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A TIME SERIES ANALYSIS OF PRIVATE AND PUBLIC INVESTMENT IN IRAQ'S ECONOMIC GROWTH PROCESS (1970 – 2010)

Hussein, Jwan

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A TIME SERIES ANALYSIS OF PRIVATE AND PUBLIC INVESTMENT IN IRAQ'S ECONOMIC GROWTH PROCESS (1970 – 2010)

By

JWAN SAEED HUSSEIN

A thesis submitted to Plymouth University

in partial fulfilment of the degree of

DOCTOR OF PHILOSOPHY

Graduate School of Management

Faculty of Business

Plymouth University

ENGLAND

October 2015

Dedication

To my dearest husband, who has made extraordinary sacrifices to help me fulfil my aspirations.

To my wonderful children, Aymen, Muhammad and Shad.

To my parents, to whom I remain eternally grateful for their wonderful upbringing and love. A special dedication to my supervisors, Dr. James Benhin and Prof. Paul Bishop.

A TIME SERIES ANALYSIS OF PRIVATE AND PUBLIC INVESTMENT IN IRAQ'S ECONOMIC GROWTH PROCESS (1970 – 2010)

JWAN SAEED HUSSEIN

Abstract

Since the 1980s, there has been growing recognition among developing countries that an essential foundation for sustainable growth is capital investment, both public and private. While Iraq is an oil-rich country, with substantial oil revenue, only a small proportion of it has been allocated to importing the capital that is most needed, while the rest has mainly been used for consumption purposes. The effects of the oil-driven state development, conflicts, sanctions, high unemployment and delayed reforms have significantly shaped Iraq's economy and limited the potential for private-sector-led growth over the past 40 years. This conclusion is worrying for a country like Iraq, which has shown some downward trends in private and public investment, both in the total amounts and relative to GDP.

This study, the first of its kind, empirically assesses the pattern of domestic private investment in Iraq and its key determinants over the past four decades. It also examines the issue of the complementarity (crowd-in effect) or substitutability (crowd-out effect) between public capital and private investment in the trend in economic growth. Finally, it evaluates the determinants of public investment, to reveal the indirect impacts oil revenue has on private investment through the increasing of public investment. The thesis employs time-series data and annual datasets covering 1970-2010. Both the ADF and the PP unit root tests are employed to test for the stationarity of the data. Johansen's cointegration is used to establish the long-run equilibrium relationship among the variables in the models. The VECM is also utilized to examine the short-run dynamics between the variables. The main empirical results support the accelerator principle hypothesis of a positive relationship between GDP and private investment. The McKinnon-Shaw hypothesis is, however, not verified in the case of Iraq but there is some evidence that private investment is crowded in by public investment, and that oil revenue has an indirect effect on private investment.

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List of Abbreviations

Abbreviations	Full term
ADF	Augmented Dickey - Fuller
AIC	Akaike Information Criterion
AR	Autoregressive
BIC	Bayesian Information Criterion
CPI	Consumer Prices Index
FAO	Food and Agriculture Organization
FPF	Final Prediction Error
GOEs	Government-Owned Enterprises
GFCF	Gross Fixed Capital Formation
GPDFCF	Gross Private Domestic Fixed Capital Formation
GPFCF	Gross Public Fixed Capital Formation
HQC	Hannan-Quinn Criterion
IMF	International Monetary
IPC	Iraq Petroleum Company
NDP	National Development Plan
PP	Phillips- Perron
SIC	Schwarz Information Criterion
SOEs	State Owned enterprises
UNCTAD	United Nations Conference on Trade and Development
VECM	Vector Error Correction Model
WB	World Bank

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Author's declaration

I hereby confirm that this thesis is a result of my original work; none of the materials in this thesis have previously been submitted for any other degree at this or any other university.

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I. Poster presentation at the Plymouth University Postgraduate Society (November 2013), on Thesis key research objectives and methodology.
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Jwan Saeed Hussein

Signed *Jwan Hussein*

Date 05/10/2015

CHAPTER 1 INTRODUCTION

1.1 Research Background

In recent years, there has been a growing recognition among developing countries that one of the most essential foundations of sustainable and healthy growth is capital accumulation, with the main source of capital accumulation being capital asset investment. Investment plays a crucial role in economic growth and development, as it enhances technological progress, productivity, and employment rates.

Conventionally, this view was reflected in the 1950s and the 1960s when developed economies enjoyed the so-called "golden age", when it was believed that higher investment would move the economy on to a higher growth path, with a higher capital-output ratio and higher productivity, associated with higher levels of output and consumption per capita. According to the Solow growth model, the essential role of investment is limited to the short run, which indicates that, although investment increases growth during the transition to the steady state, this increase is correlated with its effect on the capital-output ratio. However, long-run growth is determined only by the rate of technological change, which is assumed to be exogenous (Solow, 1956).

The issue of relevance here is the significant role of capital accumulation for the economic growth and development prospects of an economy. A substantial debate has emerged in the economic literature regarding what determines investment. It has been a central theme for a long time; a number of models have been

developed by economists to explain this phenomenon. These models have been subjected to empirical testing, eventually giving rise to a large body of literature on both developed and developing countries. Indeed, the literature provides a number of sophisticated models of investment determination, with great theoretical credibility; yet the empirical evidence seems to have done very little to clarify which are the more accurate representations of the investment determinants of an economy. Even less explanation is offered regarding the restrictive assumptions, and the difficulties faced when applying the theoretical models empirically.

Initially, the existing literature focused on industrial countries in the theoretical and the empirical context, with very little attention given to investment determinants in developing countries. It is only in recent decades that increased attention has been paid to the private investment phenomenon in developing countries. This has mainly been due to the change in economic strategy in many developing countries moving from direct intervention and state-led economies to a new approach based on a free market with liberalization and privatization programmes (Blejer and Khan, 1984).

Great emphasis was placed by policy makers on private investment as a powerful instrument for economic growth, innovation and poverty reduction. As structural adjustment efforts continued along these lines, however, it became clear that an understanding of private investment behaviour and of its responses to various market and policy incentives related to fiscal, exchange rate, regulatory, and financial reforms was important in designing efficient applications of structural adjustment programmes for which the existing literature appeared to provide little explanation (Ghura and Goodwin, 2000).

Furthermore, in the late 1980s many developing countries were confronted with severe slowdowns in economic growth and levels of investment (Oshikoya, 1994). This led researchers and policy makers to pay further attention to the determinants of private investment in developing countries.

Many approaches, strategies and recommendations have been proposed by international organizations such as the International Monetary Fund (IMF) and the World Bank (WB), and by empirical studies, aimed at enhancing the role of private investment as an engine of economic growth. Besides that, the important subject of the relative impact of public and private investment on economic growth has also received significant attention in the academic literature. There is a general consensus that these two elements of investment have differing impacts on economic growth and social conditions (Blejer and Khan, 1984; Greene and Villanueva, 1991). Since the distinction between public and private investment matters for economic growth, it is essential to understand the linkages between these two components.

The investment pattern in oil-producing countries has also received great attention in studies on developing economies. The general proposition made regarding investment patterns in oil-rich countries is that the substantial oil revenue in these countries could motivate high rates of public and private investment and therefore essential capital accumulation. Though most of the oil-exporting countries experience steady streams of foreign exchange earnings, these earnings have only allowed these countries to import a part of the most needed capital goods and services, and helped them to respond to increased demand for international goods for consumption purposes. Thus, in many oil-exporting countries such as Iraq, investment rates are still too low, motivations for innovation are insufficient and

returns on investment are not very predictable, which are some of the main reasons for slow growth in developing countries.

Indeed, Iraq needs to diversify its economic base and grow through increased levels of international trade, and this will require increased private investment. Over the past four decades, the Iraqi economy has endured costly militarization, three devastating wars, pervasive state intervention, and more recently over a decade of international sanctions. As a result, the country's gross domestic product (GDP) per capita declined from over US$3,600 in the early 1980s to US$1,000 in 2001 (Looney, 2004). However, since 2003 there has been a significant post-war economic and financial recovery, and Iraq's GDP has rebounded very quickly following the conflicts, albeit not to pre-1980 levels (White, 2012).

The main challenge for the Iraqi economy is diversification. The oil sector dominates Iraq's economy and the ratio of oil to total exports is among the highest of the oil-producing countries in the Middle East. Oil exports make up over 90% of government revenues, 80% of foreign exchange earnings and about 75% of GDP. In comparison, in Saudi Arabia and Kuwait oil production is around 50-55% of GDP, and in Iran it is 25% (Benson, 2012). Iraq's very high dependency on oil makes the economy vulnerable. Although the oil sector continues to provide the basis for growth and stability in the medium term, economic diversification is important in the long term. A sustainable future requires the development of a more diversified economic base and employment opportunities, which can only be achieved through increased rates of gross investment, both private and public, in the country (Foote et al., 2004; Tadlock, 2004).

Macroeconomic indicators in Iraq have shown poor performance and low levels of investment since the 1970s, worsened by the several wars. During 1970-2010, average annual gross fixed investment rate was barely 3% of GDP and has not even exceeded 8% in good times (Hussein & Benhin, 2015). The share of private investment in GDP declined from 5.2% in 1970 to 3% in 1975, and then to 2.11% in 1987 during the first Gulf War, but experienced an increase to about 7.5% in 1989 and 1990. Since then there has been a decreasing trend and it has been as low as 0.5% in 2007 after the second Gulf War. Moreover, successive wars have acted as significant obstacles that have drained the government budget, drastically affecting infrastructure services in the last three decades, and in turn critically influencing private investment. It is evident that Iraq is too far behind the minimum investment rate of about 30% of GDP that is needed to attain the required levels of the key macroeconomic indicators of growth, employment, and low inflation, as well as to reduce the level of violence in the country (Alnasrawi, 1994).

Despite several structural reforms carried out by the Iraqi government to enhance private investment in recent times, economic growth is still low for an oil-rich country. Iraq continues to be confronted with a number of economic constraints. Among these problems are a high rate of inflation, political instability, a low level of investment and an inability to generate sufficient productive employment. Instead of an economic recovery, the situation continues to deteriorate. In Iraq, the expected role of private investment as an engine of growth seems never to have materialized. A major expansion in private investment, needed to sustain economic growth, is yet to be attained.

Given this background, the purpose of the present thesis is to examine, within a realistic framework and using best-practice testing techniques, the key economic and social factors influencing private investment, and also to assess private investment's impact on economic growth and the role of public investment in this relationship. Iraq is the specific case of interest. Focusing on a single country is more convenient and should lead to greater success since it provides a unifying focus by allowing one to draw on different aspects in the literature. This will provide a particularly useful study on Iraq, given the deficiencies in the existing literature.

1.2 Research problems

There has been growing recognition among researchers in developing countries that private investment plays a significant role in economic wealth and job creation, and thereby the achievement of macroeconomic stability. Iraq, an oil-rich country with substantial oil revenue, has experienced a steady stream of foreign exchange earnings. Part of these earnings has been used to import the capital that is most needed, while the rest has mainly been used for consumption purposes. The effects of the oil-driven state development, conflict, sanctions and delayed reforms have significantly shaped Iraq's economy and limited the potential for private-sector-led growth over the past 40 years. On the other hand, according to a World Bank report in 2010, Iraq has one of the youngest populations in the world, with 30-40% under the age of 15 years, and a high unemployment rate, at close to 30%, almost twice the average in MENA countries.

Certainly, the levels of both private and public investment are far below those needed to create wealth or job opportunities. Aggregate investment has remained

stagnant for a prolonged period of time, motivations to innovate are insufficient, and due to political and macroeconomic instability the expected return on investment is unpredictable. Worryingly, both private and public investment has shown downward trends in amount and relative to GDP. The situation needs to be addressed carefully in order to identify key factors to enhance these two elements as the engine of Iraq's long-term growth. In terms of the diversification of Iraqi's economy, there is strong evidence that the agriculture and manufacturing, building and construction, and transport, communication and storage sectors all have very strong potential.

1.3 Research Objectives

The thesis attempts to address five key objectives:

(i) To review the historical trends in key macroeconomic indicators and evaluate the role of private and public investment in Iraq's economic performance over the period 1970-2010 in order to provide an in-depth understanding of country's economic environment as a basis for the later empirical analysis (see Chapter 4). It also contributes to the existing empirical literature on private investment in developing countries.

(ii) To comprehensively evaluate the impacts of private and public investment on economic growth by examining whether public investment crowds in (complementary to) or crowds out (substitute for) private investment. The outcomes help to assess what policies are needed to enhance the complementary relationship and therefore economic growth (see Chapter 6).

(iii)To assess empirically the impact of macroeconomic variables on private investment as proxied by private fixed capital formation, based on the modified neoclassical flexible accelerator theory and several investment studies dealing with developing countries, to clarify the picture regarding domestic investment in Iraq. The analysis is extended to assess the impact of the political instability and international sanctions on private investment over the last four decades (see Chapter 7).

(iv) To examine key factors influencing public investment, such as per capita income, current government expenditure and oil export revenue. Although a few studies have been conducted on determinants of public investment in developing countries, this study considers a public investment model in the context of Iraq. This is, again, important for policy and the country's future. The other purpose is to examine the indirect effect of the oil sector on private investment in Iraq (see Chapter 8).

(v) To make appropriate policy recommendations for encouraging and sustaining private investment and economic growth in Iraq (see Chapter 9).

1.4 Research questions

To achieve the objectives set out for this thesis in Section 1.2, and to examine the topic empirically, this thesis attempts to find an answer to several main research questions, based on an identified gap in the literature regarding whether and how domestic private and public investment affects economic growth in developing countries like Iraq, and the significance of these effects. It has only been in recent decades that increased attention has been given to the private and public investment phenomenon in developing countries. This study considers the

interaction between private and public investment, namely whether there is complementarity or substitutability between the two elements, to be important for economic growth. The outcomes could differ among countries and the debate can only be settled with country-specific evidence. Accordingly, three models are modified to fit Iraq's economic structure, and are tested empirically.

As regards to the tested hypotheses regarding the relationship between private and public investment and economic growth, they can be broken down into the following specific questions:

The first empirical chapter (Chapter 6) attempts to answer the following:

a. How does private and public investment influence economic growth in Iraq?
b. Do public-sector investment and domestic private-sector investment have different impacts on Iraq's economic growth?
c. Why is private investment not more efficient and productive than public investment in Iraq?
d. What is the impact of the oil export revenue on economic growth?

The second empirical chapter (Chapter 7) attempts to answer to the following questions;

a. Is GDP positively associated with private investment ?
b. Are private sector investments crowded out or crowded in by public-sector investment in the case of Iraq?
c. Is there evidence as to whether the real interest rate supports the McKinnon–Shaw hypothesis (has a positive impact on private investment) or the neoclassical hypothesis (has a negative impact on private investment) in the case of Iraq?

d. Do macroeconomic instability and uncertainties have an adverse effect on private investment?
e. To what extent are both war and political uncertainty severe obstacles to the attraction of private investment?

The third empirical chapter (Chapter 8) answers the following:

a. What are the main determinants of public investment?
b. Is public investment crowded out by public current expenditure?
c. Is there an indirect impact of oil revenue on private investment?
d. Which key areas should be targeted when it comes to public investment so as to enhance its impact on private investment and economic growth?

1.5 Research contributions

The outcomes of this study contribute to the economic literature and policy making on investment and economic growth in the developing world in the following ways:

(i) This study contributes to the empirical literature on economic growth through the adoption of a neoclassical framework that includes various theoretical determinants of growth, such as oil revenue, human capital and macroeconomic instability. The purpose of adopting this model is to examine the determinants of economic growth in Iraq from 1970-2010, and to determine whether there is a complementary or substitution effect of public investment on private investment.

(ii) Following from (i), the thesis establishes how public investment could enhance private investment so as to facilitate sustainable economic growth

in Iraq. The outcomes could also be useful for other oil-rich developing countries aiming for long-term sustainable growth.

(iii) It adopts an appropriate analytical framework to identify the key macroeconomic factors affecting private investment in the context of Iraq. This is believed to be particularly important for providing key recommendations on how government policies can stimulate private investment that will in turn boost economic growth. So far, no systematic empirical study has been conducted with regards to the determinants of private investment in Iraq.

(iv) Another significant contribution of the current thesis is its adoption of a simple analytical model for analysing the determinants of public investment and for identifying the indirect effect of oil revenue on private investment.

(v) This thesis also contributes to the literature by providing a historical overview of Iraq's economic performance in the last forty years, with emphasis on the evaluation of private investment vis-a-vis public investment, oil and non-oil sectors, and macroeconomic policies including fiscal, monetary, and exchange rate.

(vi) A database for private investment in Iraq is built, which would also be very useful for future analyses in this area. Gathering a long span of data from reliable resources was a great challenge in working on this thesis. The data set used in this study is based on annual, seasonally adjusted observations, covering 1970-2010, and concerted efforts were required to compile it and check its reliability.

1.6 An Overview of the Thesis

The theoretical literature on investment is reviewed in the next chapter. Various mainstream theories of investment are considered, including classical and neoclassical, Keynesian,, the Q theory of investment, the neoliberal approach and the disequilibrium investment approach. Furthermore, the increasing consensus among researchers on the importance of investment theories in developed countries and the potential for applying these theories in developing countries are reviewed in Chapters 2 and 3. By pointing out the theoretical weaknesses of these models, and the need for further understanding of investment behaviour, the survey also includes a critical discussion of recent developments attempting to address the investment phenomenon from different perspectives. Overall, this chapter provides an understanding of the theoretical background upon which a specific theoretical model of investment determination can be built, and tested empirically, in the case of developing economies.

Chapter 3 complements the review of the theoretical literature on private investment behaviour provided in Chapter 2 by reviewing relevant and current studies of the investment process in the developing world. This chapter covers a variety of variables so as to identify the most important factors influencing private investment in the context of developing countries. In general, most of the empirical studies relevant for modelling private investment are based on what is called the neoclassical flexible accelerator model, indicating that most of the conventional investment theories cannot be applied in the context of developing countries. This is due to the fact that developing countries do not always operate in a competitive environment, and often face constraints that are not accounted for in the theoretical model. Thus, there have been notable challenges to the

development of an analytical model of investment tailored to developing countries.

The chapter further examines the effectiveness of various policies, including monetary, fiscal and exchange rate policies, in stimulating private investment in developing countries. Increasing attention has been given to non-economic factors, including poor governance, political instability and economic security, which play a complementary role along with traditional factors in determining private investment. These factors essentially influence substantial investment decisions based on the rational evaluation of risks and potential profits. Finally, the potential effect of oil revenue and foreign direct investment (FDI) on private investment is also investigated in this chapter.

The Iraq's economy in its historical context is presented in Chapter 4, based on the proposition that history and institution are vital to understanding the way capital is accumulated in an economy. A historical overview of Iraq's economy, with emphasis on the evaluation of the oil and non-oil sectors and macroeconomic policies including fiscal, monetary, and exchange rate, are provided at the outset. This is followed by an evaluation of the private sector vis-a-vis the public sector and an assessment of the labour force and employment in Iraq. In analysing macroeconomic trends, the study mainly focuses on the three phases that the economy has experienced in the last four decades. The first is referred to as the prosperity period, due to the oil boom of 1970-1980 that allowed the country to adopt a development plan focused on the expansion of its industrial base. The second was 1980-2003, when the economy confronted three long wars and severe international sanctions, which effectively destroyed the positive achievements of the 1970s. In the third phase, 2003-2010, the Iraqi state faced particular

challenges in terms of reconstruction and development, with not only economic but also fundamentally political and social transition. The government managed to increase investment in the oil and non-oil sector. However, violence that resulted from internal conflict and limited administrative capacity, along with poor infrastructure, prevented growth in aggregate investment.

Taken together, the theoretical background on investment behaviour provided in Chapter 2, and the empirical literature reviewed in Chapter 3, provide a very useful guide for developing a more realistic macroeconomic model of private investment for Iraq in Chapter 5. Here, three empirical models are adopted in line with the economic structure in Iraq as discussed in chapter 4. First, a simple growth model is formulated based on the neoclassical framework and empirical studies, distinguishing between the effects of private and public investment so as to enable the study to examine the issue of complementarity and substitutability between public and private investment, that is whether public investment crowds in or crowds out private investment. Second, the neoclassical flexible accelerator model is adopted to estimate the pattern of domestic private investment and to examine key variables explaining it. Third, based on the empirical studies, a public investment model is developed to analyse the determinants of public investment and to evaluate the indirect effect of oil revenue on private investment.

