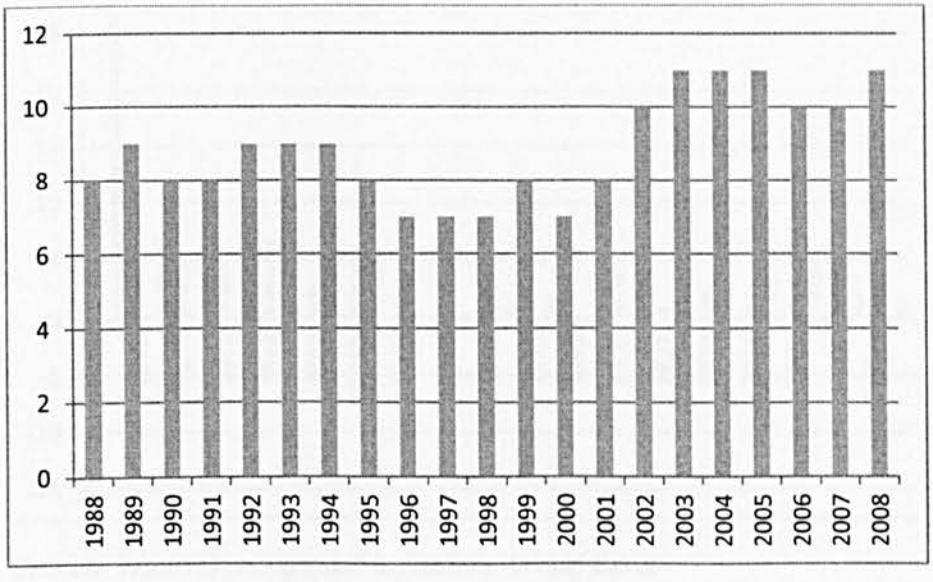
This stabilisation programme ended up in one of the deepest crises in Turkey's economic history in 2001.After the 2001 crisis, a new programme was put in place with IMF support, introduction of a floating exchange rate regime, and structural reforms. The central bank was granted independence in 2001 and committed to abstain from intervening in foreign exchange markets and to focus on reducing inflation. This new programme was started in 2002 and implemented in 2005.Until 2005, inflation rates declined to single- digit levels, after several decades of double-digit inflation. Deflation was also accompanied by strong growth performance. The key factors, which made this sharp deflation, were:

- Central bank's independence and focus on price stability. The weaknesses of the Turkish banking system that had led to financial crises in 1994, 2000 and 2001. Since 2001, the banking and financial system has been tightly regulated in line with international norms and assumed a more robust structure against possible financial crises. The crisis in 2001 changed the incentives of key actors in the Turkish economy, pushing them toward accepting the necessity for reform and structural transformation.

- Productivity gains.
- The rise in the economy's productive capacity, which resulted from employment growth in industry and services.

In the post-2001, the Turkish economy has experienced higher growth rate, lower inflation, fiscal discipline, FDI attraction and success on the privatisation front. The foremost challenge to continuous growth and macroeconomic stability in the Turkish economy is the high level of the current account deficit. Meanwhile, the most pressing problems in the Turkish economy are the high unemployment rate, with the rapid expansion of the working age population and the increase in the proportion of young people. Despite, high economic growth, declined inflation and increased investment in the recent years, the job creation capacity of the economy has not improved.

Figure 10: Unemployment Rate % in Turkey 1988-2008



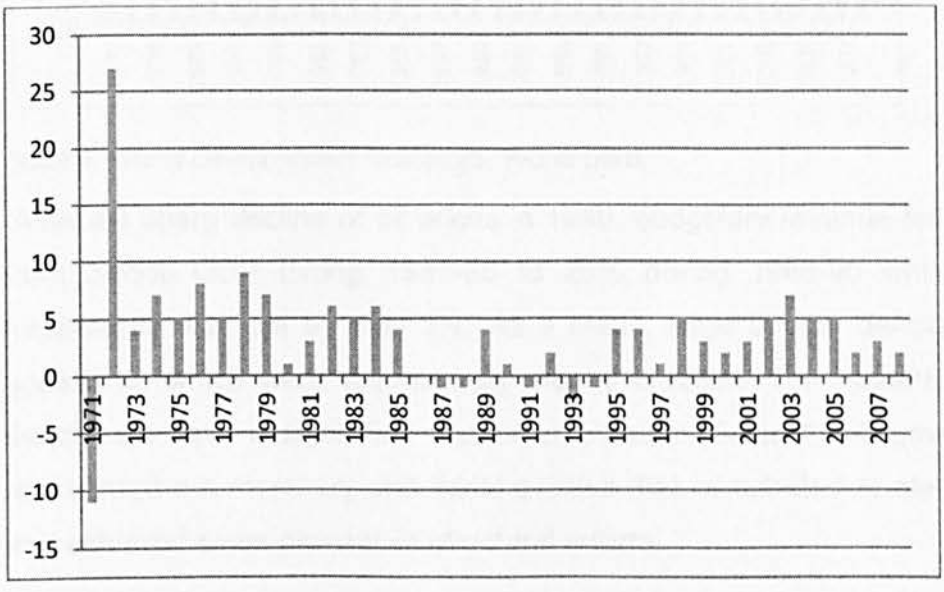
Source: World Development Indicators, World Bank

2.8.2 Algeria

Algeria is classified as an upper middle income country by the World Bank. It has the 10th largest reserves of natural gas and 16th in oil reserves in the world. Following independence, Algeria adopted an economic policy based on a socialist organisation of society. From 1967 to 1969, government

planned a programme for expansion of industry and improvement of agriculture. The second plan from 1974 to 1977 established a heavy industrial base for the economy and largely completed agricultural reform. In 1979, the government decided to limit oil and gas exports and to centralise industry. The new five year plan for 1980-1984 switched the emphasis from heavy to light industry. The second five-year plan of 1985-1989 emphasized agriculture and water supply in order to reduce the food deficit. Since 1994, the government has carried out a stabilisation programme in the face of volatile oil prices and has achieved some progress in structural reform. In 1998, the economy was saddled with foreign debt. Algeria's finances in 2000 and 2001 benefited from an increase in oil prices and government's tight fiscal policy, leading to a large increase in the trade surplus and reduction in foreign debt. (Ivan, 2003)

Figure 11: GDP Growth Rate % in Algeria 1971-2008

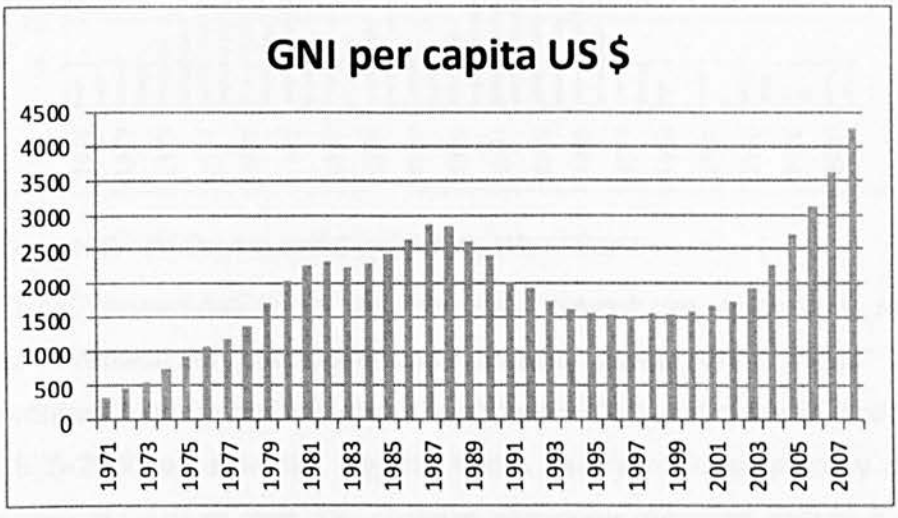


Source: World Development Indicators, World Bank

The oil sector accounts for about 30% of Algeria's GDP, more than 95% of export earnings and 75% of fiscal revenue. Over the past three decades the growth of Algeria's GDP is estimated at 2.3 % per year, the main reason for this low growth being weak performance of total factor productivity. In the 1970s, high oil prices resulted in an economic boom and GDP grew at an average annual rate of 6.8% .In the 1980s, GDP grew by 2.7% on average,

due to low oil prices. Macroeconomic adjustment efforts were put in place in 1989 and 1991 and were strengthened by an adjustment programme in 1994, to achieve macroeconomic stabilisation .From 1995 to 2000 GDP grew at by 3.1% a year on average. Since 2001, the rate of growth had better performance by 5% a year on average. (Aissoau, 2001)

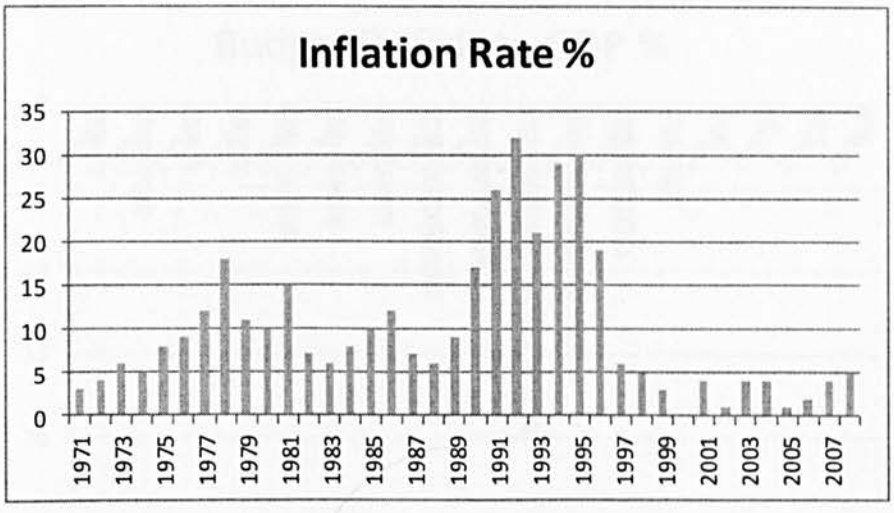
Figure 12: 1GNI per capita constant US $ 2002 in Algeria 1971-2008



Source: World Development Indicators, World Bank

After the sharp decline of oil prices in 1986, budgetary revenue fell sharply from 38.5% GDP during 1981-85 to 28% during 1986-90 while public expenditure was cut by only 5%. As a result, large budget deficits began appearing, which were financed by money creation. The monetisation of deficits did have a significant impact on inflation. Since 1994, government has carried out monetary and fiscal policies that contributed to stabilisation and achieved some process in structural reform.

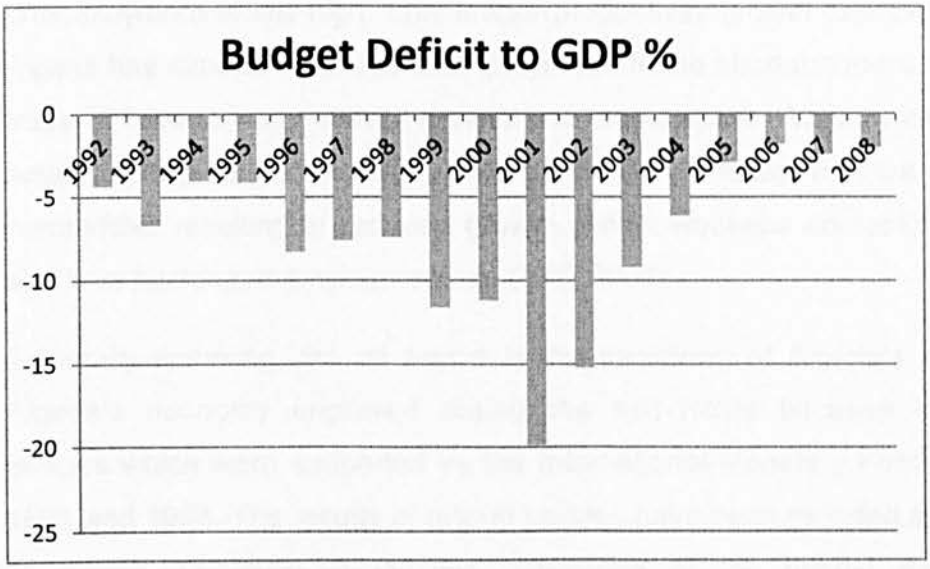
Figure 13: Inflation Rate % in Algeria 1971-2008



Source: World Development Indicators, World Bank

Fiscal consolidation in Algeria has played an important role in the achievement of macroeconomic stability since 1994. Fiscal adjustment reduced primary deficits and turned them into surplus more recently. During 1975-2000 as a whole, Algeria had a yearly average primary deficit as a share of GDP of over 3%. Surplus has been recorded only in 5 years over 1975-2000, the average amounting to about 4.3% of GDP.

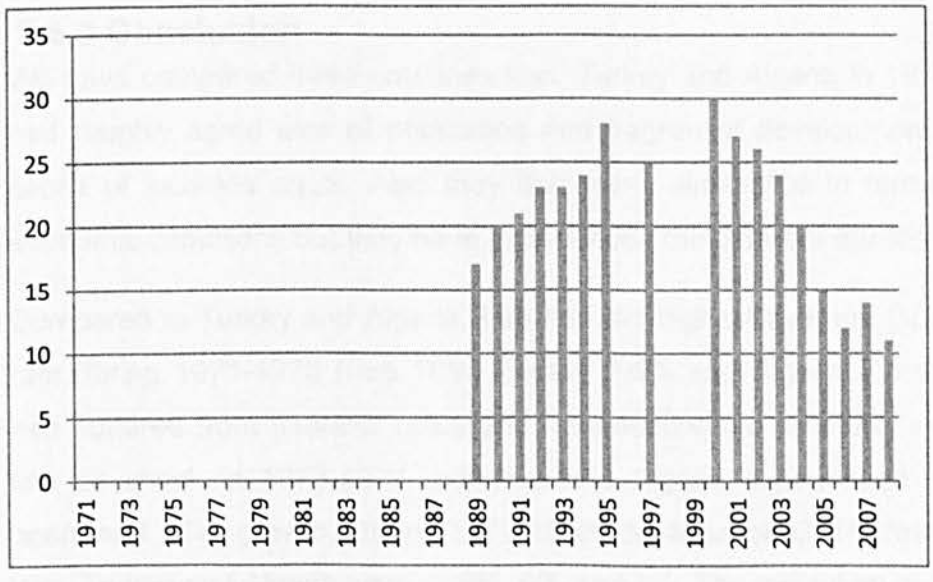
Figure 14: Budget Deficit to GDP % in Algeria 1992-2008



Source: Central Bank of Algeria

Expenditure reduction has been the target of Algeria's remarkable fiscal consolidation. On average between1975-2000, Algeria has reduced total public expenditure including the reduction of government subsidies by 18% as a share in GDP. The sharp cuts in capital expenditure between 1970 and 1990 were accompanied a doubling of government current expenditure due to the doubling of the wage bill, increased transfers and increased interest payments on public debt (World Bank, 2003, 2008).

Figure 15: Unemployment Rate % in Algeria 1988-2008



Source: World Development Indicators, World Bank

In recent years, Algeria has experienced encouraging economic growth, but unemployment is still high. Low labour productivity growth can explain why Algeria has experienced high unemployment. In the short run there may be a trade of between productivity growth and employment. Wages may tend to adjust slowly to productivity. Low productivity makes the country less competitive resulting in reduced growth, which weakens domestic demand and thus pushing unemployment up. (IMF, 2007)

Generally speaking, the oil export is the backbone of Algeria's economy. Algeria's economy improved during the mid-1990s because of reform policies which were supported by the International Monetary Fund in 1989, 1991 and 1994. The results of reform policies have been included a recovery in growth, reduction in inflation, narrowing of the budget deficit and decreasing the country's foreign debt since 1995. From 1999, the government has put emphasis on re-establishing financial and macroeconomic stability structural reforms. Government has tried to continue its efforts to attract foreign and domestic investment outside the energy sector, but still the economy remains heavily dependent on volatile oil and gas revenues. Algerian government has achieved an important surplus in the balance of trade, control of inflation and increase of foreign currency reserves. Algeria is now a country with a high unemployment rate, affecting 39% of the labour force.

2.8.3 Conclusion

We have compared three countries Iran, Turkey and Algeria in 1970s. They had roughly same size of population and degree of development and per capita of incomes equal. Also they had many similarities in terms of their economic conditions but they have experienced the different transformations.

Compared to Turkey and Algeria, Iran had the highest average GDP growth rate during 1971-1978 (Iran 10%, Turkey 5.5% and Algeria 7.4%). Turkey had suffered from financial crisis and macroeconomic instability due to the first oil shock in 1973-1974, but Iran and Algeria experienced economic boom and GDP growth. During 1979-1988, the average GDP growth rate in Iran, Turkey and Algeria were -1.5%, 4% and 3%. The revolution of 1979 and

the Iran-Iraq war in 1980-1988 were the reasons for decrease in economic growth. Turkey benefited heavily from the Iran-Iraq war in 1980-1988. Turkey's economic growth was built on the liberalisation and privatisation programmes. Algeria had a decrease in GDP growth due to low oil prices. During 1989-2008, the average GDP growth rates were respectively 5.15%, 4.1% and 2.7% in Iran, Turkey and Algeria. The average Gross National per capita Income in Iran during the 1971-1979 and 1980-1990 periods were $1355 and $2909, higher than the equivalent figures for Turkey and Algeria. But during the 1995-2008 period the average rate in Turkey was higher.

High and persistent inflation has been a major challenge in Iran and Turkey, but Turkey has been more successful in reducing the inflation rates by reform in Central bank's independence. The average rates of inflation during the periods of this study were respectively 18.4%, 47% and 10.2% in Iran, Turkey and Algeria. Inflation, the lowest among Iran and Turkey has remained stable at 4% on average between 2003 and 2008.

Algeria has experienced a high degree of instability, and civil war. Algeria became highly dependent on its mineral revenues. However, such economic policies along with a sharp drop in oil prices led the government to excessive borrowing. Budget deficit in Algeria has been turned into surplus by Fiscal Adjustment Programmes in recent years. But Iran and Turkey have experienced a high rate of budget deficit.

Algeria had a higher unemployment rate, and Turkey's unemployment rate was less than in Iran. The main factors including rising presence of educated women in the labour market, rapid expansion of the working age population and low labour productivity growth can explain the high rate of unemployment in these countries.

We believe some of the reasons for the divergence between economic performances of the three countries we have discussed above are as follows:

Dependence on Oil Revenue: This has represented a negative factor in the economic fortunes of both Iran and Algeria. The structure of the Iranian

economy heavily depends on oil and gas export. As the receiver of oil revenue, the government become and remains the important economic actor. The economy of Algeria is heavily dependence on oil and natural gas export and is transiting from government control to an open market. Having escaped this predicament, Turkey has performed better than other two countries due to more relationship with western countries.

Structural Reform and Macroeconomic Stabilisation Programmes: After war in 1988, Iran planned an ambitious reconstruction programme to deal with the highly centralised economy which was a result of war. Despite of all governments efforts to improve of infrastructure of economy were not successful. Still the national economy is suffering from inflation, unemployment and budget deficit. The development of the non-oil industries has acted very poorly and there has been little challenge by the privatisation process. Both Turkey and Algeria have gone through structural adjustment and reform, while Iran has not managed to do so successfully and consistently, despite the fact that the government in Iran has at times attempted to engage in these programmes. Turkey is a large, middle – income country, its economy has been transformed from a state-led to a market-oriented economy in 1980s, and also the economy has been changed from agricultural to industry. Since 1980, the government has undertaken a major reforms (due to high inflation, unemployment, foreign loans and low economic growth) included a reduced state role in economy, a realistic exchange rate and monetary policies, reduce on subsidies and price control, and encouragement of exports and foreign direct investment. The state planning was followed by economic liberalisation and some structural reforms and Turkey has achieved significant success on the inflation and high rate growth, since 2001 the country is experiencing deflation. The liberalisation programme achieved considerable success in reducing external deficits and restoring economic growth. Despite of important privatisation and structural reforms, but current account deficit continues to be high.

Openness to Trade and FDI: Turkey and Algeria have both been open to foreign trade and foreign direct investment (FDI). Although in large countries, especially in early stages of development, development can proceed largely in a state of autarky, as countries proceed further in their economic development, they need to specialise more and thus rely more on foreign trade. China in the last 3-4 decades has shown that even a large country at early stages of development can grow rapidly with open markets. Turkey has been the most open among the three countries and its economic growth has been more consistently higher. In 2006-2007 FDI flows covered more than 60% of the deficit and more than 25% of deficit in 2008. The high and rising current account deficits worsen the external debt. Turkish governments have persistently run large budget deficits, which have fuelled inflation, capital flight, and heavy foreign and domestic borrowing. Turkey has remained reliance on short-term FDI to finance its large deficit. In the 1970s there were periods of high rates of unemployment, Although Turkey has suffered from crises in the past but still has experienced high rates of unemployment.

Turkey benefited economically from the Iran-Iraq War 1980-88. Algeria has started to do economic reforms and important challenge for government but the rate of unemployment still is very high. Still the disadvantages in Turkish economy are high rate unemployment, budget deficit and borrowing foreign capitals. Iran was not successful to obtain economic targets due to its economic structure such as access to free market, cooperation international economics activities. Turkey has made great steps toward closely economic ties with Europe, and United States.

Democracy and Quality of Institutions: Turkey has been an open and democratic country. Iran is an Islamic state with some democratic institutions (e.g. the presidency and the Parliament or Majlis). Algeria has also enjoyed a degree of democracy, but has been dominated by military and civilian elites, representing the liberation movement that overthrew the rule of French colonial power. Overall Turkey has better quality institutions partly based on their Constitution and partly as result of the process of EU membership negotiations process.

Degree of International Isolation and Civil/Military upheavals: All three countries have had experiences of war, revolution and coup d'état. Of the three Iran in particular has experienced revolution, war and been involved in other international conflicts (US embassy hostage crisis in 1980's and the nuclear issue in 1990's and 2000s) leading to its international isolation. Thus in the case of Iran we have a history of both political isolation and lack of economic openness (point 2 above). We believe this double isolation has affected Iran's growth potential negatively.

The Balance between the Government and Private Sector: Although there has been a consensus in the past about the role of state in developing countries (e.g. Market Failure, Informational Asymmetries etc.) as exemplified by the balanced growth approach in economic development, it is believed that there should be a 'reasonable' balance between the government and private sector. Filling the gap between the two sectors there must also exist a healthy group of civil society institutions, e.g. professional societies, workers unions, voluntary organisations etc. An overblown public sector combined with a week private sector and small number of civil society institutions is not healthy as it will encourage rent-seeking, inefficiency and corruption. All the three countries reviewed in this chapter have large public sectors. But relatively speaking Turkey has better balance between public and private sector.

Chapter Three: Theories of Growth and Government Size

3.1. Introduction

Growth is an important issue in economic literature. The topic has been prominent in the history of economic thought form classical economists to modern theories including endogenous growth models. Economic growth received considerable attention after the World War II initially in relation to economic growth prospects of South and East European countries and later in connection with ex-colonies.

Major theories of growth can be classified into two prominent schools, neo-Keynesian school (Harrod- Domar Model) and neo-classical school (Solow-Swan Model). Both theories consider the role of exogenous variable and technological progress. The neoclassical growth model of Solow (1965) assumes that technology is exogenous to the economic system and does not depend on the other variables. The source of economic growth in the neo-classical models is accumulation of private capital. In Solow model there is an unexplained residual, assumed to be exponentially growing at a constant rate, which is the long run steady-state growth rate. Romer (1986) tried to explain the residual inside the model and indigenise the productivity. The new generation of growth models being associated with work of Romer (1986) and meanwhile, the economists turned their attention to other issues such as inflation, unemployment, oil shocks and macroeconomic policies. The endogenous growth has considered the role of government in economic growth and specialised the notion of public spending and distinguished between public consumption and public investment. In the R&D based growth models by Romer (1990), Grossman and Helpman (1991) and Aghion and Howitt (1992), increasing returns, imperfect competition and the research can respond to changes in demand brought about by fiscal policy. These models emphasize the endogenous development of knowledge or R&D, as the engine of growth. Barro (1990) discussed government spending and endogenous growth in his model where government spending is a productive input. Researches on the determinants of economic growth have

identified the following variables: capitalism, corruption, democracy, demographic characteristics education, ethnicity and language, fertility, finance, geography, government, health, industrial structure, inequality, inflation, infrastructure proxies, initial income, investment, labour, money growth, political instability, political rights, political institution, property rights, population, price, real exchange rate, regional effects, religion, rule of law, scale, social capital, trade, volatility of shocks and war. The theoretical and empirical frameworks for understanding the relation between growth and government size have focused on expenditures, taxes, investments and deficits.

This chapter briefly reviews a number of growth theories such as classical growth theories, neoclassical growth theory e.g. exogenous growth models and endogenous growth models. As we mentioned above there are various variables which have determined the growth but beginning with the endogenous growth theories, size of government acquires a special significance as determinant of economic growth. Then, we will discuss the size of government. We examine the theories of public sector growth from both supply and demand sides. In the final part we will review the literature of economic growth and government size in various countries followed by same as applies to Iran.

3.2. Growth Theories

3.2.1 Adam Smith, 1723 – 1790

Adam Smith in his book "The Wealth of Nations" (1776) expounded his theory of economic growth. In the supply side of growth model, output is related to labour, capital and land inputs. Consequently, output growth is driven by population, investment and land growth and increases in overall productivity. Population growth is endogenous and depends on the sustenance available to accommodate the increasing workforce. Adam Smith viewed the growth process as strictly endogenous (Lowe 1954 and 1987, Eltis 1984) placing special emphasis on the impact of capital accumulation on labour productivity. Investment was also endogenous and determined by the rate of savings.

The growth of labour productivity is due to division of labour and depends on market and capital accumulation. Smith established the idea that there are increasing returns which are largely external to firms. But, the division of labour is limited by the extent of the market, i.e. a larger market generates a larger division of labour among people and, therefore, among firms, and a larger division of labour generates a larger productivity of labour for all firms. In turn, productivity growth is one of two causes of the growth of per-capita real output. Thus, limitations on the opportunity to exchange in labour markets might limit the division of labour, the growth of productivity and per-capita real income in the nation. The division of labour improves growth; also improvements in machinery and international trade are engines of growth because they assist more specialisation and further growth (Jackson, 2005).

3.2.2 David Ricardo, 1772-1823

David Ricardo`s production function considers only three factors of production land, labour and capital (Ricardo, 1817). He focuses on supply factors and included diminishing returns on land. Output growth needs growth of factor inputs, but, land is fixed in supply and land cannot be created. He distinguished natural wage from the real wage: if the market wage rate is above the natural wage rate, it includes population growth and vice versa. In the long run equilibrium, the growth rate of labour supply remains in balance with the growth rate of labour demand and that the labour force changes proportionately to the change in supply of capital. In the short run, the rate of population growth may be slower than that of capital growth, and that this would cause a raise in the market wage rate, which would provide a stimulus to population growth, so this again leads to equilibrium between the demand and supply of labour in the long run. Capital which determines the increase in the demand for labour and the rate of capital accumulation depends on the ability to save and net income. Capital accumulation leads to an increase in the population and thus demand for agricultural production. The price of these products and the wage rate will rise. Excess wages, promotes population growth and the rise in wages reduces the share of profits in income, which thus leads to a slower rate of capital accumulation. Eventually, when the supply of labour is equal with the

demand for it, the economy breaks into a new equilibrium position in which the size of the population and the capital grow with every new equilibrium position. (Fiaschi and signorino, 2005,p11-16)

Ricardo stated that economy has reached the stationary state, with wages at subsistence level, maximum possible population, constant capital stock and a fixed quantity product.

3.2.3 Karl Marx, 1818-1883

In Marx's model the labour supply is not endogenous to the wage. As a result, the wages are not determined by necessity of natural or cultural factors but rather by bargaining between capitalists and workers and this process would be influenced by the amount of unemployed labours in the economy. Also profits were the determinants of savings and capital accumulation. Thus, declining rate of profit doing nothing to stop capital accumulation, capitalists to reduce wages of labour, there is a declining rate of profit over the long-term. Marx explained that it is investment in production by capitalists that is the driving force behind capitalism. The competition between different individual capitalists forces each one to invest in production in the search for higher profits. By investing in new and more productive machinery and processes, a capitalist can increase the productivity of own workforce, and thus produce a greater mass of commodities with fewer workers. This, in turn, allows the capitalist to decrease their costs and thus lower their prices below those offered by their rivals. In this way, an individual capitalist can gain market share and obtain profits. These profits are, for the most part, ploughed back into production by the capitalists, thus increasing productivity even further. (Kurz and Salvadori, 2003)

3.2.4 Frank Plumpton Ramsey, 1903 – 1930

In his paper of 1928, by using a utility function Ramsey determined the optimal amount which should be saved or invested rather than consumed in order to maximise utility. This specification of consumer behaviour is a key element in the Ramsey growth model.

The Ramsey growth model equation has capital, consumption, output per worker and the depreciation rate of capital. This equation simply states that investment, or increase in capital per worker, is that part of output which is not consumed, minus the rate of depreciation of capital. The amount that should be saved out of a given income is independent of interest rate, unless this is actually zero. Hence If households are maximising their consumption inter-temporally, at each point in time they are equating the marginal benefit of consumption today with that of consumption in the future, or equivalently, the marginal benefit of consumption in the future with its marginal cost.

Later, Cass and Koopmans (1965) extended Ramsey Model. In the Ramsey -Cass-Koopmans Model, the saving rate may not be constant along the transition to the long run Steady-State. The aggregate capital accumulation can be shown as: $\dot{K} = Y - C - \delta K$. Thus, the steady-state will be a point where $\dot{K} = 0$, and when consumer maximises C. The assumption of labour-augmenting technological progress implies that in the steady-state, per-capita consumption, income, and capital all grow at equal rate. Thus, the steady-state will be higher if capital is more productive and will be lower if consumers are more impatient, population growth is faster, depreciation is greater, or technological progress occurs more rapidly.

3.2.5 The Harrod-Domar Model

The model is used to explain an economy's growth rate in terms of the level of saving and productivity of capital. The model was developed independently by Sir Roy F. Harrod in 1939 and Evsey Domar in 1946.

The Harrod-Domar model was the precursor to the exogenous growth model. The model assumes that the economy is closed and there is no government and all net investment comes from saving. Output is a function of capital stock $y = f(k)$, the marginal product of capital is constant; the production function displays constant returns to scale. This implies capital's marginal and average products are equal: $\frac{dy}{dk} = c \Rightarrow \frac{dy}{dk} = \frac{y}{k}$, capital is necessary for output $f(0) = 0$

At equilibrium, saving, which is saving rate times output, equals investment: $sY = S = I$, The change in the capital stock equals investment minus the depreciation of the capital stock: $\Delta k = I - \delta k$.

From above we know that:

$$c = \frac{dy}{dk} = \frac{y(t+1) - y(t)}{k(t) + sY(t) - \delta k(t) - k(t)} = c = \frac{y(t+1) - y(t)}{sY(t) - \delta \frac{dk}{dy} y(t)}$$

$$csY(t) - \delta \frac{dk}{dy} y(t) = Y(t+1) - y(t) \Rightarrow cy(t)(s - \delta \frac{dk}{dy}) = y(t+1) - Y(t)$$

$$s = \frac{dy}{dk} - \delta \frac{dy}{dk} \frac{dk}{dy} = \frac{y(t+1) - y(t)}{y(t)}$$

$$sc - \delta = \frac{\Delta y}{y}$$

The savings rate times the marginal product of capital minus the depreciation rate equals the output growth rate. Increasing the savings rate, increasing the marginal product of capital, or decreasing the depreciation rate will increase the growth rate of output. On the other hand the growth rate of national output is positively related to the saving ratio and negatively related to the economy`s capital- output ratio.

The most fundamental criticism of the model is the use of fixed proportions in the combination of capital and labour which is not a realistic assumption. If the labour force grows faster than the capital stock, the economy will face to unemployment, and if the capital stock grows faster than labour force, the economy will face to inflation.

The model suggests that growth rates depend on level of saving and capital-output ratio. As investment increase there is the diminishing returns and the capital-output may be reduced with each unit of new capital.

3.2.6Solow-Swan Model

Solow- Swan Model is based on constant returns to scale and diminishing returns to capital and an additional set of assumptions. Consider a Cobb-Douglas function: $y_t = Ak_t^{\alpha} L_t^{1-\alpha}$, where $\mathcal{Y}$ is the total production involving two factors of labour and capital, A is the level of the technology with $A > 0$ and α is a constant with $0 < \alpha < 1$ and it is divided by L to give the total production per capita: $y_t = Ak_t^{\alpha}$

The consumer saves the fraction of income: $S_t = sY_t$ and $C_t = (1-s)Y_t$ hence $Y_t = C_t + S_t$ savings is equal to investment $S_t = I_t$

If the population growth rate is $(1+n)^t N_0$

The capital accumulation equation is given by $K_t = (1-d)K_t + I_t$, where d is depreciation rate. Next time capital stock is this time discounted for depreciation, plus whatever was invested. By using production function and saving = investment in per capita terms:

$$K_t + I_t = (1-d)K_t + S_t = (1-d)K_t + sY_t = (1-d)K_t + sAk_t^{\alpha} L_t^{1-\alpha}$$

$$\frac{k_{t+1}}{N_t} = (1-d)\frac{K_t}{N_t} + sA\frac{K_t^{\alpha} N_t^{1-\alpha}}{N_t} = (1-d)\frac{K_t}{N_t} + sA\frac{K_t^{\alpha} N_t^{1-\alpha}}{N_t^{\alpha} N_t^{1-\alpha}}$$

$$\frac{N_{t+1}}{N_t}\frac{K_{t+1}}{N_{t+1}} = (1-d)\frac{K_t}{N_t} + sA\frac{k_t^{\alpha}}{N_t^{\alpha}}$$

$$(1+n)K_{t+1} = (1-d)K_t + sAk_t^{\alpha}$$

Hence $$K_{t+1} = \frac{(1-d)}{(1+n)}K_t + \frac{sA}{(1+n)}K_t^{\alpha}$$

From the equation we can find out that, the per capita capital stock grows but at a decreasing rate, growth converges to zero. The steady- state output is constant; the growth rate is zero due to diminishing returns.

$$K_{t+1} = K_t = K^*$$

The steady- state is, $K^* = \left[\frac{sA}{n+d}\right]^{1/(1-\alpha)}$

In the steady-state, all variables grow at constant rates. Hence, the equilibrium (steady-state) rate of growth of output per capita is determined by the rate of technological progress only. The savings rate S, is a key parameter in the model and saving rate is exogenous. An increase in S, implies higher actual investment; K, grows until it reaches its new higher steady-state value. In the transition to the new steady-state, the rate of growth of output per worker accelerates. When the new steady-state is attained, all variables grow again at the same rates as before; output per labour again grows at the rate of growth of technological progress, which is independent from saving rate. An increase in the savings rate only leads to a temporary increase in the growth rate of output per labour, not a permanent rise in the level of capital per labour and output per labour. In the Solow model, differences in investment rates and population growth rates and exogenous differences in technology explain differences in per capita incomes but only changes in technological progress have permanent growth effects; all other changes have level effects only. The neoclassical model predicts that each economy converges to its own steady-state, and different countries reach different steady-state and have different rate of growth .In other words, the economies with lower levels of per capita income tend to grow faster in per capita terms. (Solow 1956, 1957, Swan1956)

3.2.7 Endogenous growth theory

The Solow model remarks that changes in the level of technology are constant overtime. As a result all per capita variables are constant in the long-run. The model will fail to explain growth rate over long periods of time. The reason is that when an economy reaches own steady-state, there is no longer any growth. The transition implies how an economy's per capita income converges toward its own steady- state value and to the per capita incomes of other economies. In the Solow model the long-run rate of growth is exogenously determined by assuming a rate of technical progress. However, the rate of technological progress remains unexplained. An

important implication of the Solow growth model is that economies should converge to their steady – state level of income. At any given times, some countries will be closer to the steady–state than others, but lagging countries should finally catch up. This feature of the model is clearly unrealistic.

The neo-classical economists of the 1950s and 1960s recognised this problem and adjusted the basic model to allow the technology to improve over time. These improvements provided an escape from diminishing returns and thus enabled the economy to grow in per capita terms in the long run. In neo-classical growth models, the long-run rate of growth is exogenous. Endogenous growth theory was developed in 1980s as a response to criticisms of neo-classical growth model.

3.2.7.1 Kenneth Joseph Arrow (1921)

One of the first attempts to indigenise technology was made by Arrow (1962), in this model technological progress is determined by investment in physical capital. He assumed that the growth rate of the effectiveness of labour is a result of workers accumulated experience in producing or learning by doing.

3.2.7.2 AK Model

Romer (Muldera, 2001) builds upon the contributions of Frankel (1962) and Arrow (1962) and assumes the technology grows in proportion to the national capital stock, potentially offsetting the effects of diminishing returns. Capital in such a setting should be considered as a broad concept, including human and intangible capital. This approach is currently known as the AK approach. This model predicts that economies without technological change would eventually converge to a steady-state, with zero per capita growth. A fundamental reason for this is the diminishing return to capital. The key property of AK endogenous-growth model is the absence of diminishing returns to capital: $y = AK$,

Output per capita is $y = AK(t)$, and the average and marginal products of capital are constant at the level $A>0$. An economy by the AK technology can

have a positive long-run per capita growth without any technological progress. When the level of the technology improves then the long-run growth rate is higher. Changes in the rates of depreciation, and population growth, also have permanent effects on the per capita growth rate. Now we continue to assume that population grows at a constant rate n, and $L(t) = \exp(nt)L(0)$ then combining with the production function y = Ak(t), the fundamental law of motion of the capital stock becomes: $\frac{\dot{K}(t)}{k(t)} = sA - \partial - n$, if $sA - \partial - n \rangle 0$, then in the equilibrium there is sustained growth of output per capita at the rate $sA - \partial - n$.

The technological progress is a major and most significant factor in understanding the progress of economic growth.

3.2.7.3 Paul M. Romer 1955

During mid-80s, a new growth theory was emerged by Romer (1986) where he tried to explain the growth process in a different manner. He presented a model of long run growth in which knowledge is assumed to be an input in production and has increasing marginal productivity. Knowledge works through each firm's net investment. Specifically, an increase in a firm's capital stock leads to increase in its stock of knowledge.

In exogenous growth model, the rate of return on investment and the rate of growth of per capita output are expected to be decreasing functions of the level of the per capita capital stock. Any decline in the stock of capital will cause higher prices for capital assets and reduce the investment, in the lake of technological change, per capita output should converge to a steady- state value. The rate of investment and the rate of return on capital may increase rather than decrease with increase in the capital stock. The level of per capita output in countries need not converge. Production of consumption goods as a function of the stock of knowledge and other inputs reveals increasing returns. So that knowledge may have an increasing marginal product, knowledge spillovers from capital investment increases the stock of

physical capital and the level of the technology for all firms in economy (Romer1994).

Romer in his article 1990 has introduced the model of horisontal innovation which indicates that innovations take the form of developing new variations of goods in three sectors including research, intermediate goods and final goods.

3.2.7.4 Robert E. Lucas (1933)

In his paper of 1988 Lucas presented a model in which the engine of growth is human capital. As human capital accumulation raises the productivity of both labour and physical capital, growth is endogenous .The model has human and physical capitals and, there is a trade-off because people divide their time between work and training, when they are training, give up part of their work income but raise their future productivity as well as their future wages. In physical capital accumulation there is a trade-off between income today and income tomorrow. The production of the physical good is given by constant returns to scale technology and it depends on the physical capital accumulated and the efficiency units of labour. The interaction among the technologies that allow, for the accumulation of physical and human capital, and consumer preferences determines endogenously the rate of economic growth.

The equation of equilibrium states that in steady –state the marginal product of two types of capital must be the same. The dynamics of accumulation of human and physical capitals are interlinked. In the other words, higher the productivity of training will increase marginal product labour that follows training and therefore raises future wage rate. The greater the encouragement to training the greater will be the growth rate of economy. The more the workers are willing to abandon present consumption to further their training, the higher will be the rate of economic growth.

3.2.7.5 The Schumpeterian approach to endogenous growth

Schumpeterian growth is a particular type of economic growth which is generated by the endogenous introduction of product or process innovations. The expression "creative destruction" was introduced by Joseph Schumpeter, in his book Capitalism, Socialism and Democracy (1942), he used it to describe the disruptive process of transformation that accompanies such innovation. He argued that economic change turns around innovation, entrepreneurial activities, and market power. He tried to prove that innovation-originated market power could provide better results than the invisible hand and price competition. The technological innovation often creates temporary monopolies, allowing unusual profits that would soon be competed away by rivals and imitators. These temporary monopolies are necessary to provide the incentive essential for firms to develop new products and processes. This incessantly revolutionises the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism.

3.2.7.6. Grossman and Helpman and Aghion and Howitt

The endogenous growth models have turned to a class of models in which growth is driven by technological change that results from the research and development efforts of profit-maximising agents, efforts which may influence the long-run rate of economic growth. Important contributions to these models include Grossman and Helpman (1991) and Aghion and Howitt (1992). In these models, research can increase productivity within a product line, or it can increase the total number of available products, where growth depends on the amount of research effort in each product line. These models propose that an increase in scale increases the number of products available in direct proportion.

3.2.7.7 Robert Barro (1948)

Robert Barro (1990) has provided the most significant model of government spending and endogenous growth. He has discussed a theory of the long-

term effects of government policies on economic growth. The aspects of government policies are the effects of public services on private production and household utility, and the impacts of taxation on private incentives to save and invest.

Each household in a closed economy seeks to maximise overall utility, as given by:

$$U = \int_0^{\infty} u(c)e^{-\rho t}dt$$

(3.1) Where c is consumption per person and $\rho \succ 0$ is the constant rate of time preference, and population which equals the labour force is constant. By considering the utility function: $u(c) = \frac{c^{1-\sigma} - 1}{1-\sigma}$

(3.2)

Where $\sigma \succ 0$, the marginal utility has the constant elasticity $-\sigma$ with respect to c. Each household- producer has access to the production function:

$$y = f(k) \qquad (3.3)$$

Where y is output per person and k is capital per person. Overall utility in equation (1) implies that the growth rate of consumption at each point in time is given by:

$$\frac{\dot{c}}{c} = \frac{1}{\sigma} * (f' - \rho)$$

(3.4)

Where f' is the marginal product of capital. By assuming constant returns to a broad concept of capital: $y = Ak$ (3.5)

Where $A \succ 0$ is the constant net marginal product of capital. Substituting $f' = A$ in to equation (4) yields:

$$\gamma = \frac{\dot{c}}{c} = \frac{1}{\sigma} * (A - \rho)$$

(3.6) Where γ is growth rate of per capita. The corresponding inequality conditions are: $A \succ \rho \succ A(1-\sigma)$

(3.7)

In this model the economy is always at a position of steady-state growth in which all variables grow at the rate γ. Given an initial capital stock, $k(0)$, when net investment is equal to γk, the initial level of consumption is:

$$c(0) = k(0).(A - \gamma) \quad (3.8)$$

The quantity of public services g is provided to each household-producer, these services are provided without user charges and are not subject to congestion effects and g corresponds to real government purchase per person. Production could be carried out directly by households or equivalently by competitive firms; net production γ can be used for consumption, investment, and government purchases. It is this productive role that creates a potentially positive linkage between government and growth. Production shows constant return to scale in k and g together but diminishing returns in k separately. The production function can be written as:

$$y = \phi(k, g) = k.\phi(\frac{g}{k})$$

(3.9)

Where ϕ convinces the conditions for positive and diminishing marginal products, so that $\varphi' \succ 0$ and $\phi'' \prec 0$.

The production function is Cobb-Douglas, so that: $\frac{y}{k} = \phi(\frac{g}{k}) = A.(\frac{g}{k})^{\alpha}$ (3.10)

Where $0 \prec \alpha \prec 1$. The public services consider as an input to production, but some issues arise, first, the flow of services need not correspond to government purchases, especially when the government own capital and national accounts. The government just buys a flow of output from the private sector. When the government and the private sector have the same

production function, the result would be the same if the government buys private inputs and has only its production, instead of purchasing only final out put from the private sector.

Let now we consider the production function of Cobb-Douglas form:

$$y = Ak^{1-\alpha} g^{\alpha}, \qquad (3.11)$$

The idea behind this equation is that some infrastructure activities of government are inputs to private production and also raise the marginal product of private capital. For the usual public-goods reasons, such as increasing returns to scale, the private market does not sustain the appropriate level of these services. In equation (11), output per capita, y, depends on government purchases per capita, g. When the public-goods aspect of government services is important, it may be more accurate to relate y to the total of government purchases, rather than to the amount per capita. Equation (11) assumes constant returns to scale in k and g. The variable k should be interpreted as a broad measure of private input, thus, k includes physical capital, human capital, and aspects of privately owned knowledge. Then the idea is that constant returns apply to this broad measure of reproducible capital, as long as the public a proportional income tax at rate τ . Hence:

$$g = \tau y = \tau A k^{1-\alpha} g^{\alpha}$$

(3.12)

Using equation (11) to calculate the marginal product of capital, f_k, (calculated when k changes with g held fixed), and substituting $g = \tau y$ leads to:

$$f_k = (1-\alpha).A^{1/(1-\alpha)}\tau^{/(1-\alpha)}$$

(3.13)

Given the specification of the production function in equation (3), an increase in $\tau = g/k$ shifts upward the marginal product of private capital in equation (3.13).

$$y = \frac{\dot{c}}{c}(1-\alpha).[(1-\alpha).A^{1/(1-\alpha)}(1-\tau).\tau^{\alpha/(1-\alpha)} - \rho]$$

(3.14)

Given the form of equation (1), the initial capital $k(0)$, and a proportional income tax at rate τ, the first-order condition for each household's maximisation of utility leads in the usual way to a condition for the growth rate of consumption per person:

$$\gamma = \frac{\dot{c}}{c}(1-\sigma).[(1-\alpha).A^{1/(1-\alpha)}(1-\tau).\tau^{\alpha/(1-\alpha)} - \rho] \qquad (3.15)$$

Where γ is a per capita growth rate, and $(1-\tau)f_k$ is the private rate of return to investment (and saving). In this model the economy is always in a steady state where the variables c, k, y all grow at the rate y shown in equation (15). The levels for c, k and y are determined by the initial quantity of capital $k(0)$ Using equation (11) and the condition, $g = \tau y$ e level of output can be written as:

$$y = A^{1/(1-\alpha)}\tau^{\alpha/(1-\alpha)}K \qquad (3.16)$$

Therefore, $k(0)$, determines $y(0)$ from equation (16), given the value of τ . The initial level of consumption, $c(0)$, equals $y(0)$ less initial investment, $k(0)$, and less initial government purchases, $\tau y(0)$ .Using the fact that initial investment equals $\gamma k(0)$ (because the capital stock grows always at the proportionate rate γ, the initial level of consumption turns out to be:

$$c(0) = k(0).[(1-\tau).A^{1/(1-\alpha)}\tau^{\alpha/(1-\alpha)} - \gamma] \qquad (3.17)$$

The growth rate γ rises initially with τ because of the effect of public services on private productivity. As τ increases, y eventually reaches a peak and subsequently γ declines because of the reduction in the term, 1 - τ, which is the fraction of income that an individual retains at the margin. The peak in the growth rate occurs when $\tau = \alpha$. Given the form of equation (11), this point

corresponds to the natural efficiency condition, $f_g = 1$, now, an increment in g by one unit generates just enough extra output to balance the resources used up by the government. This result-that the productive efficiency condition for g holds despite the presence of a distorting income tax-depends on the Cobb-Douglas form of the production function. However, the general nature of the relation between γ and τ applies for other forms of production functions. The basic idea is that more government activity of the infrastructure type is good initially for growth and investment because anarchy is bad for private production. However, as the government expands, the rise in the tax rate, τ, deters private investment. This element dominates eventually, so that growth and the size of government are negatively related when the government is already very large. The saving rate is given by:

$$s = \dot{k}/y = \gamma A^{1/(1-\alpha)} \tau^{\alpha/(1-\alpha)} \qquad (3.18)$$

Where steady-state per capita growth arises because of constant returns to a broad concept of capital, the growth and saving rates, γ and s, are intimately connected. The analysis predicts that various elements, including government policies, will affect growth and saving rates in the same direction. The model predicts that long-term per capita growth and saving rates, γ and s, would relate to g/y. The relations would be non-monotonic, with γ and s increasing initially with g/y, but decreasing with g/y beyond some high values.

In Barro model, the government purchases a constant share of private output and uses it to provide free public services to private producers. The public expenditures affect the constant returns to scale production function in k and g. By maximising household's utility, we can obtain a steady-state growth rate which is influenced by public spending on production services. An increase in the tax rate reduces the income of consumer and private investor, but it increases public services to firms. In the Cobb-Douglas production function, an increase in the tax rate boosts the growth rate until $\tau \prec \alpha$ and it reaches the maximum when $\tau = \alpha$.

3.3 Government Size

The role of the government or government intervention has long been a subject of interest for economists. Classical economic theory is rooted in the concept of a laissez-faire economic market. A laissez-faire--also known as free--market requires little or no government intervention. Neoclassical economic theory emphasizes market failures. Keynesian economists believe that the government can and should play an active role in managing the macro economy. Marxist and socialist thinking put strong emphasis on the government role in redistributing income. In the 20th century government got involved in primary education and provision of a basic infrastructure, but the share of public spending in GDP was still low.

During World War I, government increased their ability to collect taxes. After the Great Depression and World War II, the role and size of government changed, and public spending grew fast for several reasons, first, as a consequence of World War, second, recognition of a distributive role for government which was introduced by Wagner. The post war period since 1960s and 1970s witnessed a growth in public spending.

The important reasons for government intervention include:

- Greater Equality and redistribution of income and wealth to improve equality of opportunity and equality of outcomes
- Markets fail to take into account externalities and are likely to under-produce public goods. For example, governments can subsidise or provide goods with positive externalities.
- Macroeconomic intervention to overcome prolonged recessions and reduce unemployment, high but sustainable economic growth, low Inflation and equilibrium on balance of payments, reduce government deficit, and stablise exchange rates.

The size of the government has been measured by overall government spending (general government outlays). These expenditures include the spending by the central, state and local government. Other measures of

government size are also popular. Meltzer and Richard (1981) use the share of income redistributed by government as a measure of relative size. Katsimi (1998) defines the size of the public sector as the ratio of public to total employment. Others use the total tax level or the share of government consumption in total consumption. When it came to identification of determining factors of government size, the openness of the economy (Roderik 1996), initial GDP per capita to capture the catching up effect economy (Roderik 1996) the income of the median voter, urbanisation, country size , population density and the capital stock were among these causal factors.

Theories of the size of government focus on either the demand for public services and income distribution or the supply of tax revenues. The demand side considers political element including median voter framework and non-political elements including income level and war. The supply side is based on costs of governments and their capacity to raise tax revenues.

One of the oldest ways of explaining public sector growth is associated with the German economist Adolph Wagner (1835-1917) and what is commonly known as Wagner's Law, or, the "law of expanding state expenditure". His work is based on empirical observations in western industrialising countries. Income and factors such as urbanisation lie behind the growth of government. The basic assumption of Wagner's Law is that public expenditure grows continuously along with the continuing economic growth. Wagner noticed "empirical regularities" in the growth of central, local and public enterprises expenditures and observed there appeared not only to be an absolute but also a relative expansion of the public sector as economies develop.

More modern theories of government growth were introduced, by Peacock and Wiseman (1961) claiming that government responds to crises such as war by ratcheting up expenditures, or Nordhaus (1975) and Rogoff (1990) who have argued for a political business cycle. The modern analysis of the demand for goods and services provided by government involves the median voter hypothesis, associated with Downs (1957), later Meltzer and Richard

(1981) develop a model of the median voter model, and explain that government has grown because of extensions of the franchise that have changed the position of the median voter. In this framework the median voter sets the tax rate, the size of public expenditure (via the government budget constraint) and, hence, the degree of redistribution. The size of government is determined, by the rules and procedures of the voting process that lead to the resolution of political choices where the allocative outcome of that voting process is strongly influenced by the distribution of income. An increase in the ratio of mean to median income in this framework leads to expansion of the public sector.

Baumol (1967) explains that when the output of the government sector is relatively labour intensive, the rate of productivity growth will be slower in public sector than in private sector. This implies that over time the real cost of public sector output will rise relative to all other goods. It then follows that if the demand for government goods and services is price inelastic, arise in the relative price of government services will result in only a relatively small decrease in the quantity of government goods and services demanded and hence a higher aggregate expenditure on public sector output.

Becker (1985) assumes the government maximises revenue subject to the cost of taxation. As deadweight costs of government decrease, the size of government will increase, and conversely. Brennan and Buchanan (1980), introduce a government of the "leviathan" type as it is modeled as a tax-revenue maximiser, the only restrictions being some economic forces like the degree of elasticity of the respective tax base. The leviathan government will then choose a tax rate which maximises tax revenue from each and every tax base. They limit the government by constitutional constraints. If the constraint is loosened, government grows; but if the constraint is tightened, government shrinks.

Economic theory considers some main reasons why the size of public sectors is different over time and cross countries. The first argument is based on Wagner's law which predicts the government's share in GDP increase more than proportionally in GDP. As nations become richer, the demand for

public goods increase while at the same time the ability to raise revenues rises.

But recent studies (Persson and Tabellini, 1999, 2002) argue that to get re-elected fiscal policy, in particular expenditure policy tends to involve higher deficits and bigger public sectors. This tendency is stronger, the larger the number of parties forming the government, the higher the frequency of elections and in case of proportional rather than majority-based election system. Shleifer and Vishny (1998) claim that the size of government depends on the power of rent-seeking agents, these agents support a larger public sector with the objective of benefiting from a redistribution of income.

The size of the public sector eventually reflects political choices. How much of public goods to provide depends on reflection of policies (e.g. defence , law and order, public infrastructure, environmental protection) and how to address market failures and externalities (e.g. competition and regulations) and objectives (e.g. income distribution).

The object in public choice is to begin with the foundations of the government itself. A group of individuals who aim to form a government need to understand how to create a different place of power and decision making. It is necessary to examine voting and the various means of selecting candidates and choosing winners in elections. In1970 the median voter theory was accepted in public choice and later the probabilistic voting theory started to replace the median voter theory.

In recent years economists have emphasized the quality of government. The theories of determinants of government performance fall into three

North 1990; Olson1993) and cultural (Banfield 1958; Landes 1998).

We can explain the quality of government through four ways (Potal et.al. 1999) including:

- Interference with the Private Sector, which is concerned with the quality of regulation, security of property rights, and marginal tax rate.

- Efficiency of Government, which is indicated by corruption, bureaucratic delays, tax compliance, and average relative wages of government officials.
- Output of Public Goods, measured by infant mortality, school achievement, illiteracy rate, and infrastructure quality.
- Size of Government, which is inferred from government consumption, transfers and subsidies, state-operated enterprises, and employment in public sectors.