For estimation purposes, annual data from 1970-2010 are used in this study to examine the behavioural equations of the model. With regard to the method of analysis, first, two common tests are used, the Augmented Dickey-Fuller and the Phillips-Perron, to test for stationarity and the order of integration of the time-series data. Then, the Johansen cointegration test is applied to each model to examine the long-run equilibrium relationship between the variables. Finally, as

also discussed in Chapter 5, once the cointegration among the variables has been confirmed, a vector error correction model (VECM) is used to estimate the short-run dynamic relationship between the variables.

Chapter 6 is the first of three empirical analysis and it focused on the determinants of economic growth in Iraq over 1970-2010. The key purpose is to investigate how public and private investments affect economic growth and to determine the complementary or substitutive effect of public investment on private investment. The simple analytical model applied includes other theoretical determinants of growth, such as human capital proxied by the labour force, macroeconomic instability, and the exchange rate policy, all of which have received a significant amount of attention in recent literature and have to be taken into account when assessing this issue.

The macroeconomic model of the private investment function, within the context of Iraq, is tested econometrically in Chapter 7. This chapter focuses on key macroeconomic variables such as GDP, real public investment, the real exchange rate, the real interest rate, the inflation rate, and social indicators such as political instability, as the most important variables influencing private investment in Iraq over the period 1970-2010.

Chapter 8 presents an empirical analysis of determinants of public investment. It is well known that, in most developing countries, the public sector now accounts for a noticeable share of total production and investment. Thus, this chapter contributes to the existing empirical literature by assessing the determinants of public investment in the context of Iraq. This empirical model identifies key factors influencing public investment over the period 1970-2010. Oil revenue is included in the public investment model so that its indirect impact on private

investment can be examined. This study suggests that oil revenue could boost private investment indirectly through its effects on public investment.

Chapter 9 presents the conclusions of the thesis, the limitations of the study and suggestions for further studies.

CHAPTER 2 THEORITICAL LITERATURE ON INVESTMENT

2.1 Introduction

It is widely accepted in economic theory that one of the most essential foundations of sustainable and healthy economic growth and development is capital accumulation, and that the main source of capital accumulation is capital asset investment. It plays a significant role in economic wealth creation. It is an element of aggregate demand and a significant determinant of the general level of economic activity. Investment expenditure provides the basis for economic growth and improves national capacity and productivity (Aysan et al., 2006; Khan and Kumar, 1997). Thus, the consumption of goods and services increases with the growth in income that is stimulated by capital accumulation (Anwer and Sampath, 1999).

An enormous theoretical literature on investment in developed countries has been produced over the last century, aiming to understand the determinants and relative importance of the investment process. The classical approach was one of the earliest models developed for this purpose. It is based on three main foundations: markets are highly competitive, wages and prices are completely flexible, and saving is always equal to investment. According to this model, market economies would be in equilibrium and would operate efficiently with no government intervention. However, Keynes was one of the first to call attention to the existence of an independent investment function in the economy, and made the assumption that investment decisions rely on the prospective marginal efficiency

of capital relative to the interest rate, reflecting the opportunity cost of invested capital.

Following Keynes, the evaluation of investment theory was associated with the development of neoclassical theory. In its simple form (simple accelerator model) this was the other early model developed for this purpose. Although this model has been applied widely, it is believed to be too simple and restrictive to define the complete process of investment determination. The implications and unrealistic hypotheses of the simple accelerator theory led researchers to devote renewed attention to the investment model. The most prominent of the neoclassical flexible accelerator theories of investment behaviour was further developed by Jorgenson (1967), as an alternative to the simple accelerator theory. The neoclassical flexible accelerator model was the first in which the investment function was derived from an optimization model of the firm, indicating that enterprises continue to invest when there is a divergence between the marginal product of capital and the marginal cost of capital. This has been a starting point for many studies analysing investment decisions.

In spite of the advancements in the intellectual understanding of investment determination provided by the various theories, most of the work has been focused on old industrialized countries, while less attention has been given to how investment is determined in developing countries. Along with the development of the above theories, some other theoretical literature has developed to provide a better understanding of the investment phenomenon, particularly in relation to developing economies.

The neoliberal approach pioneered by economists such as McKinnon (1973) and Shaw (1973), who advocated for financial liberalization, provided an alternative

explanation for investment decisions in the developing world. The core argument in the neoliberal approach is that investment is positively affected by the real interest rate. In the sense of optimal solutions for the model of investment, the disequilibrium investment approach is among the theories that have emerged recently. This model was initially based on the belief that investment depends on profitability and output demand conditions, and was later developed through the argument that net investment is positively related to the gap between actual and long-run equilibrium capacity.

Since the early 1980s, there has been a renewed interest in private investment models in the context of developing countries. This has partially been due to major shifts in economic strategy in developing countries, from direct government intervention and a state-led economy to one based on a free market implemented through liberalization and privatization programmes. A lot of criticisms have emerged regarding the applicability of the abovementioned theories of investment to developing countries, because of a number of deficiencies in the characteristics of developing countries that hinder the adoption of the models in their entirety. Since then, international organizations such as the IMF and the WB have taken an interest in the determinants of private investment in developing countries. As a result, the modelling of private investment has further developed to include important features of investment decisions such as irreversibility, uncertainty and timing, which are highly associated with developing countries but neglected by conventional approaches.

This chapter provides a detailed discussion of the theoretical underpinnings of investment, with a focus on developing countries such as Iraq. The rest of the chapter is organized as follows. In the next section, the classical investment theory

and its limitations are reviewed. Section 2.3 provides an explanation of Keynes' investment theory and summarizes the main assumptions of this theory. Relevant models of neoclassical theory, such as the simple and flexible accelerator, are summarized in Section 2.4. The neoliberal approach that considers the characteristics of financial markets in developing countries is described in Section 2.5. The disequilibrium investment approach, which is based on the idea that investment depends on profitability and output demand conditions, is discussed in Section 2.6, with Section 2.7 providing a brief discussion on investment theories in the context of developing countries. The last section presents the main conclusions derived from this chapter and identifies an appropriate theory underpinning investment decisions in Iraq as a developing and oil-rich country.

2.2 Classical Investment Theory

Classical economics can trace its roots to Adam Smith following his book published in 1776 and notably referred to as, "The Wealth of Nations." Smith provided a broad analysis of economic phenomena based on the concepts of free markets and actions guided by individual self-interest under a non-intervening government. The classical approach is based on three key assumptions. The first is "flexible prices", under the argument that, with prices unrestricted by the government, markets can efficiently and quickly achieve equilibrium by reaching a balance between the quantity demanded and the quantity supplied. The second is Say's law, "supply creates its own demand", meaning that aggregate production of goods and services in the economy will generate sufficient income to purchase the entire output. The last assumption is "saving–investment equality", which implies that the wealth of a nation is a result of savings and investment in fixed capital and that savings via changes in the rate of interest can be translated into more or

less investment (Baumol, 1999). Peterson (1988) illustrated that the interest rate, in the classical perspective, is a dynamic tool that determines the relationship between investment and saving, and proposed a link between the decision to refrain from consumption (savings) and the decision to provide for future consumption (investment). This perspective is still the core of investment theory.

David Ricardo is considered to be one of the most prominent classical economist. Ricardo made a number of contributions to the study of international trade, the labour markets, and the distribution of income in the early 1800s that remain fundamental to the modern study of economics. Ricardo explained the labour theory of value, as a traditional classical assumption, arguing that the value of a good is determined by the labour hours. Ricardo also claimed a relation between profit and wages in the context of the labour theory of value, and that profit and wages are often in conflict. Thus, he argued that an inverse relationship existed between wages and profits, and that the capital stock and technical progress were limited, so that when wages increased, profits should decrease and vice versa. The substitutability of labour and capital as factors of production has also been proposed by Todaro and Smith (2009).

Alfred Marshall in 1890 was the first to develop the standard supply and demand curves and a number of other economic fundamentals including market equilibrium, the relationship between quantity and price with regards to supply and demand, the law of marginal utility, the law of diminishing returns, and the idea of consumer and producer surpluses (Rittenberg, 2009). Marshall has been called the founder of marginalist economics, having explained how each extra unit of capital accumulation increases output, but that the rate of increase has a diminishing nature. In a perfectly competitive factor market for capital, Marshall

argues that firms should employ capital in production up to the point at which the marginal cost of capital is equal to the value of output generated by one unit of extra capital investment. It has also been shown that the demand for capital goods will continue as long as the return on capital exceeds the market interest rate (Castle, 1991). From the marginalist perspective, investment is mainly determined by two factors: the cost of capital, which can be measured by the interest rate, and the value of output that can be added by making one unit of new capital investment, otherwise known as the marginal return of capital investment.

It can be concluded that the classical theory of investment and the marginalist approach mainly focused on the optimal amount of capital stock rather than how to increase its contribution to the economy (Eisner and Nadiri, 1970). The classical economists showed that aggregate income is equal to aggregate investment plus aggregate consumption, and in turn that aggregate income is identical to output. According to Say's law, the economy is always in equilibrium and has full employment, with investment always equal to savings. According to this perspective, inequality between saving and investment can be adjusted by changing the interest rate, through the mechanism of market forces.

2.3 Keynes' Investment Approach

The theories of investment behaviour can be traced back to Keynes' (1936) "General Theory", which first called attention to the existence of an independent investment decision function in the economy (King, 2003). In contrast to the classical assumption, Keynes (1936) assumed that investment was a function of the marginal efficiency of capital in relation to a given level of interest rate that reflected the opportunity cost of the invested capital. According to Keynes' theory, investment should be made when the marginal efficiency of capital is

greater than or equal to the market rate of interest. Then, the demand for capital goods will increase and new investments will be profitable. Therefore, according to this theory, the rate of investment is determined by the gap between the marginal efficiency of capital and the interest rate.

From Keynes' perspective, expected future income, the main determinant of the marginal efficiency of capital, depends on a number of predicted factors. Price and the potential demand for output are two important factors that affect the marginal efficiency of capital and the demand for capital stock. An increase in aggregate demand raises the future expected return on investment and the marginal efficiency of capital. In this situation, surplus demand for output, as well as expectations of an increase in demand, positively encourage investment decisions. Therefore, expectations about future events have an important effect on the marginal efficiency of capital and investment behaviour. Moreover, the type and quantity of the stock of capital can also change the marginal efficiency of capital during the lifetime of the capital asset. A large volume of capital stock requires a large quantity of replacement investment and therefore diminishes net investment, and vice versa. Finally, wage changes and psychological expectations are the other factors that affect the marginal efficiency of capital and the demand for capital stock.

Keynes believed that, often, economies did not operate at full employment and did not fully utilize resources and capacities. He advocated the use of government fiscal and/or monetary policies to intervene in the economy in recessionary periods so as to increase aggregate demand and alleviate economic depression. Such policies, he argued, could be implemented through a government budget deficit funded by an increase in the money supply, bonds or other financing

instruments, including foreign borrowing. Keynes held the view that income redistribution, as a part of fiscal policy, increased aggregate demand as well as investment expenditure.

Furthermore, it has been argued that investment decisions could be highly unpredictable owing to the uncertainty related to the expected returns on investment (Evans, 1969). Keynes postulated that the decision to invest capital was mainly associated with what he called the "animal spirits"[1] of the investors (Dow and Dow, 2011), referring to investment decisions taken despite the uncertainty involved. According to this, the decision to invest is deemed to be mostly affected by the level of optimism or pessimism held by investors regarding the overall situation within which the investment will be undertaken. For example, when investors are pessimistic about the future of the economy, i.e., when the marginal efficiency of capital is predicted to decline, a very low rate of interest is not sufficient to ensure that aggregate demand for investment will exceed total savings. Producers who are not confident of selling their excess supply of goods at reasonable prices will not speculate on any interest rate (Montiel, 2003). This means that the investment decision relies on the individual investor's expectations regarding the potential returns of the investment project.

Based on Keynes' theory, the demand for capital goods in an individual firm depends upon a number of other factors besides the interest rate. Individual firms maximize the expected profits from their capital assets. Expected profits depend upon present and future prices, sales and the cost of factors of production. Individual firms can demand excess capital as long as the average price of capital

[1]Animal spirits is a term formulated by the economist John Maynard Keynes. The term was chosen to emphasize the importance of the confidence of businessmen in their future business prospects. Animal spirits may also refer to the inevitable risk involved in investment decisions (Dow and Dow, 2011).

goods is less than the discounted value of their anticipated future earnings stream. Furthermore, an improvement in technology will increase the marginal efficiency of capital, thereby increasing capital investment demand (Kaldor & Trevithick, 1981).

2.4 Neoclassical Accelerator Model of Investment

The initial perspective of the neoclassical model emerged from the simple accelerator model. The accelerator theory was the dominating theory of investment in the 1950s and early 1960s, and is widely used even today in practical growth models. Originating from Clark's (1917) work, this is the simplest investment model and postulates that the investment level is a function of a constant proportion of the change in output. In order to set the fixed ratio between capital stock and output, the model posits a constant returns to scale. Another assumption of this theory of investment is that relative prices of inputs are not important since there is a unique optimal level of capital and labour required to produce each level of output (Crotty, 1992). A further assumption of this model is that substitutability between capital and labour is impossible. Alternatively, the possibility of substitution between capital and labour could be allowed in the case where relative prices matter. However, the only way to maintain a unique relationship between investment and output is to assume that relative prices remain constant.

Due to its unreasonable hypotheses, the simple accelerator has been criticized on a number of grounds. The first limitation stems from its very simplistic assumptions, such as the fixed ratio of desired capital stock to output. The second is its assumption that there is sufficient investment to ensure the desired amount of capital stock. Finally, in this model, factors such as investors' expectations,

profitability and the cost of capital play no role in determining investment behaviour (Jorgenson and Siebert, 1968).

Early implications of the simple accelerator model motivated a number of researchers, such as Goodwin (1951), Chenery (1952) and Koyck (1954), to formalize a flexible accelerator model. This version of the accelerator model was based on the optimal accumulation of capital and retained the output factor as the sole determinant. Jorgenson (1967) developed the most prominent of the neoclassical flexible accelerator theories of investment behaviour. This neoclassical approach was mainly based on the assumption of market competition, and that credit and information are perfectly competitive, while enterprises have perfect expectations and can adjust their capital stock costlessly in all markets. In contrast to earlier theories, Jorgenson (1971) postulated decreasing returns to scale in the production function, where capital and labour are continuously substituted.

Similar to classical theory, Jorgenson's neoclassical theory assumed, enterprises continue to invest when there is a divergence between the marginal product of capital and the marginal cost of capital. Entrepreneurs, therefore, respond instantaneously to relative changes in prices in order to maintain their optimization condition. Based on that, the net investment is the gradual adjustment of the actual capital stock to its desired level, which is derived from the maximization of profit (Aysan et al., 2005). The investment model, from the neoclassical flexible accelerator perspective, can be determined by the expected aggregate demand (the accelerator), the user cost of capital, the wage rate and the initial capital stock.

Furthermore, according to Jorgenson and other studies, profits can work as a guide to businesses by helping them to make judgments about the possibility of future profits. The major motivation for undertaking investment expenditure is based on the anticipation that the investment project will be profitable in the future. In cases where there is no access to investible funds through financial institutions (as is the case in developing countries), firms basically depend on financing their investments out of retained profits. The greater are the levels of profits, the better are the possibilities of self-financing the business (Eisner and Nadiri, 1968; Jorgenson, 1971; Kuh, 1963).

However, others (Aysan et al., 2005; Greene and Villanueva, 1991) have argued that, although the flexible accelerator model has been the most widely applied general theory of investment, and empirical tests of the model have shown some success in developed countries, firms in developing countries face constraints that are not accounted for in the conventional neoclassical theory (Agénor and Montiel, 2008; Shafik, 1992). The model puts forward that the risk, uncertainties and expectations related to future output and input prices are not vital in making optimal investment decisions. Also, unrealistic assumptions are made, including the existence of perfect capital markets, and little or no government intervention, which contradict the structural and institutional factors prevailing in developing countries. Costless adjustment of capital stock (i.e., the market is free of tax and transaction costs) is scarcely applicable in the real world of firm behaviour. The issue of how prices of capital goods are determined is ignored in this theory. Finally, certain variables, such as capital stock, real wages and real financing for debt and equity, are normally either unavailable or inadequate in developing countries.

2.5 Neoliberal Approach to Investment

Due to the absence of well-functioning financial markets in developing countries, the neoclassical assumption of the flexible accelerator model regarding the availability of credit supply from the banking sector cannot be taken for granted. A contradiction with the aforementioned model also arises because of the public deficit and debt, which can lead to financial repression and a reduction in private investment. With these concerns in mind, "liberal" economists such as McKinnon (1973) and Shaw (1973) have advocated financial liberalization and provided an alternative explanation of the investment decision in the developing world.

The core argument in the neoliberal approach of McKinnon and Shaw (1973) is that the level of investible funds is achieved by a rise in the interest rate, through what McKinnon (1973) called the "conduit effect". In a real-world situation, while it is true that the demand for investment is negatively affected by the real interest rate, in the case of developing economies where financial repression is widespread, realized investment actually increases as a result of the greater availability of funds made possible through increases in the real rate of interest.

According to the McKinnon and Shaw (1973) viewpoint, savings are necessary for investment and consequently for growth and economic development within a country. In developing markets, savings resources or mechanisms exist but are often poorly managed. Emerging economies tend to be fragmented, leading to a greater possibility of investments being less productive. Capital accumulation is discouraged due to the fact that, under a high inflation rate, nominal interest rates are set too low and thus real interest rates could be negative. As the capital supply of the banking sector is limited and banks only engage in specialized credit

activities, private investors have to finance their investment projects themselves or go to the informal sector, where interest rates are often high or even usurious.

This line of argument is based on the fact that the liberalization of interest rates will not only motivate savings and hence loanable funds, but will also provide a more efficient mechanism for the allocation of available funds, with the ultimate target of achieving a higher growth rate for the economy. Thus, financial repression in developing countries needs to end, and such countries need to develop their financial spheres so as to increase the real growth of the economy. This view is in direct contrast to the neoclassical approach, which posits a negative relationship between private investment and interest rates. The key limitation of this model is that it neglects the negative effect of higher real interest rates on private investment, through the increases in users' cost of capital that normally follow higher interest rates.

2.6 Disequilibrium Investment Approach

As the search for an optimal model of investment continued, another set of alternatives, known as the "disequilibrium models of investment", emerged. The origin of these models can be traced to the works of Malinvaud (1982) and Sneessens (1987). They are based on the idea that investment depends on profitability and output demand conditions. Malinvaud (1982) posited that investment decisions could be separated into two major phases. The first included decisions relating to the expansion of the level of productive capacity, which in turn would depend on the level of capacity utilization in a given economy. The second phase comprised decisions relating to the capital intensity of the extra capacity, which would also be dependent on the cost of capital and labour input.

This theory was further developed by Sneessens (1987), who proposed that net investment was positively related to the gap between actual and long-run equilibrium capacity. This gap was perceived as reflecting the divergence between actual and equilibrium rates of capacity utilization (sales constraints), and actual and equilibrium mark-up rates (profitability). It was thus assumed that this situation of disequilibria was what impacted investment behaviour. The simplistic assumptions of disequilibrium models are based on rational expectations and market disequilibrium existing side by side. Therefore, the market disequilibrium model and rational expectations can be combined to explain the determination of investment.

The theories are not necessarily mutually exclusive. For instance, in establishing investment models for developed countries, different approaches are usually integrated in what has been called a neoclassical flexible accelerator model (Catinat et al., 1987; Sakr, 1993).

2.7 Investment Theory and Developing Countries

The aforementioned theories provide a basis for an econometric analysis of investment determinants in developed countries, with flexible accelerator models being the most widely applied and empirically supported. However, a lot of criticism has emerged in the last few decades regarding the applicability of the abovementioned theories to investment in developing countries. They appear to be less successful in modelling the case of developing countries, whose economies operate considerably differently from those of developed countries. A number of deficiencies in the characteristics of developing countries deter the application of such models in their entirety.

The key factors that limit successful application of these models to developing countries are as follows:

(i) The absence of well-functioning financial markets: active stock exchanges are rare in developing countries and distortions arise from foreign exchange constraints. The free exchange of domestic and foreign currencies is usually restricted, thus the domestic currency is maintained at an overvalued level by the government in order to slow down the inflation rate (Aysan et al., 2005).

(ii) The strong role of the government in the economy: with the aim being to increase the level of private investment in manufacturing, the interest rate is often kept much lower than the market rate (Khan and Khan, 2007b; Wai and Wong, 1982).

(iii) Economic data, such as on international debt, the capital stock, nominal wages, and the marginal efficiency of capital , along with other data and information, do not exist, or are irrelevant or difficult to calculate.

(iv) There are many conceptual differences between the economies of developed and developing countries, such as expected returns, optimal profit and marginal efficiency for cost and product (Greene and Villanueva, 1991; Majeed and Khan, 2008; Malik et al., 2012).