However, recently a lot of studies have focused on the institutional framework. According to this view the institutional quality of limited government promotes economic growth (Easterly and Levine 2003) and Economists believe these institutions to be simply the rules of the game by which society works. The institutions come in the form of contract, property rights and rule of law. (Rodrik et. al. 2004).

3.4 The literature review of government size and economic growth

The literature on the relationship between the size of government and economic growth is full of considerable findings. The studies differ in terms of the countries that are included in the sample, period of estimation, and how one chooses to define and measure the many activities of the public sector, and the most important point being the method and tools of econometric approaches. The size of government is largely explained by variations government revenues (supply side) or alternatively by government expenditures (demand side) relative to GDP, and relying on total expenditure, current and investment expenditure and total tax. Composition of public spending is also a relevant issue. The empirical literature varies in terms of data sets and econometric techniques, often producing conflicting results. For example, the cross-section approach has been used widely in the growth literature; the regressor should be strictly exogenous and does not allow for structural heterogeneity across countries. In addition, cross-country growth regressions do not allow capture of any dynamics of growth besides imposing strong parametric restrictions across countries that often differ greatly in terms of their economic structures.

The time-series approach has the problem of testing for stochastic trends and co-integration when there is a limited range of existing macroeconomic series. A panel methodology is better for controlling the endogeneity and the differences in initial levels of efficiency. The results of studies regarding the relationship between the size of government expenditures relative to GDP and economic growth performance indicate how sensitive any conclusions are to the measure of government size selected, the time-period investigated and the countries included in the sample. Also, the results indicate the sensitivity of estimation frameworks such as linear and non-linear relationship between government expenditure and economic growth. There is a linear relationship with general approaches and techniques which includes multivariate Ordinary Least Square (OLS), Vector Autoregressive (VAR), Error Correction (ECM) and Co-integration Models, although Sheehey (1993), Armey (1995), Tanzi & Zee (1997), Vedder & Gallaway (1998), Giavazzi, Jappelli & Pagano (2000), among others, subscribe to forms of non-linear relationship.

There are some disagreements about the relation between the size of government and economic growth. Some studies have revealed that a bigger government has a damaging effect on economic growth such as: Gemmel (1983), Landau (1983, 1986), Saunders (1985), Falvey and Gemmel (1988), Barro (1989, 1990,1997), Engen and Skinner (1991) Romer (1998), Alexander (1990), Easterly and Rebelo (1993), Guseh (1997), Tanninen (1999),Folster and Henrekson (2001), and Dar and AmirKhalkhali (2002). The negative effects could be due to diminishing returns and the crowding-out effect for private investment. Moreover, government expenditure often turns into inefficient expenditure which will make a misallocation of resources and lead to rent-seeking as well as corruption. On the other hand, while government expenditure is expanding, government needs more taxes to support the expenditure, but more taxes will damage the economy. Taxation induces distortions in economy by resulting in allocative inefficiencies as long as lump-sum levies are not feasible. Taxation impacts growth by creating disincentives to accumulate physical and human capital.

On the other hand, some studies have found out a positive relationship between economic growth and the size of government including: Ram (1986), Kormendi and Meguire (1986) Grossman (1990), Holmes and Hutton (1990), Levine and Renelt (1992).Karras (1993, 1996, 1997), Rubinson (1997), and Ghali (1998). The positive effects may be due to providing substructures and public goods. Public expenditure can promote private investment and private property, which will cause economic growth.

Meanwhile, the results of some studies indicate there is no a relationship between economic growth and government size. In this chapter we review the empirical studies of government spending and economic growth. Since 1980s a large number of studies have been conducted to show that relationship between government size and growth is positive, negative or non- existent significant results

Now we review a number of studies, some of which they indicate a negative relationship between government expenditures and economic growth as following we discuss:

Cameron (1982) presents a systematic analysis of the relationships among 19 nations between the average %age of GDP spent by government and the average rate of growth in real GDP over the period 1960–1979 and finds out that there is a negative bivariate correlation between government and economic growth.

Landau (1983) studies 96 developed and less developed countries on a cross-sectional basis and adds control variables for education and energy consumption and some geographic dummies over the period 1961-1976. He shows that the growth rate of real GDP per capita and the level of government consumption expenditures as a ratio to GDP have significantly negative relation. He concludes that growth of government hurts growth.

Gemmell (1983) investigates the effects of growing public expenditure on non-marketed outputs in the Egyptian economy for years 1960- 1976 and finds out that this expansion of the non-market sector reduces output growth

and increases inflationary pressures. Gemmell believes that the growth of public expenditure is harmful for economic growth.

Kormendi and Meguire (1985) study 47 countries over period 1950-1977, using data on total government consumption expenditures, this measure of government spending excluded public investment and transfer and expenditure on defence and education. They find out that no significant relation between average growth rate of real GDP and average growth rates of the share of government exist.

Marlow (1986) investigates the level and growth of social expenditure data of 19 industrialised countries over the period 1960–1980. He finds that public sector size slows overall economic growth. He finds the relationship between growth and government size is negative.

Barth and Bradley (1987) find a negative relation between the growth rate of real GDP and the share of government consumption spending for 16 OECD countries in the period 1971-83. They also find that the share of government investment in GDP has a statistically insignificant effect on growth.

Gupta (1988) re-examines the Kormendi-Meguire model and divides the data into two sub-samples including developed and developing countries and finds out that there is an insignificant impact on the growth of output. He remarks that the measure of civil liberties had a significant effect on investment. In addition, the impacts of the civil liberties measure on economic growth seem to be greater for the full sample than for the developing countries. He finds that government consumption is negatively associated with economic growth in developed countries and positively associated with it in developing countries.

Grier and Tullock (1989) extend the Kormendi-Meguire form of analysis to 115 countries, by using data on government consumption and other variables. They find a significantly negative relation between the growth of real GDP and the growth of the government share of GDP, meanwhile, Grier and Tullock estimate separated equations for cross-countries and with the

result that government consumption has positive relationship in the growth of Asian countries.

Diamond (1989) analyses 115 countries for period 1960-1980 and finds a negative relationship between the real share of government current expenditure in GDP and the real growth of GDP. However, the relationship is statistically significant only in developed countries.

Peden and Bradley (1989) try to measure the effect of public size on economic production and productivity in the United States of America between 1949 and 1985. They come to the conclusion that the level of government activity in economy has a negative effect on growth rates both at the level of aggregate production.

Lin (1994) investigates the impact of government spending on growth for 20 developed and 42 developing countries for the period 1960-1985. By considering the ratio of government consumption expenditure to GDP and government non-productive expenditure to GDP as government size indicators, he finds that the two consumption and non-productive expenditures both have a positive impact to economic growth in the short run. However, Lin indicates that the contribution of government consumption expenditure will be less than the contribution of government investment expenditure, because government investment expenditure has an encouraging effect on private investment. He observes that non-productive spending has a negative and significant impact on economic growth in developed countries but a significant positive impact on economic growth in developing countries.

Hadjimichael and Ghura (1995) uses pooled time-series and cross-section data for 33 countries in Sub-Saharan Africa for the period 1970-1990 and produces evidence that points towards the existence of a negative relationship between government consumption and economic growth.

Lee (1995) by using pooled cross-section and time-series data on 113 countries produces further evidence on the relationship between government consumption and economic growth. More specifically, by using an

endogenous growth model of an open economy, he finds that government consumption of economic output is associated with slower growth. The results indicate a negative link between size of government and economic growth.

Guseh (1997) in a study on the effects of government size on the rate of economic growth conducted OLS estimation, using time-series data over the period 1960 -1985 for 59 middle-income developing countries. The study suggest that growth in government size has negative effects on economic growth, but the negative effects are three times as great in non-democratic socialist systems as in democratic market systems.

Gwartney, Lawson, and Holcombe (1998) considering a sample of 23 OECD member countries, from 1960 to 1996, they argue that the expansion of government size is associated with the slower growth rates of GDP in the member countries. Government expenditures have a negative influence on economic growth for three reasons, firstly, the discouraging effects of high taxation and the crowding out effect of public investments if compared to private ones; Secondly, the diminution in profits coming from governmental intrusion in activities not appropriate to the public sector; and thirdly ,the interference in the wealth generating process.

Folster and Henrekson (1999) repeat and extend Agell, Lindh, and Ohlsson model for period 1970-1995 for 22 OECD countries and examine the effects of expenditure and fiscal withdrawal measures on growth rate. They find a strong negative relation between public expenditure and economic growth.

Dar and Amirkhalkhali (2002) studying 19 OCED countries between 1971 and 1999, find out that the negative effect should be expected in countries with a large government size. They believe that expanding government size has the effect of a decreasing return on government expenditure and over-expanding government size will cause a crowding-out effect on private investment. In addition, government expenditure often turns into inefficient expenditure which will cause a misallocation of the resource. When

expanding government expenditure, a government needs more taxes to support the expenditure, but expanding taxes will damage the economy.

The relationship between economic growth and government size in the context of Indonesia has been reviewed by Ramayandi (2003). He claims that government size tends to have a negative impact on growth.

In the study of Higgins, Levy and Young (2006), the relationship between the economic growth and the government size of USA is explored at three levels: federal, state and local. They conclude that all federal, state and local governments are either negatively correlated with economic growth or are uncorrelated with economic growth. Actually, the evidence in study shows that the increased public spending is often directed towards expanding productive capacity.

Mollick and Cabral (2011) examine the effect of government expenditures on economic growth by using data for 22 industrial and 32 emerging market countries in the period 1986-2004. In this study, the simulated generalised method of moments estimation is employed. The results show that increases in government size have negative effect on economic growth in industrial countries.

Devarajan, Swaroop and Zou, (1996) study the effects on economic growth of the composition of public expenditure as current and investment expenditures, using data for 43 developing countries from 1970 through 1990, and shows that an increase in the share of current expenditure has positive and statistically significant growth effects, while the investment expenditure is at margin, negatively related to growth. They believe that current expenditure rather than capital expenditure is more productive because the former includes spending on public goods which are more conducive to growth. They note that expenditures which are considered productive could become non-productive when there is an excessive amount of them. They show that changes in the composition of government spending towards consumption expenditure may in fact lead to higher steady state growth.

Hassan Y. Aly and Magda Kandil (2001) examined the relationship between government spending and growth in the countries United Arab Emirates, Bahrain, Kuwait, Oman, Qatar and Saudi Arabia for period 1975-1995. The evidence indicated that government spending is an important component of output growth in these six countries. Expansionary shocks to government spending increase real output growth significantly in Bahrain, Kuwait, and Oman. Furthermore, contractionary shocks to government spending decrease real output growth significantly in Kuwait. Hence, the evidence established the desirability to increase government spending in order to stimulate output growth. Furthermore, concerns about the adverse effect on output growth of a reduction in government spending are particularly evident for Kuwait.

Nakibullah and Islam (2007) by using Bahrain and US annual data for the period 1977-2004 studied the effects of government spending on non-oil GDP of Bahrain. The results indicated that there was a multiplier effect of permanent Bahrian government spending on non-oil GDP. But the positive multiplier effect would be substantially reduced by a negative impact of changes in temporary US government spending on non-oil GDP of Bahrian, This is because a temporary increase in US government spending will crowd out private consumption and investment in Bahrain due to increase in interest rate and there will be an excess supply of non-oil GDP at the initial price level.

Bose, Haque and Osborn (2007), examine the growth effects of government expenditure for 30 developing countries over the 1970s and 1980s by using panel data, with a particular focus on disaggregated government expenditures. The results indicated that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant. At the disaggregated level, government investment in education and total expenditures in education are the only outlays. These expenditures are significantly associated with economic growth when the budget constraint and omitted variables are considered.

Akitoby *et al.* (2006) have examined the short- and long-term behaviour of government spending with respect to output in 51 developing countries for the period 1970–2002. The categories of public spending examined include: total spending, current spending, government consumption, wage and nonwage government consumption, government capital spending, noninterest total spending, and noninterest current spending. They found that output and government spending were co-integrated for at least one of the spending aggregates in 70% of countries, implying a long-term positive relationship between government spending and output.

Oteng-Abayie (2011) have studied the relationship between government expenditures and economic growth in Gambia, Ghana, Guinea, Nigeria and Sierra Leone over period 1989-2004. The empirical results revealed that there was no long-run co-integration relationship between government expenditures and economic growth among five countries. The finding indicated that government expenditures did not play a significant role in promoting economic growth.

Jawadi , Mallick and Sousa (2011) have explored the impact of government spending on economic growth for Brazil, Russia, India, and China over the period 1990-2008. They have showed that an expansion of government spending had a strong and positive effect on output.

Further estimates provided by Engen and Skinner (1992) for 107 countries over the period 1970-1985, suggested that a balanced-budget increase in government spending and taxation is predicted to reduce output growth, by adopting a Granger causality approach.

Ghali (1997) uses annual data from Saudi Arabia over the period 1960 - 1996. He first tests for the existence and direction of Granger causality between the share of total government spending in GDP and the growth rate of real per capita GDP. Then he runs the econometric tests after decomposing government spending into consumption and investment. Finally, he finds out no consistent evidence that changes in government spending have an impact on per capita real output growth.

Kneller, Bleaney and Gemmell (1999) believe that the different results of studies are due to the fact that government budget has not been considered in most estimations. By including expenditures or revenues into equation, government expenditures should have positive impact on economic growth. Using data for 22 OECD countries from 1970 to 1995 they show that productive government expenditure enhances growth, whilst non-productive expenditure does not.

Miller and Russek (1997) examine the effects of fiscal structure on economic growth. They found evidence to support the view that debt-financed increases in government expenditure retard growth and tax-financed increases stimulate growth for developing countries. Debt-financed increases in government expenditure do not affect growth and tax-financed increases reduce growth for developed countries.

Ram (1986) concludes from the evidence that government size generally affects growth in a positive manner which is one of the few studies to find a positive link between government spending and economic growth, Ram employs both cross-section and time-series data for 115 countries for period 1960-1980, the regression results indicate that higher real government consumption contributes to economic growth.

Carlstrom and Gokhale (1991) show in their study that increasing government expenditures cause a long-run decline in output. According to the evidence obtained the contributions of public investment and social expenditures to growth is rather significant.

Caselli, Gerardo and LeFort. (1996) by using generalised method of moments (GMM) estimator for 97 countries during 1960-1985, examine the relation between government spending and economic growth. Their estimates point to positive contribution from the government spending to economic growth.

Heitger (2001) uses a panel of 21 OECD countries for period 1960-1990. He points out that government expenditures for central public goods such as rule of law, security from external aggression and internal order have a positive

impact on economic growth; but this positive impact of government tends to decline or even reverse when government increases expenditures in a way that it also provides private goods.

Loisides and Vamvoukas (2005) examine the effects of the relative size of government by using Granger causes on the rate of economic growth. They use an error correction model and add unemployment and inflation as explanatory variables to the model using data on Greece, UK and Ireland for the period 1950-1995. The results of analysis show that in all countries public expenditure Granger causes growth in national income in both short and long run. The hypothesis that public spending expansion has positive effect on economic growth in these countries is rejected.

Alexiou (2007) in a study for the Greek economy, after disaggregating government spending, reports evidence on the basis of which there is a positive association between the growth in the components of government spending and GDP growth.

Ghosh and Gregoriou (2008) use panel data on 15 developing countries from 1972 to 1999 to investigate the link between components of government expenditure and growth. In order to resolve the endogeneity problem, they use lags of the explanatory variables in the GMM methodology. The empirical estimates show that there is a negative link between optimal growth and public investment.

Saunders (1986) investigates the relationship between growth and government size for 21 OECD countries over the two sub-periods, 1960-73 and 1975-82. The results do not shed any light on the nature of any causal link between the size of government and economic growth, because the results are sensitive to the choice of time period and countries.

Conte and Darrat (1988) investigate the impact of total government expenditure on economic growth of OECD countries for period 1960-1984, special emphasis is put on the feedback effects from economic growth to government growth that influence from macroeconomic policy. They show that government growth has mixed effects on economic growth rates,

positive for some countries and negative for others. However, for the majority of the OECD countries, there is no discernible impact of government growth on the rate of real economic growth.

Levine and Renelt (1992) by using cross-section date for OECD countries over period 1960-1990, find out that growth rate of government consumption has a fragile statistical relationship with GDP growth.

Easterly and Rebelo (1993) study the cross- section data of 100 countries for the period 1970-1988, in the empirical analysis they consider the prediction of growth model: that high public spending on infrastructure investment raises growth, the results of investigation shows that general government investment is positively correlated with growth, public investment in transport and communications has a direct impact on growth for period 1970-1990. Considering the relation between government size or share of total public expenditure and economic growth, they conclude that no negative or positive effect can be confirmed.

Kelly (1998) explores the effects of public expenditures on growth among 73 nations over the year, 1970-1989, and highlights the contributions that public investment and social expenditures may make to growth. The results do not support a strong relationship between public investment and growth.

Ghali (1998) uses time series methods to analyse the relationship between government size and economic growth for ten OECD countries. He finds that growth in government size has impact on growth directly or indirectly in most countries. Overall, the results show that there is no clear consensus on relation between government size and national output.

Knoop (1999) uses time series data from 1970 to 1995 for USA and develops an endogenous growth model to concluding that a reduction in the size of the government does not necessarily improve growth and welfare.

Grimes (2003) studies the data with respect to 22 OECD countries and finds out that the size of government has only a minor effect on long-term growth outcomes.

As is evident from the above in the studies by Cameron(1982), Marlow(1986), Barth and Bradley (1987), Gupta (1987)Grier and Tullock(1989), Diamond (1989), Peden and Bradley (1989) Lin (1994), Gwartney et.al(1998), Floster and Henrekson (1999), Dar and Amirkhalkhali (2002), Higgins et.al (2006), Mollic and Cbral (2011) in the developed countries, there is a negative link between government size and economic growth.

Meanwhile in studies in Cross-countries by Landau (1983), Kormendi and Meguire (1985), Jong-Wha Lee (1995) and other studies by Gemmell (1983) in Egypt, Ghura (1995) in 33 Sub-Saharan Africa countries, Guesh (1997) in 59 middle-income developing countries, Ramayandi(2003) in Indonesia, Davarjan et.al (1996) in 43 developing countries, Aly and Kandil (2001) in Kuwait we can see a negative relationship between government spending and growth.

In the other researches by Aschauer (1998), Heitger(2001), Oisides and Vamvooukas (2005) in the developed counties and by Ram (1986) in 115 countries,Caselli et.al (1996) in 97 countries, Aly and Kandil (2001) in six Arab Countries, Bose et.al, (2007) in 30 developing countries. Ghosh and Gregoriou (2008) in 15 developing countries, we can find the results which indicate a positive link.

Saunders (1986), Conte and Darrat (1987), Levine and Renelt (1992), Easterly and Rebelo (1993,) Kelly (1998), Ghali (1998), Knoop (1999) and Grimes (2003), cannot reach to significant result.

3.5 Government expenditures and economic growth in Iran

Empirical studies about the relationship between government size and economic growth can be considered in three different aspects: relationship between current, investment and total government expenditures and economic growth, size of government in Iran and impact of budget financed on economic growth.

Valadkhani (1998) has investigated the effect of real government capital expenditure on GDP using data for the period 1959-1992 and employing

superexogeneity test. He found that government capital expenditure has strong positive impact on GDP unrelated to structural reform and shifts in regime in the economy.

Asali (2004) has examined the relationship between growth of government expenditure and economic growth by using a simple macroeconomic model, with emphasis on subsides which have been directly influenced by population growth. He has found any increase in current government expenditure has caused decrease in investment, national income, and economic growth.

Sameti and others (2003) have divided expenditures into current and investment and with stress on different income group's consumption and design simultaneous equations system for each group. They have found out that investment expenditures have positive impact on economic growth.

Tari and Satari (2005) have revealed the relationship between government expenditures and growth as negative. They used panel data for OPEC courtiers, period 1970-1998.

Naderan and Foladi (2005) by using general equilibrium model have investigated the relationship of growth and government expenditures. They have found increasing of current expenditures reduces production, employment and household income.

Khodarahemi (1993) by using the production function, has designed an econometrics model and showed the relationship between economic growth and expenditure growth is positive during years 1958-1990. Also government investment expenditures compared with current expenditures have more impact on economic growth.

Dejpasand and Goodarzi (2010) have used Hanen's threshold estimation to investigate Armey Curve in Iran during years 1957-2006 and found that increasing the size of government till the threshold point, increased economic growth and after this point increasing the size of government

decreased the economic growth. The size of government between 23-30% has the best impact on economic growth.

Komejani and Nazari (2009) by using contract demand function of Erkin, Bairam and VAR method for 1974- 2005 period and using variables such as: GDP, Private consumption, private investment, total government expenditures, net export and relative prices, have found the impact of government size and relative prices are negative and insignificant but impacts of private consumption and net exports on economic growth are positive and insignificant.

Majdzadeh Tabataby and Nematollahi(2010) by using two different models have investigated the short and long term relationships between size of government and economic growth for period of(1968-2006) and VECM Method . The variables of Models are: amount of money in real circulation, total real government expenditures, real consumption government expenditures, real investment government expenditures and real transfer government expenditures. They have showed, the real total government expenditures and amount of money in real circulation have positive and significant impact but real investment and transfer expenditures have negative impact on growth in long –term. Changing in the real total government expenditures have positive and significant impact on changing in GDP in short –term. Meanwhile, changing in real government consume, investment, transfer expenditures and amount of money in real circulation have not significant impact on changing in GDP.

Mirzamohamadi (1991) by using OLS examination for period 1959-1988, has found out both investment expenditure and current expenditure have positive and significant impact on value added of services sector. All the expenditures have not any significant impact on agriculture sector. But investment expenditure has significant impact on added value of industry and mining sectors.

Hashemi (1995) for period 1960-1992,Najm (2000) for period 1959-1998 and Ansari (2002) for period 1959-1999 have used Rati Ram Model (1986) in

their researches and observed that total expenditures have significant impact on economic growth. Hashemi has disclosed current expenditures have negative effects that the most effect belongs to the industry and mining sector. Meanwhile, investment expenditures have positive effects that the less effect belongs to agriculture sector.

Sherazi (2007) by using ARDL model for period 1967-2003 has revealed that between government expenditures and GDP is a long-run equilibrium and the government expenditures have positive and significant impact on economic growth.

3.5.1. Size of government and economic growth

Sameti (1993) by using Armey Curve has tried to estimate the optimal size of government. The size of government is including the total government expenditure, current expenditure and investment expenditure. He has used two different time series data: 1989-1988 and 1989-1998. The size of government (total expenditure) is near to optimal size, there is no negative effect on economic growth, but any increase in the size of government beyond the optimal size will have negative impact on economic growth. The size of government (investment and current expenditures) is estimated more than optimal size, which has harmed economic growth.

Gholisadeh (2004) investigated the optimal size of government based on general government budget during the years 1959-2001 and has found that government expenditures are one of important variables which has impact on economic growth.

3.5.2 Budget Resources and Economic Growth

Perani and Pourfarj (2004) in their research by using data for period 1979-2001 and an ARDL model have investigated the effect of budget resources and economic growth and have founded out that reducing the amount of investment expenditure due to reduce the deficit of current expenditure has negative impact on economic growth.

Nili and Moslehi (2004) have considered the Barro Model 1990 and used data for period 1958-2002. They have reached to these results: oil revenues

in a certain period have positive impact on economic growth but any lag of oil revenues have negative impact.

Parvin and Gholibegloo (2002) by using Simultaneous Equations model and 3SLS method for period 1961-1996 have found out that increasing tax and oil and gas exports have positive impact on economic growth.

3.5.3 Wagner's law on the size of government and economic growth in Iran

Zonnoor, S. H (1995) examined the growth of government expenditures and revenues in Iran over the period of 1970 - 1990 in light of conventional theories as to the nature of public sector economic activity. In his study simple forms of government expenditure and tax functions are estimated. He also examined the speed of the adjustment process by estimating a simple disequilibrium model of government expenditures and revenues. Using a constant shares model as well as a constant marginal shares model, he compared the pattern of expenditures and the revenues structure before and after the Iranian revolution. The results showed that Wagner's law applied to Iran's economy before revolution but it was not applicable after revolution.

Mohammad Ghorbani and Ali Firooz Zarea (2009) have investigated Wagner's law by using Iran's time series data of period the 1960 -2000. Results showed that GNP, government expenditure and government consumption expenditure were not co-integrated, and real income elasticity for non-proportional versions were bigger than one and for proportional ones were bigger than zero. Wagner's law was applicable to Iran's economy, because government expenditure growth and the size of government was a natural result of economic growth. In other words, based on Wagner's law, economic growth is the cause of increasing government size. In addition to this, increase in government size causes GNP to rise.

In another paper, Mosayeb Pahlavani, Davoud Abed and Farshid Pourshabi (2013) examined the long run and causal relationship between size of government (measured as the share of total expenditure in GDP) and economic growth in order to investigate Wagner's law in Iran during the period of 1960–2008. By using the bounds test approach to co-integration,

and using the Toda and Yamamoto (1995) version of the Granger causality test, they found that there was a unidirectional causality running from economic growth to size of government. The empirical findings confirm the validity of Wagner's law in Iranian economy, that is economic growth has been a major factor in the public sector growth.

Chapter Four: Growth and Government Expenditure

4.1 Introduction:

In this chapter we are going to investigate the relationship between economic growth and government expenditure. We will estimate a model which is based on Barro's endogenous growth theory. We will investigate the interaction between economic growth and government expenditures simultaneously by using 3SLS method. These systems of equation estimations ensure that growth and total government including current and investment expenditures are determined simultaneously. Firstly, we estimate the impact of total government expenditures on economic growth. Secondly, we estimate the impact of current and investment expenditures on economic growth. We test the following hypotheses:

- *Increase in the total government expenditure has a positive effect on economic growth.*
- *Increase in current government expenditure has a positive effect on economic growth.*
- *Increase in investment government expenditure has a positive effect on economic growth*

4.2 Budget

The budget preparation and adjusting has a long history in Iran in its primitive form. Iranians were skilful in governing, and governmental offices, and in tax collection, and custom houses and application of financial principles. Most countries learned the governmental affairs from Iranians (Farzib, 2001).

The first definition of budget in 1910 according to law was: "The budget of government is a document that all national operations of income and cost are estimating and approving during one fiscal year".

The last change in definition of budget was in 1987, the budget consists of the government public budget, budget of government corporations, banks and government affiliated enterprises.

Government performance in Iranian economy can be divided into three levels, including central government, general government and public sector.

Government activities and responsibilities divide into: General Affairs, National Defence Affairs, Social Affairs and Economic Affairs. General Affairs have several chapters as following: Adjusting relation between three powers, Legislation, Administration of judiciary, land register and public endowments affairs, Domestic policies implementation, Law enforcement and internal security, Administration of financial affairs, Statistics and general technical services, Information and mass communications, Public building and installations and Administration of work force affairs.

Social Affairs Chapters are: Public education and training, Culture and arts, Health, medical care and nutrition, Social security and welfare, Physical training and juvenile affairs, Urban development and reconstruction, Housing, Environment protection, Multi-purpose regional development operations, Technical and vocational training, Higher education and Research.

Economic Affairs are: Agriculture and natural resources, Water, Electricity, Manufacturing, Oil, Gas, Mining, Commerce, Roads and transportation, Post and telecommunications and Tourism.

The share of central government budgeting is allocated to social sectors, including health, education, safety nets, subsidisation of basic goods. The public expenditure management is very complex, all responsibilities are shared between government's executive including Management and Plan Organisation which manages the budget progress and the Ministry of Economic Affairs and Finance which manages accounting functions and tax collection.

4.3. Government Expenditures

The categories of government expenditures in Iran are:

1- Current Expenditures

2- Investment Expenditures

3- Costs from Special revenue

The current expenditures try to maintain the current capacities of government administration including :expenditures on goods and services such as wages of government employees, social security and pensions, interest payment, subsidies and other payments of government management in health, education, military and social activities. Capital expenditures attempt to develop the current capacities of government by investing and creating new capacities in infrastructure services and public goods. Current expenditures have to maintain new investments, so that they are sticky downward. Because of dependency of budget on oil revenues, when oil revenues go up, the current expenditures also increase and there is a large size of government. When oil prices go down, government cannot reduce the size of its activities straight away, facing to a significant budget deficit.

Table 1 shows the government expenditure structure, first, it is clear that the government expenditures are increasing. Oil price increased in the world during the period 1973-1977 was the main cause of increase in government expenditure with a focus on capital expenditure. The ratio of government expenditures to GDP rose from 34.04% in 1971 to a peak of 54.34%in 1975 and dropped down to 36.71%in 1979. During the period 1978-1988, when Iranian economy experienced both revolution and the eight- year war with Iraq, the ratio decreased, and in the years following the war, the ratio fell to almost 16.7% in 1992. Generally, after the war, the government of Iran has become increasingly involved in all types of economic activity, both as a regulator and a producer of goods and services. In many cases, the government's involvement has been through budgetary means. However, a great deal of intervention has also been applied through extra-budgetary mechanisms. These policies led to the growth the public expenditures from Rls. 4316.7 billion in 1989 to Rls. 805742.3 billion in 2002.

Comparing the ratio of current and capital expenditures to GDP is very important. Table 1 shows that the current expenditure formed a large proportion of total government expenditures in Iran, while capital expenditure formed a small proportion of total government expenditures. This

circumstance is a cause of budget deficit, which leads to inflation. The average annual increase of total government expenditure was 43.42 during 1971-1978 and 27.98%during 1979-1988 and 21.22 % during 1989-2008. The average ratios of current expenditures to GDP in the three periods are 28.36, 20.81 and 15.03 %. But the average ratios of capital expenditures to GDP were 15.07, 7.16 and 5.74 %. There is no question that the level of government expenditures has increased sharply and the share of current expenditures is always more than capital expenditures over the period of this study. When the world oil price is going down the rate of capital expenditures fluctuates more because the current expenditures are sticky.

The reasons for the increase in the government expenditure can be summarised as follows:

- Oil shocks in 1973 and 1979 and dependency on oil revenue,
- Public sector expansion
- High subsidies
- High level imports
- Nationalisation of most of industries and all Banks
- Huge debts of public Companies to the banking system.
- Losses of public Companies.
- The eight-year war with Iraq during 1980-1988 and the huge war expenditure
- Western economic sanction against Iran.
- Freezing of Iranian assets by Western counties
- Devaluation of Iranian currency

Table 1: **Current and Capital Expenditures in Iran, 1971-2008 (Billion Rls)**

Year	Total Expenditures	Current Expenditures	Capital Expenditures	Current Expenditures	Capital Share%	Total Share%
1971	320.4	204.4	116	21.72	12.32	34.04
1972	417.8	286	131.8	24.46	11.27	35.73
1973	574.8	412.8	162	24.18	9.49	33.67
1974	1511.3	1003.2	508.1	33.89	17.15	51.02
1975	1775.9	1083.5	692.4	33.15	21.18	54.34
1976	2006.2	1318.9	687.3	30.03	15.65	45.68
1977	2492.2	1491.1	1001.1	29.17	19.58	48.76
1978	2207.8	1512.7	695.1	30.33	13.93	44.27
1979	2227.9	1588.8	639.1	26.18	10.53	36.71
1980	2298.4	1727.9	570.5	27.43	9.05	36.48
1981	2707.1	2032.4	674.7	26.54	8.81	35.35
1982	3167.4	2251.5	915.9	22.34	9.08	31.42
1983	3672.3	2523.1	1149.2	20.28	9.23	29.52
1984	3353.6	2475.6	878	18.25	6.47	24.73
1985	3313.2	2548.1	765.1	17.66	5.3	22.97
1986	3156.8	2410.3	746.5	16.44	5.09	21.53
1987	3640.6	2911.4	729.2	16.24	4.06	20.31
1988	4210.8	3394.4	816.4	16.8	4.04	20.84
1989	4316.7	3385.2	931.5	13.49	3.71	17.21
1990	6051.1	4284.8	1766.3	12.41	5.11	17.53
1991	8090.8	5563.8	2527	11.48	5.21	16.7
1992	10756.8	7808	2948.8	12.1	4.57	16.67
1993	20886.9	13654.7	7232.2	13.63	7.22	20.86
1994	28912.4	19841.1	9071.3	15.05	6.88	21.94
1995	41330.9	28448.1	12882.8	15.11	6.84	21.93
1996	56783.1	37571.2	19211.9	15.09	7.71	22.8
1997	65438	44966.9	20471.1	15.41	7.01	22.42
1998	70724.3	53299.6	17424.7	16.22	5.3	21.52
1999	92759.6	67736	25023.6	15.59	5.76	21.35
2000	105049.2	82605.8	22443.4	14.32	3.89	18.22
2001	125297.7	100918.2	24379.5	15.18	3.66	18.85
2002	202325.3	147572.3	54753	16.14	5.99	22.14
2003	252054.9	178255.2	73799.7	15.85	6.56	22.42
2004	304229.4	231923.1	72306.3	15.93	4.96	20.89
2005	448522.8	330884.1	117638.7	17.84	6.34	24.18
2006	561359.1	415788.1	145571	18.39	6.43	24.83
2007	569036.6	421284.7	147751.9	14.57	5.11	19.68
2008	805742.2	582723.4	233018.7	16.85	6.73	32.3

Source: National Accounts, Central Bank of the Islamic Republic of Iran

4.4 The Theoretical Model

In Barro's model the utility function is: $u(c) = \frac{c^{1-\partial} - 1}{1-\partial}$ (4.1)

Where $\partial \rangle 0$, so that marginal utility has the constant elasticity $-\partial$. The production function is given by: $y = f(k)$ (4.2)

Where the marginal product of capital is $f' \rangle 0$, $f'' \langle 0$ and indicating diminishing returns to capital. The function has the constant returns to a broad concept of capital. The representative, infinite-lived household in a closed economy seeks to maximise overall utility, as given by: $U = \int_0^{\infty} u(c)e^{-\rho t}$

After maximisation of the utility function, we arrive at the growth rate in equation (4.3): $y = \frac{c'}{c} = \frac{1}{\partial}(f' - \rho)$ (4.3)

Where ρ is the constant rate of time preference. The production function has constant return to a broad concept of capital, which can rewrite the equation (4.2) as given by: $Y = AK$

Where A >0 is the constant net marginal product of capital, we can rewrite the equation (4.3): $y = \frac{c'}{c} = \frac{1}{\partial}(A - \rho)$ (4.4)

Where the symbol y denotes a per capita growth rate, the technology is sufficiently productive to ensure positive steady state growth, but not so productive as to yield unbounded utility. The corresponding inequality conditions are: $A \rangle \rho \rangle A(1-\partial)$ (4.5)

The first part implies A > 0 in equation (4.4). The second part, which is satisfied automatically if A > 0, ρ > 0, and, $\partial \leq 0$ guarantees that the attainable utility is bounded. In this model the economy is always at a position of steady-state growth in which all variables, K, and Y grow at the rate y shown in equation (4.4).

He adjusts the analysis to incorporate a public sector. In his model g is the quantity of public services provided to each household-producer. These services are provided without user charges and are not subject to congestion effects (which might arise for highways or some other public services). That is, the model abstracts from externalities associated with the use of public services. The role of public services is to serve as an input to private production. It is this productive role that creates a potentially positive linkage between government and growth. Production now exhibits constant returns to scale in k and g together but diminishing returns in k separately. That is, even with a broad concept of private capital, production involves decreasing returns to private inputs if the (complementary) government inputs do not expand in a parallel manner. Given constant returns to scale, the production function can be written as: $y=\phi(k,g)$ where ϕ satisfies the usual conditions for positive and diminishing marginal products, so that $\phi'\rangle 0$ and $\phi''\langle 0$ k is representative producer's quantity of capital, which corresponds to the per capita amount of aggregate capital, g is the per capita government expenditure, we can show:

$$y=\phi(k,g)=k\phi(\frac{g}{k}) \tag{4.6}$$

Using Cobb-Douglas production function,

$$\frac{y}{k}=\phi(\frac{g}{k})=A(\frac{g}{k})^{\alpha} \quad 0<\alpha<1 \tag{4.7}$$

Barro considers more assumptions such as the government has a balanced budget and the government cannot finance deficits by issuing debt or run surpluses by accumulating assets. The government expenditure is financed contemporaneously by a flat-rate income tax:

$$g=T=\tau y=\tau k\phi(\frac{g}{k}) \tag{4.8}$$

Where T is government revenue and τ is the tax rate, the production function in equation (4.6) and equation (4.8) implies that the marginal product of capital is:

$$\frac{dy}{dk} = \phi(\frac{g}{k})(1-\phi'\tau) = \phi(\frac{g}{y})(1-\phi'\frac{g}{y}) = \phi(\frac{g}{k})(1-\eta) \qquad (4.9)$$

Where η is production elasticity with respect to g, so that $0< \eta <1$. Therefore, we can obtain the growth rate of consumption by replacing equation (4.9) in equation (4.3) as following:

$$y = \frac{c'}{c} = \frac{1}{\partial}[\,(1-\tau\eta\frac{y}{g})\phi(\frac{g}{k})\rho\,] \qquad (4.10)$$

4.5 General Model

$$Y = F(K_i, K L_i) = A K_i^{\alpha} (K L_i)^{1-\alpha} \qquad 0<\alpha<1 \qquad (4.11)$$

This function has a decreasing return to k_i and K has a constant return to scale so that the growth is endogenous. According to Barro (1991), accumulation of capital might not have any effect on efficiency of firms. He uses the government spending on public goods instead of capital.

$$y = F(K_i, G L_i) = A K_i^{\alpha} (G L_i)^{1-\alpha} \qquad 0<\alpha<1 \qquad (4.12)$$

Where G is government expenditure, we consider the growth rate of GDP as:

$$\text{Growth} = f(K, \frac{G}{GDP}, \varepsilon) \qquad (4.13)$$

Where K is physical capital and ε is the effects of other variables. By using, Wagner's law that government expenditure is function of growth of government expenditure in the past periods, now we have:

$$\frac{G}{GDP} = f(Growth, (G/GDP)(-1), (G/GDP)(-2), (G/GDP)(-3) \qquad (4.14)$$

$$\text{Growth} = f(K, \frac{G}{GDP}, L, oil, pi, Dum, \varepsilon)$$

(4.15)

We have introduced some changes in the model for Iran as following:

$$\frac{G}{GDP} = f(Growth, (G/GDP)_{t-i}, Dum, v) \quad (4.16)$$

$$\text{Growth} = f(K, \frac{G}{GDP}, L, oil, pi, Dum, \varepsilon) \quad (4.17)$$

Where Growth is GDP per capita, K is total capital but we used the log of GDP with one lag, L is the ratio of employment to the total of population over 15 years old, Oil is revenues of oil, Dum is Dummy variable of war for years 1981-1988 and PI is inflation rate.

The final Simultaneous Equations model for estimation is:

$$Growth = \alpha_1 + \alpha_2 \log(Gdp(-1)) + \alpha_3 L + \alpha_4 \log(oil/Gdp) + \alpha_5 Pi + \alpha_6 \log(G_i/Gdp) + \varepsilon \quad (4.18)$$

$$\log(G_i/Gdp) = \alpha_8 + \alpha_9 Growth + \alpha_{10} \log((G/Gdp)(-1)) + \alpha_{11} \log((G/Gdp)(-2)) + v \quad (4.19)$$

In order to estimate the Simultaneous Equations model, we can use the methods of Ordinary Least Square, Cross-Equation Weighting, Cross-Equation Restriction, Full Information Maximum Likelihood, Generalised Method of Moments, Seemingly Unrelated Regression, Two Stage Least Square and Weighted -Two Stage Least Square. As these are not good estimators for our purposes, we used 3SLS. The latter is used to handle the simultaneity appropriately. The advantage of 3SLS is not only being asymptotically maximum likelihood and of giving more efficient parameter estimates, but also performing the regressions simultaneously on all the equations in the model. This estimation technique is therefore adopted in this analysis by using annual time-series data for the years 1971-2008, [available in the National Accounting of Central Bank of Iran].

4.6 Simultaneous Equation

Simultaneous equation models are systems of equations in which one or more of the dependent variables is an explanatory variable in the equation for another dependent variable. In a single-equation model a dependent y variable is a function of independent x variables; other y variables are among the independent variables in each simultaneous equation model. The y

variables in the system are jointly (or simultaneously) determined by the equations in the system.

$$y_1 = \alpha_0 + \alpha_1 y_2 + \alpha_2 x_1 + \varepsilon_1$$
$$y_2 = y_0 + y_1 y_1 + \varepsilon_2 \qquad (4.20)$$

The first equation in the system has a conventional x variable, but it also has a dependent variable y_2 on the right-hand side. Likewise, the second equation has a dependent variable y_1 as a right-hand side variable. In a simultaneous equations system, variables that appear only on the right-hand side of the equals sign are called exogenous variables and they are truly independent variables. Variables that appear on the right-hand side and also have their own equations are referred to as endogenous variables, because their values are determined within the system of equations. The endogenous variables change value as the simultaneous system of equations grinds out equilibrium solutions. (Barreto and Howland 2006)

The three-stage least squares (3SLS) estimator refers to a method of estimation that combines, seemingly unrelated regression (SUR), and two-stage least squares estimation. It is an instrumental variables estimation that permits correlations of the unobserved disturbances across several equations, and restrictions among coefficients of different equations, and improves upon the efficiency of equation by equation estimation by taking into account such correlations across equations. The two-stage least squares (2SLS), estimates the coefficients of each structural equation separately, the three-stage least squares estimates all coefficients simultaneously.

Three-stage least squares was developed by Arnold Zellner and Henri Theil (1962). In the classical specification, although the structural disturbances may be correlated across equations, it is assumed that within each structural equation the disturbances are both homoskedastic and serially uncorrelated. The classical specification thus implies that the disturbance covariance matrix within each equation is diagonal, whereas the entire system's covariance matrix is non-diagonal.

The Zellner-Theil proposal for efficient estimation of this system is in three stages, where the first stage involves obtaining estimates of the residuals of the structural equations by two-stage least squares (2SLS) of all identified equations. The second stage involves computation of the optimal instrument, or weighting matrix, using the estimated residuals to construct the disturbance variance-covariance matrix; and the third stage is joint estimation of the system of equations using the optimal instrument. Although 3SLS is generally asymptotically more efficient than 2SLS, even if a single equation of the system is mis-specified, 3SLS estimates of coefficients of all equations are generally inconsistent. Consider a general linear model:

$$y_i = Y_i\beta_{i+} X_i\gamma_{i+} u_i \qquad (4.21)$$

Where y_i is a $n\times 1$ vector of sample observations on the dependent variable in the i^{th} equation, y_i is a $n\times g_i$ matrix of observations on the other endogenous variables in the equation, and x_i is a $n\times k_i$ matrix. This can then be rewritten as:

$$y_i = Z_i\delta_i + u_i$$

(4.22)

Where $Z_i = \left[Y_i\, X_i\right]$ and $\delta_i = \begin{bmatrix}\beta_i \\ \gamma_i\end{bmatrix}$

We then premultiply the equation by X' the $n\times k$ matrix of all the predetermined variables in the model:

$$X'y_i = X'Z_i\delta_i + X'u_i \qquad i = 1,\ldots G \qquad (4.23)$$

The variance covariance matrix of this disturbance term is:

$$E\left(X'u_iu_i'X\right) = \sigma_{ii}X'X \qquad (4.24)$$

On the standard assumption that $E\left(u_iu_i'\right) = \sigma_{ii}I$ the obvious way to estimate $X'y_i = X'Z_i\delta_i + X'u_i$ is by GLS (Generalised Least Squares). Hence the GLS estimator of δ_i is:

$$\delta_i = \left[Z_i'X(X'X)^{-1}X'Z_i\right]^{-1} Z'X(X'X)^{-1}X'y_i \tag{4.25}$$

This approach leads to a considerable simplification in the presentation of the 3SLS estimator. It can be shown that a non-singular matrix P exists such that:

$$\begin{aligned} &(X'X)^{-1} = PP' \\ &P'X'XP = I \\ &P'X'y_i = P'X'Z_i\delta_i + P'X'u_i \\ &w_i = W_i\delta_i + v_i \end{aligned} \tag{4.26}$$

$$E(v_i v_i') = E(P'X'u_i u_i'XP) = \partial_{ii}P'X'XP = \partial_{ii}I \tag{4.27}$$

$$\begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_G \end{bmatrix} = \begin{pmatrix} w_1 & \cdots & 0 \\ 0 & \ddots & 0 \\ \vdots & & \\ 0 & 0 & w_G \end{pmatrix} \begin{bmatrix} \delta_1 \\ \delta_2 \\ \vdots \\ \delta_G \end{bmatrix} + \begin{bmatrix} v_1 \\ v_2 \\ \vdots \\ v_G \end{bmatrix} \tag{4.28}$$

Or

$$w = W\delta + v$$

The application of OLS to the following equation:

$$w_i = W_i\delta_i + v_i \tag{4.29}$$

Which gives: $\delta_i = (w_i'w_i)^{-1}W_i'w_i$, which is the standard 3SLS estimator. However, Zellner and Theil also discuss a number of interesting conditions under which 3SLS and 2SLS estimators are equivalent. First, if the structural disturbances have no mutual correlations across equations (the variance-covariance matrix of the system disturbances is diagonal), then 3SLS estimates are identical to the 2SLS estimates equation by equation. Second, if all equations in the system are just-identified, then 3SLS is also equivalent to 2SLS equation by equation. Third, if a subset of m equations is over identified while the remaining equations are just-identified, then 3SLS

estimation of the m over-identified equations is equivalent to 2SLS of these m equations.

The 3SLS applies the Generlised Least Squares (GLS) estimation to all equations that have been estimated individually by 2SLS. The real advantage of using the 3SLS method over the 2SLS is that it is more efficient when structural equations disturbances are correlated. The 2SLS, estimates the system equation by equation, and only the endogenous variables in each equation.

4.7 Empirical Results

In order to investigate the interaction between economic growth and government expenditures we estimate equations (4.18) and (4.19) simultaneously by using 3SLS method. This system of equations estimations ensure that growth and total government including current and investment expenditures are determined simultaneously. Firstly, we estimate the impact of total government expenditure on economic growth leading to the results as presented in table 2. Most of coefficients are significant at 95% level. The results show that the total government expenditure has a negative and significant effect on economic growth. Since the variables are measured as log, a unit change in the policy variable causes a rate of change or acceleration (deceleration) on the endogenous variable. The coefficient shows the elasticity of GDP growth rate to changes in share of total government expenditure to GDP. It means, if the total expenditures change by 1%the economic growth will decrease to 0.13%.

Table 2: The Result of Total Government Expenditure on Economic Growth

	Coefficient	Std-Error	t-Statistic	Prob.
C(1)	-1.727973	2.922330	-0.591197	0.5565
C(2)	-0.239000	0.091465	-2.613011	0.0112
C(3)	0.201469	0.118649	1.698021	0.0944
C(4)	0.117584	0.025784	4.560391	0.0000
C(5)	-0.133578	0.055175	-2.420997	0.0184
C(6)	-0.002401	0.000927	-2.589145	0.0119
C(7)	0.185909	0.063888	2.909944	0.0050
C(8)	0.354202	0.426763	0.829975	0.4097
C(9)	1.005889	0.017605	57.13629	0.0000
Determinant residual covariance 8.11E-05				
Equation: Growth=C(1)+C(2)*LogGDP(-1)+ C(3)*Log labour+C(4)*Log Oil revenue+(5)*log total government expenditures +C(6)* log inflation R^2 = 0.52				
Equation: log total government expenditures= C(7)+C(8)*growth+ C(9)* log total government expenditures(-1) R^2 = 0.98				

The coefficient of inflation is negative and has a significant impact on the economic growth. This shows that inflation is harmful for the national economy. The coefficient of labour is positive and has significant impact on economic growth. The log of GDP with one lag has a negative coefficient. The GDP is strongly dependent on oil revenues. There is no expectation that future oil revenues will follow the pervious oil revenues, because of the fluctuation in the world oil price. But the coefficient of the oil revenue is positive with significant impact on the economic growth. These results indicate that, economic growth in Iran depends on oil revenue.

Now, we try to investigate the effects of current and investment expenditures on economic growth and the results are presented in table 3. The results show there is a significant negative relationship between current expenditures and economic growth. The coefficient is -0.15, which means if the share of current expenditures to GDP increases (decrease) 1%, the economic growth decrease (increase) by 0.15%.The current expenditure in

national budget indicates that the size of government has a negative impact on economic growth through misallocation of resources, reduction in competition and private sector efficiency. The reason of increasing in trend of current expenditures is expanding oil revenues. The investment expenditures have a positive impact on economic growth. The results of our estimation show that if the share of investment expenditures to GDP increases (decreases) by 1%, the economic growth rate will increase (decrease) by 0.066%.

Table 3: The Results of Current and Investment Expenditures on Economic Growth

Variables	Coefficient	Std-Error	t-Statistic	rob.
C(1)	-1.954086	2.491016	-0.784453	0.4347
C(2)	-0.324543	0.068615	-4.729928	0.0000
C(3)	0.242008	0.099941	2.421493	0.0174
C(4)	0.076039	0.024799	3.066280	0.0028
C(5)	0.066882	0.056597	1.181725	0.2403
C(6)	-0.158600	0.048610	-3.262700	0.0015
C(7)	-0.002674	0.000871	-3.071213	0.0028
C(8)	0.186999	0.063891	2.926883	0.0043
C(9)	0.324477	0.427088	0.759744	0.4493
C(10)	1.006109	0.017606	57.14739	0.0000
C(11)	0.298847	0.293808	1.017150	0.3117
C(12)	-0.859881	0.385192	-2.232342	0.0279
C(13)	1.009218	0.018395	54.86332	0.0000
Determinant residual covariance 1.72E07				
Equation: Growth=c(1)+c(2)*Log GDP(-1)+c(3)*Log labour+ C(4)*log oil revenues +c(5)*log investment expenditure+ C(6)* log current expenditures+ c(7)* inflation				R^2 = 0.62
Equation: Log investment expenditures= c(8)*+ c(9)*growth + c(10)*log investment expenditures (-1)				R^2 =0.98
Equation: Log current expenditures= c(11)+ c(12)*growth +c(13) log current expenditures(-1)				R^2 =0.98

Chapter 5: Growth and Government Expenditure and Sources of Finance

5.1 Introduction

In this chapter, we are going to investigate the impact of government expenditure and the sources of financing government expenditure on economic growth. This analysis is based on autoregressive distributed lag (ARDL) model, or bounds testing approach advanced by Pesaran, Shin, and Smith (2001). The sources of financing government expenditure are oil revenue, tax revenue and borrowing from central bank. In the ARDL model we consider long and short terms and estimate the Error Correction. The goodness of fit for ARDL model is checked through stability tests such as cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ). In this model our hypotheses are as following:

- *Increase in oil revenue has a positive effect on economic growth.*
- *Increase in tax revenue has a positive effect on economic growth.*

Increase in borrowing from central bank has a positive effect on economic growth.

5.2 Government Revenues

- The government revenues are:
- Tax Revenues
- Revenues from Oil and Gas
- Revenues from Government Monopolies and Properties
- Revenues from Sales of Goods and Services
- Insurance Premiums, Contributions, Transferred revenues and Miscellaneous
- Principal and Interest of Loans and Returns of Government Investment
- Other Financial Resources

General government revenues in Iran include the tax revenues, oil and gas revenues and other revenues. Government revenues structure during the period 1971-2008 is shown in Table. It is evident that total government revenues faced many fluctuations, mainly due to changes in oil prices in international markets and socio-political factors over this period. First, the growth of total government revenues is closely associated with the growth of oil revenues. For example, during 1973-1977, oil and gas revenues and total government revenues increased following a rise in oil price and oil exports. On the other hand, following the fall in the oil price in 1986, oil and gas revenues and total government revenues showed a decline. In addition, total government revenues experienced a significant decline following the first year of war with Iraq (1980). While, with the ending of the Iran-Iraq war in 1988, oil revenues and total government revenues experienced a sharp rise in 1989. Furthermore, tax revenues showed a decline following the revolution and first year of the war. It decreased from Rls. 465.9 billion in 1978 to Rls. 368.3 billion in 1979 and to Rls. 340.4 billion in 1980.

Generally, oil and gas revenues have played a major role in Iranian economy pre and post-revolution. Over the period 1971-2008, oil and gas revenue has fluctuated wildly. Iranian economy experienced the first oil price shock in 1973 when oil price increased sharply, thus oil and gas revenue increased suddenly over the period 1973-1977. But, over the period 1978-1988 due to revolution and war, oil and gas revenue have faced sharp fluctuations. Oil and gas revenue continued to decline following the revolution and the first year of the war. From 1981 to 1983, oil and gas revenue increased. Then, oil and gas revenue continued to decline over the period 1984-1986. Iranian economy experienced the lowest oil and gas revenue during post-revolution in 1986 (Rls. 434.7 billion). With the end of the war in 1988, oil and gas revenue rose continuously until 1996. Following the fall in the oil price in 1997 and 1998, oil revenue again showed a decline. Other revenues are non-oil revenues of government in Iran and are a small proportion of total government revenue over the period of study. In summary, we can say that structure of government revenues is not suitable for Iranian economy, because the total government revenues are highly dependent on oil

revenues, and tax revenues don't play remarkable role in total government revenues, and composition of government revenues are instable.