Since the 1980s, the IMF and the WB have been examining the determinants of private investment in developing countries, aiming to make the private sector the engine of growth. A fundamental question has been raised: "How does private investment respond to changes in government policy, not only in designing long-term development strategies, but also in implementing short-term stabilization programs?" (Blejer and Khan, 1984). Another question raised is the following: If it can be supposed that increasing private investment will increase output, what

factors most influence private investment in developing countries? Economists from these international organizations have further studied the restrictions on investment in such countries and have suggested several economic policies aimed at stimulating the private investment decision (Everhart and Sumlinski, 2001).

In recent times, another stream of theoretical literature, focusing on the rather complex issue of irreversible investment under uncertainty, has led to an adjusted and extended account of the determinants of investment. In contrast to the traditional theories, this approach has led to the emergence of a new view of investment, emphasizing three important features of most investment decisions that are neglected by the conventional approaches (Dixit and Pindyck, 1994). First, most capital investments are partly or completely irreversible: the initial cost of investment is at least partly a sunk one. This means that the initial cost of investment cannot be retrieved completely by selling the capital once the investment decision has been taken (Pindyck, 1991). That is, disinvestments are very costly as alternative uses for such firm-specific capital goods are hard (if not impossible) to find. Examples of such costs include expenditure on major infrastructure such as buildings, roads, and bridges, and the purchase of certain types of machinery. Second, investment decisions might face an element of risk that arises from uncertainty about the future returns on an investment project. This indicates that the best investors can do is to attach probabilities to the potential outcomes associated with profits or losses. Third, investors can decide on the timing of their investment. This implies that investors have the choice to postpone an investment while they assemble accurate information about the future outcomes.

The theoretical expectations about how the element of uncertainty affects investment differ but most studies assume a negative relationship. Various forms of uncertainty have been used, such as economic, social and political instability (Pindyck, 1991; Serven, 2002; Campos and Nugent, 2003). In the case of developing countries, uncertainty can be measured in terms of volatility of inflation, the exchange rate, output, and terms of trade.

Therefore, empirical studies of the determinants of private investment in developing countries have used a much more eclectic model of private investment, initially based on the neoclassical flexible accelerator model, in order to capture the characteristic institutional and structural features of those economies, in which uncertainty often prevails (Asante, 2000; Atukeren, 2005; Aysan et al., 2005; Blejer and Khan, 1984; Serven and Solimano, 1992; Sundararajan and Thakur, 1980; Wai and Wong, 1982).

2.8 Summary

This chapter has attempted to shed light on the most relevant investment models in the context of the developed countries, with consideration of the issues surrounding investment theory and developing countries. The theoretical literature on private investment is quite rich and diverse. Based on what has been discussed above, investment is an important factor affecting economic growth. Reviewing the main investment theories, namely classical, Keynesian, neoclassical (simple and flexible accelerator), and disequilibrium, which relate to old, industrialized countries, allows this study to identify the most important factors that can influence investment aimed at the achievement of optimal growth.

The classical economists believed that investment was a function of profit, and was in turn affected by the interest rate. Keynes argued that the marginal

efficiency of capital determined investment. He emphasized that government intervention increased aggregate demand and encouraged investment, even if the economy did not operate at full employment and/or full capacity. Keynes also believed that the expectations of investors about the marginal efficiency of capital or the capital rate of return in the future were the key element in this regard. Meanwhile, the neoclassical economists observed that the maximization of profit could be the most important determinant of investment. The neoliberal approach, in contrast to the conventional theories, argued for the existence of a positive relationship between private investment and the interest rate, indicating that a high interest rate would not only motivate savings and hence loanable funds, but would also promote a more efficient mechanism for the allocation of available funds, with the ultimate target of achieving a higher growth rate for the economy. Disequilibrium models of investment were also included in the review. They are based on the idea that investment depends on profitability and output demand conditions. Finally, due to irreversible investment, especially in the case of developing countries, more recent literature has introduced an element of uncertainty into investment theory. In general, based on the aforementioned theories, private investment depends on broad categories of variables, such as the growth rate of GDP, internal funds (e.g., a change in the credit provided to the private sector), capacity utilization, the real interest rate, the user cost of capital, public investment, and finally uncertainty variables, which will be detailed in the next chapter.

A surprising feature of the investment literature is that little attention has been paid to understanding investment behaviour in the context of developing countries. The models are almost exclusively adapted to old industrialized countries with an acceptable degree of success (Bischoff, 1971; Clark, 1979).

However, as yet, empirical studies have not clarified which of these models is the most accurate representation of the way that capital formation occurs in developed countries. In the case of such countries, the assumptions underlying the standard optimizing investment models are usually not applicable since investment decisions in developing countries face certain constraints that are not accounted for in these conventional investment theories. Thus, a modified version of the neoclassical model has been proffered to analyse investment behaviour in developing countries, in order to capture the characteristic institutional and structural features of these economies.

CHAPTER 3 EMPIRICAL LITERATUE ON INVESTMNET

3.1 Introduction

The theoretical and empirical literature on investment in the context of developed countries is enormous. In contrast, the literature concerned with the determination of investment in developing countries is sparse. Undoubtedly, since it has been recognized, as discussed in chapter 2, that most of the investment theories are not applicable to the context of developing countries, there have been notable challenges to developing an analytical model of investment tailored to such countries. Overall, a common feature of the empirical studies in the last two decades is that they have been limited and based on the simple adoption of one of the traditional models, such as the neoclassical accelerator, the Keynesian approach, or a combination of one or two of these relevant theories. Some other empirical studies have relied on simple equations that comprise a number of variables believed to be relevant to the investment decision. Although these studies have some limitations, they have introduced a somewhat valuable view of the process of capital formation in the case of developing countries.

Although the significance of private investment for achieving sustained economic growth has been widely confirmed in the empirical literature, less is known about what induces private firms to invest in developing countries. In fact, developing countries do not always operate in a competitive environment and they often face constraints that are not accounted for in the theoretical models. This partially explains why economists do not generally agree on the determinants of investment in the developing world (Aizenman and Marion, 1993, 2003; Faini and

De Melo, 1992; Greene and Villanueva, 1991; Khan and Reinhart, 1990; Serven and Solimano, 1992; Sundararajan and Thakur, 1980; Wai and Wong, 1982).

Since the 1980s, there has been a broad consensus that private-sector-led growth has a stronger positive impact on economic growth than public-sector investment, owing to the fact that the former is relatively more efficient (Frimpong and Marbuah, 2010). Since then, as socialist regimes have collapsed one after another, the economic activities of the private sector have increased in developing countries, while the public sector has regressed, and the general conviction has been that the private sector can lead the way to economic development (Ouattara, 2004). In these countries, in order to develop the private sector as a basis for sustainable economic growth, structural adjustment programmes and sectoral reforms have been adopted.

The question of how developing countries can promote sustained growth by stimulating private investment has become important. Hence, policy makers have put great effort into determining how private investment responds to changes in government policy – not only in terms of long-term development strategies, but also in response to short-term stabilization programmes (Blejer and Khan, 1984; Serven and Solimano, 1989). Even if there is agreement among economists that an increase in private investment has a clear positive effect on economic output, it is still essential to clarify the determinants of private investment, in developing countries in particular. Therefore, one of the significant contributions of this study is its attempt to extend the existing empirical literature on private investment in developing countries by examining the main determinants of private investment in countries such as Iraq.

This chapter aims to determine the factors that influence private investment in developing countries and to examine the most effective policies for stimulating private investment in such countries. It attempts to cover a variety of topics relevant in modelling private investment. The chapter is organized as follows: The next section provides an empirical review of determinants of private investment in developing countries, the relationship between private and public investment, and how they impact on economic growth. Section 3.3 deals with the overall trend in private investment in developing countries, while Section 3.4 examines the impact of macroeconomic policies on private investment, which includes the impact of monetary and credit policies, fiscal policy, and the exchange rate, along with other factors such as irreversibility and uncertainty. In Section 3.5, the effects of non-economic factors on private investment are considered. The relationship between oil revenues and private investment is investigated in Section 3.6. Private investment and FDI are studied in Section 3.7. The final section provides concluding remarks.

3.2 Empirical Review: Determinants of Private Investment in Developing Countries

This section attempts to examine the enormous number of theoretical and empirical studies of the investment process in the developing world. Most of the empirical studies have used single-equation models based on the neoclassical flexible accelerator model of investment (Khan and Kumar, 1997; Khan and Reinhart, 1990; Mankiw et al., 1992; Wai and Wong, 1982). These studies have also tended to incorporate specific investment determinants, including, most often, financing availability and the role of government investment. Some other factors, such as the inflation rate, external inflows, the size of external debt, market structures, the level of protection, the degree of price distortion, the real exchange

rate and uncertainty, have also been explored. Thus, a number of empirical studies have argued that, once modified to accommodate these considerations, the classical models of investment are applicable to developing countries (Blejer and Khan, 1984; Sundararajan and Thakur, 1980; Wai and Wong, 1982). In these studies, however, the degree of modification required has varied from minimal to fundamental. The following discussion aims to provide a general overview of several of these studies, focusing briefly on the major factors affecting investment in developing countries.

3.2.1 Private and Public Investment Relationship

In the last few decades, one of the most important issues in macroeconomic and development economics has been the impact of public and private investment on economic growth. This has been the subject of renewed consideration in the academic literature. There is a general consensus that these two elements of investment have differing impacts on economic growth and social conditions. Since the distinction between public and private investment matters for economic growth, it is essential that we understand the linkages between these two components.

In an early study, Sundararajan and Thakur (1980) examined the relationship between public and private investment in two developing countries, India and Korea, as part of a growth model, through the application of the neoclassical investment model. The empirical results confirmed that public investment crowded out private investment by limiting the availability of financial resources for private investment. The results further showed that, because the availability of financial resources was lower in India than in Korea, the crowding-out effect was much higher in India than in Korea. Dynamic simulations of the model produced

different response patterns of private investment in the two countries, with the effects of interest rate volatility on investment and savings different, but significant in both countries.

Naqvi (2002) examined the relationship between public and private investment and economic growth in Pakistan by adopting a cointegrated VAR (vector autoregressive) based approach over the period 1964-2000. The annual change in the real exchange rate was used as a proxy for uncertainty, and was also utilized in short-run VECMs under the hypothesis that investment decisions are likely to be affected by recent uncertainty. A model based on the accelerator model hypothesis suggested that economic growth generated both public and private investment; however, investment by itself did not appear to have a significant influence on economic growth. The empirical results suggested that past public investment exerted a positive impact on future private investment. However, uncertainty was shown to have a greater significantly negative impact on private investment than public investment.

Cavallo and Daude (2011) examined the relationship between public and private investment using panel data from 116 developing countries over 1980-2006. The empirical results suggested that the crowding-out effect was smaller in countries with more developed institutions, and when the marginal productivity of public investment was considerably higher. The study also argued that the magnitude and sign of the estimated coefficient of public sector investment relied on a number of factors, such as institutional quality and the implementation of policies associated with market access, in terms of both trade and finance. However, Erden and Holcombe (2006) used several pooled specifications of a standard investment model and a panel of developing countries over 1980-1997 and confirmed that

public investment complemented private capital formation and that, on average, a 10% increase in public-sector investment was associated with a 2% increase in private capital formation.

Based on Namibian data, Kandenge (2007) adopted the endogenous growth framework to examine the impact of public and private investment on economic growth over the period 1970-2005, using cointegration and error correction methods. The empirical results showed evidence of a crowding-in effect between private and public investment, although private investment showed a much stronger impact on economic growth than public investment, which was consistent with earlier empirical results (Khan and Reinhart, 1990; Serven and Solimano, 1993). The empirical results further suggested that – in addition to public and private investment – export volumes, economic freedom, labour size and human capital all positively influenced economic growth in both the short and the long run. In contrast, the real exchange rate and terms of trade were found to have an adverse effect on economic growth in the short and the long run.

Khan and Reinhart (1990) examined the relative effects of private and public investment on economic growth, indicating that private investment had a larger positive impact on growth than public investment. The authors also argued that, despite the growing support for market-oriented strategies, and for a greater role of private investment, the empirical growth models for developing countries typically made no distinction between the private and public elements of investment. They proposed that private and public investment should be separated, and that economic growth should be assumed to be a function of the ratio of private investment to GDP, the ratio of public investment to GDP, and the growth rates of the labour force, exports and imports. Their empirical results

showed private and public investment to have different effects on long-run economic growth, with private investment playing the dominant role, in developing countries. The only shortcoming of the study was that it failed to show the complementary effect of private and public investment in terms of public infrastructure investment in elements such as electricity, roads, communications, the education system etc.

Baghebo and Edoumiekumo (2012) developed a Solow neoclassical growth model to examine the effect of macroeconomic variables, such as inflation, the interest rate, the size of domestic capital accumulation and public investment, on economic development in Nigeria between 1970 and 2010, using a Johansen cointegration test and error correction models. The empirical results showed that economic growth in Nigeria was positively affected by all of the macroeconomic variables in the model, consistent with the theorized effects of both private and public investment, while the results for inflation and the real interest rate contradicted the a priori expectations of the study. Similarly to Kandenge (2007), this study showed positive signs for the effects of both public and private investment, confirming the crowding-in effect between these two variables, although the later has found that private investment have larger and more effective impact than public investment in the long run.

Accordingly, many empirical studies have examined the interaction between public investment, private investment and economic growth, and the results on the effect of public investment on private investment have been mixed. Some research demonstrates a crowding-out effect in some countries, whereas other research show a crowding-in effect in other countries. Even when considering the same country, studies show conflicting results, but this could be because of different

methodological approaches and time periods. It can be concluded from the earlier discussions that the interaction between private and public investment and their effects on economic growth could differ among countries, and that the debate can only be settled with country-specific evidence.

3.2.2 Determinants of Private Investment

In an early study, Wai and Wong (1982) estimated a model of the determinants of private investment for five developing countries (Malaysia, Greece, Thailand, Mexico and Korea). The model was based on a modified version of the flexible accelerator model of investment. The empirical study revealed that private investment in those countries largely depended on government investment, the change in bank credit provided to the private sector, and the inflow of foreign capital to the private sector. The study further found that the net effect of government expenditure on private investment was positive for three of the countries (Greece, Korea and Malaysia).

A formal framework for studying private investment in developing countries was first developed by Blejer and Khan (1984). Their study made a significant contribution to the empirical literature by making notable progress towards deriving an aggregate investment function under an optimizing framework. The authors argued that the assumptions underlying the standard optimizing investment models were not applicable in the context of developing countries because of institutional and structural constraints such as data problems, the absence of well-functioning financial markets, the relatively strong role of the government in capital formation, foreign exchange shortages, a heavy dependence on imported capital goods, economic and political instability, deficiencies in infrastructure, a lack of skilled labour, and deficiencies in structural reform. Due

to the above constraints, they developed a flexible accelerator version, taking into account the relevant data problems and structural features, to specify private investment behaviour precisely for 24 developing countries over the period of 1971-1979.

Blejer and Khan (1984) argued that the neoclassical investment theory was significantly supported by the data from developing countries. However, the estimation results contrasted with the neoclassical assumptions, and the study failed to prove that public investment crowds out private capital formation, showing instead that public investment has a positive impact on private investment due to the latter being highly constrained in developing countries by the availability of finance, monetary policy and the flow of credit to the private sector. Furthermore, the study assumed that the response of private investment could be influenced by three main factors: the stage of the economic cycle, the availability of financial funds, and the level of public investment. The study was extended to make a distinction between government investment associated with the development of infrastructure and government investment of other kinds. The estimation results of the study revealed that public-sector infrastructure investment was complementary to private investment, while other kinds of public investment would tend to compete with private investment's share of total investment and the ratio of total investment to income. The results also indicated that the larger was the share of private investment, the higher would be the average growth rate of the economy. The results called for the testing of formal models of private capital formation in individual countries.

Similarly, Chhibber et al., (1988), studied public policy and private investment in Turkey. Their study revealed that changes in the composition of public

expenditure, towards the provision of major infrastructure facilities, had a positive and significant effect on private investment. This result appears reasonable, especially in the case of developing countries where certain types of infrastructure, such as good roads, transportation, communication facilities, the electricity supply etc., are limited, and thus the development of such facilities by the public sector is essential for accelerating the necessary growth.

Another important study on developing countries was carried out by Greene and Villanueva (1991), who examined the effect of various macroeconomic factors on private investment in 23 developing countries over the period 1975-1987. Their study also supported other empirical studies in showing that the original version of the neoclassical flexible accelerator model was not applicable to the case of developing countries due to its main assumptions of perfect capital markets and little or no government economic intervention. According to their empirical evidence, private investment has a positive relationship with real GDP growth, but is negatively related to domestic inflation, the real interest rate, and the ratio of debt to GDP. They concluded that adopting efficient economic policies was highly important for promoting and sustaining private investment in developing countries. Their model has some shortcomings: First, there is an issue with the level of economic growth studied, with the majority of countries in the sample relatively more advanced in economic growth than most developing countries. Second, some of the variables in the model, such as inflation and external debt, have a correlation misspecification. Third, the model is a single-equation model of investment that cannot be applied to all developing countries. Fourth, the model is ad hoc and there is insufficient theoretical explanation to support the results. Therefore, the results cannot be generalized to all developing countries.

In line with earlier studies, Serven and Solimano (1992) were the first to bring attention to the effects of different macroeconomic policies, for example monetary and fiscal exchange rate policies, and uncertainty over private investment in developing countries. They mainly considered the interaction of public and private investment and the effects of exchange rate policy in their study. They also analysed the significance of financial constraints, the imperfection of capital markets, and the effect of political instability on irreversible investment decisions. They argued that aggregate economic activity and political and macroeconomic instability had the potential to influence private investment.

A study conducted by Oshikoya (1994) is also considered a prominent early study in the empirical literature explaining investment behaviour in developing countries. The study investigated macroeconomic determinants of private investment using a sample of seven African countries for the period 1970-1988. Four were middle-income countries (Cameroon, Morocco, Mauritius and Tunisia) and three low-income (Kenya, Malawi and Tanzania). The estimation procedure used was the ordinary least squares (OLS) approach. The explanatory variables assumed to explain private investment in these countries were the real economic growth rate, the real deposit rate of interest, changes in the terms of trade, the public investment to GDP ratio, the inflation rate, and the lagged debt service ratio. The estimated empirical evidence showed private investment to be positively related to public investment and the real interest rate for the middle-income countries. For the low-income countries, the results confirmed a significantly negative relationship between private investment and the inflation rate, while the relationship between the real exchange rate and private investment was also found to be negative but insignificant. The study also showed that the supply of domestic credit to the private sector had a positive and significant

impact on the level of private investment activity in both the low- and middle-income countries covered.

In another study, Jaspersonet et al. (1995) confirmed that a high level of private investment was common in countries with high growth rates and a high level of access to financial resources, but that high inflation rates and government deficits were insignificant factors. A further discovery was that a high level of private-sector investment tended to be common in countries with relatively open economies, which can be measured by the share of trade flows in GDP.

Zerfu (2001) conducted a study on the macroeconomic determinants of private investment in Ethiopia, using time-series data, for the period 1965-1999. The empirical results revealed that GDP, public investment in infrastructure, and foreign exchange availability all had positive effects on private investment. In contrast, Getnet (1992), which was cited in the work of Hailu (2015), found a negative relationship between public and private investment in a similar study in Ethiopia, showing a crowding-out effect of public investment on private-sector activities.

Ouattara (2004) assessed the determinants of private investment in Senegal over the period of 1970-2000. This study was also based on the flexible accelerator model, adjusted to take into account foreign aid flows and terms of trade that were posited to be additional essential determinants of investment in developing countries. Also discussed in this study was the idea that foreign aid flows could increase private-sector investment through the conditions attached to them. One condition attached to these flows since the 1980s has been that the recipient country has to privatize some of its publicly owned enterprises. Aid can also increase private investment if donors use it to provide private credit via local

institutions and non-governmental organizations. The analysis in Ouattara' s (2004) study showed that private investment was positively affected by public investment, real GDP and foreign aid, but negatively affected by credit to the private sector and terms of trade.

Similar to Blejer and Khan (1984), Sakr (1993) aimed to emphasize the effect of public investment on private investment, by classifying public investment into infrastructural and non-infrastructural components. The findings showed infrastructural government investment to have a positive impact on private investment, but non-infrastructural government investment to have a negative one. A recent study by Khan and Khan (2007) conducted in Pakistan attempted to analyse the determinants of private investment over the period 1972-2005. An autoregressive distributed lag (ARDL) cointegration approach was employed to detect the existence of a long-run relationship and the short-run dynamics of investment. The results of the analysis showed most traditional factors to have little or no impact on private investment. The authors found partial support for the accelerator principle and the crowding-out hypothesis in the case of Pakistan. The study failed to find proof for the McKinnon-Shaw hypothesis (see Section 2.5).