Table 4: Government Revenues in Iran, 1971-2008 (Billion RLs)

Year	Total Government Revenues	Oil Revenues	Tax Revenues	Other Revenues	Share% Oil Revenues	Share% Tax Revenues	Share% Other Revenues	Share% Total Government Revenues
1971	258.3	155.3	80.6	22.40	16.5	8.56	0.92	27.44
1972	302.1	178.2	99.4	24.5	15.24	8.5	0.72	25.82
1973	464.8	311.3	131.2	22.3	18.23	7.68	0.44	27.22
1974	1394.4	1205.2	157.8	31.4	40.68	5.32	0.17	47.07
1975	1582.1	1246.8	270.8	64.5	38.15	8.28	0.25	48.81
1976	1836.4	1421.5	342.9	72	32.37	7.8	0.17	41.82
1977	2034.2	1497.8	443.6	92.8	29.3	8.67	0.16	39.06
1978	1598.9	1013.2	465.9	119.8	20.31	9.34	0.18	32.06
1979	1699.6	1219.7	368.3	111.6	20.1	6.06	0.09	28
1980	1325.9	888.8	340.4	96.7	14.11	5.4	0.08	21.09
1981	1770.1	1056.4	554.1	159.6	13.79	7.32	0.09	23.12
1982	2501.9	1689.5	613.9	198.5	16.76	6.09	0.06	24.82
1983	2773.7	1779.4	796.5	197.8	14.3	6.4	0.05	22.3
1984	2714.8	1407.7	898.7	408.4	10.38	6.62	0.04	20.02
1985	2666.2	1208.6	1033.7	423.9	8.37	7.16	0.04	18.48
1986	1707.3	434.7	1024.6	248	2.96	6.98	0.04	11.64
1987	2171.5	853.2	1030.2	288.1	4.76	5.74	0.03	12.11
1988	2085.4	809.3	986.5	289.6	4	4.88	0.02	10.32
1989	3174.6	1515.1	1187.8	471.7	6.04	4.73	0.018	12.65
1990	5632.5	3375.1	1695	562.4	9.78	4.91	0.014	16.32
1991	6933.5	3549.4	2765.2	618.9	7.32	5.7	0.011	14.48
1992	9884.5	5145.9	3775.5	963.1	7.97	5.85	0.009	15.32
1993	20250.7	14683.2	4061.3	1506.2	14.06	4.05	0.004	20.22
1994	29244.5	21479.7	5490.8	2274	16.3	4.16	0.003	22.19
1995	41575.4	29431.2	7313	4831.2	15.63	3.88	0.002	22.09
1996	57121.9	38153	12560.2	6408.7	15.32	5.04	0.002	22.94
1997	62378.1	36446.7	17344.6	8586.8	12.49	5.94	0.002	21.37
1998	53626	22530	24881.6	6214.4	6.87	7.57	0.002	16.32
1999	92315.7	44170.4	40265.7	7879.6	10.16	9.26	0.002	21.25
2000	104640.8	59448.5	36585.2	8607.1	10.31	6.34	0.001	18.15
2001	125479.5	71957.1	41786.1	1176.3	10.82	6.28	0.0009	18.87
2002	165156.7	102626.4	50586.5	11943.8	11.32	5.53	0.0006	18.07
2003	207867.5	128153.9	65099	14614.6	11.4	5.79	0.0005	18.49
2004	255000.26	150413.3	84421.1	20165.9	10.32	5.79	0.0003	17.51
2005	387669.4	186342.4	134574.4	66752.6	10.04	7.25	0.0003	20.19
2006	413927.99	181881.2	151620.9	80425.9	8.04	6.7	0.0002	18.31
2007	472995	173519.1	191815.3	107660.6	6	6.63	0.0002	16.36
2008	595975.21	215650.3	239741.4	140583.6	6.23	6.93	0.0002	17.23

Source: National Accounts, Central Bank of the Islamic Republic of Iran

5.3 Financing of Budget Deficit

The government budget deficit has been financed by different sources during 1971-2008 as follows: borrowing from banking system, government bond issue, open market operations and privatisation, external debt and Oil Stabilisation Fund (OSF).

The main sources of financing budget deficit during 1971-1979 were borrowing from the central bank, government bonds issue and external debt. But after revolution of 79, the government budget deficit was largely financed through borrowing from the central bank. Till 1988 the budget deficit and banking system claim on government were increasing and during 1989-1993 the banking system claim on government was decreased due to reduction in budget deficit. The other methods of financing budget deficit, such as external borrowing and open market operations, have been insignificant till 1993. However, the external debt has increased sharply since the end of the war, particularly after the 1993 exchange rate unification policy.

According to Dadkhah (1996), during the war period 1980-1988 the average ratio of external debt to GNP was 4.2%, whereas this ratio averaged 16.8% in the post-war period. In other words, total external debt increased from US$ 4.5 billion in 1980 to US$ 22.3 billion in 1995, a five-fold increase. Short-term external borrowing constituted about 61% of Iran's total foreign debt during the period 1980-1995.During the 1997-1999, the government budget deficit has been financed largely by government bond issue. For example, in 1997, the share of government bond issue for deficit finance was around 71%. According to the CBI, only in 1998, the government budget deficit has been financed by borrowing from banking system. In 1998, the share of borrowing from banking system for deficit finance was around 38.2%.

Increase in world oil prices and improvement in economic indicators in 2000 helped the government to design the 2001 Budget without borrowing from the banking system. In the Third Five-Year Development plan, the Oil Stabilisation Fund (OSF) was established to insulate the budget from fluctuations in crude oil prices, to convert oil export proceeds into other reserves, to invest, and to support realisation of projected activities during

the course of the Plan. Therefore, oil revenues in excess of budgeted amount are deposited into an account kept with the Central Bank of Iran. Utilisation of OSF to finance government general budget expenditures is merely allowed in case of a drop in oil export revenues as compared with the approved budget and inability to compensate it from tax or other sources.

5.4 Extra-Budgetary Funds

The government of Iran typically has some hidden expenditures and debts that are not reflected in the official accounts. There are some reasons for setting up Extra-Budgetary Funds. The first reason is to help the budget by separating out clear and direct tasks that can be run with their own sources of finance. Second is to keep some expenditure outside the budget to give particular organisational flexibility in doing tasks that would be impossible to perform under normal budgetary procedures. Third and the most important reason is to keep certain expenditures outside the budget to protect them from annual review in the budget process (Salehi-Esfahani, and Tehranipour 2002)

These funds are large and play significant roles in the Iranian public finances because the government of Iran has become increasingly involved in all types of economic activity during the last several decades. The extra budgetary mechanisms focus on price and quantity controls in credit, foreign exchange, and fuel markets. The government is controlling its power to keep the prices in these markets low and rations their available resources. Subsidies on food and energy are good examples.

The government controls the allocation of credit at below market-clearing interest rates. A large part of this credit allocation is the government's own borrowing from the banking system to finance its deficit, which is included in the national budget accounts. However, as the regulator and owner of the banking system, the government uses its monopoly power to direct credit toward sectors that it wants to support. Such implicit taxation and subsidisation are not included in the budget accounts. To sum up, interventions in the credit market has created substantial extra-budgetary funds for the Iranian government.

Also allocation of foreign exchanges at below market prices has been another source of extra-budgetary funds in Iran. The government controls the foreign exchange supply in the country through its leading role in foreign borrowing and oil sector, the government sells its foreign exchange revenues to the Central Bank at the basic official exchange rate and includes the RLs equivalent in the budget as oil export proceeds. A similar procedure is used for foreign borrowing, which is reflected in the budget as part of revenues from foreign exchange sales.

5.5 Budget Reform

The budget system in Iran faces many problems including: dependence on oil revenue and low tax base; high current expenditures with little left over for capital expenditures; universal subsidies and budget deficits which have been highly inflationary; weak linkage between the annual budget and the five-year plans; unreliable accounting, auditing and poor monitoring and the weak mechanism of allocation of funds and several off-budget accounts; lack of clarity in laws and regulations and non-transparency in explanation for the regulatory and operational roles of the government; poor linkages between the organisational structure of the government and its fiscal and budgetary policies.

In 2000 the government launched a budget reform programme to manage its public resources more effectively. The Management and Planning Organisation (MPO) formulated the Budget Law for 2002 on the basis of the Government Finance Statistics Manual (GFSM 2001) and the Management and Planning Organisation was ordered to prepare the budget operationally. Performance budgeting is a method for developing financial plans for the organisation, and involves allocating resources based on results achieved. (Foltin, 1999; Andrews and Hill, 2003; Pérez et al., 2005; Weygandt, 2009; Atkinson et al., 2011). The operation of budgeting helps governmental organisations reach high quality services through specifying details of budgeting process. It provides better performance measurement for governmental organisations; it helps government organisations reach a more precise cost for products and services; operational budgeting allocates the

necessary budget proportion to performance measurement; it redirects costs towards objectives and it will lead us to reach transparent budget. Overall, a performance-based budget is supposed to be a system that improves programme effectiveness, increases efficiency and effectiveness of budget decisions and decreases cost by reducing duplicative services and changing appropriation levels. It increases the accountability of government organisations.

Up until 2002, budget preparation followed an old-fashioned system. According to the old system oil and gas revenue, tax revenue, and other revenue is classified under government revenues. On the expenditures side, current expenditure and capital expenditure is classified under government expenditures. According to this system, differential of government revenues and government expenditures is considered as deficit (surplus). Formulation of the Budget Law on the basis of old system is as:

Government Expenditures = (current expenditure) + (capital expenditure) Government Revenues = {(oil and gas) + (taxes) + (other)}. Deficits (surplus) = (government revenues) - (government expenditures)

In the first step taken for implementation of GFSM 2001 in Iran, the sum of tax revenues and other revenues is classified under government revenues, and receipts from export of crude oil and gas under disposal of non-financial assets. Moreover, receipts such as receipts from sale of participation papers, principal of government loans abroad, privatisation proceeds, foreign financing and Oil Stabilisation Fund (OSF) utilisation, which could create indebtedness or be converted into assets, are classified under disposal of financial assets.

On the expenditure side, payments for current expenditure are classified under expense and those referring to development, infrastructure and capital formation appear under acquisition of non-financial assets. Payments for debt repayment and fulfilment of obligations are classified under acquisition of financial assets.

According to GFSM 2001, differential of revenues and expenses is measured as operating balance, and differential of disposal and acquisition of non-financial assets as net disposal of non-financial assets. The sum of operating balance and net disposal of non-financial assets which has substituted for deficit (surplus) in the old classification is financed through net disposal of financial assets (differential of disposal and acquisition of financial assets). Formulation of the Budget Law on the basis of the Government Finance Statistics Manual (GFSM 2001) is as:

Revenues = (taxes) + (other) Expenses = current expenditures Operating balance = (revenues) – (expenses) Net disposal of non-financial assets = (Disposal of non-financial assets) - (Acquisition of non-financial assets) Deficits (surplus) = (operating balance) + (net disposal of non-financial assets)

In this part of study, we are going to investigate the impacts of government expenditures and the sources of finance of these expenditures on economic growth. This analysis is based on autoregressive distributed lag (ARDL) model, or bounds testing approach advanced by Pesaran, Shin, and Smith (2001).Pesaran (1997) and Pesaran and Shin (1999). There are several reasons why econometric models contain lagged values. Economic variables need time to respond to policy and there is an expectation of long lags between policy changes and their impacts. These expectations are shaped by aggregating new information and past experience. Totally lagged variables can provide a better functional form of econometric model and allow producing a dynamic forecasts in models. An Autoregressive Distribution Lag Model refers to a model with lags of both the dependent and explanatory variables; the following equation is a general ARDL model:

$$Y_t + \mu + \sum_{i=1}^{k} Y_{t-i} + \sum_{j=0}^{p} \beta_i X_{t-j} + \delta W_t + \varepsilon_t \qquad (5.1)$$

Several co-integration approaches are available in the literature to establish a long-run relationship between co-integrated variables. In the framework of Engle and Granger (1987),Granger (1981,1986), Johansen and Juselius (1990) and Gregory and Hansen (1996 a and b), among others, if two

variables are integrated of order one, and the associated error term is integrated of order zero, then the two variables are said to be co-integrated. Moreover, these approaches are particularly appropriate for large samples. The autoregressive distributed lag (ARDL) method developed by Pesaran, Shin, and Smith (2001,) is a more effective approach for determining co-integrating relationships in small samples. A further advantage of the ARDL is that while other co-integration techniques require all of the regressors to be integrated of the same order; the ARDL can be applied irrespective of their order of integration. It thus avoids the pre-testing problems associated with standard co-integration tests (Pesaran, Shin, and Smith 2001). Moreover, while the conventional co-integration method estimates the long run relationships within a context of a system of equations, the ARDL method employs only a single reduced form equation (Pesaran and Shin, 1999). Furthermore, the ARDL method avoids the large number of specification to be made in the standard co-integration test. These include decisions regarding the number of endogenous and exogenous variables (if any) to be included, the treatment of deterministic elements, as well as the optimal number of lags to be specified. With the ARDL, it is possible that different variables have different optimal lags, which is impossible with the standard co-integration test.

We apply the autoregressive distributed lag ARDL $(p_1, q_1, q_2, \ldots\ldots q_k)$ as in following equation:

$$Q(L,P) = \sum_{i-1}^{k} \beta_i(L,q_i)x_{it} + \delta' w_t + u_t \qquad (5.2)$$

Where i=1,2,...k, L is lag operator, p is lag of dependent variable, q_i is log of independent variable and w_t is vector of exogenous variables with constant lag. The ARDL method involves three steps. First, the existence of a long-run relationship among the variables in the model is determined. The ARDL is a linear model with a classical disturbance. As such, ordinary least squares is the efficient estimator. We can estimate the equation by OLS in order to test the long run relationship among the variables by conducting F- statistics through Wald restriction test. At this stage, the calculated F-statistic is

compared with the critical value. The null hypothesis of no co-integration will be rejected if the calculated F-statistic is greater than the upper bound. If the computed F-statistic falls below the lower bound, then the null hypothesis of no co-integration cannot be rejected. Finally, the result is inconclusive if it is between the lower and the upper bound. In the second step when co-integration is established the long –run model, we can select the orders of the ARDL model by using Akaike information critical (AIC). In the third and final step, we can obtain the short-run dynamic parameters by estimating an error correction model associated with the long –run estimates.

5.6 The Theoretical Model

We consider a production function; $GDP = Af(K,L)$ (5.3)

Where GDP is gross domestic production, A is technology variable, K is capital and L is labour. The government expenditures have strong impact on GDP and economic growth and in a country like Iran government expenditure has important roles in providing suitable economic foundations, human development and improvement of technology. Therefore government determines significant elements of gross domestic production and we can consider government expenditures as an input in production function as follow: $GDP = AL^{\alpha_1} K^{\alpha_2} G^{\alpha_3}$

(5.4)

Where A is technology variable, and any increase of capital K, Labour L, government expenditures G, and technology variable A, or any combination of these inputs changes total level of production. The coefficients of α_1, α_2 and α_3 are production elasticity of labour, capital and government expenditures.

In order to find out the impacts of financing government expenditures on GDP and growth, we add the variables of oil revenues, tax revenues, borrowing of banking system and government expenditures as inputs in production function. We have a production function as:

$$GDP = AL^{\beta_1} K^{\beta_2} OIL^{\beta_3} T^{\beta_4} BD^{\beta_5} \quad (5.5)$$

Where A is technology variable, and any increase e in capital K, labour L ,the share of oil revenue OIL, tax revenues T, borrowing of central bank to finance the government expenditures, and development of technology or any of compound of these inputs cause changes in total production and GDP. The coefficients of $\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are production elasticity of capital, labour, the share of oil revenues, tax revenues and borrowing of central bank to financing the government expenditures.

We want to investigate the impacts of current and investment expenditures on economic growth. We now construct the following regressions, thus:

$$\Delta LGDP_t = a_1 + \sum_{i=1}^{k} b_{i1}\Delta LGDP_{t-i} + \sum_{i=1}^{k} c_{i1}\Delta LK_{t-i} + \sum_{i=1}^{k} d_{i1}\Delta LL_{t-i} + \sum_{i=1}^{k} e_{i1}\Delta LCG_{t-i} + \sum_{i=1}^{k} d_{i1}\Delta LIG_{t-i} + \partial_1 LGDP_{t-1}$$
$$+\partial_2 LK_{t-1} + \partial_3 LL_{t-1} + \partial_4 LCG_{t-1} + \partial_5 LIG_{t-1} + \partial_6 DU79 + \partial_7 DU81 + \varepsilon_{1t}$$

Where $LGDP$ denotes the log of gross domestic of production at time t, and LK is the log of the stock of capital, and LL is the log of the stock of labour, LCG is the log of current expenditure, and LIG is the log of investment expenditure. To capture the effects of the 1979 revolution and Iran-Iraq war period (1981-1988) as important structural breaks in Iran's economy two intercept shift dummy variables ($DU79$) and ($DU81$) have been included in the model.

Now we are going to explore the impact of the sources of financing government expenditures on economic growth. In the model we consider the oil revenues, tax revenues and borrowing from the central bank as main sources of financing of the government expenditures in Iran.

$$\Delta LGDP_t = a_1 + \sum_{i=1}^{k} f_{i1}\Delta LGDP_{t-i} + \sum_{i=1}^{k} g_{i1}\Delta LK_{t-i} + \sum_{i=1}^{k} h_{i1}\Delta LL_{t-i} + \sum_{i=1}^{k} j_{i1}\Delta LBD_{t-i} + \sum_{i=1}^{k} k_{i1}\Delta LT_{t-i} + \sum_{i=1}^{k} m\Delta LOIL + \partial_1 LGDP_{t-1}$$
$$+\partial_2 LK_{t-1} + \partial_3 LL_{t-1} + \partial_4 LBT_{t-1} + \partial_5 LT_{t-1} + \partial_6 LOIL_{t-1} + \partial_7 DU79 + \partial_8 DU81 + \varepsilon_{1t}$$

Where LBD is the log of borrowing from the central bank, LT is the lag of tax revenues and $LOIL$ is the lag of oil revenues. At the first step before we proceed with the ARDL bounds test, we test the stationary status of all variables to determine their order of integration. In Pesaran, Shin, and Smith

(2001) critical values are based on the assumption that the variables are integrated of order I(0) or I(1). Unit root tests insure that none of the series is integrated of order I(2) or higher.

5.7 Estimation Techniques

5.7.1. Non-stationary, Stationary data and Unit Root Test

Many economic variables have a common tendency of growing over time as shown by time series. Some time series contain a time trend, from which we can draw causal inferences. Ignoring the fact that two sequences are trending in the same or opposite directions can lead us to falsely conclude that changes in one variable are actually caused by changes in another variable. In many cases, two time series processes appear to be correlated only because they are both trending over time for reasons related to other unobserved factors. Data points are often non-stationary or have means, variances and co variances that change over time. Non-stationary behaviors can be trends, cycles, random walks or combinations of the three. Non-stationary data, as a rule, are unpredictable and cannot be modeled or forecasted. The results obtained by using non-stationary time series may be spurious in that they may indicate a relationship between two variables where one does not exist. In order to receive consistent, reliable results, the non-stationary data needs to be transformed into stationary data. In contrast to the non-stationary process that has a variable variance and a mean that returns to a long-run mean over time, the stationary process reverts to a constant long-term mean and has a constant variance independent of time.

The identification of non-stationarity as a problem in econometric analysis is one of the latest development. The assumptions of the classical model require all variables to be stationary and have errors whose mean is zero and variance is finite. Granger and Newbold (1974) show that an ordinary least squares regression can be spurious in the face of non-stationary variables, the r-squared may be high, and t-statistics significant, even though there is no relationship. The output looks good because OLS does not give consistent estimates and the asymptotic of the t-test are non-normal.

A stationary process has played an important role in the analysis of time series. A stationary time series process is one whose probability distributions are stable over time, if we take any collection of random variables in the sequence and then shift that sequence ahead h time periods, the joint probability distribution must remain unchanged. A time series is said to be strictly stationary if the joint distribution of $X_{t_1},.....,X_{t_n}$ is the same as the joint distribution of $X_{t_1+\tau},.....,X_{t_n+\tau}$ for all $t_1.....t_n$ and τ. The distribution of the stationary process remains unchanged when shifted in time by an arbitrary value τ. Thus the parameters which characterise the distribution of the process do not depend on t, but on the lag τ. A stochastic process that is not stationary is said to be a non-stationary process. A non-stationary process with a deterministic trend becomes stationary after removing the trend, or detrending. In a time series we are dealing with two kinds of trends: deterministic or stochastic.

Now consider a time series (y) as following:

$$y_t = \alpha + \rho y_{t-1} + \beta_t + \varepsilon_t \quad ,\alpha \neq 0 \tag{5.6}$$

Where ε_t *is* a white noise and t is a time trend. A stochastic trend appears if $\rho = 1$ and $\beta = 0$ or the trending variable changes by a constant amount each period and then: $\Delta y_t = \alpha + \varepsilon_t$ (5.7)

It is clear that this kind of trend can be removed by first-differencing. Therefore y is referred to as a difference stationary. On the other hand, if $\rho = 0$, the deterministic trend which the trending changes by a random amount each period appears as following:

$$\Delta y_t = \alpha + \varepsilon_t \tag{5.8}$$

In this circumstance, y trends upwards or downwards depending on the sign β, this kind of trend cannot be removed by first-differencing, since t doesn't remove from the process and y, is then known as a trend stationary process. Consider an autoregressive process of order one AR (1):

$$y_t = \rho y_{t-1} + \delta D_t + \varepsilon_t \quad (5.9)$$

Where D_t is a vector of deterministic terms (constant, trend), ρ and δ are parameters to be estimated and the ε_t are assumed to be a white noise with zero mean and an equal variance.

The hypothesis of the existence of unit root in the y series can be evaluated by testing whether the absolute value of ρ is strictly less than one. If $|\rho| \geq 1$, y is a non-stationary, stochastic series and the variance of series increases with time and goes to infinity, whereas if $|\rho| < 1$, y is a trend-stationary series. The OLS approach is applied to equation (5.9) to obtain the estimate of ρ and then using a t-test the null hypothesis H_0 : ρ = I against the alternative hypothesis H_1 : ρ <I. In this procedure, there are some problems. First of all, the OLS estimator of ρ is biased downwards in small samples, since there is a lagged dependent variable in equation (5.9), which may lead to the conclusion that the y is stationary when it is not. Second, if the process is non-stationary, then standard large-sample distribution results are invalid. In order to conduct unit root test, Dickey and Fuller (1981) was rewritten equation (4) after subtracting y_{t-1} from both sides of the equation:

$$\Delta y_t = \varphi y_{t-1} + \delta D_t + \varepsilon_t \quad (5.10)$$

Where $\varphi = \rho - 1$ In these conditions, the null and alternative hypotheses are rewritten as:

$$\begin{aligned} H_0 &: \varphi = 0 \\ H_1 &: \varphi < 0 \end{aligned} \quad (5.11)$$

and applying the following conventional t-test, the null hypothesis is evaluated:

$$t_{\hat{\varphi}} = \hat{\varphi} / (se(\hat{\varphi})) \quad (5.12)$$

Where $\hat{\varphi}$ is the estimate of φ , $(se(\hat{\varphi}))$ and is the coefficient standard error.Dickey-Fuller (DF) test (1979,1981) is very important in terms of measuring which degree stationary series have, but it does not consider an

autocorrelation in disturbance term. If disturbance term contains autocorrelation, DF test is invalid. In this situation, by adding lagged terms of dependent variable to explanatory variable, Generalised Dickey Fuller (Augmented Dickey-Fuller) is used.

The ADF test states whether series are stationary or not, which can be defined as follows:

$$\Delta Y_t = Y_0 + \alpha_t + \Phi Y_{t-1} + \sum \Phi_i (Y_{t-1}) + u_t$$
$$\Delta Y_t = Y_t - Y_{t-1}$$

Where Y_t is dependent variable, Y_0 is constant term, Y_{t-1} is trend variable and u_t is stochastic disturbance term. These are hypothesizes to test the series:

$$H_0 : \Phi = 0$$

$$H_1 : \Phi \neq 0$$

ADF is a regress test using each series own lagged terms with big differences. Dickey-Fuller (ADF) test statistic is based on the *t*-statistic of the coefficient φ from OLS estimation. It does not have an asymptotic standard normal distribution, but it has a nonstandard limiting distribution. If calculated t-value of variable is greater than ADF critical t-value then H_0 is rejected and thus the data is stationary. The Phillips-Peron (1988), or PP employs an alternative (nonparametric) method of controlling for serial correlation when testing for a unit root by estimating the non-augmented Dickey-Fuller test equation. They modify the different test statistic so that its asymptotic distribution is unaffected by serial correlation. The PP tests are robust to general forms of heteroskedasticity and autocorrelations in the error terms. Another advantage is that the users do not have to specify a lag length for the test regression. Search for co-integration among the time series must be preceded by testing the stationarity properties of each of variables. Elliott, Rothenberg and Stock, (1996) recommended DF-GLS test for autoregressive unit root. The test is a simple modification of the conventional augmented Dickey and Fuller (ADF) t-test as it applies generalised least squares GLS detrending prior to running ADF test regression. This test has

the best overall performance in terms of sample size and power comparing with the ADF test. We applied ADF (Dickey and Fuller, 1981); PP (Phillips and Perron, 1988); and DF-GLS (Elliott, Rothenberg and Stock 1996).

Usually, the ARDL framework does not require pre-testing of variables to be done, the unit root test could convince us whether or not the ARDL model should be used. The augmented Dickey–Fuller and Phillips–Perron and DF-GLS unit-root tests were employed for unit root test purpose and the results are summarised in Tables 5 and 6. These results imply that we cannot reject the unit root null hypothesis in all tests. However, when we convert these series into first difference and subject the series to the ADF test, ADF-GLS and PP test, the calculated t-statistic for all three variables is smaller than the critical values at the 5% level. This implies that we can reject the unit root null hypothesis for three series in first difference form. As a result, all variables are integrated of order one.

Table 5: Results of Unit Root Test

Level	ADF Intercept	ADF-GLS Intercept	P-P Intercept	ADF Trend & Intercept	ADF-GLS Trend & Intercept	P-P Trend & Intercept
Variable						
GDP	2.23906[3]	1.36158[1]	2.77196[0]	0.25846[3]	-1.1776[1]	0.96988[0]
Labour	0.95520[1]	-0.44927[3]	1.66803[3]	-2.1756[6]	-1.6878[4]	-1.5513[2]
Capital	2.27545[0]	-0.13934[0]	7.42923[4]	1.45168[0]	-1.5233[0]	5.1584[3]
Oil revenue	-2.3374[0]	-2.08235[0]	-2.2498[0]	-2.2842[0]	-2.2498[0]	-2.5224[3]
Tax revenue	-2.8599[8]	-2.5274[0]	-2.5634[4]	-2.5451[0]	-3.1163[8]	-2.3826[4]
Total Spending	1.72732[1]	-0.7104[3]	2.472070[1]	0.1979[2]	-0.8998[2]	-9.3017[2]
CBI	-1.28517[0]	-1.0359[0]	-1.28517[0]	-1.6923[1]	-0.9389[0]	-0.8146[7]

Table 6 Results of Unit Root Test

1st Differences	ADF Intercept	ADF-GLS Intercept	P-P Intercept	ADF Trend & Intercept	ADF-GLS Trend & Intercept	P-P Trend & Intercept
Variables						
GDP	-3.056[0]*	-2.863[0]*	-3.056[0]*	-3.69[2]*	-3.476[0]*	-3.54[4]*
Labour	-4.13058[0]*	-4.01257[0]*	-4.05969[2]*	-4.33526[0]*	-2.78168[7]*	-4.14387[6]*
Capital	-0.89279[0]*	-1.17136[0]*	7.429236[4]*	-1.06043[0]*	-1.96248[0]*	5.158422[3]*
Oil revenue	-5.71300[0]*	-5.79146[0]*	-5.71300[0]*	-5.64046[0]*	-5.80884[0]*	-5.64039[1]*
Tax revenue	-3.52719[2]*	-2.82909[2]*	-1.10801[7]	-3.11262[0]*	-3.03760[0]*	-1.36329[6]*
Total spending	0.197915[2]*	-0.89989[0]*	-9.30172[2]*	-2.16508[0]*	-1.41183[3]*	-4.57505[1]*
CBI	-3.88382[0]*	-3.86870[0]*	-3.75240[6]*	-4.380137*	-4.32862[0]*	-5.6164[25]*

Note: * Represents significance at 5 % level of significance

5.7.2 Co-integration

Now we apply the co-integration test to see whether the variables are co-integration or not suggesting long-run relations. An important property of $I(1)$ variables is that there can be linear combinations of these variables that are of $I(0)$. If this is so then these variables are said to be co-integrated. The concept of co-integration was introduced by Granger (1981). The economic interpretation of co-integration is that if two or more series are linked to form an equilibrium relationship over the long-run, then even though the series themselves may contain stochastic trends or non-stationary, they will nevertheless move closely together over time and the difference between them will be stable or stationary. Most economic theory is based on equilibrium models which require the economy to get back to an equilibrium relation in the long run terms. This relation imposes the condition that none of the dependent or independent variables can wander away from each other for an extended period of time, implying that the error term associated with the corresponding equilibrium relation has to be white noise.

Thus the conception of co-integration indicates the existence of a long- run equilibrium to which an economic system converges over time, and u_t can

be interpreted as the disequilibrium error or the distance that the system is away from equilibrium.

5.7.3 VAR, VECM, and ARDL Models

The vector autoregressive (VAR) model is just a multiple time series generalisation of the AR model. The VAR model has been popularised by Sims (1980) and it also forms a starting point for the analysis of co-integrating regression. In matrix notation, the VAR model for k variables can be written as:

$$Y_t = A_1 Y_{t-1} + \ldots\ldots + A_p Y_{t-p} + \beta X_t + U_t \qquad (5.12)$$

Where Y_t is a k vector of endogenous variables, X_t is a d vector of exogenous, $A_1, \ldots\ldots, A_p$ and β are matrices of coefficients to be estimated and U_t is a dimensional vector of errors, With $E(U_t) = 0$ and $\sum$ is positive definite.

Since the VAR model is nothing but the stacked form of stationary $AR(p)$ models and the regressors are the same for all the equations, the estimation of the VAR model is straightforward. In practice it has been found that the unrestricted VAR model gives very erratic estimates (because of high multicollinearity among the explanatory variables) and several restricted versions have been suggested. Also, when some of the variables in Y_t are $I(1)$, then one needs to use them in first-differences.

The error correction model (ECM), first introduced into the econometric literature by Sargan (1964) and popularised by Davidson *et al.* (1978) has been a viable alternative to the VAR model. The main characteristic of ECMs as compared with the VARs is the notion of an equilibrium long-run relationship and the introduction of past disequilibria as explanatory variables in the dynamic behaviour of current variables. The recent revival in the popularity of the ECMs has been based on the demonstration by Granger and Weiss (1983) that if two variables are integrated of order 1, and are co-integrated, they can be modelled as having been generated by an ECM.

The ECM links the realised value Y_t to its target value $y_t^* = \beta_{zt}'$. In its simplest form, it can be written as:

$$\Delta y_t = \lambda_1 \Delta y_t^* + \lambda_2 (y_{t-1}^* - y_{t-1}) \tag{5.13}$$

where $\lambda_1 \succ 0$ and $\lambda_2 \succ 0$. The last term represents past disequilibrium. The partial adjustment model is given by:

$$\Delta y_t = \lambda (y_t^* - y_{t-1}) = \lambda \Delta y_t^* + \lambda (y_{t-1}^* - y_{t-1}) \tag{5.14}$$

Thus the partial adjustment model corresponds to the ECM, with $\lambda_1 = \lambda_2$.

The notion of co-integration applies when two series are $I(1)$, but a linear combination of them is $I(0)$ in this case, the regression of one on the other shows the long-run relationship between them. Co-integration between two series is called an error correction model, for the short-term dynamics.

If $y_t : t = 0,1,.....$ and $x_t : t = 0,1,...$ are two I(1) processes, then, in $Y_t - \beta x_t$ is an I(1) process for any number β. If, $\beta \neq 0$ in $Y_t - \beta x_t$ is an I(0) process, with constant mean, constant variance and uncorrelated. When β exists then y and x are co-integrated.

The error correction model, allows estimation of both short term and long run effects of explanatory time series variables. Let us consider an error correction model equation as following:

$$\Delta Y_t = \alpha_0 - (Y_{t-1} - \beta_1 X_{t-1}) + \beta_0 \Delta X_t + \varepsilon_t \tag{5.15}$$

In the above equation, current changes in Y are a function of current changes in X, the first difference of X and the degree to which the two series are outside of their equilibrium in the previous time period. Specifically, β_0 captures any immediate effect that X has on Y described as a short-term effect. The coefficient β_1 reflects the equilibrium effect of X on Y. It is the causal effect that occurs over future time periods, often referred to as the long-term effect that X has on Y. Finally, the long-term effect occurs at a rate

dictated by the value of α_1. When we are dealing with time series data, a change in x may affect y immediately, or the effect of x on y may be delayed, occurring in the future across several time periods. There are at least three possible combinations of dynamic effects:

1- An x variable may have only contemporaneous effects, where x affects y immediately, but that effect does not persist into the future. It would occur if β_1 is equal to 0.

2- An x variable may have a contemporaneous effects as well as an equilibrium com-ponent that persists across future time periods and decaying at some rate.

3- An x variable may have no contemporaneous effects, but instead have an equilibrium effect, where the causal effect on y only occurs across future time points, this occurs when β_0 is equal to 0.

The power of error correction models is that we can estimate and test for all three types of effects. The standard way to derive the error correction model is to show that if x and y are linear functions of a latent integrated process, the residuals of y regressed on x should be stationary. This derivation of the error correction model starts with the assumption that both y and x are integrated and demonstrates that the error correction model captures the equilibrium causal movements between these two co-integrated processes.

Consider the ARDL (1,1) as following:

$$Y_t = \alpha_0 - (\alpha_1 Y_{t-1} + \beta_0 X_t) + \beta_1 X_{t-1} + \varepsilon_t$$

(5.16)

Given that the ARDL (1,1) has a lagged dependent variable on the right side, it should be consistently estimated by OLS and has a stationary condition, that is Y_t must be stationary (Davidson and MacKinnon 1993). The short-run effects of economic expectation are readily estimated in the model by the

coefficients β_0 and β_1.Any long-run equilibrium effects are given by the unconditional expectations or the expected value of Y_t.

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta y_{t-1} + \gamma_0 \Delta x_t + \gamma_1 x_{t-1} + u_t \quad (5.17)$$

Where u_t has zero mean and further lags, we have additional $I(0)$ which we include in equation.

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta y_{t-1} + \gamma_0 \Delta x_t + \gamma_1 x_{t-1} + \delta s_{t-1} + u_t \quad (5.18)$$

We assume $s_t = y_t - \beta x_t$, so that s_t is $\mathrm{I}(0)$, and has zero mean. Then we have:

$$y_t = \alpha_0 + \alpha_1 \Delta y_{t-1} + \gamma_0 \Delta x_t + \gamma_1 x_{t-1} + \delta(y_t - \beta x_t) + u_t \quad (5.19)$$

The term $\delta(y_t - \beta x_t)$ is error correction term, and equation (5.20) is an error correction model:

$$\Delta y_t = \alpha_0 + \gamma_0 \Delta x_t + \partial(y_{t-1} - \beta x_{t-1}) + u_t \quad (5.20)$$

Where $\partial \prec 0$ if, $y_{t-1} \succ \beta x_{t-1}$ then *y* in the previous period has overshot the equilibrium, because $\partial \prec 0$ the error correction term works to push y back toward the equilibrium. If $y_{t-1} \prec \beta x_{t-1}$ the error correction term induces a positive change in y back toward the equilibrium.

A vector error correction (VEC) model is a restricted VAR that has co-integration restrictions built into the specification, so that it is designed for use with non-stationary series that are known to be co-integrated. The VEC specification restricts the long-run behavior of the endogenous variables to converge to their co-integrating relationships while allowing a wide range of short-run dynamics. The co-integration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

Granger (1969) has defined a concept of causality which, under suitable conditions, is fairly easy to deal with in the context of VAR models. The idea is that a cause cannot come after the effect. Thus, if a variable x affects a

variable z, the former should help to improve the predictions of the latter variable.

We consider a model to investigate the impacts of government expenditures on GDP and growth:

$$\Delta LGDP_t = a_1 + \sum_{i=1}^{k} b_{i1}\Delta LGDP_{t-i} + \sum_{i=1}^{k} c_{i1}\Delta LK_{t-i} + \sum_{i=1}^{k} d_{i1}\Delta LL_{t-i} + \sum_{i=1}^{k} e_{i1}\Delta LCG_{t-i} + \sum_{i=1}^{k} d_{i1}\Delta LIG_{t-i} + \partial_1 LGDP_{t-1}$$
$$+\partial_2 LK_{t-1} + \partial_3 LL_{t-1} + \partial_4 LCG_{t-1} + \partial_5 LIG_{t-1} + \partial_6 DU79 + \partial_7 DU81 + \varepsilon_{1t}$$

We use the gross domestic production *GDP*, capital K ,labour L, government expenditures (current CG and investment IG) variables, and dummy variables DU 1979 and DU 1981. We also consider a model in order to investigate the impact of financing government expenditures on GDP and growth:

$$\Delta LGDP_t = a_1 + \sum_{i=1}^{k} f_{i1}\Delta LGDP_{t-i} + \sum_{i=1}^{k} g_{i1}\Delta LK_{t-i} + \sum_{i=1}^{k} h_{i1}\Delta LL_{t-i} + \sum_{i=1}^{k} j_{i1}\Delta LBD_{t-i} + \sum_{i=1}^{k} k_{i1}\Delta LT_{t-i} + \sum_{i=1}^{k} m\Delta LOIL + \partial_1 LGDP_{t-1}$$
$$+\partial_2 LK_{t-1} + \partial_3 LL_{t-1} + \partial_4 LBT_{t-1} + \partial_5 LT_{t-1} + \partial_6 LOIL_{t-1} + \partial_7 DU79 + \partial_8 DU81 + \varepsilon_{1t}$$

And we use the gross domestic production GDP, capital K labour L, share of borrowing from central bank BD in government expenditures, share of tax revenues T in government expenditures, OIL share of oil revenues in government expenditures variables, and dummy variables DU 1979 and DU 1980.

In this step, we test for presence of long-run relationship using the following equations:

$$LGDP_t = a_1 + \sum_{i=1}^{k} b_{i1} LGDP_{t-i} + \sum_{i=1}^{k} c_{i1} LK_{t-i} + \sum_{i=1}^{k} d_{i1} LL_{t-i} + \sum_{i=1}^{k} e_{i1} LCG_{t-i} + \sum_{i=1}^{k} d_{i1} LIG_{t-i}$$
$$+\partial_6 DU79 + \partial_7 DU81 + \varepsilon_{1t}$$

$$LGDP_t = a_1 + \sum_{i=1}^{k} f_{i1} LGDP_{t-i} + \sum_{i=1}^{k} g_{i1} LK_{t-i} + \sum_{i=1}^{k} h_{i1} LL_{t-i} + \sum_{i=1}^{k} j_{i1} LBD_{t-i} + \sum_{i=1}^{k} k_{i1} LT_{t-i} + \sum_{i=1}^{k} m_{i1} LOIL$$
$$+\partial_1 DU79 + \partial_2 DU81 + \varepsilon_{1t}$$

In the first step of the ARDL analysis, we used AIC respectively to select a maximum lag order of 2 for the model. Then we estimated an OLS regression for the first differences part of the equation and then test for the joint significance of the parameters of the lagged level variables, when we added to the first regression. The F-statistic tests the joint null hypothesis that the coefficients of the lagged level variables are zero or no long-run relationship exists between them.

It is very important to note that we estimate the model by Eviews 7 software, and the existence of a long-run relationship among the variables is determined by using Wald Test. The calculated F-statistic is compared with the critical value indicated that the null hypothesis of no co-integration is rejected. Our results show that there is a long-run relationship among the variables.

Now we established that a long –run co-integration relationship existed by using following equations:

$$LGDP_t = a_1 + \sum_{i=1}^{k} b_{i1} LGDP_{t-i} + \sum_{i=1}^{k} c_{i1} LK_{t-i} + \sum_{i=1}^{k} d_{i1} LL_{t-i} + \sum_{i=1}^{k} e_{i1} LCG_{t-i} + \sum_{i=1}^{k} d_{i1} LIG_{t-i} + \partial_6 DU79 + \partial_7 DU81 + \varepsilon_{1t}$$

$$LGDP_t = a_1 + \sum_{i=1}^{k} f_{i1} LGDP_{t-i} + \sum_{i=1}^{k} g_{i1} LK_{t-i} + \sum_{i=1}^{k} h_{i1} LL_{t-i} + \sum_{i=1}^{k} j_{i1} LBD_{t-i} + \sum_{i=1}^{k} k_{i1} LT_{t-i} + \sum_{i=1}^{k} m_{i1} LOIL + \partial_1 DU79 + \partial_2 DU81 + \varepsilon_{1t}$$

The results of estimation of long-run relation are presented in the table 7. The coefficients of independent variables in log-run show the elasticity of dependent variables to independent variables. The coefficient of investment expenditure is 0.105; it suggests that in the long run, an increase by 1% in investment expenditure is associated with an increase by 0.10% in gross domestic production. By comparing the coefficients of variables in long-run term, the capital has more impact and the labour has less impact on economic growth. In addition, results indicated that increasing the investment expenditure has a positive effect on Iranian economy but the current expenditure has a negative and insignificant effect on economic growth.

Furthermore, we take the effects of the Iranian revolution (1979), and the Iran–Iraq war (1980–1988) into account by using two dummy variables. Table 7 reports the coefficient of the war dummy variable DU80. This dummy variable is negative and clearly insignificant.

Table 7: Estimated Long-run Coefficients (Impact of Government Expenditure on Growth)

ARDL (2,0,0,0) selected based on AIC, Dependent variable is LGDP				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	5.214136	2.737331	1.904825	0.0664
LGDP (-1)	0.460080	0.123356	3.729696	0.0008
LLabour	0.034647	0.131000	0.264483	0.0008
Lcapital	0.067875	0.022366	3.034763	0.0049
Lcuex	-0.047482	0.064092	-0.740844	0.4645
Linex	0.105930	0.048175	2.198846	0.0357
Dum80	-0.032128	0.07500	-1.168295	0.2519
Goodness of Fit: R-squared 0.977035			Adjusted R-squared	0.972442
Akaike info criterion -2.843951			F-statistic	212.7252

Table *8*: Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	61.31592	NA*	0.001298	-3.814891	-3.532002	-3.726294
1	62.77760	2.217714	0.001262	-3.846731	-3.516694	-3.743367
2	65.26021	3.595516	0.001145*	-3.948980*	-3.571795*	-3.830851*

Table 8 presents the results of the long-run coefficient estimates using the autoregressive distributed lag approach. The order of the lags was obtained by means of Akaike Information Criterion (AIC) which indicated that the optimal lag level as two, respectively for this study.

In impact of the financing government expenditure on Growth, the results of estimation of long-run relation are presented in table 9. The oil revenue has more impact on the GDP and growth but tax revenue has less impact on the GDP and economic growth in Iran.

Table 9: Estimated Long-run Coefficients (Impact of Financing of Government Expenditure on Growth)

ARDL (2,0,0,0) selected based on AIC, Dependent variable is LGDP				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0857125	0.521126	10644755	0.1112
LLabour	0.622415	0.52018	11.96527	0.0000
LCapital	0.130152	0.028841	4.512691	0.0001
LOilreve	0.060169	0.020330	2.959680	0.0062
LTaxreve	0.051091	0.022398	2.281045	0.0304
LCBI	-0.081224	0.029537	-2.749877	0.01030
Dum79	0.106055	0.106055	0.059345	0.08448
Dum81	-0.004029	0.032277	-0.124835	0.9015
squared 0.975090			**Adjusted R-squared 0.968862**	
Akaike info criterion -2.727277			**F-statistic 156.5771**	

In other words, government through increasing tax revenues in order to finance the public expenditures re-allocates resources by changing the relative prices and transfers of resources from private sector to public sector. The latter changes the level of investment in private sector leading to changes in total production and supply. But, increase in oil revenues will increase the capacity to import. Borrowing from central bank has a negative impact on economic growth. Our finding suggest that oil revenues and tax revenues have positive impact on the Iranian economy but borrowing from central bank as a method to financing government budget has negative impact. We also include two dummy variables (DU79 and DU80) in this model, in order to assess the effect of the Iranian revolution (1979), and the Iran–Iraq war (1980–1988).

Table 10: Error Correction and Short-run Coefficients (Impact of Government Expenditure on Growth)

ARDL (2,0,0,0) selected based on AIC, Dependent variable is Growth				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004226	0.017873	-0.236439	0.8149
DLGDP(-1)	0.258541	0.156079	1.655830	0.0281
DLGDP (-2)	0.396443	0.170421	2.326259	0.0281
DLLabour	0.306540	0.278585	1.100349	0.2813
DLcapital	0.056031	0.020709	2.705631	0.0119
DLcuex	-0.263984	0.107364	-2.458780	0.0209
DLinex	0.132743	0.046136	2.877184	0.0079
Dum81	-0.004397	0.023255	-0.189081	0.8515
ECM	-0.597088	0.162752	-3.668697	0.0011
R-squared 0.591244		Adjusted R-squared 0.465473		
Akaike info criterion -2.930718		F-statistic 4.700949		

Table 10 reports the short-run coefficient estimates obtained from the ECM version of the ARDL model. The short run coefficients are less than the long run ones. The results suggest that the short run impact of current expenditure on the economic growth is negative and significant but, the impact of investment expenditure is positive and significant on economic growth. The coefficients for the other explanatory variables including labour and capital have the expected sign and significance for capital and insignificant for labour. The coefficient for the war dummy is negative and insignificant. Moreover, the coefficient of the ECM is negative and highly significant. This corroborates the existence of a stable long-run relationship and points to a long-run co-integration relationship among variables. The ECM represents the speed of adjustment to restore equilibrium in the dynamic model following a disturbance. The coefficient of the ECM is around -0.59, implying that a deviation from the long-run equilibrium is corrected by about 60% after each year.

Table 11: Error Correction and Short-run Coefficients (Impact of Financing of Government Expenditure on Growth)

ARDL (2,0,0,0) selected based on AIC, Dependent variable is Growth				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.009307	0.014111	0.659554	0.5151
DLLabour	-0.016244	0.265943	-0.061081	0.9517
DLCapital	0.078149	0.024540	3.184548	0.0036
DLOilrevenues	0.069506	0.022982	3.024405	0.0054
DLTaxrevenues	0.036128	0.021693	1.665456	0.1074
DLCBI	-0.098936	0.036719	-2.694393	0.0120
DUM81	-0.183482	0.186774	-0.982375	0.3346
ECM	-0.017524	0.022188	-0.78914	0.4365
R-squared 0.629807			**Adjusted R-squared 0.533831**	
Akaike info criterion -2.960124			**F-statistic 6.56218**	

Table 11 shows reports of the short-run coefficient estimates obtained from the ECM version of the ARDL model. The coefficient on the interaction term for financing government spending through oil revenues is positive and statistically significant in the short run. The impact of tax revenues is positive but insignificant. The impact of borrowing from central bank on economic growth is negative The coefficient for the war dummy is negative and insignificant.

To represent the impact of these shifts in our models, we have included two dummy variables, whose coefficients are insignificant. One interpretation would be that the economic instabilities are rooted in the structure and foundation of Iranian economy.

5.7.4 Granger Causality

Once the long-run relationships have been estimated, the next step is to examine the short-run and long-run Granger causality between the government expending and economic growth. A question that frequently arises in time series analysis is whether or not one economic variable can help forecast another economic variable.

One way to address this question was proposed by Granger (1969) and popularised by Sims (1972). The traditional Granger's definition of causality is based on the notion that the future cannot cause the past, but that the past can cause the future. Testing causality, in the Granger sense, involves using *F*-tests to test whether lagged information on a variable *Y* provides any statistically significant information about a variable *X* in the presence of lagged *X*. If not, then *Y* does not Granger-cause *X*.The results of Granger causality test show that there is a relationship between government expenditure and GDP. Oil revenue and tax revenue do necessarily imply Granger-causality, meaning that causality runs from oil revenue and tax revenue to GDP.

Table 12: Granger-causality (Impact of Financing of Government Expenditure on Growth)

Null Hypothesis:	F-Statistic	Prob.
LLABOUR does not Granger Cause LGDP	2.79410	0.0479
LGDP does not Granger Cause LLABOUR	1.13177	0.3642
LCAPITAL does not Granger Cause LGDP	0.78157	0.5478
LGDP does not Granger Cause LCAPITAL	2.18100	0.1004
LCBI does not Granger Cause LGDP	1.94018	0.1378
LGDP does not Granger Cause LCBI	4.73597	0.0062
LTAXREVE does not Granger Cause LGDP	4.78016	0.0053
LGDP does not Granger Cause LTAXREVE	0.16535	0.9540
LOILREVE does not Granger Cause LGDP	3.29538	0.0267
LGDP does not Granger Cause LOILREVE	1.51715	0.2275

Table 13: Granger-causality (Impact of Government Expenditure on Growth)

Null Hypothesis:	F-Statistic	Prob.
LLABOUR does not Granger Cause LGDP	2.79410	0.0479
LGDP does not Granger Cause LLABOUR	1.13177	0.3642
LCAPITAL does not Granger Cause LGDP	0.78157	0.5478
LGDP does not Granger Cause LCAPITAL	2.18100	0.1004
LCUEX does not Granger Cause LGDP	5.55903	0.0024
LGDP does not Granger Cause LCUEX	0.40545	0.8029
LINEX does not Granger Cause LGDP	2.99605	0.0378
LGDP does not Granger Cause LINEX	1.07856	0.3882

The results in Table 13 show that there is a relationship between government expenditure and GDP. Current expenditure and investment expenditure do necessarily imply Granger-causality, meaning that causality runs from current expenditure and investment expenditure to GDP.

The existence of co-integration does not necessarily imply that the estimated coefficients are stable. If the coefficients are unstable the results will be unreliable. The goodness of fit for ARDL model is checked through stability tests In order to test for long-run parameter stability, and Pesaran (1997) suggests applying the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of recursive residuals of square (CUSUMSQ) tests. These tests are proposed by Brown, Durbin, and Evans (1975) to the residuals of the estimated ECMs to test for parameter constancy. Hansen (1992) and Johansen (1992) also suggest a parameter constancy test but they require the variables to be $I(1)$. Also, they do not incorporate the short-run dynamics of a model into testing unlike CUSUM and CUSUMSQ tests. In both CUSUM and CUSUMSQ, the related null hypothesis is that all coefficients are stable.

The CUSUM test uses the cumulative sum of recursive residuals based on the first observations and is updated recursively and plotted against break point. The test is more suitable for detecting systematic changes in the regression coefficients. The CUSUMSQ makes use of the squared recursive residuals and follows the same procedure. However, it is more useful in situations where the departure from the constancy of the regression coefficients is haphazard and sudden. The CUSUM and CUSUMSQ statistics are plotted against the 5% critical lines. CUSUM statistics is useful to find systematic changes in long term coefficients of regression and CUSUMSQ statistics is helpful when deviation from regression coefficients stability is randomised and occasional (short term). If the plot of the CUSUM and CUSUMSQ stays within the 5% critical bound the null hypothesis that all coefficients are stable cannot be rejected. If however, either of the parallel lines are crossed then the null hypothesis (of parameter stability) is rejected at the 5% significance level.

All figures show that both CUSUM and CUSUMSQ are within the critical bounds of 5% so it indicates that the model is structurally stable

Figure 16: CUSUM Test. The impact of Government Expenditures on Growth

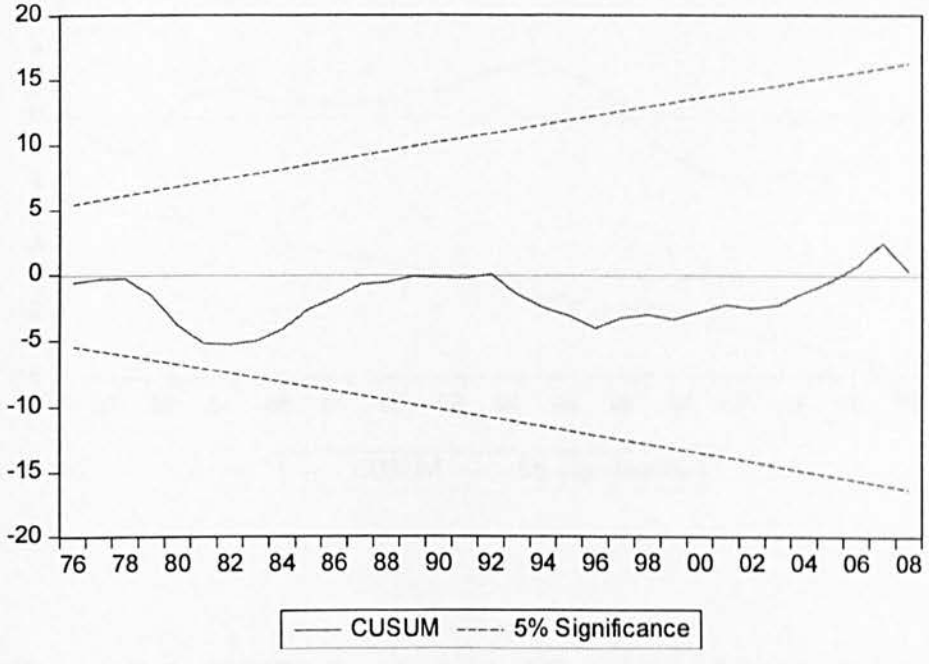


Figure* 17: *CUSUMSQ: Test The Impact of Government Expenditures on Growth

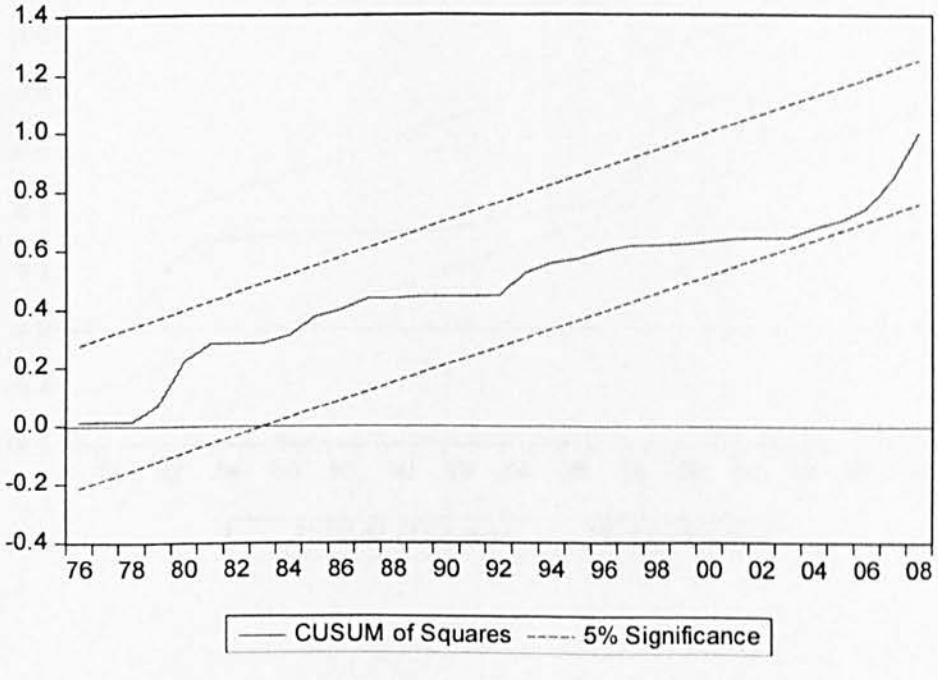


Figure 18: CUSUM Test, The Impact of Financing of Government Expenditures on Growth

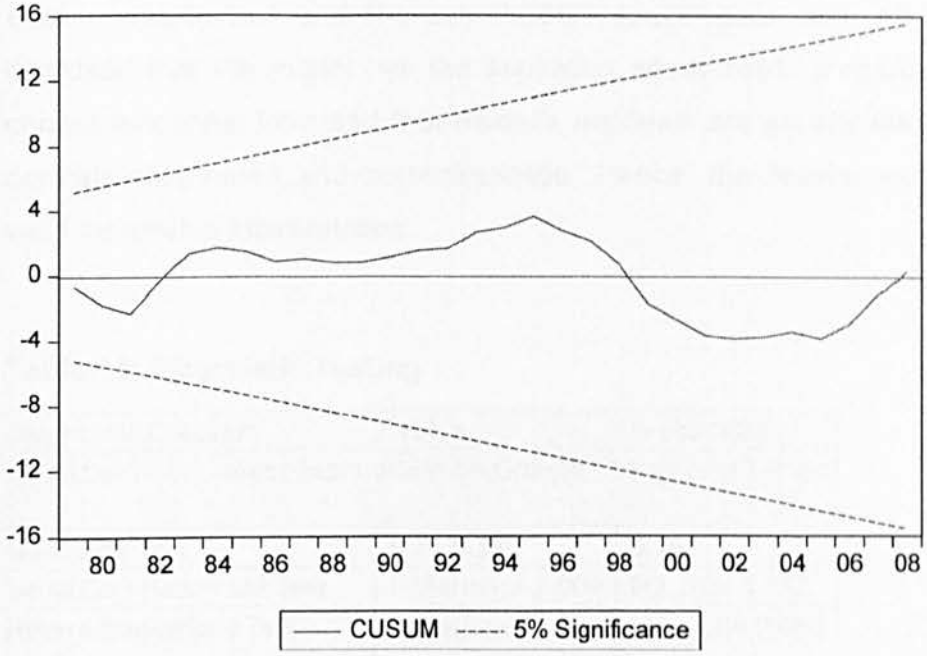
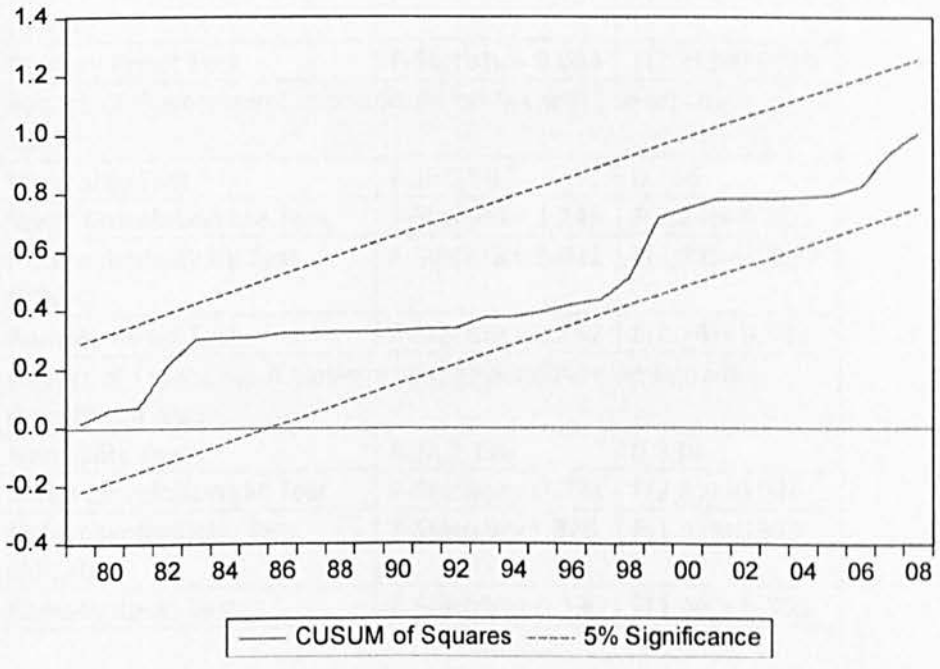


Figure 19: CUSUMSQ Test Impact of Financing of Government Expenditures on Growth



The robustness of the model has been defined by several diagnostic tests such as Breusch- Godfrey serial correlation LM test, ARCH test, Jacque-Bera normality test and Ramsey RESET specification test. All the tests disclosed that the model has the aspiration econometric properties, has a correct functional form and that model's residuals are serially uncorrelated, normally distributed and homoskedastic. Hence, the results reported are valid for reliable interpretation.