With the increasing interest in investment behaviour in developing countries, Naa-Idaret al. (2012) examined private investment behaviour in Ghana using data for the period 1960-2010, focusing on whether political instability hampered or encouraged investment in Ghana. Additional variables included GDP, inflation, external debt, the exchange rate, public investment, aid, trade openness and credit provided to the private sector. The empirical results showed that political stability, GDP, inflation, trade openness and credit provided to the private sector positively

influenced the private investment level in Ghana, while public investment, the exchange rate, external debt and aid had a negative influence.

In a study on Muslim developing countries, Salahuddin et al. (2009) attempted to examine potential determinants of investment behaviour in a panel of 21 countries over 1970-2002. The authors argued that, despite enormous growth potential and resources, the overall growth and investment rates of most Muslim developing countries were, on average, lower than those of non-Muslim developing countries. They traced this to several reasons, including unbalanced economic growth and development, a high level of consumption, and poor industrialization. In addition, the levels of investment and saving in most Muslim developing countries are unsatisfactory. Raimi and Mobolaji (2008) attributed the low rates of investment and growth in Muslim developing countries to other factors such as the low level of technological development, low levels of trade and financial openness, lower savings, political instability, lack of infrastructure, poor institutions, and high amounts of foreign debt accompanied by high production costs. These common characteristics may provide the best explanation for the insufficient rate of private investment in these countries. Therefore, it can be argued that Muslim countries such as Iraq face different challenges to other countries in their attempts to achieve investment and growth targets (Raimi and Mobolaji, 2008).

Following the recent trend in the literature on investment, a study carried out by Bakare (2009) used the flexible accelerator model to analyse economic and non-economic factors, aiming to assess the variables with the most influence on private domestic investment in Nigeria. The variables investigated included GDP, public investment, the exchange rate, inflation, the corruption perception index, macroeconomic instability, infrastructure, political instability and savings. The

empirical results revealed GDP and savings to have a positive impact on private investment, and the exchange rate, inflation, the corruption perception index, macroeconomic instability, infrastructure, political instability and public investment all to have a negative impact. The study further argued that private investment could have a stronger and more favourable influence on growth than public investment, because public investment might be less efficient and could be associated more closely with corruption. Furthermore, political and macroeconomic instability were shown to present a major hindrance to private investment. The further study on Nigeria by Kehinde et al. (2012), who examined private domestic investment over 1970-2008, found similar results regarding the effect of macroeconomic instability and the political situation on private investment. They argued that these two factors represented big obstacles to private investment due to their augmenting of uncertainty. However, the results contradicted earlier studies by finding a "crowding in" effect of public investment on private domestic investment in Nigeria.

Yin (2011), applied Johansen cointegration techniques with an error correction model to data from 1975-2009. The results showed that, in the long run, private investment decisions were mainly determined by output, domestic credit, the interest rate and government spending, and indicated that a competitive interest rate stimulated Malaysia's private investment. However, increased public spending was found to crowd out private investment. In the short term, private domestic investment was explained by economic output, domestic credit, the interest rate and government investment.

The review of the empirical literature has identified that growth in real GDP, the real interest rate, the debt service ratio, public sector investment, net capital

inflows, GDP per capita, the availability of credit to the private sector, the real exchange rate and the rate of inflation, among others, explain private investment behaviour in most developing countries. However, some differences have been found in the signs of their effects on private investment. This is particularly the case for public-sector investment and inflation. In addition, most of the reviewed studies were based on cross-country data.

3.2.3 Determinants of Public Investment

Renewed interest has been shown in empirical studies into the different types of public investment expenditure and how they may impact economic growth (Blejer and Khan, 1984; Sakr, 1993). In order to explain the function of the public sector, the theory of public expenditure growth will be briefly reviewed here. An inevitable starting point is Wagner's law of "expanding state activity", which was formulated at the end of the nineteenth century (Lamartina and Zaghini, 2011). This law stated that, with rising per capita income in industrializing countries, the public sector's relative share of national output would rise. Wagner offered three reasons for this: first, with industrialization there would be increased need for the administrative and protective functions of the state. Second, the cultural and welfare functions of the state would expand, especially those connected with education and income distribution. Finally, with the change in technology that would follow industrialization and the increasing capital requirements of many industries, the state would intervene to protect consumers from private monopolies and, therefore, the direct investment role of the government would expand. Wagner did not see war and defence as playing a role in the expansion of public expenditure. However, war and defence expenditure, in some countries at least, proved to be one of the most important causes of the growth of public expenditure in the last century (Bird, 1971).

It is widely accepted that Wagner's law is highly supported by the empirical evidence of public sector growth. However, some of its assumptions need to be adjusted to bring them in line with the available evidence. An earlier study by Groenewegen (1970) proposed that there were many reasons for the phenomenon of public sector growth, which can be summarized as follows:

(i) The effect of economic growth on public sector expenditure, as proposed by Wagner's law, plus the need for growth in defence spending as a product of industrialization, either because of the rising significance of the protective function of the state or due to the pressure for regional and market expansion, and maintaining foreign investment.

(ii) The high income elasticity of demand for public goods at a certain stage of development. Musgrave (1959), in his study of fiscal systems, found variation in the income elasticity of demand for public goods in three ranges of per capita income levels. At a low level of per capita income, associated generally with pre-industrial society in developing countries, demand for public goods was generally very low because almost all income is devoted to satisfying basic needs. When per capita income starts to increase, the demand for goods supplied by the public sector becomes more important. Therefore, public sector expenditure will expand at a rate faster than that of the private sector. Finally, at the high levels of per capita income associated with developed countries, public sector growth will slow down until public and private expenditure grow almost at the same rate.

(iii) The productivity differential between the public sector and the private sector. When the productivity of the resources used in the public sector grows more slowly than that of similar resources used in the private sector,

there is a greater relative need for inputs to produce a given output in the public sector.

(iv) War expenditure appeared to have what was called a "displacement effect" (Peacock and Wiseman, 1979). This study argued that government expenditure had to be increased during a post-war period, indicating that improvements to transportation and communications, for example, required central government intervention through the provision of equalization grants to improve the different standards of public services in various parts of a country. In summary the major aims of government expenditure are to achieve economic stability, full employment and price stability. Some economists also stress national security, social security, economic and social progress, and political stability. The latter is an important objective for all countries because, without it, economic stability cannot be achieved.

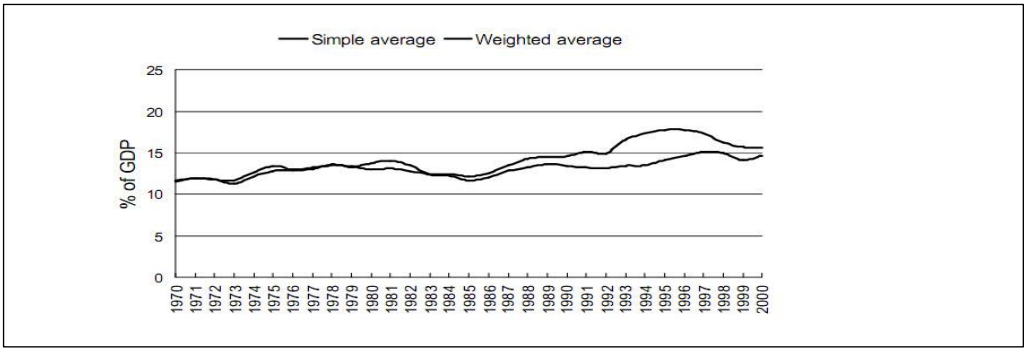
Based on the above arguments, public investment has a significant impact on economic growth and is responsible for providing a healthy environment for private investment in the case of developing countries. However, only a small number of studies have analysed the determinants of public investment in these countries. They have placed a particular emphasis on the effects of per capita income, government current expenditure and oil revenue in explaining public investment (Clements et al., 2003; De Haan et al., 1996; Saghir and Khan, 2012; Välilä and Mehrotra, 2005).

3.3 The Overall Trend of Private Investment in Developing Countries

The growing interest in investment behaviour in developing countries became more apparent during the late 1980s. The debt crisis of the early 1980s and

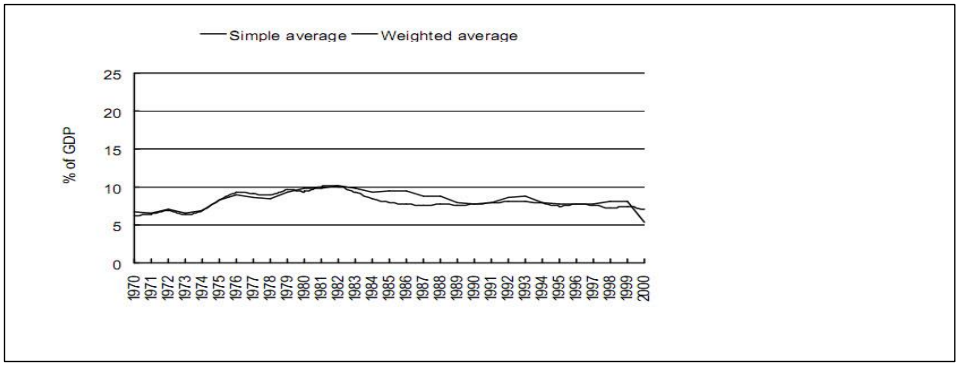
subsequent global shocks that affected developing countries led to a drastic decline in capital formation. Since the 1980s, the opinion has been growing that private investment may be more efficient and productive than public investment in developing countries (Khan and Reinhart, 1990; Serven and Solimano, 1990), given that the average ratio of private investment to GDP in 90 developing countries has increased slightly from just above 10% to above 15% between 1970 and 2000 (see Figure 3.1). In contrast, public investment has shown a downward trend, with the average ratio of public investment to GDP declining from 10% in the early 1980s to just above 5% in 2000 (see Figure 3.2) (Everhart and Sumlinski, 2001). As a result, many developing countries took a new approach, shifting from the post-war era of state-dominated investment programmes to market-oriented structural reform efforts. Based on policy-induced incentives, reform programmes under the new paradigm were adopted to varying degrees by almost all countries of the developing world in the mid-1980s. Ultimately, this meant that the old paradigm of catching up with the leaders was now largely left in the hands of the private sector, in an environment with greater market reliance. Since then, private investment has continued to be recognized as an essential factor for economic growth and more productive than public investment (Khan and Kumar, 1997; Khan and Reinhart, 1990; Serven and Solimano, 1990).

Figure 3.1: Trend in private investment in developing countries (1970–2000)



Source: Everhart and Sumlinsk, (2001), P 1.

Figure 3.2: Trend in public investment in developing countries (1970–2000)



Source: Everhart and Sumlinski (2001), P 2

Further to this, Pfeffermann and Madarassy (1991) attempted to evaluate the trend in private investment in 40 developing countries using annual data for the period 1970-1989. They showed that, on average, private investment increased in developing countries in the first half of the 1980s and its share of total investment increased in about 34 of the 40 countries in this period. The average ratio of private investment to total investment increased from 52% in 1985 to over 60% in 1989. They further argued that the increased share of private investment in gross domestic investment, and reduced activity in the public sector, were a reflection of the world crisis and government policy aimed at controlling inflation by reducing public deficits.

What is clear from the above studies is that private investment has become an important channel for influencing economic growth in these countries. However, in the designing and implementing of the new policies, it was soon realized that clear knowledge about how investment is determined and how a strong private investment response could be encouraged was largely absent. Indeed, since the debt crisis, private investment in developing countries had slowed substantially, remaining depressed throughout the decades. Signs of recovery had been very slow and weak during the late 1980s, often lagging behind stabilization and

adjustment efforts by several years. In some cases, a strong private investment response did not come into play at all, leading to a halt in the sustainability of stabilization and structural adjustment programmes, and hence to the collapse of adjustment efforts.

3.4 Macroeconomic Policies and Private Investment

It has been observed that monetary, fiscal and exchange rate policies aimed at correcting unsustainable macroeconomic imbalances are bound to affect private investment (Aysan et al., 2006; Montiel, 2011; Serven and Solimano, 1992). As mentioned earlier, there have been very few notable attempts to develop an analytical model of investment adapted specifically to a developing country. Existing empirical studies in this field are also simple and limited both in number and scope. Overall, the common characteristics of these studies are that the estimated investment functions are either a simple adaptation of one of the traditional models such as the neoclassical accelerator, or endogenous, or a combination of two of these models. Some other studies simply depend on an estimation of an empirical model involving a number of variables believed to be related to private investment activity. In spite of these limitations, the existing literature has provided valuable knowledge on the process of capital formation in the context of developing countries.

The basic notion here is that the correction of macroeconomic imbalances and the achievement of macroeconomic stability are prerequisites for attaining sustained growth. In turn, a strong response of private investment to the set of macroeconomic policies imposed by an adjustment programme is a basic element for economic stabilization, and would certainly be followed by sustained growth

(Serven and Solimano, 1992). Key macroeconomic policies that affect investment decisions are discussed in the rest of this section.

3.4.1 The impact of monetary policy on private investment

Monetary policy is one of the principal economic management tools that governments use to shape economic performance (Olweny and Chiluwe, 2012). According to the theoretical literature, a stable macroeconomic environment requires a prudent monetary policy. Compared to fiscal policy, monetary policy can more quickly resolve economic shocks. Kahn (2011) argued that monetary policy objectives were concerned with the management of multiple monetary targets, including the promotion of growth, price stability, achieving full employment, preventing financial crises, smoothing the business cycle, and stabilizing long-term interest rates and the real exchange rate. That these objectives are not all consistent with each other is noticeable, as the preferences of monetary policy objectives are based on the weights given to them by the monetary authorities, or the country's priorities. A number of studies have shown that emphasis is usually placed on retaining price stability or ensuring low inflation (Dailami and Giugale, 1991; Khan, 2011; Khan and Khan, 2007).

Therefore, price stability and low inflation are among the key objectives of monetary policy. Since high inflation rates have an adverse impact on investment by increasing the risk associated with long-run projects, inflation will lower productivity growth, as well as depressing output growth by decreasing real investment (Fischer, 1993). The policy recommendations for attaining these aims are based on the concepts of monetarism (Abdou, 1997; Greene and Villanueva, 1991; Khan and Khan, 2007; Raimi and Mobolaji, 2008; Serven and Solimano, 1992).

Abdou (1997) argued that a positive effect on private investment from restrictive monetary and credit policies can be expected if inflation is reduced and price stability is achieved. In other words, a macroeconomic environment in which the uncertainties associated with high and unpredictable inflation are reduced may attract private investors. However, this phenomenon can only be achieved in the medium or the long run. In the short run, the policies of monetarism tend to reduce private investment (Abdou, 1997).

Thus, recently, increasing attention has been paid to the impact of monetary policy on private investment decisions, with suggestions that there is a significant impact on the determination of private investment and its performance in both the short and the long run. Conventionally, private-sector investment can be influenced by monetary policy through three channels: the interest rate, the demand for money, and credit. In less developed countries, Kahn (2011) confirmed that underdeveloped financial systems and weak interest rate responsiveness constrain the use of the interest rate and the demand for money channels due to limited applicability. However, it has been argued that monetary policy is effective on the asset side of financial intermediation (the credit channel), where it tends to have a greater impact.

Furthermore, Van Wijnbergen (1982) stressed the importance of the institutional structure of the financial markets to any understanding of the effects of monetary and credit policies on investment and how such policies are conducted in developing countries. A number of studies, including Azam and Lukman (2010), Dailami and Giugale (1991), and Van Wijnbergen (1982), have indicated that there is a direct effect of tight credit policies on the stock of available credit for investment, rather than an indirect effect through the interest rate, since credit

provision is characterized by access to borrowing at preferential interest rates for firms. Firms with better access to the credit market will have higher levels of investment, implying that credit availability has a positive direct effect on private investment.

Understanding the role of interest rates is also essential to understanding how private investment decisions are influenced by monetary policy. According to the neoclassical assumption, savings and investment can be equalized via the interest rate mechanism. This means that, where government spending increases are funded out of domestic debt, interest rates will increase to bring the capital market into equilibrium, reducing private-sector investment. This view is supported by the key proposition that the money supply remains constant. Should the money supply increase or accommodate fiscal spending, then interest rates may remain constant or decrease depending on the growth of the money supply and therefore liquidity in the economy (Kutepel, 2005; Olweny and Chiluwe, 2012).

From the firm's point of view, monetary policy affects the private sector through the cost of capital, its effect on investment decisions and the internal rate of return (Gaiotti and Generale, 2001). This implies that a monetary policy that facilitates the provision of credit for private-sector investment will stimulate private investment, whilst a tight monetary policy that restricts the credit provided to businesses will discourage private-sector growth.

In the recent literature, a number of studies have emphasized that restrictive monetary and credit policies lead to an increase in the real cost of bank credit and thus the user cost of capital, in turn causing a decrease in private investment (Todaro and Smith, 2009). Similarly, Serven and Solimano (1992) indicated that a restrictive monetary policy aimed at reducing inflation and/or the current account

deficit would affect investment decisions through two channels. First, it would increase the real cost of bank credit, which is a major source of investment financing in developing countries. Second, it would increase the opportunity cost of retained earnings or internal funds, also a vital source of investment financing in most developing countries, due to higher real interest rates. Both effects would lead to an implicit or explicit decrease in the market value of existing capital relative to its replacement cost, and thus to a decline in investment.

Furthermore, Ndikumana (2008) claimed that a tight monetary policy associated with high interest rates and a strong currency might cause damage to the export sector, thus discouraging international competitiveness. Achieving low inflation might, therefore, be potentially costly in terms of low investment, output, and employment.

Taban and Kara (2006) discussed that, according to the monetarist view, if budget deficits were financed by taxes or borrowing via flotation, due to the increase in demand for loanable funds, interest rates would rise as well. This would increase the cost of investment and hence reduce private investment. In this case, private-sector expenditure would decrease by as much as the increase in public expenditure.

Most of the recent studies have shifted their attention to financial development as a key factor influencing the growth of private investment in developing countries, suggesting that financial development presents more opportunities and incentives to investors (Karagoz, 2010; Khan and Khan, 2007; Ribeiro and Teixeira, 2001). The empirical findings of these studies show that financial development and private investment have a positive relationship. In a developed financial system, the mobilization and distribution of resources will be more effective for investors

(Huang, 2006). The credit constraints that are a feature of less developed capital markets and inadequate financial intermediation have a negative influence on firms' investment decisions (Shrestha and Chowdhury, 2005). Because of the absence of long-term financing and futures markets in developing countries, bank loans and external borrowing may be the only sources of credit available for the financing of private-sector investment.

3.4.2 The effect of fiscal policy on private investment

It has been broadly discussed that expansionary fiscal policies with high fiscal deficits cause a reduction in private investment, either by pushing interest rates up or by reducing the availability of private funds for financing investment, or both (interest rate/credit effect). However, a number of studies have questioned the validity of this statement, given that expansionary fiscal policies may lead to increases in public infrastructure that can benefit economic growth by enhancing the productivity of private investment (Greene and Villanueva, 1991; Oshikoya, 1994).

The theoretical assumption made by the Keynesians was that governments were justified in stimulating economic growth through the use of a deficit-causing fiscal policy. Their belief was that the economy was not at full employment and that the interest rate sensitivity of investment was low. Thus, increased government expenditure would cause a minimal increase in the interest rate whilst increasing output and income. Further, they argued that government expenditure would increase private investment due to the positive effect of government spending on the expectations of investors. Their argument was based on the principle of the multiplier effect, whereby a change in government spending would induce more than a proportionate change in output.

Overall, the effect of fiscal policy on private investment can be summarized as functioning through five channels (Ndikumana, 2008):

(i) Investment can be impacted by fiscal policy through public infrastructure investment, which decreases the private costs of production, thereby raising profitability.

(ii) Investment can also be stimulated through a predictable and credible fiscal policy that will build investor confidence. To achieve this, the government must not only implement low fiscal deficits, but must also be consistent in pursuing clear goals to which it commits in advance; that is, the government must overcome the problem of the time discrepancy of fiscal policy.

(iii) Based on the view that investment is demand-constrained, fiscal policy influences investment by affecting domestic demand. A tight fiscal policy achieved through expenditure compression or tax increases thus leads to a decline in domestic aggregate demand, which harms sales and profit expectations, thus reducing the incentives to invest.

(iv) Fiscal policy affects investment directly through tax policy that influences the cost of capital.