Table 14: Diagnostic Testing

Diagnostic Checker	Value	Probability
Impact of Government Expenditure on Growth (Long- run) Table: 13		
Normality Test	B.J= 0.590	0.744
Serial Correlation LM Test	F-Statistic= 2.009	F(2,28)= 0.152
Heteroskedasticity Test (white)	F-Statistic= 2.201	F(25,11)= 0.086
Ramsey Reset Test	F-Statistic=2.634	F(2,28)=0.0895
Impact of Financing of Government Expenditure on Growth (long-run) Table:		
Normality Test	B.J = 0.927	0.629
Serial Correlation LM Test	F-Statistic= 5.873	F(2,26)= 0.0079
Heteroskedasticity Test (white)	F-Statistic= 6.930	F(27,8)= 0.0039
Ramsey Reset Test	F-Statistic= 9.084	F(2,26)=0.0010
Impact of Government Expenditure on Growth (Short- run) Table:		
Normality Test	B.J= 3.587	0.166
Serial Correlation LM Test	F-Statistic= 1.245	F(2,24)= 0.305
Heteroskedasticity Test (ARCH)	F-Statistic= 3.072	F(1,32)=0.0892
Ramsey Reset Test	F-Statistic= 0.552	F(2,24)= 0.582
Impact of Financing of Government Expenditure on Growth (Short-run) Table:		
Normality Test	B.J= 2.178	0.336
Serial Correlation LM Test	F-Statistic= 0.771	F(2,25)=0.926
Heteroskedasticity Test (ARCH)	F-Statistic=3.320	F(1.32)=0.575
Ramsey Reset Test	F-Statistic= 0.330	F(1,26)= 0.701

Chapter 6: Budget Deficit and Inflation in Iran

6.1 Introduction

Iranian government has faced a budget deficit between 1971 and 2008. Cassard, Lane, and Masson (1997) claim that in developing countries the central banks are often required to automatically finance budget deficit. Iran has experienced the financing of government budget deficit through the central bank and has also experienced both high inflation rates and huge budget deficit. The Central Bank of Iran has not chosen freely instruments for monetary policy. Over the period of 1971-2008, liquidity (M2) grew continuously So, the central bank could not control high growth rate of liquidity (M2) during this period

In order to find out the relationship between budget deficit and inflation we investigate the long-run relationship and causality between inflation, budget deficit, liquidity M2, official exchange rate and political factors in Iran during 1971-2008. In the empirical analysis of this model, the following hypotheses are tested:

- *Increase in the government budget deficit has a positive effect on the price level.*
- *Increase in liquidity (M2) has a positive effect on the price level.*
- *Increase in official exchange rate has a positive effect on the price level.*

6.2 Budget Deficit in Theory

Government has a budget deficit when the government expenditures exceed revenues over a particular period of time.

The measure of budget deficit is the difference between government expenditure and revenue:

$DEF = G - T$

Where:

DEF =budget deficit; G = government expenditure; T = government revenue.

There are two types of budget deficit: real budget deficit and hidden budget deficit. The real budget deficit has been reported in national account whereas; the hidden deficit has not been in national account. Government is trying to approach its aims such as reducing unemployment or increasing investment by using fiscal policies including tax cut or increasing government expenditures. A government deficit can result from recession, when there is a decrease in tax revenues. The reason for hidden budget deficit is some kind of government policies for example, giving loan with low interest rate, or subsides. This kind of budget deficit has not been reported but has important impact on allocation of resources, consumer price index and balanced of payments.

Classical economists consider the role of government only to provide national security, defence and public goods. The source of government revenues is tax, government must provide a balanced budget to avoid the growth of public sector, government expenditures, tax and inflation. Neoclassical, Keynesian, and Ricardian schools of thoughts have paid attention to the economic effects of budget deficits.

The Neoclassical view asserts the budget deficits raises total life time consumption by shifting taxes to subsequent generations. If economic resources are fully employed, increased consumption necessarily implies decreased saving. Interest rates must then rise to bring capital markets into balance. Thus, persistent government deficits crowd out private capital accumulation.

According to Keynesian economic theory, any increase in budget deficit will increase the real interest rate. The budget deficit occurs through increased real budget expenditures, which increases the aggregate national demand. If the aggregate supply curve is not inelastic, a shift in aggregate demand will also cause the increase of production and prices, the increased nominal income will cause the increase in transactional demand for money, what must be rewarded by a decrease in speculative demand for money and rising

real interest rate. Consequently, the budget deficit, along with its potential expansion impact on economy can cause a drop in real gross investment, or the crowding-out effect.

The Ricardian view argues a deficit-finance reduces the current taxes for a certain amount of government spending, and it leads to higher future taxes that have the same present value as the initial cut. This result follows, from the government budget constraint, which equates total expenditure for each period including interest rates to revenues from taxation or other sources and the net issue of interest-bearing public debt. Obviously government spending must be paid for now or later, with the total present value of receipts fixed by the total present value of spending. Hence, holding fixed the path of government expenditures and non-tax revenues, a cut in today's taxes, must be matched by a corresponding increase in the present value of future taxes.

There is a strongly belief among economists, that budget deficit is harmful to the economy. The most known effects of budget deficit are crowding-out effect and inflation. The effects of budget deficit depend on the causes of budget deficit, the method of financing budget deficit and the period of budget deficit. In view of macroeconomics, the budget deficit has two primary and secondary effects and one total effect. The causes of budget deficits are known as primary effect and the methods of financing are known as secondary effect.

A decrease in tax revenue leads to deficit in national budget and results in a shift in the IS-LM curves, the reduction in tax increases disposable income and causes an increase in private saving. The primary effect is that the IS curve shifts up but the secondary effect depends on how the budget deficit is financed. If government financing the deficit budget by borrowing from the central bank then the money supply increases directly and in the money market is not in equilibrium condition and the interest rates increase. In the short run, the economy is operating at full employment and any borrowing from central bank to finance the budget deficit may increase the price level and then increase inflationary expatiations, demand for money decreases and IS curve shifts down. On the other hand, if the government attends to the

deficit by issuing bonds, there will be no changes in money stocks and money supply, and thus the LM curve does not shift. But the net financial assets of private sector increase by an amount equal to bonds sold, the IS shifts up and thus is the second effect. The secondary effect enhances the primary effect; the total effect is increasing in consumption and income. Increase in income raises money demand which increases the rates of interest. Increasing in interest rates causes a reduction in investment demand.

A rise in government spending, has the same effect on the IS curve as a reduction of taxes. In fact, both fiscal policy changes lead to a higher budget deficit; here we assume that this budget deficit is financed by issuing bonds. We know that an increase in government spending leads to a shift of the IS curve to the right, before the increase in government spending, in the new equilibrium both output and the interest rate are higher. Let us see why a fiscal expansion leads to these effects, an increase in government spending leads to an increase in aggregate demand; initially this leads to an excess demand for goods but since output is demand-determined, the increase in demand soon leads to an increase in supply. Therefore, output starts to increase. Note that, as output goes up, the interest rate starts to increase. The reasons why the interest rate goes up are two: first, as income goes up the demand for money increases; but since the supply of money is constant, the increase in the demand for money must lead to an increase in the interest rate. Second, since the higher budget deficit is bond-financed, the increased supply of bonds by the government must lead to a fall in their price and an increase in interest rates; agents will hold these extra government bonds only if their return is higher. Therefore, as output increases, the interest rate goes up. Note that the difference between expansionary monetary and fiscal policy, then, is that one lowers interest rates, the other raises them; both of them lead to an increase in output. Note also that, in the case of a fiscal expansion, the increase in the interest rate leads to a "crowding-out" of private investment. In fact, as interest rates go higher, private investment tends to fall leading to a smaller increase in output than would have occurred if interest rates had not gone up. If the interest rate had

remained constant, the shift in the IS curve would have led to an increase in output; instead, the actual increase in output ,since the increase in interest rates leads to a fall in private investment (the crowding-out effect).

Since in the long-run output is determined by supply factors, a fiscal expansion cannot permanently increase output above its long-run full employment level. Then, in the short-run the fiscal expansion leads to an overheating of the economy as output is above its full employment level. This excess demand for goods, in turn, will cause over time some inflation. As the price level goes up, the real money supply will fall, this fall in real money balances leads to a shift to the left of the LM curve. As the LM shifts back, the interest rate will tend to rise. This increase in interest rates, in turn, leads to a reduction in aggregate demand. This fall in aggregate demand, in turn, leads to a fall in output. So, the output level starts to shrink back to its original full employment level. The increase in prices terminates when output is back to its full employment level and the excess demand for goods is eliminated. In the new equilibrium the interest rates are even higher than in the short-run. Since output is back to its initial level while government spending is at a higher level, the goods market clears through a permanent reduction in the components of demand that are interest sensitive. So, there is a long-run crowding-out of investment. Note that this permanent long-run crowding-out of investment can be avoided, if the increased budget deficit caused by the increased government spending is financed by an increase in tax. When an increase in taxes occurs, the IS curve shifts back to the original IS and the long run. In this new long-run equilibrium, there is no crowding-out of investment as the interest rate falls back to the original. However, since output is constant to its full employment level, while government spending is at a higher permanent level, there must be a full crowding-out of private consumption; in fact, the higher taxes reduce disposable income and lead to a permanent reduction in consumption.

Most economists believe that inflation is a monetary phenomenon, in the long run. Therefore, they assume that deficits can lead to inflation, but only to the extent that they are monetised. Sargent and Wallace (1981) show that

under certain conditions, if the time paths of governments spending and taxes are exogenous, the central bank should eventually monetise the deficit. This will increase the money supply and inflation in the long run. Miller (1983) argues that government deficits are necessarily inflationary irrespective of whether the deficits are monetised or not. According to Miller, deficit policy leads to inflation through three channels. Monetary authorities might be forced into monetary accommodation of the deficits. But, even if the monetary authorities do not monetise the deficit, deficits are still inflationary through private monetisation or crowding out. That is, non-monetised deficits lead to higher interest rates. Higher interest rates crowd out private investment, reduce the rate of growth of real output, and with a given money supply, lead to higher prices.

6.3. Budget Deficit in Iran

As was mentioned before, in the concept of government budget in Iran (before 2002), the government expenditures includes current expenditures and capital expenditures and general revenues including oil and gas revenues, tax revenues and other revenues. According to this system, differential of government revenues and government expenditures is considered as deficit (surplus). One of the features of public sector of Iran in recent years is that the government expenditures are more than government revenues and the Iranian government often faces to budget deficit.

Table19 shows the trend of government budget deficit in Iran during the period 1971-2008. The government budget deficit had been increasing largely over the period 1973-1977 (oil boom period). Budget deficit increases from 62.1 billion Rls in 1971 to 608.9 billion Rls in 1978. In the other words, budget deficit during seven years had been increasing approximately 9 times. However, the government budget deficit has fluctuated, but it grew largely over the period 1978-1988. It is very important to note that since 1989 a new source of government revenue originated from the sale of foreign currencies. The exchange rate was devalued by approximately 25% over the period 1989-1992, but in spite of such a devaluation, the black market for foreign currencies persisted. The government's exchange rate policy had the

effect of making the government a beneficiary of its own policy. The gap between the black market and official exchange rate has rendered a considerable gain for the government. The sale of foreign currencies by the CBI in the black market played a major role to decrease the government budget deficit over the period 1989 -1999. In periods 1994-1996 and 2001 Iran has experienced a budget surplus. Since 2002 the Iranian economy has faced budget deficit. The lowest amount belongs to year 1971 and the highest amount belongs to year 2005.

Total budget deficit or surpluses as percentage of gross domestic product (GDP) in Table 15 shows that in period 1971-1977 the ratios were less than 10 % but in years 1978, 1980. 1981, 1988 were more than 10%. In the period 1989-2008 the ratios were less than 5%.The ratio of budget surplus/deficit to government payments in table shows the dependency of national economy to oil revenues resulted a positive relationship between budget deficit and oil revenues during 2002-2008.

Growth of government budget deficit in Iran has different reasons as following:

1. High current public expenditures.
2. The large subsidies on essential food items, fuel and public services.
3. Government revenues are dependent on the oil revenue.
4. Defective tax system.
5. Dominant public sector investments.
6. Non-economic factors such as war and political factors.
7. Low productivity in public sector.

Table 15: Budget Deficit / Surplus (Billion RLs),(%) 1971-2008

Year	Budget Deficit (-) Surplus(+)	Budget Deficit to GDP %	Budget Deficit to Government Payments %	Year	Budget Deficit (-) Surplus(+)	Budget / surplus/ Deficit to GDP %	Budget Surplus /Deficit to Government Payments %
1971	*-62.1*	*6.6*	*19.38*	**1990**	-418.6	*1.2*	*6.91*
1972	*-115.7*	*9.89*	*27.69*	**1991**	-1157.3	*2.38*	*14.3*
1973	*-110*	*6.44*	*13.13*	**1992**	-872.3	*1.35*	*8.1*
1974	*-116.9*	*3.94*	*7.73*	**1993**	-636.2	*0.63*	*3*
1975	*-193.8*	*5.93*	*10.91*	**1994**	+332.1	*0.25*	*1.1*
1976	*-169.8*	*3.87*	*8.46*	**1995**	+244.6	*0.13*	*0.5*
1977	*-458*	*8.99*	*18.37*	**1996**	+338.8	*0.13*	*0.06*
1978	*-608.9*	*12.2*	*27.57*	**1997**	-3059.9	*1.04*	*4.67*
1979	*-528.3*	*8.7*	*23.71*	**1998**	-17098.3	*5.2*	*24.17*
1980	*-972.5*	*15.43*	*42.31*	**1999**	-443.9	*0.1*	*0.47*
1981	*-937*	*12.23*	*34.61*	**2000**	-408.4	*0.07*	*0.38*
1982	*-665.5*	*6.6*	*21.01*	**2001**	+1818	*0.25*	*1.45*
1983	*-898.6*	*7.22*	*24.46*	**2002**	-37168.6	*4.06*	*18.37*
1984	*-638.8*	*4.71*	*19.04*	**2003**	-44187.5	*3.93*	*17.53*
1985	*-647*	*4.48*	*19.52*	**2004**	-49229.2	*3.38*	*16.18*
1986	*-1449.5*	*9.88*	*45.91*	**2005**	-60853.4	*3.28*	*13.56*
1987	*-1469.1*	*8.19*	*40.35*	**2006**	-147431	*6.32*	*26.26*
1988	*-2125.2*	*10.52*	*50.47*	**2007**	-9041.7	*3.32*	*16.87*
1989	*-1142.1*	*4.55*	*26.45*	**2008**	-20767	*6.07*	*26.03*

Source: National Accounts, Central Bank of the Islamic Republic of Iran

6.4 Inflation in Theory

There are many variations in the definition of inflation. Vane and Thompson (1979), and Bronfenbrenner and Holzman (1965), define inflation as a rise in the general price level, which is therefore equivalent to a continually falling value of money. Flemming (1976) defines the rate of inflation as changes in the rate of the general level of prices in the economy. There are two main schools of thought which attempt to explain the main cases of inflation, Keynesians and Monetarists. First, the Keynesian economists, state that the main determinants of inflation are aggregate demand in the economy rather than the money supply. According to the Keynesians, the natural level of gross domestic product is a level of GDP where the economy is at its optimal level of production. If GDP increases beyond its natural level, inflation will accelerate as suppliers increase their prices. If GDP decreases below its natural level, inflation will decelerate as suppliers attempt to fill excess capacity by lowering prices. Keynes argued that money has no significant

relationship with inflation, but inflation is an outcome of the goods market. In addition, inflation can be caused by an increase in aggregate demand or a decrease in aggregate supply. He believed that the target of economy policy is full employment at any cost and money does not matter, and is a trade-off between unemployment and inflation. He stressed that during Inflationary times increases in tax reduces disposable income and thus reduces aggregate demand, which in turn reduces inflation. The second school thought is Monetarism. They focus on money supply and on inflation as an effect of the supply of money being larger than the demand for money. Now consider the equation of exchange: MV=PT

Where M is the amount of money currently in circulation over a set time period, V is the velocity of money, P is the average price level and T is the level of expenditures or the number of transactions. The velocity of money, V, often stays relatively constant over time. An increase in M resulted in an increase in P. Thus, as the money supply grows inflation will grow. According to Friedman (1956), "inflation is always and everywhere a monetary phenomenon." For Friedman the role of a central Bank should be to limit or expand the supply of money in the economy. If the money supply expands quickly, then the rate of inflation increases. This makes goods more expensive for consumers and puts downward pressure on the economy, resulting in recession. When the economy reaches these low points, the central bank can exacerbate the situation by not providing enough money. According to monetarism, by plugging more money into the economy, the central bank could incentivise new investment. Friedman proposed that the central bank set targets for the rate of inflation. To ensure that the central bank met this goal, the bank would increase the money supply by a certain percentage each year. This has two primary effects: it removed the central bank's ability to alter the rate at which money is added to the overall supply, and it allows businesses to anticipate what the central bank would do. This effectively limits changes to the velocity of money. The annual increase in money supply was to correspond to the natural growth rate of GDP.

6.5 Inflation in Iran

Government spending out of oil revenues leads to large liquidity injection that the central bank accommodates due to its efforts to prevent a significant nominal appreciation of the Rial and the lack of effective sterilisation instruments. Money is an important predictor of inflation in middle and low-income countries. Bonato (2008) identifies a long-run relationship between the price level and money supply, the interest rate, real output, and exchange rate. Money supply is found to have a prominent role in driving inflation both in the long and the short run. The main targets of macroeconomic policies in general and monetary policies, in particular, are price stability, economic growth and employment. Policy makers usually set some intermediate objectives that are reflected in controlling rate of return and money supply. The monetary policy by controlling monetary aggregates tries to prevent monetary expansion, which is incompatible with liquidity and inflation targets.

Perhaps the most significant policy during these years which certainly had a huge reflection on the economy was foreign exchange. The official rate had remained unchanged for a long time despite a significantly higher domestic inflation. By reducing the degree of real exchange rate misalignment to manageable proportions, its use in domestic production and consumption of imported goods could be economised and domestic production of many items could become profitable. Correction of exchange rate misalignment in favor of tradable goods and lifting of restriction on export could signal the movement of capital and labour to non-oil exports and domestic production of import competing goods, hence increased supply of much needed foreign exchange by the private sector. Thus devaluation became an important part of the Structural Adjustment Programmes. Foreign borrowing was another path through which additional resources could be mobilised. A nominal devaluation was attempted in 1986 to form a multiple exchange rate system, raising the rates for exporters. In 1992 a partial devaluation was implemented to unify various exchange rates around the free-market rate. The fiscal and monetary policy, however, was not consistent with the objective of achieving a real depreciation via nominal devaluation as a

means to stimulate exports and discourage imports. Government started borrowing from international markets and reduction in oil prices, foreign debt repayment, and limited access to international financial markets the inflation rate reached its height in 1995.

As a consequence a real depreciation was not achieved by exchange rate unification policy in 1992 and the central bank had to implement several rounds of devaluation.

6.6. The Estimate of Model

Iran has experienced the financing of government budget deficit through the Central Bank. We have observed huge government budget deficits, high growth of liquidity M2 and double-digit inflation rates in the last three decades in Iran. However, the relationship between budget deficit and inflation is not always definite, but since Iran has experienced both high inflation rates and huge budget deficits, we investigated the long-run relationship and causality between inflation, budget deficit, liquidity M2, official exchange rate and political factors on inflationary process in Iran during 1971-2008. Specially, the vector error correlation was deployed to determine the long-run behavior and the casual relation among the variables. The empirical studies in developed and developing countries showed that budget deficit variable was directly and indirectly entered into the model and the relationship with inflation studied. This study has also directly studied the relationship between budget deficit and inflation. Hence, price function is as follows:

$$CPI = f(BD, M2, EXC)$$

Where CPI is the consumer price index; BD is the government budget deficit; M2 is the volume of liquidity; and EXC is the official exchange rate (between the Rial and U.S. Dollar). The model is developed for empirical estimations as following:

$$\ln CPI = \alpha_0 + \alpha_1 BD_t + \alpha_2 \ln M2_t + \alpha_3 \ln EXC_t + u_t$$

The concept of co-integration was first introduced by Granger (1981) and elabourated further by Engel and Granger (1987), Engel and Yoo (1987, 1991), Phillips and Quliaris (1990), Stock and Watson (1988), Phillips (1991), Johansen (1988, 1991) and Johansen and Juselius (1990). If these variables LCPI, BD, LM2 and LECH are stochastically trending and if they have one common trend, then these variables should be co-integrated. According to the Engle and Granger (1987), co-integrated variable must have an error correction representation, or otherwise the regression would simply be based on spurious correlations Two statistical properties are required of the variables used in the VEC model: non-stationary and co-integrated.

We started by Augmented Dickey Fuller (ADF) and Phillip Perron (PP) unit root tests to examine the stationary properties of long run relationship of time series variables. Table 16 represents the results of unit root test. Results of table confirm that the stationary of all variables exist at first difference. This means that the combination of one or more series may exhibit long run relationship.

Figure 20: Trend of Consumer Price Index, liquidity, Budget Deficit and official exchange rate

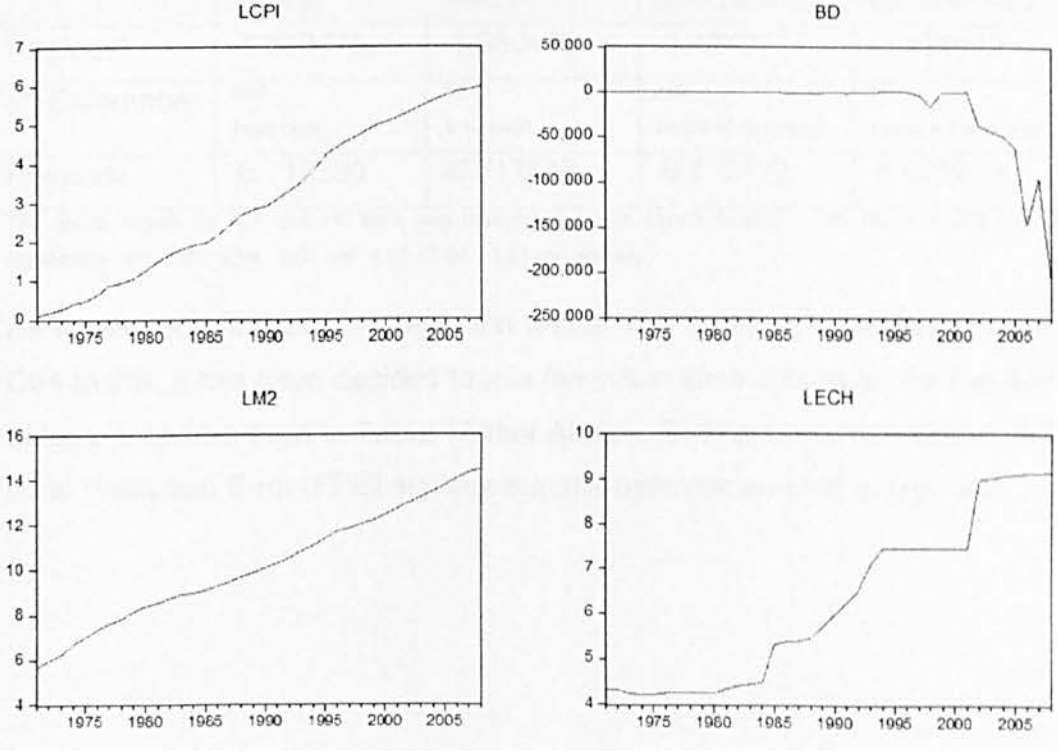


Table 16: Root test table

Level				
Variable	**ADF Intercept**	**PP Intercept**	**ADF Trend & Intercept**	**PP Trend & Intercept**
BD	-2.622427	8.080011	4.005582	3.253199
Ln CPI	-0.565455	-0.064167	-1.939155	-1.920688
Ln M2	-0.537874	-0.646275	-2.590633	-2.214596
Ln EXC	0.308122	0.307279	-2.710452	-2.700055
1st Differences				
Variable	**ADF Intercept**	**PP Intercept**	**ADF Trend & Intercept**	**PP Trend & Intercept**
BD	-0.430550	-0.461831	-0.430550	-10.09913
Ln CPI	-3.419333	-3.330854	-3.336746	-3.222085
Ln M2	-3.058452	-3.027573	-3.035625	-2.972791
Ln EXC	-5.625693	-5.619384	-5.672863	-5.665397

****The critical values for ADF and PP tests with intercept and with trend& intercept 1%, 5% and 10% level of significance are -3.621, -2.943, -2.610 and -4.226, -3.536, -3.200 respectively.