(v) According to the view that investment is dependent on saving, fiscal policy influences private investment by affecting the volume of savings. A tight fiscal policy is deemed to promote private investment by increasing overall domestic saving and reducing interest rates.

Looking at point (i) above, in many developing countries the deficiency of infrastructure is a substantial obstacle to private capital formation. Hence, an expansionary fiscal policy in the form of the provision of public goods and services, such as power plants, roads, communication utilities, irrigation, social

services, etc., can provide the private sector with significant benefits (Nwosa Philip Ifeakachukwu ,2013; Khan and Kumar, 1997; Montiel, 2011). This is most likely to be true in those developing countries where the existing stock of infrastructure capital is inadequate (Khan and Kumar, 1997) rather than in countries with high-quality and extensive public infrastructure. Thus, in the case of countries with extensive public infrastructure, there could be greater advantages to the private sector if public expenditure were targeted at improving the efficiency of infrastructure, as opposed to increasing its quantity (Chibber et al., 1992; Ghura and Goodwin, 2000).

With regards to point (ii), fiscal policy can also motivate private investment by building investor confidence through predictability and credibility of fiscal policy. Public investment in infrastructure might also signify a long-run adherence by the government to its policy programme of restructuring the economy, creating a more favourable environment for private investment projects (Aschauer, 1989; Badawi, 2003; Brownbridge, 1994).

However, the overall net effect is theoretically less established and there are differences across countries in terms of both sign and magnitude. On the one hand, if fiscal deficits are caused by current public expenditure or non-infrastructure investment, they tend to exert a negative influence on private capital formation. It is also argued, in the case of the provision of goods by public enterprises, that such enterprises are more competitive than complementary to the private sector (for example, in the manufacturing, mining and tourism sectors) as these activities require substantial funds, reducing the availability of private funds, and making private investors reluctant to invest and compete in these sectors (Chibber et al., 1992; Montiel, 2011).

It has also been argued that an increase in public investment could have an adverse effect on private investment indirectly via the public-sector budget constraint. If, for example, public investment were financed through increases in taxation, this might exacerbate distortions in the economy and increase the costs of inputs, leading to an adverse effect on output growth and private investment. In line with this theoretical perspective, various empirical findings (Looney, 1997; Wai and Wong, 1982; Zou, 2006) have revealed that public investment crowds out private investment.

The effect of restrictive fiscal policy on private investment is therefore ambiguous. Blejer and Khan (1984) found that, in a number of developing countries, private investment complements public infrastructure investment but not other types of public investment. Similar results have been shown by various other studies using different country samples. This complementarity, however, does not rule out the possibility of the crowding out of private investment by high public deficits.

However, the effect of a restrictive fiscal policy on private investment, one may conclude, should be positive. Decreasing public expenditure leads more private funds to become available, and interest rates to become low, leading to decreases in the cost of capital and the opportunity cost of retained profits as well. On the other hand, the way that a fiscal correction is made matters. For example, reducing fiscal deficit by cutting public infrastructure expenditure accompanied by insufficient government involvement in the economy may hamper the expansion of private investment due to the complementary relationship indicated by several empirical studies (Chee-Keong et al., 2010; Hassan and Salim, 2011; Morrissey and Udomkerdmongkol, 2012; Naa-Idar et al., 2012).

3.4.3 Exchange rate regime and private investment

Exchange rates are a key variable in macroeconomic policy design due to the fact that developing countries are highly dependent on imported inputs and capital goods. In general, there are three forms of exchange rate policy, namely, floating exchange rates, managed exchange rates, and fixed exchange rates (Maddison, 2013). In most developed countries, a floating exchange rate regime is adopted, which means that there is no government intervention in the foreign exchange market, leaving the exchange rate to be determined only by the supply and demand in the market. Managed exchange rates, also termed managed floating, are generally allowed to adjust to equilibrium levels through the interaction of the supply and demand in the foreign exchange market, but with occasional intervention by the government. Finally, a fixed exchange rate is an exchange rate that is maintained at a specific level through government intervention (usually through the monetary policy actions of a central bank). To fix an exchange rate, a government must be willing to buy and sell currency in the foreign exchange market in whatever amounts are necessary to keep the exchange rate fixed. A fixed exchange rate typically disrupts the balance of trade and balance of payments of a country but it is the preferred regime in some developing countries (Montiel, 2011).

Many international organizations, such as the WB and the IMF, support the idea of devaluation or depreciation of the currency in the case of developing countries, as a key element of economic growth that should accompany the financial aid and loans they provide to their member countries for the development of domestic production via the stimulation of net exports (Bahmani-Oskooee and Kandil, 2007). It increases the competitiveness of firms and the production of domestic

products and output and is an effective policy for countries running out of reserves and experiencing balance of payments deficits. The reason for this is that it is expected to increase the volume of exports and decrease the volume of imports. Indeed, typical adjustment programmes are designed in order to reduce expenditure on foreign-produced goods and shift it towards domestic goods through real currency devaluation (Taye, 1999). Therefore, devaluation of the currency will encourage domestic investment and improve the trade balance, thus increasing GDP in the long run.

However, it is not easy, at least theoretically, to conclusively specify the effects of exchange rate policies. The difficulty arises mostly from the existence of various possible mechanisms that could produce different effects on private investment. The fact that such effects also differ between the short and the long run adds a further complication to the overall net effect.

According to the literature, devaluation may affect investment through five channels (Chhibber et al., 1992; Jongwanich and Kohpaiboon, 2008):

(i) by changing the real supply price of capital goods;

(ii) by raising the real price of imported goods;

(iii) by altering the distribution of income through real changes in wages and product prices, thus affecting profitability;

(iv) by changing real income that affects the demand for domestically produced goods; and

(v) by affecting nominal and real interest rates, which affect the supply price of capital.

The effects of devaluation on private investment may operate differently in the short and long run via its impact on aggregate demand. When final demand is

encouraged after devaluation through an increase in the volume of exports and in the growth rate of the economy, the long-run effect of devaluation tends to be positive, although it is initially expected to be negative. Devaluation may even lead to a contractionary effect on output, at least in the short run (Montiel, 2003; Serven, 1989; Todaro and Smith, 2009). This argument is based on the possibility that devaluation could lower the consumption element of aggregate demand. In the absence of money wage increases, the inflationary effect of currency devaluation redistributes income from workers to producers. Since workers are said to have a high marginal propensity to consume compared to producers, total consumption declines as a result of currency depreciation (Van Wijnbergen, 1982).

Furthermore, Ribeiro and Teixeira (2001) explained that the exchange rate could influence the level of private-sector investment, as it is one of the components that determine the real cost of imports. Devaluation may have an adverse effect on investment, raising the cost of the imported component of new capital goods. As this reduces investment, especially in the non-tradable sector where output prices tend to decline relative to the tradable sector, it reduces the profitability of the private sector and may cause investment to decline. Furthermore, a real devaluation can mean a fall in the real income of the economy as a whole, thus decreasing production capacity and activity to levels that businesses find uncomfortably low. On the other hand, real currency devaluation can have a positive impact on investment in sectors producing internationally traded goods, as it increases competitiveness and export volumes (Todaro and Smith, 2009).

Therefore, to understand the effect of devaluation on domestic investment, one must look at both the supply and demand sides of an economy. On the demand

side, devaluation may have a contractionary or an expansionary effect, depending on the time horizon chosen. On the supply side, devaluation stimulates investment in the tradable goods sector, while it depresses it in the non-tradable goods sector. The magnitude of the two conflicting tendencies may depend on the relative sizes of the tradable and non-tradable sectors. The larger is the tradable goods sector relative to the non-tradable, the greater is the likelihood that, on average, investment will increase. Therefore, countries with a large export sector may benefit from devaluation. However, if these economies are highly dependent on imported capital goods and intermediate materials, investment may decline. The inflationary outcome of devaluation and the financial difficulties it creates for indebted firms could have a depressing effect on private investment (Chhiber et al., 1990; Serven, 1992).

However, overvalued currency is another side of exchange rate policy that may affect private investment. Dorkin (1999) reported that an overvalued domestic currency could have a negative impact on private investment by causing aggregate demand to shift from domestic products to imports, due to the latter becoming cheaper. At the same time, the country's exports would decrease because the overvalued currency would make production expensive, increasing the prices for consumers abroad. Increased imports combined with decreased exports may lead to a troublesome deficit in a country's current account (Dorkin, 1999). Moreover, Chhibber e al., (1990) explained that an overvalued exchange rate might be beneficial only in the short run. The lower growth in exports due to the overvaluation would lower overall growth and reduce investment in the longer run. Therefore, an overvalued currency is not attractive for investment since it makes exports too expensive. It also has a negative impact on foreign investors wishing to repatriate their profits to their home country.

3.4.4 The effect of irreversibility and uncertainty on private investment in developing countries

The other variable influenced by macroeconomic policies, which relates to the investment decision, is the irreversible nature of investment in capital goods. As was previously explained, a growing literature has focused attention on the, possibly large, impact of uncertainty on investment. Investment theories confirm that uncertainty and investment irreversibility can harm fixed investment decisions. The basic idea is that irreversibility, in this context, means that investment can be considered a sunk cost because capital, once installed, is firm- or industry-specific and cannot be sold or put to productive use in another activity, at least without incurring a substantial cost (Pindyck, 1991). This means that an irrecoverable cost is attached to the sale of such goods. This irreversibility results in uncertainty, which may have a considerable negative impact on the private investment decision. This may explain why investors are reluctant to make major investments, even during periods of prosperity. When an investment includes more irreversible features, excess volatility and related uncertainty could lead investors to seek profit opportunities in short-term portfolio projects rather than long-term, productive investments (Aysan et al., 2006; Karagoz, 2010). The cost attached to an investment relies on the degree of economic stability and the credibility of public policies. This is why recent studies on private investment in developing countries have incorporated variables representing uncertainties into models of the investment decision-making process (Agosin, 1994; Busari and Amaghionyeodiwe, 2007; Greene and Villanueva, 1995; Serven and Solimano, 1992).

Furthermore, as shown by several studies, different forms of uncertainty can be used, such as economic instability and socio-political instability (Campos and Nugent, 2003; Pindyck, 1991; Serven, 2002). For developing countries, economic uncertainty can be measured in terms of volatility of output growth, inflation, the real exchange rate and terms of trade. Macroeconomic instability is an element that may lead to uncertainty, by creating an unreliable economic environment that prevents investors from benefiting from profit opportunities (Aysan et al., 2005). The macroeconomic instability indicator often refers to high inflation, a public deficit and foreign exchange volatility. High inflation rates, in addition to raising the cost of long-term financing, are expected to adversely affect private investment by increasing the risk associated with long-term investment projects. Similarly, a budget deficit and volatility of the exchange rate can lead to unsustainable macroeconomic imbalances and sudden economic policy reversals, which are likely to affect the profitability of long-term investment (Faini and De Melo, 1992; Larrain and Vergara, 1993; Serven and Solimano, 1992).

Economic volatility is another factor that may lead to uncertainty. As noted earlier, volatility leads investors to search for profit opportunities in short-term portfolio investments rather than long-term productive projects, especially when an investment contains more irreversible features (Pindyck, 1991). Many researchers have shown that economic volatility has a negative impact on private investment (Aizenman and Marion, 2003; Aysan et al., 2005; Bleaney and Greenaway, 2001).

An important implication of the above discussion is that, if a goal of macroeconomic policy is to motivate private investment, then stability and credibility may be much more important than particular levels of tax and interest

rates or other factors in a country such as Iraq that has gone through prolonged economic and political instability. Overall, private investment is much more likely to be depressed under economic and political instability (Leonard, 2009).

3.5 The Effects of Non-Economic Factors on Private Investment

In addition to the economic factors reviewed above, there are some non-economic factors that have been identified in the literature as playing an essential role in motivating private investment growth in the case of the developing countries. These include good governance, improvement of the quality of institutions, political instability, and economic security. These factors are also important elements that allow the private sector to make substantial investment decisions based on a rational evaluation of risks and potential profits. These factors can play a complementary role alongside the traditional economic factors. It has been proposed that private investment and the enterprise strategies adopted are greatly influenced by the external environment in general, and the institutional context in particular (Karagoz, 2010).

Recently, many studies have shifted their focus to the non-economic factors, due to the fact that these variables have caused major obstacles to the achievement of economic development, by limiting the volume of private investment in developing nations. These studies have supported the view that poor governance and government institutions are highly detrimental to entrepreneurial investment (North, 1990; Rodrik, 1996, 2001).

The significance of good governance as part of the investment climate has been confirmed in many studies that contribute to reducing uncertainty and promoting efficiency (North, 1990). In this regard, and as reported by the World Bank, better governance improves the investment climate by improving bureaucratic

performance and predictability. This in turn reduces uncertainty, as well as the cost of doing business. Better governance also contributes to the effective delivery of public services that are necessary for productive business. It has also been confirmed that, in countries with good governance (political stability, low corruption, strong property rights), levels of private investment seem to be higher than in countries with poor governance (Khan and Khan, 2007; Morrissey and Udomkerdmongkol, 2012; Udomkerdmongkol and Morrissey, 2008).

Political instability is another non-economic factor that influences the growth of private investment in developing countries. Econometric evidence widely supports a negative relationship between aggregate investment and political instability since the latter increases uncertainty in the economy and discourages risk-averse entrepreneurs from taking action on profitable investment opportunities. The political stability index includes the aspects of government stability, internal conflict, external conflict, and ethnic tensions (Le, 2004). Many studies have used different indicators of political uncertainty. Instability prevents political institutions from ensuring property rights, which in turn increases the probability that returns on investments will be expropriated. As a result of the higher risk, less is invested (Aysan et al., 2006; Busari and Amaghionyeodiwe, 2007).

Both Karagoz (2010) and Ribeiro and Teixeira (2001) argued that prolonged economic and political instability was another form of uncertainty prevalent in developing countries. The low credibility of government policies and reform programmes, inefficient institutional structures and operating of the economy, and high debt burden – all common in these countries – act as the main sources of

such uncertainty, and eventually exert a negative impact on private investment decisions.

The study by Le (2004) found a significant effect of political stability on investment. The study attempted to link private investment to several types of political risk, estimating the private investment equation for a panel of 25 developing countries over 21 years. It achieved the following results: (i) socio-political instability characterized by non-violent protests encourages private investment, while violent uprisings hinder private investment; (ii) regime change instability characterized by constitutional government change encourages private investment; and (iii) policy uncertainty characterized by variability of contract enforcement rights promotes private investment, while variability of government political capacity hinders private investment.

Due to difficulties in measuring political instability, many empirical studies have measured it by a dummy variable to evaluate its effect on private investment. For example, the empirical investigations conducted recently by Kehinde et al. (2012) showed that growth in private investment was best explained by the political situation, explaining that macroeconomic instability and the political situation represent large obstacles to private investment growth. The same conclusion was reached by Bakare (2009), who also measured political instability by using dummy variables.

A secure environment is another non-economic factor that can affect private investment. It is identified by the literature as a key factor that helps to promote private investment and economic growth in developing countries. It does so by decreasing uncertainty about the return on investment. Security factors also

influence growth directly by enhancing the efficiency of resource allocation, independent of their effect on private investment (Stasavage, 2002).

Based on the above, non-economic factors such as good governance, improved institutional quality, political stability, and economic security are confirmed by the literature as playing significant roles in reviving the investment environment and attracting more private investment to developing countries. However, due to the limited studies on such factors and difficulties in measuring them, only political instability, which is more relevant to the case of Iraq, is considered in this study.

3.6 Oil Revenues and Private Investment

In the past, proponents of oil-led development believed that countries with an abundance of natural resources could base their development on such resources. They expected many benefits to materialize, such as enhanced economic growth, job creation, increased government investment, improvements in infrastructure services and technology transfer. However, in reality, very few of these benefits have been realised in oil-exporting countries. In addition to this, oil-exporting countries tend to suffer from a set of economic and political ailments (Auty, 2001). Recent econometric studies have shown that countries that depend on oil exports – especially developing countries – tend to have certain characteristics, such as (i) slow economic growth (Manzano and Rigobon, 2001; Sachs and Warner, 1999, 2001), (ii) oil and mining sectors that have dominated total economic output and exports (Auty, 2001; Gylfason, 2001), (iii) unusually high corruption rates (Gylfason, 2001; Gylfason and Zoega, 2006); (iv) abnormally low rates of democratization (Lam and Wantchekon, 2002; Ross, 2003), and (v) a

much higher risk of civil war (Collier et al., 2001; Fearon and Laitin, 2003; Ross, 2003).

In general, the more heavily a country relies on oil exports, the more likely it is to suffer from these problems. Iraq is an example of a country that is substantially dependent on oil and it has been highly subject to these tribulations. Against this, in developed countries such as the United States, Australia and Canada that have more successfully managed their oil revenues, the mining and oil sectors have never dominated total economic output. The oil sector contributes only a small percentage of total exports, and oil and mineral revenues have never been relied upon as an engine of economic growth (Karl, 2007).

Therefore, this issue has been the focus of a number of studies in the last few decades that have analysed the relationship between natural resources and economic growth. Natural resources have been described as a "resource curse", implying that negative growth and poor development outcomes are related with natural resources, and that these countries seem to grow more slowly than countries with scarce natural resources (Auty, 2001; Gylfason, 2001; Karl, 2007; Sala-i-Martin and Subramanian, 2003).

The key reason for the slow growth is that these countries have failed to produce growth in economic sectors other than the oil sector (Wood, 1999). A large petroleum industry and high dependence on oil exports reduced the opportunities for job creation by causing what is generally referred to as the "Dutch Disease" (Corden and Neary, 1982; Sachs and Warner, 2001). Karl (2007) explained the phenomenon of Dutch Disease, suggesting that it occurs when a booming minerals sector raises both the value of the real exchange rate and the cost of inputs for the manufacturing and agricultural sectors. Both of these effects raise

the prices and hence reduce the international competitiveness of exports from the manufacturing and agricultural sectors. The net result may be an absolute decline in aggregate activities and economic growth. Looney (2004) argued that, in oil-exporting countries, the state often did not make an effort to find alternative sources of revenue, and had less motivation to develop non-oil wealth or to raise revenue through taxes.

The unfortunate fact is that most oil-rich countries are underperforming across a whole range of economic, political, social, and governance standards (Karl, 2007). Large windfall gains associated with a rapid increase in oil prices have been a particular problem in that they seem to create severe conditions in the working of the economy and the political system, with strongly negative socio-political consequences (Stevens, 2003). Shleifer and Vishny (1993) argued that the governments in such countries usually did not encourage any steps towards reforms, because they were highly corrupt and took huge advantage of the resources. This, they said, distorted the allocation of resources and reduced both economic efficiency and social equity. Empirical evidence stresses that the civil conflict, cronyism, poor governance and corruption that has resulted from the oil revenue boom all tend to be obstacles to economic diversification and hinder economic efficiency and growth (Bardhan, 1997; Mauro, 1996).

In addition to this, oil wealth can damage the economy of a country by creating economic volatility. Volatility tends to impact the economy in two ways: by causing macroeconomic shocks, and by making government revenues unstable. Unmanaged external shocks create a number of economic problems, including fiscal and monetary disequilibria and inflation, exchange rate appreciation, which

can hurt other export sectors, lower private investment, and the encouragement of capital flight (Ross, 2003).

In oil-rich countries, a sudden rise in oil revenues might lead to an inefficient allocation of financial resources due to an acceleration of economic growth. This could encourage a government to lower its standards when choosing investments. With few exceptions, rapid growth in public investment leads to a reduction in the quality of such investment (Gelb, 1988). As a result, the investments are dissipated, and corruption and rent-seeking increase, ultimately harming private investment.

Ross (2003) discussed the fact that revenue volatility may also cause uncertainty about future incomes and create instability in government policies and institutions, forcing investors to adopt a shorter planning horizon, and less encouraging them to move towards longer-term projects.

The relationship between oil revenues and economic growth has implications for private investment. It has been argued that an increase in oil revenues allows governments to invest in economic infrastructure, and increases capital imports as well, which eventually reflect positively on economic growth. Furthermore, increased government investment in infrastructure produces higher efficiency (or lower production costs or transaction costs) and profitability, attracting more private investment. Increased government investment will also increase demand for private-sector products, thereby increasing investment in this sector. Private investment also benefits directly from cheap imports of technology and intermediate and capital goods (Looney, 2004; Ross, 2003).