In table 17 presents the results of ADF and PP for the residual series, it implies that the variable is stationary in first- difference.

Table 17: Unit Root Test on Residual

Level				
Variable	**ADF Intercept**	**PP Intercept**	**ADF Trend & Intercept**	**PP Trend & Intercept**
Residual	-3.580478	-3.580478	-3.434072	-3.434072
1st Differences	**ADF Intercept**	**PP Intercept**	**ADF Trend & Intercept**	**PP Trend & Intercept**
Residual	-6.718290	-6.717613	-6.676172	-6.675213

The critical values for ADF and PP tests with intercept and with trend& intercept 1%, 5% and 10% level of significance are -3.62, -2.94, -2.61 and -4.23, -3.54, -3.21 respectively

As it has been known, co-integration test is very liable to a number of lags. Due to this, it has been decided to use the information criteria as the number of lags. It can be seen in Table 18 that Akaike, Schwarz, Hannan-Quinn and Final Prediction Error (FPE) indicate that the optimum number of lags is 2.

Table 18: Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-488.0587	NA	19119044	28.11764	28.29540	28.17900
1	-292.8728	334.6045	688.7011	17.87844	18.76721*	18.18525
2	-266.5365	39.12816*	396.8357*	17.28780*	18.88759	17.84005*
3	-257.3143	11.59362	647.2947	17.67510	19.98591	18.47279

Table 19: Johansen Co-integration Test (Trace Statistic)

Hypothesized No of CE(S)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.606683	68.43885	47.85613	0.0002
At most 1*	0.510042	35.77900	29.79707	0.0091
At most 2	0.194742	10.80875	15.49471	0.2235
At most 3	0.088104	3.228020	3.841466	0.0724

Trace test indicates 2 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 20: Johansen Co-integration Test (Maximum Eigenvalues)

Hypothesized No of CE(S)	Eigen value	Max- Eigen Statistic	0.05 Critical Value	Prob**
None*	0.606683	32.65985	27.58434	0.0102
At most 1*	0.510042	24.97025	21.13162	0.0137
At most 2	0.194742	7.580732	14.26460	0.4229
At most 3	0.088104	3.228020	3.841466	0.0724

Max-egenvalue test indicated 2 co-integration equn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Hug- Michelis (1999) p-values

After testing for stationary and determining the number of lags, we applied the Johansen's trace and maximum eigenvalues tests to determine whether the variables were co-integrated and if so, how many co-integration vectors should be identified. The maximum eigenvalue and trace tests proceed sequentially from the first hypothesis –no co-integration– to an increasing

number of co-integrating vectors. The maximum eigenvalue test is based on the null hypothesis that the number of co-integrating vectors is r in contrast to the alternative r+1 co-integrating vectors, while the trace test is based on the null hypothesis that the number of co-integrating vectors is less than or equal to r in contrast to a general alternative.

As can be seen in Table19, the result of the trace statistics shows that maximum 1 co-integration hypothesis has been rejected with 5% significance. On the other hand, the hypothesis which indicates maximum two co-integration equations has not been rejected with 5% significance. For this reason, it has been concluded that there are two co-integration equations that indicate long term relation. According to the unrestricted Johansen Co-integration Test, the results of the Trace and the Maximum Eigenvalue Tests indicate two co-integration relations. The outcomes of the Johansen Co-integration test indicate that there is a stable long-run relation between inflation, budget deficit, money supply and exchange rate.

The co-integration vector normalised to the price level with restricted intercepts has no trends in the vector autoregressive (VAR), with the order 2 of VAR. The lag order of the VAR model is selected based on Akaike (AIC), Schwarz(SC), Hannan-Quinn(HQ) information criterions and Final Prediction Error (FPE).

Given the evidence in favor of co-integration, we can estimate the long-run parameters of the model. Normalising on inflation shows that coefficients of budget deficit and money supply have positive signs and are statistically significant, but the exchange rate has a negative sign and is statistically significant.

Table 21: The Co-integrating Equations

Normalised Co-integration Coefficients			
LCPI	BD	LM2	LECH
1.000000	5.84E-05 (3.3E-05)	3.2093833 (0.65293)	-5.157722 (0.84006)

Standard error in parentheses

Table 22: Pairwise Granger Causality Tests

Null Hypothesis	Obs	F- Statistic	Prob
BD does not Granger Cause LCPI	36	1.29176	0.2892
LCPI does not Granger Cause BD		1.96909	0.1567
LM2 does not Granger Cause LCPI		0.17832	0.8375
LCPI does not Granger Cause LM2		2.97517	0.0658
LECH does not Granger Cause LCPI		2.18345	0.1297
LCPI does not Granger Cause LECH		4.40721	0.0207
LM2 does not Granger Cause BD		1.56165	0.2258
BD does not Granger Cause LM2		0.16868	0.8455
LECH does not Granger Cause BD		1.81241	0.1801
BD does not Granger Cause LECH		0.87294	0.4277
LECH does not Granger Cause LM2		6.32170	0.0050
LM2 does not Granger Cause LECH		2.62484	0.0885

Granger causality tests show that inflation has a casual effect on exchange rate and the exchange rate has a casual effect on money supply. Hence, we can use univariate co-integration test such as Fully Modified Least Squares (FMOLS) Estimator.

Table 23: Fully Modified Last Squares Estimates

Dependent Variable is LCPI				
Variable	Coefficient	Std.Error	t-Statistic	Prob.
BD	4.33E-06	1.04E-06	4.159390	0.0002
LM2	0.579801	0.056756	10.21563	0.0000
LECH	0.365086	0.073906	4.939852	0.0000
C	-5.057714	0.209745	-24.11367	0.0000
R-squared	0.992893	Mean dependent var	3.106976	
Adjusted R-squared	0.992247	S.D. dependent var	1.920617	
S.E. of regression	0.169117	Sum squared resid	0.943820	
Durbin-Watson stat	0.968992	Long-run variance	0.047475	

The co-integrating relationship between price level and its explanatory variables is tested and estimated using the Phillips and Hansen (1990) fully modified OLS estimator. We commence with the estimation of the price

equation, where CPI is a function of budget deficit, liquidity (M2) and official exchange rate. Results from the estimator confirm the existence of a co-integrating relationship. Estimated model shows that prices are directly related to budget deficit, liquidity (M2), and official exchange rate and the coefficients of all the regressors have expected signs and are statistically significant.

Table 24: Wald Test on Short-run Causality

Variables			
LCPI	BD	LM2	LECH
F-Statistic Value	2.5873	0.2406	2.58008
Chi-Square Probability	0.0752	0.7862	0.7577

Based on our estimation result in the Wald test, we can reject the effect of budget deficit, money supply and exchange rate on inflation in short-run in Iran.

Table 25: The Co-integrating Equations

Error Correction:	D(LCPI)	D(BD)	D(LM2)	D(LECH)
CointEq1	-0.003975	1149.801	-0.024941	0.067360
	(0.00645)	(2097.90)	(0.00553)	(0.03310)
	[-0.61584]	[0.54807]	[-4.50934]	[2.03504]

The above table shows the speed of adjustment coefficients, which reveals that only two variables are adjusting. The adjustment coefficient on co-integration equation 1 for the inflation is negative. The adjustment coefficient for money supply is negative and significant. As it should be, adjusting coefficient of budget deficit is positive insignificant. Adjustment coefficient for exchange rate is positive and significant, as it should be. But the estimated error correction model shows a very low goodness of fit (R2=0.4878, adj R2 =0.30347).

According to our theoretical model, we would expect the government budget deficit to have a positive influence on the inflation over the long-run. Based on our estimation result, the government budget deficit has a positive impact

on the inflation rate in long-run. The long-run estimated coefficient of liquidity (M2) is positive and statistically significant. This result confirms our theoretical model. The positive impact of the official exchange rate on inflation rate confirms our theoretical model. We found that the exchange rate has been a major contributor to price level over the long-run in Iran.

Our findings about the relationship between current and investment government expenditures and economic growth in Iran, confirm the studies of Valadkhani (1998), Asali (2004), Sameti and others (2003), and Naderan and Foladi (2005). Valadkhani (1998) has investigated the effect of real government capital expenditure on GDP using data for the period 1959-1992 and employing superexogeneity test. He has found that government capital expenditure has strong positive impact on GDP unrelated to structural reform and shifts in regime in the economy. Asali (2004) has examined the relationship between growth of government expenditure and economic growth. He has found that any increase in current government expenditure causes decrease in investment, national income, and economic growth. Sameti and others (2003) have found that investment expenditures have positive impact on economic growth. Naderan and Foladi (2005) have found increasing of current expenditures reduces production, employment and householder's income.

Chapter Seven: Conclusion, Implications and Directions for Future Research

7.1 Conclusions

This research has examined the relationship between economic growth and government expenditures in Iran over the 1971-2008 periods. Following our own personal interests, we focused on exogenous growth, Barro Model and plan and budgeting in Iran. The major findings from this research largely relate to the results from chapter 5 and 6, although other issues are also worth highlighting. In chapter 1, the overall outline of the study presented. The main purpose of this chapter was to clarify the structure, motivation and objectives of the study, as well as explaining hypotheses and research methodology. In chapter 2, we have undertaken a comprehensive analysis of the economic performance in Iran and a comparison with two very similar countries such as Turkey and Algeria. Since the early 1960s, and particularly since the first oil shock of 1973-74, oil has also played an important role in the national economy.

The Iranian economy is heavily dependent on production of oil and gas, and is suffering from high inflation rate, high unemployment rate, high budget deficit and volatility of economic growth. Iran's economy is marked by an inefficient public sector, and most economic activities are controlled by the government. The reasons for instability in macroeconomic performance are dependency on oil exports and the size of government. we discussed the historical background of the Iranian budgetary, planning and government activities. We found out how traditional government with limited activities turned in to modern government. In the period of 1501-1722, the Safavid established a unified Iranian Shia state with an efficient central bureaucracy and government. Meanwhile, Iran experienced economic reforms by transforming the economic principles of Shi'ite Islam into a powerful state. The economy was developing due to trade relations with European countries. A large number of reforms have been financed by cash from foreign trade. Even during this remarkable period, the estimation of revenues

and expenditures in Iranian economy in 1690s and 1720s displayed budget deficit.

The Qajars dynasty which ruled in Iran during the years of 1785 to 1925, attempted to revive the Safavid Empire but they failed to establish strong central government due to pressure from two great world powers, Russia and Britain, Iran lost all its territories in the Caucasus north of the Aras River and Herat. The two great powers also came to dominate Iran's trade and interfered in Iran's internal affairs. The government roles were internal security, maintenance and guarding the borders. A series of concessions was granted to both English and Russian subjects. Budget was only a simple estimation of revenues and expenditures of government and there always was deficit in budget. The weakness of the central government during the Qajar rule only began to disappear with the appointment of two reformist Prime Ministers in Iran for a short period. Both Prime Ministers tried to solve the most important problems in governments including the national budget, but any changes in revenues and expenditures of government reduced the benefits of Royal Families and influential groups.

In late 19th century and early of 20th century, Iran experienced social and economic change: increasing population, increasing trade, increasing rate of inflation, declining value of domestic currency. The sources of government revenue were: land tax, income tax, customs duties, and direct foreign loans, sales of trade concessions to foreigners and sales of public offices. The heavy tax imposed by the government on agriculture was one of the most important sources of governmental income.

During the nineteenth century, due to increasing of foreign imports a number of indigenous industries disappeared. Meanwhile, in the Western countries, as a result of the industrial revolution, government roles were being enhanced, which resulted in economic development of these countries. The economic and political relationship with the West and contacts with the new civilisation of Europe, were established at the level of military and diplomatic relations, advisors and experts, foreign travelers, and establishing new schools in which the main subjects were modern science. Indeed they played

an important role in introducing the new Western scientific ideas. The graduates of these new schools created the new middle class, known as the educated or bureaucratic class. All students after their graduation occupied high positions in the country. The new social groups in Iran mainly Iranian politicians and intellectuals introduced the reformist ideas into Iran. Due to the big gap between Iran and Western countries, the Iranian people demanded a government with new institutions through which people could benefits from social equality, legal framework and economic development. These tendencies and factors led up to the Constitutional Revolution.

The first budget on the basis of modern budgeting was designed in 1910, it was divided into general and special revenues and expenditures and the amounts of expenditures were based on the sources of revenues. The direct and indirect taxes were the source of government revenues. Even in the first budget the government faced a deficit. Oil revenue and government had not yet played important roles in the Iranian economy. Reza Khan established a system of modern government. Meanwhile, oil production and oil revenues became important and major factors of the Iranian political economy by determining the level of domestic demand, state expenditure, and imports. The oil exports revenues which accrued to the government increased it's the economic and political power as it was responsible for the receipt and the distribution of oil revenues. Any increase in oil revenue made the power of government greater. Since 1925, economic achievements were: increase in roads and communication networks, industries and the application of modern technology, modern education, the greater share of state and private monopolies, and the state monopoly of foreign and domestic trade. All modernisation and industrialisation policies have been financed by oil revenues and indirect taxes. These economic policies wasted resources because of the projects with high costs and low returns.

Oil nationalisation was approved by the Iranian parliament in 1951, but this popular movement in Iran was failed by the coup d'état of August 1953. By establishing an international oil consortium in 1954 and introduction of American military, economy and social aid programmes, in the next few

years there was a growing interest in modernising and westernising Iran's economy and society and resulted in more economic dependency on West.

From 1949 to 1978, within the framework of five economic development plans which had been set up, Iran undertook economic development and social reforms. The sources of funds for financing the projects were oil revenues and foreign loans, negotiation between government and international consortium, provided a huge amount of income to the government. The national economy experienced increased in oil revenues, imports of goods, budget expenditures, consumption, decreased in non-oil exports and non-continuously economic growth.

After revolution of 1979 from 1989 to 2008, four Five-Year Economic Development Plans were set up. To conclude , the five-year economic development plans before and after revolution were not successful in achieving any of its major targets including rapid growth, price stability, high employment, increased investment and reduced reliance on oil-export receipts, decreased imports , increased non-oil exports and privatisation never attained their targets according the expectation of plans.

The main sources of financing budget deficit during 1971-1979 were borrowing from the central bank, government bonds issue and external debt. But after revolution of 79, the government budget deficit was largely financed through borrowing from the central bank.

The budget system in Iran faces many problems including: dependence on oil revenue and low tax base; high current expenditures with little left over for capital expenditures; universal subsidies and budget deficits which have been highly inflationary; hidden expenditures, weak linkage between the annual budget and the five-year plans; unreliable accounting, auditing and poor monitoring and the weak mechanism of allocation of funds and several off-budget accounts; lack of clarity in laws and regulations and non-transparency in explanation for the regulatory and operational roles of the government; poor linkages between the organisational structure of the government and its fiscal and budgetary policies.

In order to have a better understanding of Iranian economy, we focus on benchmarking analysis of Turkey and Algeria. There are some reasons for choosing these countries: firstly, in 1970s all three counties Turkey, Algeria and Iran belonged to upper middle income countries group. Secondly, Iran and Turkey had many similar features regarding their geographic, demographic and socio-economic size. Iran and Algeria are members of OPEC as oil and gas exporters and both have economies reliant on oil and gas revenues. Economic growth in Iran has been relatively volatile and highly dependent on intensive use of natural resources, mainly oil and gas.

The growth potential in the Iranian economy is limited due to misplaced incentives, uncertainties and lack of some specific institutions for efficient allocation of resources. In 1973 oil prices increased and in 1976 GDP per capita reached its peak which was about 64 % of the average for 12 Western European countries. Of course, that high level of income did not fully translate into improvement of standards of living. Over a third of that income was due to oil exports, which were not gained through productivity. The first reaction to these increasing revenues was doubling the planned government expenditures. A significant proportion of the increased revenue was directed towards investment, as a result of which the economy overheated and started experiencing high and rising inflation in the mid-1970s. Increased economic instability led to sharp declines in investment and GDP. Following the Revolution of 1979, the economy entered a period of rapid decline. Except for a brief period during 1983-1984, investment and GDP were rapidly falling and inflation was on the rise. At its trough in 1988, real GDP per capita had dropped to only 54 % of its peak in 1976. In the more recent period of 2000-2008, real GDP growth picked up, reaching 5.2 % due to significant progress in economic reforms such as the exchange rate unification, trade liberalisation, the opening up to foreign direct investment (FDI), and financial sector liberalisation, plus high oil prices and expansionary fiscal and monetary policies. During the last three decades the rate of inflation of Iran has been in double digits.

In the recent decades Iran has experienced several important events in the economic and political fields. These included the three oil shocks of 1972, 1979 and 1986; the Islamic revolution in 1978 which was followed by nationalisation of major sectors of the economy; the eight-year war with Iraq during 1980-1988; and the structural adjustment programme. The effects of the oil shocks were particularly profound due to the dependence of the economy and the macroeconomic policies on oil revenue. After the war the economic reform programme also had major effects through the removal of price controls and government subsidies, currency devaluation, and the deregulation of trade and tariffs. Available evidence supports the view that monetary factors are the main determinants of inflation in Iran. Government spending out of oil revenues leads to large liquidity injection that the central bank accommodates due to its efforts to prevent a significant nominal appreciation of the Rial and the lack of effective sterilisation instruments. First oil shock in 1974 encouraged the Iranian policy makers to increase government expenditures and the economy experienced budget deficit. The main problem in deficit financing is borrowing from the banking system. Borrowing from the banking system causes increasing government debt and in turn, increase supply and liquidity.

Unemployment has been a major problem even before the revolution in 1976 when the rate of unemployment was at 10.2%. The rates of unemployment have been on average about 12% in recent years. By the late 1970s, Turkey's macroeconomic instability had increased. The main reasons for the rise of the instability were the deterioration of the fiscal balances due to a significant rise in public investment and excessive reliance on foreign borrowing.

The Turkish economy faced high inflation rate, high unemployment rate, budget deficits and excessive debt accumulation. By using liberalisation programme including: devaluation of the Turkish lira, establishment of flexible exchange rate, maintenance of positive real interest rates, tight control of the money supply and credit, elimination of most subsidies, reform of the tax system, central bank's independence and focus on price stability

and encouragement of foreign investment, the Turkish economy experienced higher growth rate, lower inflation, fiscal discipline, FDI attraction and success on the privatisation front. Despite high economic growth, lower inflation and increased investment in the recent years, the most challenging factor in the Turkish economy is the high level of the current account deficit and high rate employment.

The oil export is the backbone of Algeria's economy and the national economy has suffered from high inflation rate, high unemployment and high deficit in budget. Algeria's economy improved during the mid-1990s because of reform policies, the results of reform policies have been included a recovery in growth, reduction in inflation, narrowing of the budget deficit and decreasing the country's foreign debt since 1995. From 1999, the government has put emphasis on re-establishing financial and macroeconomic stability structural reforms. Government has tried to continue its efforts to attract foreign and domestic investment outside the energy sector, but the economy remains heavily dependent on volatile oil and gas revenues. Algerian government has achieved an important surplus in the balance of trade, control of inflation and increase in foreign currency reserves. Algeria is now a country with a high unemployment rate.

As a commonly the case, prior to empirical analysis, we should know what are the theoretical approaches, so in chapter 3, we discussed growth theories. Major theories of growth can be classified into two prominent schools, neo-Keynesian school (Harrod-Domar Model) and neo-classical school (Solow-Swan Model). Both theories consider the role of exogenous variable and technological progress. The neoclassical growth model of Solow (1965) assumes that technology is exogenous to the economic system and does not depend on the other variables. The source of economic growth in the neo-classical models is accumulation of private capital.

Endogenous growth theory was developed in 1980s as a response to criticisms of neo-classical growth model. Endogenous growth theory contains a class of models that goes beyond Solow-Swan by endogenising technological change. Robert Barro (1990) has provided the most significant

model of government spending and endogenous growth. He has discussed a theory of the long-term effects of government policies on economic growth. The aspects of government policies are the effects of public services on private production and household utility, and the impacts of taxation on private incentives to save and invest.

The only way to determine the economic effects of government expenditure is through empirical analysis. In the final part of chapter 3, the literature on the relationship between the size of government and economic growth was discussed. These studies differ in terms of the countries that are included in the sample, period of estimation, and how one chooses to define and measure the many activities of the public sector, and the most important point being the method and tools of econometric approaches. Since 1980s a large number of studies have been conducted to show that relationship between government size and growth is positive, negative or non- existent significant results.

Our hypotheses were thoroughly investigated empirically by using three models. In chapter 4, in the first model which is based on Barro's endogenous growth theory, we investigated the interaction between economic growth and government expenditures simultaneously by using 3SLS method. The results show that the total government expenditure has a negative and significant effect on economic growth. Most of coefficients are significant at 95% level. Since the variables are measured as log, a unit change in the first policy variable (government revenue) causes a rate of change or acceleration (deceleration) on the endogenous variable. The coefficient shows the elasticity of GDP growth rate to changes in share of total government expenditure to GDP. It means, if the total expenditures change by 1% the economic growth will decrease to 0.13%.

The coefficient of inflation is negative and has a significant impact on the economic growth. This shows that inflation is harmful for the national economy. The coefficient of labour is positive and has significant impact on economic growth. The log of GDP with one lag has a negative coefficient. The GDP is strongly dependence on oil revenues. There is no expectation

that future oil revenues will follow the pervious oil revenues, because of the fluctuation in the world oil price. But the coefficient of the oil revenue is positive with significant impact on the economic growth. These results indicate that, economic growth in Iran depends on oil revenue. To investigating the effects of current and investment expenditures on economic growth, the results show there is a significant negative relationship between current expenditures and economic growth. The coefficient is -0.15, which means if the share of current expenditures to GDP increases (decreases) 1%, the economic growth decreases (increases) by 0.15%. The current expenditure in national budget indicated that the size of government has a negative impact on economic growth through misallocation of resources, reduction in competition and private sector efficiency. The reason of increasing in trend of current expenditures is expanding oil revenues.

In chapter 5, we investigated the impacts of government expenditures and the sources of finance of government expenditures on economic growth. This analysis was based on autoregressive distributed lag (ARDL) model. Our results show that is a long-run relationship among the variables, because the calculated F-statistic is compared with the critical value and indicated that the null hypothesis of no co-integration is rejected. The results of estimation of long-run indicated that increasing the investment expenditure has a positive effect on Iranian economy but the current expenditure has a negative and insignificant effect on economic growth.

As to the impact of the financing of government expenditure on growth, the results of estimation of long-run relation indicated that the oil revenue has the greater impact on the GDP and growth, but tax revenue has lesser impact on the GDP and economic growth in Iran. In other words, government by increasing tax revenues in order to finance public expenditure allocates resources by changing relative prices and transferring resources from private to public sector, which changes investment level and total production and supply. But, increases in oil revenues will increase the capacity to imports. Borrowing from central bank has a negative impact on economic growth. Our finding suggests that oil revenues and tax revenues have positive impact on

the Iranian economy but borrowing from central bank as a method to finance government budget has negative impact. The short-run coefficient estimates obtained from the ECM are less than the long run ones. The results suggest that the short run impact of current expenditure on the economic growth is negative and significant but, the impact of investment expenditure is positive and significant on economic growth. The coefficient on the interaction term for financing government spending through oil revenues is positive and statistically significant in the short run. The impact of tax revenues is positive but insignificant. The impact of borrowing from central bank on economic growth is negative.

In chapter 6, we investigated the effect of the government budget deficit, liquidity (M2), official exchange rate, on price level in Iran. According to the unrestricted Johansen Co-integration Test, the results of the Trace and the Maximum Eigenvalue Tests indicate two co-integration relations. The outcomes of the Johansen Co-integration test indicate that there is a stable long-run relation between inflation, budget deficit, money supply and exchange rate. Normalising on inflation shows that coefficients of budget deficit and money supply have positive signs and are statistically significant, but the exchange rate has a negative sign and is statistically significant. Granger causality tests show that inflation has a casual effect on exchange rate and the exchange rate has a casual effect on money supply.

According to our theoretical model, we would expect the government budget deficit to have a positive influence on the inflation over the long-run. Based on our estimation result, the government budget deficit has a positive impact on the inflation rate in long-run. The long-run estimated coefficient of liquidity (M2) is positive and statistically significant. This result confirms our theoretical model. The positive impact of the official exchange rate on inflation rate confirms our theoretical model. We found that the exchange rate has been a major contributing factor in price level determination over the long-run in Iran. But in short–run the government budget deficit, money supply and exchange rate do not impact inflation rate.

We can summarise the main findings:

- Total government expenditures have a negative and significant impact on economic growth.
- Current expenditures have a negative and significant impact on economic growth.
- Investment expenditures have a positive and insignificant impact on economic growth.
- In the short run current expenditures have a negative and significant impact but, investment expenditures have positive and significant on economic growth.
- In the long run, investment expenditures have a positive and significant effect but the current expenditures have a negative and insignificant effect on economic growth.
- In the short run the interaction term for financing government spending through oil revenues is positive and significant. The impact of tax revenues is positive but insignificant and the impact of borrowing from central bank on economic growth is negative.
- In long run the interaction term for financing government spending through oil revenues is positive and significant. The impact of tax revenues is positive and significant and the impact of borrowing from central bank on economic growth is negative.
- There is a stable long-run relation between inflation, budget deficit, money supply and exchange rate.
- Increase in budget deficit has a positive effect on the inflation rate in long run, but in short run increase in budget deficit does not have a positive effect on the inflation rate
- Increase in liquidity (M2) has a positive effect on the inflation rate in long run.
- Increase in official exchange rate has a positive effect on the inflation rate in long run.

7.2 Implications

The findings of this research have important implications for future policy as following:

Size and composition of government expenditures including high current expenditures (leaving little for investment expenditures) seems to influence growth negatively. Government should put more emphasis on investment expenditures, since investment expenditure increases GDP through increasing the total demand and private investment. Government can encourage private investment by investing in education, health and research. The institutional variables (property rights, rules and regulations and financial markets) can increase the volume of investment. Increase in investment has a positive impact on employment rate.

Government expenditure's dependence on oil revenue and oil revenue being the primary source of government revenues (with tax revenues as the secondary source) is economically unhealthy and inefficient. The government has been unsuccessful in privatisation process due to the monopoly of government in many sectors of the economy, which encourages tax evasion.

Government should implement a fundamental tax reform and persevere in privatisation in order to increase economic efficiency and widen the tax base. The government budget deficit is financed by borrowing from central bank in Iran, which increases the money supply and thus has a tendency to raise the rate of inflation. An independent central bank would be a crucial policy reform which can decrease the inflation rate.

7.3 Directions for Future Research

As there are only a limited number of empirical studies on economic growth and government expenditures in Iran, this study may be extended in the following ways. This dissertation which has investigated the relationship between economic growth and government expenditures may be extended by employing other methods. There are problems with data limitations in developing countries including Iran, which may improve in future. Future work might consider an assessment of different sources such as World Bank and International Monetary Fund. For instance, instead of using time series data, panel data can be used in future studies.

Secondly, another extension can be made by investigating the effects of institutional variables (rent-seeking, corruption and bureaucracy) on the size of government. Another promising area for future research would be to investigate the effects of fluctuations in international oil prices on the size of government in Iran.

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