On the other hand, a large windfall of gains, due to a rapid increase in oil prices, can encourage the state to make irrational decisions regarding expanding the level of investment. Since the economies in oil-rich countries have limited capacity for absorbing excessive investment, when combined with higher increases in oil revenues this leads to an inefficient allocation of financial resources to the public sector, creating unproductive investment which barely exerts a positive impact on economic growth. Moreover, the increase in imported consumer goods that is likely to result from a natural resource boom would decrease the competitiveness of domestic products and the relative productivity of private investments, leaving the private sector little motivation to invest in the tradable products sectors, and in turn harming economic growth (Mehara, 2011). An abundance of natural resources may also reduce private and public incentives to attract human capital because of high levels of non-wage income sources such as dividends, social spending, and low taxes (Abed and Davoodi, 2003).This view was confirmed by Gylfason and Zoega (2006), who observed that oil-rich countries with a heavy dependence on natural resources might harm saving and investment indirectly, by slowing down the development of the productive sector and the financial system.

Several proposals have been put forward, by different studies, of ways to avoid the resource curse phenomenon (Collier et al., 2009; Hammond, 2011; Looney, 2004; Mehrara, 2008; Merza, 2011; Richmond et al., 2013). One suggested the allocation of oil revenues to a separate account to which governments would have no direct access and would be unable to use for their own private advantage; this would allow a certain proportion of the oil revenues to be allocated to investment projects and developing deeper capital markets. Mehrara (2008) argued that if a country was unable to manage oil revenues optimally, it might be preferable to

leave the resources in the ground, where they would increase in value as oil became scarcer and prices increased.

This section has demonstrated the impact of oil revenue on growth and investment in oil-exporting countries. It tends to be the case that these countries with the significant advantage of oil revenue have often promoted private investment to a lesser extent than other countries. Since the mining and oil sectors dominate total economic output, the oil sector contributes a high percentage of total exports, and these countries rely on the oil and mineral revenues as an engine of economic growth. However, inefficiencies in the system may result in the "resource curse" phenomenon.

3.7 Private Investment and Foreign Direct Investment (FDI)

Economic theory attributes an essential role to FDI in fostering economic growth in developing countries. FDI has been observed to be an effective channel for transferring technology and creating employment. It influences economic growth through the adoption of new methods of production and enhances productivity by bringing competition into the economy. FDI also introduces a new knowledge base in the host country, adding to novice management and organizational skills, and explores hidden markets in the economy (Barro and Sala-i-Martin, 1995; Grossman and Helpman, 1993). It reduces barriers to the adoption of technology and improves the quality of labour and capital inputs in the host economy (de Mello Jr, 1997; Kim and Seo, 2003).

With rising macroeconomic imbalances and the increasing need for investment to grow at a faster pace in developing countries, FDI flows have become increasingly important for providing macroeconomic stability. The greater the capital investment in an economy, the more favourable are its future prospects,

and FDI can be seen as an important source of capital investment and a determinant of the future growth rate of an economy.

Recently, many countries have adopted more open economies and created investment-friendly environments so as to attract more investment and maximize the benefits in the host countries. Masuku and Dlamini (2009) empirically investigated the relative importance of locational determinants of FDI in Swaziland by employing a cointegration and error correction model. They concluded that the key factors in attracting FDI were infrastructure, per capita GDP, the extent of urbanization, and political and economic stability. They also noted that flexible and stable exchange rate policies were needed to attract FDI. More recent studies have pushed this argument further, suggesting that providers of FDI are no longer satisfied with traditional or underdeveloped physical infrastructure but are likely to seek out the best locations, historical background, market size, domestic growth-related factors, domestic entrepreneurial skills, skilled labour, provision of incentives in the form of tax exemptions and customs exemptions (Elboiashi, 2011; Haq, 2012; Morrissey and Udomkerdmongkol, 2012).

Adams (2009) discussed two main points about how FDI affects the economic growth in these countries. First, it contributes to the economic development of the host country through the expansion of domestic capital and the boosting of efficiency through the transfer of new technology, innovation, marketing, and managerial skills and best practices. Secondly, the positive effect of FDI is determined by the country-specific conditions in general and the policy environment in particular, in terms of the ability to diversify, the level of absorption capacity, the targeting of FDI, and opportunities for linkages between

FDI and domestic investment. The conclusion was that FDI was a necessary but not a sufficient condition for economic growth.

However, much uncertainty still exists about the relationship between FDI and economic growth in the host countries. Recent investigators (Borensztein et al.,1998; Chudnovsky et al., 2008; Elfakhani and Matar, 2007; Frimpong and Oteng-Abayie, 2006; Kinoshita and Campos, 2004; Morrissey and Udomkerdmongkol, 2012; Tang et al., 2008) have argued that this relationship may differ noticeably between countries and among industries. The effect of FDI on economic growth is associated with the absorptive capacity of the host country, and can vary according to the nature of the sectors within the host country. Gachino (2009) examined FDI by focusing on its positive spillovers, capability development and performance. The study revealed that FDI played a positive role in industrial development through spillover benefits. Alfaro (2003) revealed that FDI contributed positively to economic growth if it was directed towards the manufacturing sector, negatively in the primary sector, and ambiguously in the services sector.

Despite these theoretical assumptions, the empirical literature on the growth effects of FDI provides varied evidence. The ambiguity of the evidence has been justified in the FDI literature in two ways. First, it has been argued that not all host countries are capable of benefiting from FDI externalities. Specifically, host countries need to reach a minimum threshold of absorptive capacity, including for example the development of the financial sector, the reduction of the technology gap, the development of infrastructure and the quality of human capital, etc., before they can benefit from the growth effects of FDI (Ali, 2010). The second argument is that not all types of FDI are capable of providing the host countries

with positive externalities. In particular, the positive growth effects attributed to FDI in the literature are confined to the manufacturing sector, while primary-sector FDI, as just mentioned, has been found to have negative effects on growth (Alfaro, 2003; Aykut and Sayek, 2007; Tang et al., 2008).

Moreover, researchers have shown an increased interest in identifying factors that determine the relationship between foreign and domestic investment. A study by Agosin and Mayer (2000) argued that the impact of FDI on total private investment relied on several factors, including the recipient country's business environment and economic policy, types of FDI and the strength of domestic firms, but also relied on the relationship between FDI and domestic private investment. FDI that brings in goods and services that are new to a host country, particularly those using high technology, usually has positive effects on private investment. However, Misun and Tomsík, (2002) argued that FDI in sectors competing with domestic firms decreases investment opportunities for domestic investors. Even where FDI does not crowd out domestic private investment, it may not stimulate new downstream or upstream production and so may fail to exert a positive effect on domestic private investment. Potential spillovers from FDI to domestic firms may not be sufficient to stimulate private domestic investment; the contribution of FDI to technology transfer may be largely restricted to subsidiaries (Almeida and Fernandes, 2008), and spillovers may not significantly improve the efficiency of domestic firms (Girma and Gong, 2008).

Tang et al. (2008) examined the causal link between FDI, domestic investment and economic growth in China for the period 1988-2003. The results illustrated that FDI, instead of crowding out domestic investment, had a more complementary effect, although domestic investment had a larger impact on

growth than FDI. These findings provide some support to the theoretical view that FDI complements domestic investment, and that long-run economic growth is positively associated with FDI. Consequently, FDI may not only help in overcoming capital shortages, but may also be a catalyst for economic growth, in complementing domestic investment, based on the evidence from China.

According to the evidence reviewed above, since FDI complements domestic investment, less developed countries must encourage FDI inflows, for which appropriate FDI policies and regulations are required. For instance, host governments should not only promote FDI inflows, they should also impose regulations on foreign companies to motivate them to undertake export obligations or to invest in high-risk areas or in resource industries where domestic investment is limited. FDI should also be encouraged to invest in the primary and secondary industries, and in the less developed regions. Additionally, host governments could impose regulations on foreign companies to increase the generation of employment in the country.

3.8 Summary

The mysterious nature of investment behaviour is well reflected by the expansive literature on the topic. This chapter has focused on different streams of literature on the determinants of private investment in different countries, in order to clarify the nature of investment in developing countries. The major objective of this chapter has been to examine a highly selective portion of the existing literature, so as to identify factors that influence private investment in developing countries, and to examine more effective policies for stimulating such investment. This chapter has also attempted to cover a variety of topics relevant in modelling

private investment, and to provide an idea of the significance of existing investment models for developing countries.

Most of the empirical studies examining determinants of private investment to date have been based on the modified neoclassical flexible accelerator model. It has been widely argued that, once modified, the neoclassical flexible accelerator model is applicable to developing countries (Blejer and Khan, 1984; Sundararajan and Thakur, 1980; Wai and Wong, 1982). In these studies, however, the degree of modification required has varied from minimal to fundamental.

More recently, attention has focused on investment trends and behaviour in developing countries, mainly stimulated by changing fundamental economic policies that have emphasized the importance of a market-based, private-sector-driven economy with a strong private investment response. Since the 1970s, studies have attempted to highlight the interactions between macroeconomic policies and private investment, indicating that the private sector has become more motivated to invest and participate in capital formation.

A large number of the published studies state that there are two basic types of factors that could influence private investment, namely economic and non-economic. Economic factors include gross domestic production, the real interest rate, public-sector investment, the amount of available credit, the volume of external debt, the inflation rate, the exchange rate and others. Non-economic factors include the quality of governance, political stability, corruption and economic security.

Finally, the impacts of natural resources such as oil revenue and FDI have been taken into consideration in this chapter, and it has been confirmed that they play a

substantial role in stimulating private investment. Moreover, it is worth noting that not all of the variables discussed above will be included in our model of the determinants of private investment, as data on some variables do not exist or are inadequate, and some are irrelevant to the case of Iraq.

CHAPTER 4 MACROECONOMIC ASSESSMENT AND COMARATIVE ROLE OF PUBLIC AND PRIVATE INVESTMENT IN IRAQ

4.1 Introduction

Iraq is located in the Middle East between Iran and Saudi Arabia and is also bordered by Jordan and Syria to the west, Kuwait to the south, and Turkey to the north (see Appendix A). It has a land area of 437,072 square kilometres, with an estimated population in 2014 of around 36 million, 97% of whom are Muslims, mainly Sunnis, Shias, and Kurds. Per capita income for the country was estimated at US$6,900 in 2012 (IMF, 2013).

The country's economy was based solely on agriculture until the 1950s, but after the 1958 revolution, extensive economic development began. In the 1970s, Iraq had an impressive annual economic growth rate of over 10% in real terms and similarly large growth in investments (Gal, 2013). Oil resources had allowed the country to reach a middle-income status with modern infrastructure and good education and healthcare systems. By 1980, Iraq had the second largest economy in the Arab world after Saudi Arabia and the third largest in the Middle East, and had developed a complex, centrally planned economy dominated by the state.

However, between 1980 and 2003, Iraq experienced three long wars and severe international economic sanctions, effectively ending the positive achievements of the 1970s. Since then, the economy has suffered from over 20 years of neglect and degradation of its infrastructure, environment and social services. Key social and economic indicators were severely affected when the economy moved from positive growth and development in the 1970s to a retraction and eventual

collapse in the 1980s. Income per capita, for example, which rose to over US$3,600 in the early 1980s following sharp rises in oil prices, is estimated to have fallen to as low as US$200 in the early 1990s, before recovering to an estimated US$770-1,020 by 2001 (World Bank, 2003). The latter figure was still only about 20-30% of the values seen in the 1980s.

Development regressed mainly because the economic policies adopted were aimed at supporting war efforts and resisting sanctions, with very little consideration given to developmental progress. The Iraqi economy was trapped in a cycle, and investment activities seriously declined as a result of both a severe lack of resources and years of instability in the economy, social and political conditions, and security, which continue to threaten development efforts today. Although per capita income increased from US$770-1,020 in 2001 to US$6,900 in 2012, since 2012 there has been further instability in the country, which may have eroded such gains, sending the country back to where it was in the early 2000s.

In addition to the political and economic instability, the main challenge for the Iraqi economy is diversification. The oil sector's dominance in the economy is the highest among all oil exporters in the Middle East. Oil exports account for 95% of total exports and government revenues from oil exports make up about 70% of the GDP (Rivlin and Gal 2014). The latter rates in Saudi Arabia and Kuwait are around 50-55% of GDP, and in Iran 25%. The large oil exports provide the Iraqi economy with sufficient funds to finance the huge investments required for the development of the oil and gas sector. However, the rehabilitation and development of its economic infrastructure, the diversification of the economy to fields other than the energy sectors, and the realization of these investments, are

encountering non-financial obstacles such as political instability. For long-term sustainable growth, Iraq needs to diversify its economic base and increase its levels of international trade, which will require increased private investment. The private sector is a key mechanism for long-term sustainable growth, but seems to have been neglected in Iraq.

In the last four decades, Iraq has shown an inability to manage its annual budget in terms of allocating investments efficiently, and has failed to create an economy that allows for progress and development. The purpose of this chapter is to shed some light on the historical trends in Iraq's key macroeconomic indicators and to evaluate the role the public sector and private investment have played in Iraq's economic performance over the last forty years.

The remainder of this chapter is organized as follows. Section 4.2 provides a historical overview of Iraq's economy, while the effects of the oil and non-oil sectors on Iraq's economy are described in Section 4.3. Section 4.4 examines macroeconomic policies including fiscal and monetary policies. Section 4.5 considers key macroeconomic indicators, including the trends in GDP and GDP per capita, evaluates the role of public and private investment, and assesses the labour force and employment in Iraq. The final section provides a summary of the chapter. The discussion is a reflection of the exposition in chapter 3 and underpins the analysis to come in Chapters 6 – 8. It also helps to explain the poor state of private investment in the country and to identify the policies needed to increase such investment and enable it to play the role required in economic growth.

4.2 A Historical Overview of Iraq's Economy

Before oil discovery and exploration began in the 1950s, Iraq's economy was based exclusively on agriculture. However, the nationalization of the oil industry in the early 1970s provided Iraq with a source of sustainable financial strength, leading to the adoption of expansionary fiscal policies that stimulated economic activity, motivated the production cycle, and encouraged consumption. Since then, industrial development, diversification and manufacturing have gone through numerous phases in Iraq. In the mid-1970s, a strong emphasis was placed on the agriculture sector, the aim being to apply an import substitution policy, and the government established food-processing industries in smaller towns throughout the country. Despite the emphasis on the agriculture sector, the main focus of development was on the petroleum sector, refining, natural gas processing and the development of chemical industries in Basra and Kirkuk where are located in South and North of a country. The concrete and building supplies industry also expanded rapidly.

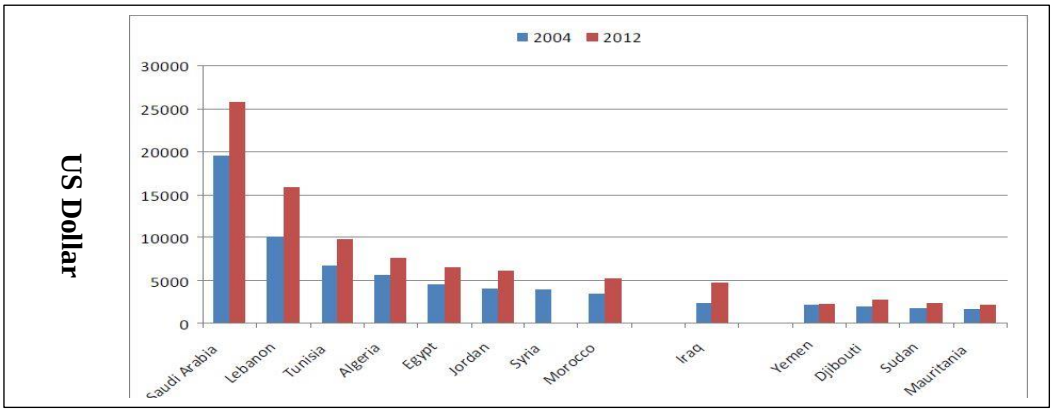
By the late 1970s, the emphasis in development planning had shifted towards heavy industry and diversified away from oil. Iron and steel production was set up, with French assistance, at Khor al-Zubair (which located in South East of a country)and the defence sector was given a high priority. The economy experienced high rates of growth in the 1970s, which were significantly reflected in the country's standard of living and allowed the population to enjoy economic and social prosperity. At the same time, however, the spending policy of the 1970s caused a host of issues, including increases in the consumer price index and higher import rates, leading to balance of payment deficits. Generally, the final outcomes of the 1970s seem to have been positive when evaluated using locally

and internationally recognized economic and social development measures, which will be clarified in the following sections (Alnasrawi, 1994).

Since the 1980s, Iraq has experienced three major wars (the long war with Iran (1980-1988) and the two Gulf Wars with the United States and its allies (1991 and 2003)) and close to a decade of harsh international sanctions in the period between the two Gulf Wars, all of which has had an enormous economic toll on the country. Poor economic performance in this period can also be attributed to the lack of challenge to the economy's concentration on oil and the country's ill-defined objectives. Certainly, as was the case for all other sectors of the economy, manufacturing and industrial diversification was scaled down when the Iran-Iraq War began, and has never recovered.

At the end of Saddam Hussein's rule in 2004, Iraq's GDP per capita was a third lower than it had been in the early 1980s, while most Arab states' GDP had doubled or tripled in size during the same time span. As a result, Iraq went from being one of the wealthiest, most developed Arab states to one of the poorest (Figure 41.)

Figure 4.1: Iraq's GDP per capita in comparison to other Arab States, 2004 and 2012 (US$)



Sources: IMF (2012); Gal (2013), P 3.

Thus, the combined effect of wars and sanctions caused dramatic fluctuations in Iraq's oil production and economic involvement in the world market. The country's oil infrastructure was also severely damaged, while UN sanctions from 1990 to 2003 severely limited Iraq's ability to export oil and gain access to the latest technology to develop its fields, with repercussions for other sectors of the economy (Crocker, 2004).

After Saddam Hussein's demise, the Iraqi economy stabilized, despite political and security-related difficulties. Moreover, until recent years, Iraq has enjoyed accelerated economic growth, caused by a leap in oil exports. There have been important effects, both in the regional context and in the context of the global oil market. The most essential development has been the significant and continuing growth in Iraqi oil production and exports. Oil production has reached 3 million barrels per day (bpd), a doubling of the production levels seen at the end of Saddam Hussein's rule. Iraq became the second largest oil producer and exporter in the Middle East after Saudi Arabia, and the third largest oil exporter in the world, after Saudi Arabia and Russia, replacing Iran, which moved to the fifth largest in the Middle East (Alnasrawi, A. (1994).

By 2003, the country had witnessed efforts to abandon central government control over the economy, to create independent financial and private sectors, to bring physical infrastructure up to adequate levels, to reduce unemployment and to enhance the overall economy. These goals were designed to serve the overarching objective of creating a new and united Iraq with a liberal economy. The economy began a transition to a market economy. Policy changes meant that the decades of heavy regulation, and the largely state-owned economy of the 1970s, had given way by 2003 to a much weakened public sector (Mahdi, 2007). This was a radical

shift from the Baath party's[2] conception of the private sector as not only exploitative but a threat to its power. The private sector is now subject to fewer restraints but has yet to emerge from the shadows of state patronage and oil dependence.

It is worth mentioning that, after 2003, Iraq faced a particular challenge in terms of reconstruction and development, with a transition that was not only economic, but also fundamentally political and social. In the period of 2005-2007, the government managed to substantially increase investment in the oil and non-oil sectors. However, these efforts were again hampered by outdated infrastructure, violence and limited administrative capacity, which kept the rate of implementation of the investment budget low during 2005 and 2006 (Grigorian and Kock, 2010).

Despite the importance of the economy, in terms of its potential to contribute towards social, political, and security-related stability, it has received the least attention from the Iraqi authorities. Looney (2004) argued that economic recovery in Iraq must be part of a comprehensive strategy oriented towards creating a virtuous circle, in which improved security leads to economic gains that in turn facilitate improvements in governance and market reforms.

In summary, Iraq's environment of economic development over the past 40 years has exhibited five key features:

(i) Oil revenue has been the main source of financing for the development process. This has detracted from the role and importance of other

[2] The Baath party, usually called the Arab Socialist Baath party famously headed by Saddam Hussein, ruled Iraq between 1968 and 2003. At the beginning of this period, the country experienced high economic growth and soaring prosperity, but its rule ended with Iraq facing social, political, and economic stagnation.

financing sources, particularly taxes. Sectorial financing policies are unable to generate an economic surplus that can effectively contribute to the financing process.

(ii) In the past, centrality was the approach adopted for managing the Iraqi economy, with the public sector playing a critical role in the development process, while the private sector had no impact and was even distanced from the economic arena. Though the Saddam regime did encourage privatization in the late 1980s, it was unsuccessful because of the continuing conflicts, and the lack of financing and support for private business owners in Iraq.

(iii) Capital accumulation has been achieved through the transfer of oil revenues to other economic sectors in the form of fixed assets. There has been no contribution to capital accumulation from technological advancement or higher productivity rates.

(iv) There is no rational basis for distributing income between investments and consumption. This has discouraged process development in Iraq, and reduced the standards for sustainable development that would improve the quality of life.

(v) There has been a lack of coordination and cooperation, and divisiveness among various branches of economic policy. This has particularly been the case with fiscal, monetary, exchange rate and other financial policies, which has exacerbated the severity of unemployment, inflation and the spread of administrative corruption.

4.3 The Effect of the Oil and Non-Oil Sectors on Iraq's Economy

Although oil exploration in Iraq dates back to the latter part of the 19th century, oil was first struck in commercial quantities in 1927. The multinational Iraq

Petroleum Company (IPC) received three concessions from the Iraqi government that covered the whole of Iraq. British Petroleum, Shell Petroleum and Compaignie Francais des Petroles were the partners of IPC (Crocker, 2004).

Iraq's oil revenues largely benefited from these concessions until the price revolution of 1952 occurred. The concessions stipulated that the Iraqi government receive a fixed payment per unit of production, which in practice did not exceed 5% of actual revenues. In 1952, a new agreement between the Iraqi government and IPC entitled the government to receive 50% of the profits from oil exports, as well as up to 12.5% of the net production, which it could sell at any price (Ozlu, 2006).

The significance of the new agreement for the Iraqi economy was that, for the first time, the government acquired a direct interest in crude oil prices. With the United States becoming a net importer of oil in 1948, and with the worldwide increase in the demand for crude oil, Iraq expanded its oil output. Government revenue per barrel increased from $0.222 in 1950 to $0.84 in 1952 (Alnasrawi, 1994).

Oil production accelerated from 0.09 million bpd in 1949 to 0.697 million bpd in 1952. The resulting upsurge in oil revenue, which went from Iraqi dinar (ID) 31 million to ID 74 million during the same period, led to a policy of allocating a high proportion of the oil revenue to development purposes. At the time, the policy was further strengthened by the WB, which provided about $12.8 million in loans to Iraq under the condition that it created an independent plan for development (Hasan, 1970).

The result was the creation of the first "Development Board" in 1950 by the monarchy, which was ruling Iraq at that time. Multiyear plans were produced,

with an emphasis on three major fiscal priorities: agricultural development (including irrigation and flood control), transportation and communication, and construction. The broadly set ambitious development goals covered four key periods between 1951 and 1961. They proposed a large amount of capital investment in agriculture, transportation and communication, building, and housing, but limited attention was given to industry and the development of human resources.

In 1968 the political situation changed, when the Baath party seized power from the previous military regime via a coup d'etat. The nature of the Baath party's regime caused a significant shift in Iraq's economic policy. The party ruled from 1968 until 2003, and began its economic change by shifting away from the military rules and multiyear economic plan, later formulating its own plan aimed at taking control of Iraq's economy.

The first National Development Plan (NDP) formulated by the new government covered the period of 1970-1974. Despite the new government's adoption of a socialist approach and introduction of radical change, the development plan continued on the theme of past development plans that had overemphasized the agriculture sector. As shown in Table 4.1, the agriculture sector received 73% of the amount targeted for it in the planned budget, while the manufacturing industry, construction sector and transportation and communication sector received 44%, 40% and 67% of their respective targets (al-Ameen, 1981; Alnasrawi, 1994).

Despite the shortage of economic data for this period, growth rates for some sectors between 1975 and 1980 can be derived, as shown in Table 4.2. According to an OPEC report, in the 1970s, both the oil and non-oil sectors grew rapidly.

World oil prices were high, and Iraq's oil production increased from 1.5 million bpd in 1970 to 3.2 million bpd in 1979, as shown in Figure 4.2. Rising oil revenues allowed the government to implement investment programmes outside the oil sector, so that the non-oil economy grew as well (Alnasrawi, 1994). Following the introduction of the NDP, annual investment programmes were adopted.

Table 4.1: NDP Targets and Actual Values for Certain Economic Indicators, 1974 (ID Millions)

Economic Indicator	Target	Actual	Actual % to Target
GDP	1163	3347	288%
Oil Extraction	409	2023	495%
Total Exports	465	1943	418%
Total Imports	263	906	344%
Agriculture	317	232	73%
Manufacturing Industry	401	176	44%
Construction	174	69	40%
Transportation and Communication	186	124	67%
Electricity and Water	35	14	40%
Private Consumption	684	1047	153%
Public Consumption	321	477	149%
Employment (Thousands)	3165	2800	88%

Sources: Arab Monetary Fund (1983); Ozlu (2006), P 14.

Table 4.2: Average Growth Rates for Economic Sectors, 1975 - 1980

GDP	11.00%
Mining	6.50%
Agriculture	2.60%
Manufacturing	14.20%
Construction	15.80%
Transportation and Communication	20.30%
Government Services	13.20%

Sources: Arab Monetary Fund (1983); Ozlu (2006), P 15.

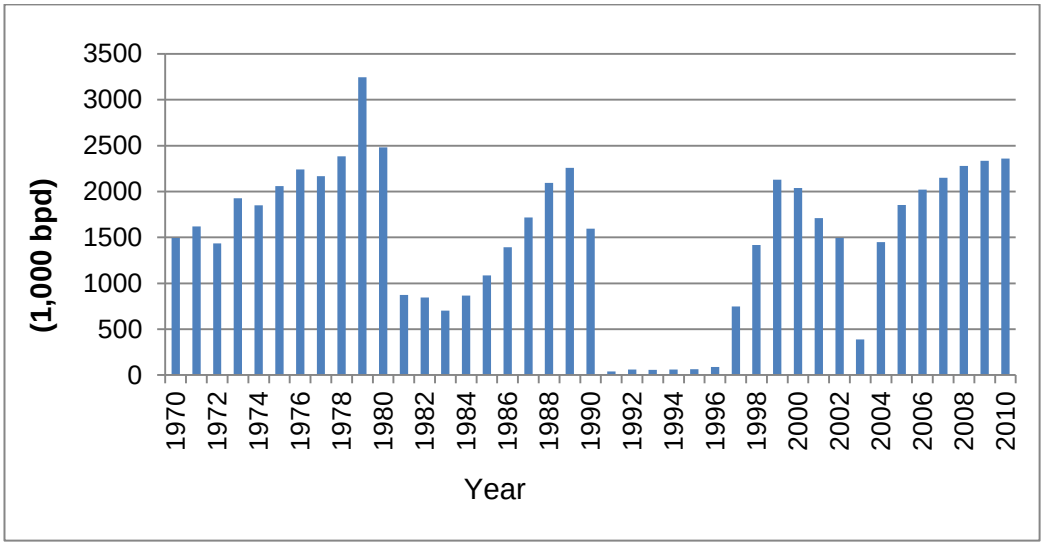
Furthermore, during 1976-1980, oil production and revenues increased rapidly, resulting in oil GDP increasing from US$9,218 million in 1976 to US$19,451 million in 1980, at 2005 prices (see Appendix B1). Consequently, Iraq had a balance of payments surplus of US$40 billion and the government budget increased from a mere ID 61 million in 1976 to ID 1.6 billion in 1990 (Ozlu, 2006). This led to a change in the second NDP (1974-1980) in favour of capital-intensive industries. According to Sanford (2003), the Iraqi government budget over 1974-1980 allocated US$14.2 billion to economic development, producing heavy industrial complexes such as the petrochemical complex in Basra and the iron and steel mill at Khor al-Zubair, and developing sulphur and phosphate extraction and processing, and fertilizer industries.

In addition to that, increasing oil exports and a surplus budget allowed the government to play a mediating role in distributing the huge oil rent to Iraqi citizens and economic sectors. For example, they encouraged the government to increase its expenditure on different sectors, such as education, health infrastructure, fuel and electricity services, and also to provide subsidies for the main food commodities, fuel and electricity. As a result, the second half of the 1970s witnessed a high rate of growth in national income, per capita income, industrial growth, construction, and public and private consumption.

As mentioned previously, before the Iran-Iraq War, Iraq had one of the most prosperous and advanced economies in the Arab world. It was an upper-middle-income economy with a substantial middle class, considerable technical capacity, some female participation in education and the economy, and decent standards of education and healthcare (Ozlu, 2006; Sanford, 2003). Iraq's economic collapse began with the onset of its eight-year war with Iran in the 1980s; the country encountered major challenges in terms of declining oil revenue, oil prices and

production, and it was difficult for the government to control the structural imbalance in the economy and the fiscal deficit. Oil production almost stopped in the month after the war began, and Iraq's Gulf port facilities were destroyed. Production averaged slightly less than 1 million bpd from 1981 to 1985, recovering to just below 2 million bpd the year after the war (Figure 4.2).

Figure 4.2: Oil Production in Iraq during 1970-2010



Source: Organization of Petroleum Exporting Countries (OPEC) (various years).

After the war, Iraq experienced various economic crises, such as reductions in economic growth, the level of capital accumulation and national income, along with increases in the rate of unemployment and poverty. By 1987, the growing economic burdens of the Iran-Iraq War had resulted in a decline in government spending due to the fall in oil revenue. However, these circumstances forced Saddam Hussein's regime to change its policy from one of strict socialism to more pragmatic economic regulation, including some economic liberalization for example, in order to escape from the economic crisis related to the war and the declining oil prices and production.

The new programme included: (1) the privatization of state-owned enterprises (SOEs) such as Iraqi Airways, bus companies, gas stations, agricultural

enterprises, department stores and factories; (2) incentives for foreign companies to operate in Iraq through the relaxing of restrictions on foreign direct investment; and (3) the removal of controls on commodity prices. Overall, however, one can conclude that these policies did not help Iraq's economy to recover, but in fact caused further economic problems, such as the depreciation of the real exchange rate (RER) for the Iraqi dinar in the financial market, a failure to control inflation rates, and declining government support for basic commodities, which eventually led to a deterioration in the standard living for most Iraqi citizens.

The war had major economic consequences, which can be regarded as another set of root causes of Iraq's current economic problems. At the end of the eight-year-long war, Iraq's total monetary losses were estimated to be US$452.6 billion, including: (1) US$91.4 billion in potential gross national product (GNP) losses in the oil sector as well as manufacturing, agriculture, energy, telecommunications, housing and health; (2) US$197.7 billion in oil revenue losses; (3) US$78.8 billion of losses in foreign exchange reserves, comprising US$35 billion in original reserves plus the loss of accumulated interest over the duration of the war; and (4) US$80 billion of potential losses in foreign exchange reserves resulting from the high degree of military spending (NDP, 2010-2014; IMF, 2003).

When Iran started negotiations with Syria against Iraq, it caused the suspension of about 2.5 million bpd of Iraq's oil export capacity, which reflected negatively on Iraq's economy. An estimate of the war's negative effects on the Iraqi economy from an oil revenue perspective is provided by the fact that Iraq's total national oil revenue from 1931 to 1988 was US$179.3 billion, while, according to the Baath regime, its spending during the eight years of the Iran-Iraq War came to 254% of

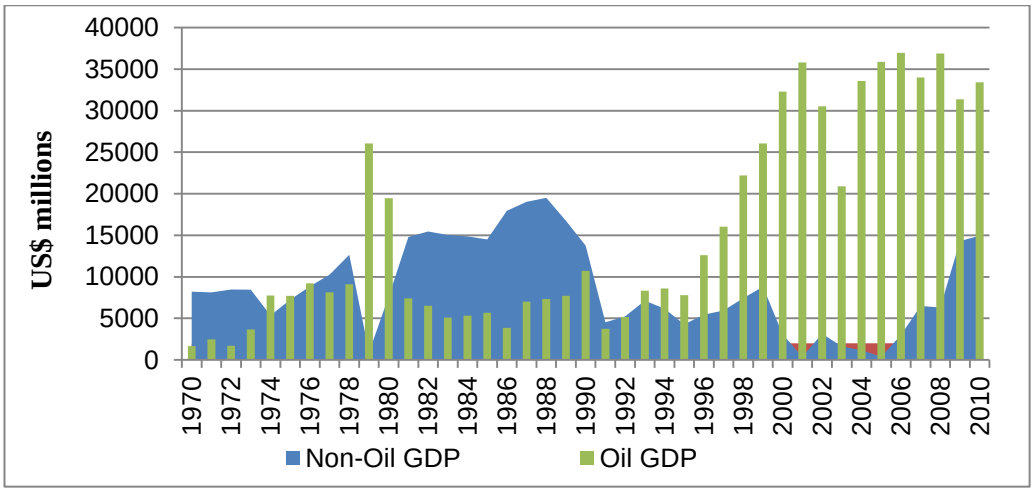
the entire oil revenue that Iraq had received in the previous 57 years (Sanford, 2003).

However, the Iran-Iraq War proved insignificant when compared to the economic disaster that faced Iraq following Saddam Hussein's decision to invade Kuwait in August 1990. By 1991, instead of the Iraqi government being able to focus on Iraq's economic challenges, the Iraqi occupation of Kuwait had caused a new war, ending in defeat by a US-led coalition. This defeat devastated the already weak Iraqi economy, damaged the country's infrastructure, and led to the imposition of strict economic sanctions (Bilmes and Stiglitz, 2008). A further major interruption to the flow of oil revenues came about due to the second Persian Gulf War, when the UN embargo imposed on Iraq following the invasion caused Iraq's economy to be isolated from all kinds of international transactions. This drove the country to near collapse, its oil production declining from a peak of 2260 thousand bpd before the invasion to approximately 60 thousand bpd in 1994 following the United Nations Security Council's decision, (see Appendix B1). According to Foote et al. (2004), oil production was held at a level close to that of domestic consumption (about 500,000 bpd) until 1996.

Following the negotiations between the UN and Iraq under the "Resolution 986" in 1991, Iraq was allowed to export a limited amount of oil in return for basic foodstuffs and medication. However, in 1996, an "oil for food" programme was officially implemented and provided Iraq with opportunities to export oil to finance the purchase of humanitarian goods, in an effort to mitigate human suffering in the country. All Iraqi oil revenues earned under the programme were held in a UN-controlled escrow account that could not be accessed by the Iraqi government (Katzman, 2003).

Merza (2007) argued that both the oil and non-oil sectors began to grow to some extent in the early 1990s. However, in the late 1990s, the international sanction regime strangled all economic activity in Iraq except oil production, since oil was the only item the country was allowed to export (IMF, 2003). As a result, oil GDP in real prices increased markedly to US$35,798 million in 2001, from US$7,778 million in 1994. In contrast, non-oil GDP dropped to US$384 million in 2001, from US$6,171 in 1994, remaining severely depressed in comparison to the values of the 1970s, as Figure 4.3 shows.

Figure 4.3: Oil and Non-Oil GDP at Constant Prices (2005=100), 1970 - 2010



Sources: OPEC (various years).

Eventually, after the demise of the Saddam Hussein regime in 2003, Iraq emerged from conflict, isolation and international economic sanctions. The economy had deteriorated heavily, due to decades of heavy state control over all kinds of economic activity, successive wars, a decade of international sanctions and the looting that followed the invasion. However, after the constitution was approved, a new democratically elected government was established. The new state began efforts to build foundations for new, stable governance and economic growth (Benson, 2012).

By 2003, the US had lifted the sanctions and was providing major support for economic liberalization reforms. In 2004, power was transferred back to Iraq, allowing the government to open the way for the resumption of oil exporting. With revenues added to the development funds held by Iraq's central bank, the country witnessed greater efforts to create financial independence and renew the private sector, rebuild physical infrastructure, reduce unemployment levels and enhance the overall economy. These goals were designed to create a new and united Iraq with a liberal economy.

According to data published by the WB, from 2003 to 2005 the economy of Iraq relied heavily on oil GDP. For example, in 2005, oil GDP rose to US$35,884 million, comprising 96% of total GDP, with non-oil GDP decreasing sharply to US$384 million from a figure of US$1,623 million in 2003. The central bank also projected that oil exports would account for 97% of Iraqi national budget revenues between 2004 and 2007 (Ozlu, 2006). However, post conflict in 2007, economic reforms were established and included building a market-based financial system, setting up a functioning governing institution, reconstructing critical sectors of the economy such as manufacturing and agriculture, privatizing SOEs, providing basic services such as power, education, electricity, health and water, and creating jobs, as well as stabilizing the country's relationship with the world. Based on these economic reforms, the share of oil to GDP decreased, from 83% and 85% in 2007 and 2008 respectively, to 69% in 2009. Meanwhile, the average growth rate of oil GDP during 2007-2009 was zero, and growth in non-oil GDP was 42%.

However, Iraq inherited many economic problems from the former regime, such as the still ongoing effects of the hyper-inflation that had occurred in the 1990s, a high rate of unemployment, depreciation of the Iraqi exchange rate, low

productivity in the commodity sectors (agriculture, manufacturing, construction, etc.), external debt, undeveloped education and health systems, and underdeveloped infrastructure services.

The outcomes of past and ongoing reform efforts remain far from meeting the needs and expectations of the Iraqi people. Despite increasing oil export revenue, growing national income and the adoption of several NDPs to improve economic performance in the country, the Iraqi government has failed to achieve either economic progress or political stability, due to its lack of a clear strategy for economic development since April 2003. This has caused further deterioration in several key indicators, especially an increase in the number of unemployed, a further decline in public services, particularly electricity and water, and emerging administrative corruption that has harmed economic performance in both agriculture and manufacturing. Thus, with its economic and political instability and devastating security climate, the country has been unable to create an environment for investment, whether private or public, domestic or foreign, that is needed as a driver for sustainable and diversified economic growth (Merza, 2011).

4.4 Macroeconomic Policies

As observed in Chapter 3, macroeconomic policies are the set of government rules and regulations used to control or stimulate the aggregate indicators of an economy. There are two main regulatory macroeconomic policies, fiscal and monetary, in addition to exchange rate adjustments. In recent years, fiscal and monetary policies in Iraq have been completely subordinated to political objectives.

4.4.1 Fiscal policy

According to the economist John Maynard Keynes (1883-1946), the concept of fiscal policy involves governments altering the levels of taxation and government spending in order to influence aggregate demand and the level of economic activity (Montiel, 2011). The key purposes of fiscal policy in any economy are basically to (1) stabilize economic growth and achieve lower unemployment, (2) keep inflation low, and (3) achieve sustained but controllable economic growth. For example, in a recession, governments will stimulate the economy with deficit spending (expenditure exceeds revenue), while during a period of expansion they will restrain a fast-growing economy with higher taxes and aim for a surplus (revenue exceeds expenditure). Fiscal policy is often used alongside monetary policy.

Iraq faces great fiscal policy challenges following more than 30 years of sanctions and conflict, which have resulted in huge infrastructure and social needs. Oil revenue accounts for the vast majority of government income and output. As noted earlier, the oil sector has contributed more than half of GDP since 1974. The importance of the oil sector can also be seen from its substantial contribution towards financing annual budgets, the development plans and the balance of payments. For example, as shown in Table 4.3, the contribution of oil revenues, at current prices, during 1970-1979, was as high as 81.4% of ordinary budget revenues, 90.2% of total development revenues, and 98.2% of foreign exchange earnings (Mahdy, 1984).

In Iraq, the majority of government revenues come from oil exports rather than alternative financial resources. Taxation, as a fiscal mechanism and a vital source of government revenue, makes a negligible contribution to the country's

economy. Iraq's oil wealth means that it does not have to levy domestic taxes. Furthermore, the government believed that adopting a non-tax regime might be valuable and could stimulate business, since Iraq's exports of natural resources could put upward pressure on its RER and thereby limit non-oil exports, the so-called "Dutch disease[3]" (Karl, 2007).

Table 4.3: Contribution of Oil Revenue to Annual Budgets, Development Plans and Exports, 1970-1979

	Oil Revenue Million Dinar	Total Expenditure (receipts) Million Dinar	Ratio of Oil Revenue to Total Expenditures (%)
Ordinary Budget	9,131.4	11,217.9	81.400
Development Plans	7,534.1	8,352.6	90.201
Exports	20,881.2	21,264.8	98.196

Source: Mahdy (1984), P 12.

Following the oil revenue boom of the 1970s that came as a result of increasing oil prices and export quantities, the Iraqi government was encouraged to set an objective of balanced growth and a self-sustaining economy. Therefore, during the five-year plan of 1970-1974, it revised its budget in favour of gross investment.

In the 1970s, the government adopted a policy of allocating all income surpluses to the investment plan after the consumption budget had been satisfied, regardless of efficiency of projects or the expected rate of return, aiming to diversify the economy rather than rely on one resource. However, the increase in government spending and excessive allocation

[3] "Dutch Disease" was named after the problems experienced by the Netherlands following its initial exploitation of its vast domestic reserves of natural gas. The rapid growth in petroleum exports led to an appreciation of the exchange rate and put upward pressure on the costs and prices of non-traded domestic goods and services, diminishing their competitiveness and eroding the diversity and balance of the domestic economy. Similar symptoms have subsequently been identified in almost all countries where petroleum exports play a major economic role. The arrival of oil devastated all three of Nigeria's traditional agricultural export industries, for example (Karl, 2007).

encouraged government agencies to propose various unsound projects without conducting accurate feasibility studies, simply so as to fully spend their large budgets. Meanwhile, bottlenecks and shortages resulting from large amounts of investment and excessive demands on resources may have created a new cycle of unsound projects, as attention shifted to eliminating those shortages for political or social reasons.

Consequently, the amount of investment was determined largely by the expected income from oil, with no real consideration of the opportunity cost of capital. It can be concluded that the approach adopted by the Iraqi government in the 1970s was contrary to the stated objectives of balanced growth and a self-sustaining economy.

Iraq's fortunes began to change in the 1990s, particularly after the second Persian Gulf War in 1990 and 1991, which immediately followed the Iran-Iraq War. The wars were exacerbated by the international sanctions imposed by the UN. More generally, the Iran-Iraq War forced the diversion of virtually all of the country's discretionary revenues to pay for the cost of the conflict. In 1980, Iraq spent 38.8% of its GDP on defence. Military spending absorbed between a half and two-thirds of GNP during the late 1980s (Ozlu, 2006).

The country faced a real challenge in the form of declining oil revenues; it was no longer able to control the structural imbalance in its economy or the fiscal deficit. According to Foote et al. (2004), when the Iran-Iraq War and the UN embargo disrupted oil sales, the government was denied its main source of income. The government started to seek out new resources with which to run its economy, such as internal taxation, which typically

totalled less than 3% of GDP; income from state activities, such as wages earned by employees of SOEs, was exempt from taxation, and only medium-sized and small firms were asked to pay taxes. This put more pressure on the growing private investment, commonly resulting in firms under-reporting their income and employment levels so as to reduce their tax bills. The government collected some revenues from sales taxes, but these too represented only a small source of funds. Therefore, in 1987, the government adopted a new policy via the privatization of the majority of the SOEs, including the sale of the majority of agricultural and industrial enterprises at lower than market prices. This programme also included the liberalization of the prices of agricultural and industrial commodities, and the provision of incentives for domestic and foreign investment.

In general, this policy failed to mitigate the economic difficulties, and even exacerbated other problems in the Iraqi economy. As a result, the economy experienced an absolute decline in GDP and a high fiscal deficit due to the interruption to its oil revenues during the UN embargo. The government then began to finance its operations by printing money. Until then, Iraq had not been a country with high inflation. However, increasing the money supply after the Gulf War caused inflation to rise from 6% in 1989 to nearly 448% in 1994. The Iraqi dinar depreciated from around 4 dinars per dollar in 1990 to more than 1,700 in 1995 (Foote et al., 2004). The rate of inflation exceeded the rate of money growth during this period, as Iraqis fled the dinar as a store of wealth and began to hold gold or foreign currency instead. These problems along with low interest rate on deposits which were capped in single digits, meant that holding dinars in a bank account was a losing proposition. These caused chronic

inflation, a depreciation of the local currency, a lack of domestic investment, a rise in unemployment, and eventually a drop in living standards.

However, the re-emergence of oil revenues from mid-2003 allowed the government to propose various reforms, such as transforming the centralized economy into a market economy by removing restrictions and barriers to foreign trade, creating an environment to stimulate the private sector, and liberalizing labour, capital and foreign investment, involving many elements of an economy that had been deteriorating for decades. According to the IMF (2003), fiscal expenditure was spread across four main areas: government employment (approximately 30%), public capital accumulation (17%), savings and foreign assets (18%), and transfers and subsidies (approximately 35%). Initially, in 2003, because of the significant decline that had occurred in the level of human development in Iraq, the government increased the role of the public sector in the economy. On the other hand, the government aimed to play a supplementary role to the private sector by directing public expenditure towards providing for basic needs and necessary infrastructure (van der Ploeg et al., 2012).

Overall, in the years that have followed the last war, in spite of the improved policies, the economy has seen a further net deterioration, driven largely by the after-effects of the war, civil disorder, and weak and unstable Iraqi governments. This has forced the Iraqi governments to shift more and more resources into security and counter-insurgency-related short-term aid, which has further weakened many aspects of the infrastructure and the economy, posed a constant threat to the nation's oil exports, and sharply limited outside investment. It has also left a legacy of

growing sectarian and ethnic violence, crime, and constant shifts in the nature of central and local governance that have seriously disrupted local development.

4.4.2 Monetary policy

Monetary policy involves using interest rates and other monetary tools to influence the level of consumer spending and aggregate demand. Due to the limited development of their domestic financial systems, monetary policy in many developing countries is conducted by means of the central bank supplying money directly to the domestic banking system, and is often aimed at specific monetary aggregates. That is, the focus is the monetary supply or stock for domestic credit, rather than, as is more typical in advanced industrial countries, a specific short-term domestic interest rate (Montiel, 2011).

According to the theoretical literature, a stable macroeconomic environment requires a prudent monetary policy. Iraq had abundant foreign exchange reserves due to its oil revenue. Crude oil revenue represented 92% of the total government revenue. Monetary policy under the Baath regime was subservient to fiscal policy and a public budget was used to cover the party's random spending. Therefore, the Iraqi Central Bank's (CBI's) monetary policy, created under the auspices of Law No. 64 of 1976, has not been effective, having failed to manage foreign reserves, achieve economic stability, or ensure a stable exchange rate for the Iraqi dinar in the past four decades (Mahdi, 2007).

Managing the elements of the foreign currency reserve and their roles in supporting monetary policy requires a country to achieve stability, support growth, and balance out inflationary pressures, issues that have generally been seen as a formality and unrelated to monetary policy in Iraq. This is because the

financial policy allowed the use of these reserves and considered them highly flexible methods of paying and fulfilling the obligations of the previous regime. This was achieved by exchanging the Iraqi dinar for foreign currency. For the last three decades of the last century, this view led to the monetary policy following the options and trends of financial policy, using the public budget (Merza, 2011). In other words, the monetary policy involved rebalancing the national debt with foreign currency when the Iraqi dinar was drained. The excessive possession of foreign currency and its replacement with the Ministry of Finance's treasury transfers rendered the Central Bank incapable of addressing domestic liquidity crises, including demand for foreign currency to finance external business. The situation became worse when treasury transfers were used as a substitute for foreign currency through the printing of new money to fund public budget deficits. This greatly increased domestic liquidity without a real cover (reserve) of foreign currency for over two decades. Consequently, the Iraqi dinar's external value depreciated and exchange rates fell, causing severe shocks that created extraordinary inflation of prices and a continual deterioration in living standards. Therefore, stabilizing domestic liquidity rates, addressing inflation and achieving a stable exchange rate became impossible tasks for the central bank.

However, after 2003, the government aimed to restore the function of the monetary policy by promoting economic and financial stability, maintaining stability of domestic prices to create a competitive economic environment based on market forces, and eventually establishing independent objectives and setting policies accordingly. The Central Bank gained its independence and was allowed to refuse to provide credit or loans to the government or other public entities, except for liquidity support in the form of loans. Loans given to state-owned commercial banks were required to be kept under Central Bank supervision. The

same loan provisions would be applicable to commercial banks in the private sector. Thus, it is essential to shed light on the nature of the monetary policy tools, such as exchange rates and interest rates, which have been used over the last four decades.

4.4.2.1 Exchange Rate Policy in Iraq over 1970-2010

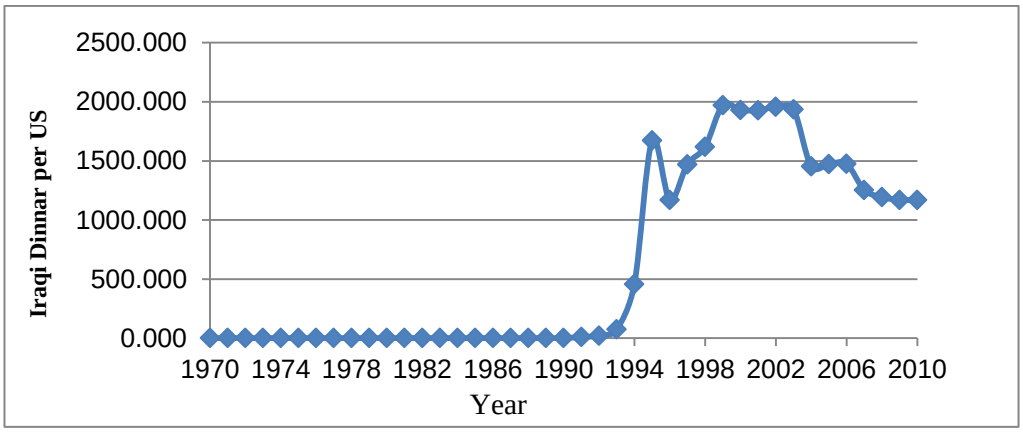
The exchange rate regime is a key variable in macroeconomic policy design due to the fact that developing countries are highly dependent on imported inputs and capital goods. As discussed in chapter 3, there are three forms of exchange rate policy, namely, floating exchange rates, managed exchange rates, and fixed exchange rates (Maddison, 2013). It was also observed that a fixed exchange rate typically disrupts the balance of trade and balance of payments of a country, but it is the preferred regime in some developing countries (Montiel, 2011).

In the case of oil-producing countries like Iraq, fixed exchange rates accompanied by high inflows of oil revenues during the oil boom led to increased demand for imports. This in turn led to higher domestic prices in the short run and the appreciation of the RER. Also, the increase in foreign assets resulting from balance of payment surpluses during the oil boom led to a temporarily higher money stock being required to maintain the fixed exchange rate policy. This negatively affected domestic production by making it less attractive for investment. Consequently, this restricted the growth rate of agriculture, manufacturing, and other sectors in the economy. Moreover, it led to limited job opportunities in the non-oil tradable sectors and made the economy heavily dependent on the oil sector. These all seems to be evidence of the “Dutch Disease” in Iraq. The fixed exchange rate regime, together with oil revenues, was,

ultimately, not conducive to attracting investment or the diversification of the economy (Hermes and Lensink, 2013).

Figure 4.4 illustrates the development of the Iraqi nominal exchange rate over the period 1970-2010. It can be noted that, for many years, the official nominal exchange rate for the Iraqi dinar was subject to a fixed exchange rate regime. From the early 1970s, the official exchange rate of the Iraqi dinar was pegged at US$3.3. In other words, one Iraqi dinar was equal to approximately 3 US dollars on average and remained steady at this exchange rate, even during the period of the oil boom in the 1970s, and from the late 1980s until 1990.

Figure 4.4: Nominal Exchange Rate of Iraq Dinar, 1970-2010



Sources: WB (various years); UNCTAD (various years); IMF (various years).

In the 1980s, the government experienced budget deficits due to increased military spending requirements. Hence, the second interruption to Iraq's oil revenue, the UN embargo, which involved the controlling of Iraqi exports and the freezing of Iraq's foreign currency accounts, caused many economic difficulties, such as a heavy debt burden, inflation, currency depreciation, a non-responsive private sector, stagnant output, and a lack of funds for reconstruction. Therefore, the government pursued another approach, financing its operations by printing

money. This situation caused the money supply to grow much faster than the output of goods and services, leading to high inflation rates. As the money supply and inflation rates grew, firms' international competiveness declined and unemployment rose.

Furthermore, the rapid increase in the price of the US dollar relative to the Iraqi dinar, driven by an increasing money supply, political events and instability, led to a change to a flexible exchange rate regime in the late 1990s. As a result of increasing demand for the dollar and a rising inflation rate, the price of the dollar increased sharply from 10 dinars in 1991 to 1,700 dinars in 1995 (Foote et al., 2004).

An increasing expectation of higher rates of inflation was the key reason for the depreciation of the Iraqi currency, which led people to convert their financial assets into real assets in Iraq or foreign assets abroad, as the dinar lost its function as a store of value. Thus, there were increased demands on foreign currencies such as the dollar for transactions, and the Iraqi dinar began to play an increasingly limited role in the market (Alnasrawi, 1994).

Another reason for the depreciation in the exchange rate during the Gulf War was the increasing uncertainty, which stimulated those who could do so to emigrate, requiring them to convert their wealth into foreign currency. This increased the supply of the dinar on the international market and caused a further decline in its value (Al-Saadi, 2006).

Grigorian and Kock (2010) further clarified the reasons for the depreciation of the Iraqi currency, attributing it to a reduction in the importation of consumer goods during the wars, which in turn motivated the smuggling of local currency to neighbouring countries so as to import goods for sale in Iraq at prohibitive prices.

The increase in the supply of the dinar in these countries led its value to decline further against foreign currencies.

However, in the post-war period, government reforms in the financial sector have allowed the CBI to gain independence and credibility, which should help transform the country from a centralized economy into a market-oriented one. To stabilize the exchange rate, the CBI issued Law No. 56, aimed at achieving equilibrium between the demand and supply of the dollar on the one hand, and a balance in the dollar-to-dinar exchange rate on the other hand, objectives that could aid price stability and make the domestic currency more attractive.

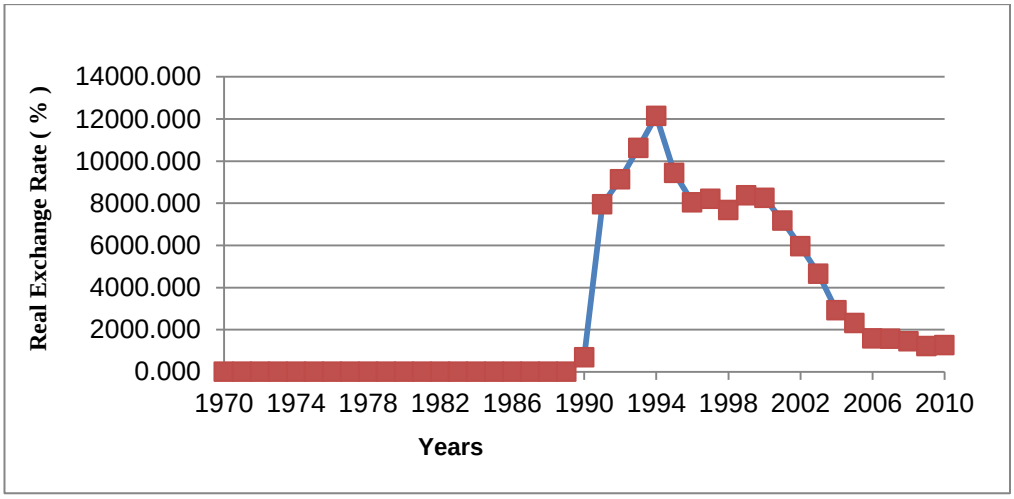
Practically, since the restoration of oil revenues in 2004, monetary policy has mainly been influenced by oil exports, two-thirds of Iraq's economic output being comprised of exporting oil to international markets for a price denominated in US dollars. High oil prices after the war have put an upward pressure on Iraq's RER. Hence, monetary policy is closely intertwined with the exchange rate and how these US dollars are converted into dinars. In the end, Iraq has adopted a de facto managed floating exchange rate. A floating exchange rate provides Iraq's economy some cushion against oil-price shocks; a drop in the oil price would likely cause the dinar to fall, which would encourage Iraq's as yet limited non-oil exports to rise, and would decrease demand for its imports in competing industries (Foote et al., 2004).

In general, central banks in small open economies typically intervene in currency markets so as to guard against high volatility. In 2004, this approach was used by the CBI to influence the exchange rate and control the growth of the domestic monetary base, in foreign exchange auctions. The Ministry of Finance sold dollars

from its oil income to the CBI, purchasing dinars to pay for government operations. The CBI then sold some of those dollars in the daily foreign exchange auctions. Consequently, the CBI successfully increased the value of the Iraqi dinar and achieved stability in it. The dinar was pegged to the dollar at a stable rate of between 1,193 and 1,170 dinars per dollar during 2008-2010 (IMF, 2013).

The RER is often used as an indicator of the competitiveness of the foreign trade of a country. Figure 4.5 shows the development of the RER, confirming the vital improvement in the international value of the Iraqi dinar that has resulted from the growth in oil exports and the trade surplus. Furthermore, monetary policy has included reforms aimed at causing the Iraqi dinar to appreciate, via the use of interest rate tools to control the money supply.

Figure 4.5: Real Exchange Rate at Constant 2005 Prices, 1970-2010



Sources: WB (various years); UNCTAD (various years); IMF (various years).

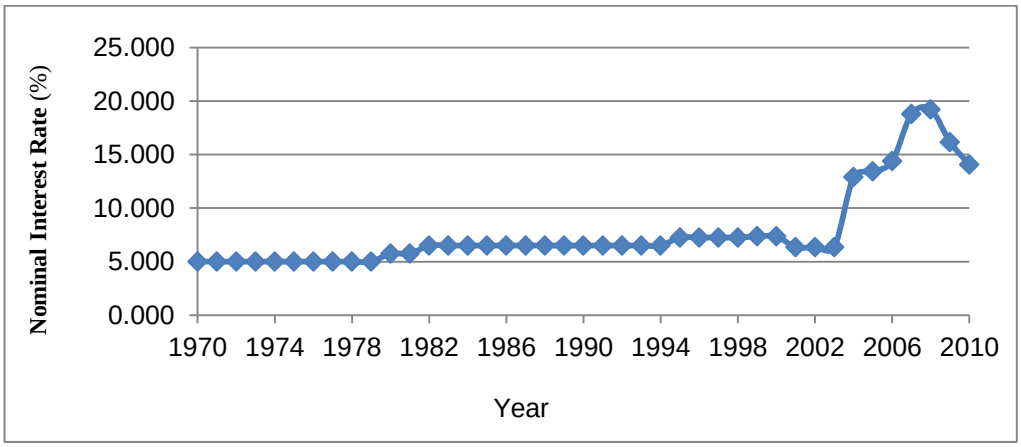
However, the nominal exchange rate continues to be a very common tool for conducting monetary policy, maintaining price stability, reducing domestic inflation rates, and supporting the advantages of foreign payments and reserves. For example, appreciation of the nominal exchange rate in Iraq from 2006 to 2009 helped to bring inflation down from 53.23% in 2006 to low single digits.

Appreciation of the RER stimulated a reduction in the total cost of local production in the real economy, the promotion of growth, and an increase in total revenues from production activities.

4.4.2.2 Interest Rate and Inflation

The CBI, since its establishment, has relied on a policy of administratively setting the nominal interest rate (NIR). As shown in Figure 4.6, during the period from 1970 to 2003, the NIR stood at a level of 6% on average, and remained steady even during the period of the oil boom and sanctions. The trend in the NIR has not seen any change related to inflation trends. This implies that the interest rate has played no significant role as an instrument of monetary policy in Iraq's economy, which has made monetary policy ineffective for the achievement of macroeconomic goals.

Figure 4.6: Nominal Interest Rate in Iraq, 1970-2010



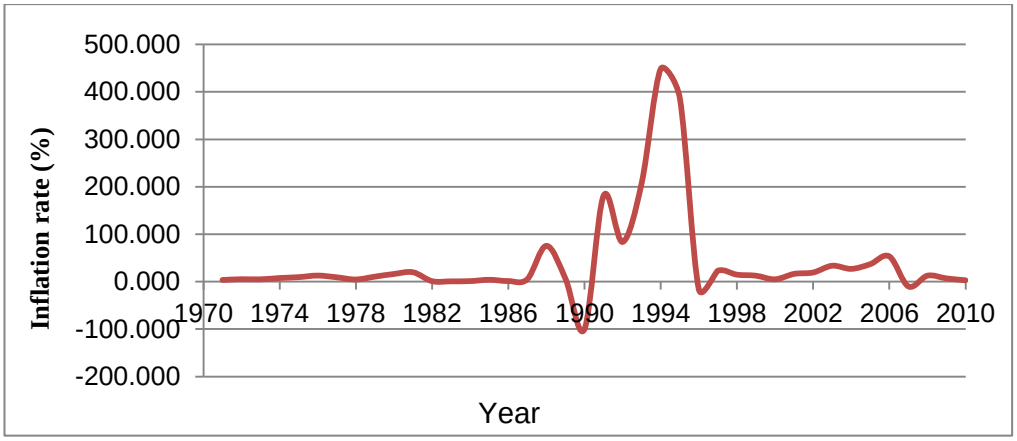
Sources: CBI, Quarterly Bulletin (various issues); IMF (various years); World Bank (various years); COST (1991, 2006, 2010).

Iraq's economy did not experience high inflation[4] during 1970-1989, and for most of that period inflation remained in single digits. Despite the increased money supply, the consumer price index (CPI 2005=100) indicates that inflation was

[4] Inflation is a general increase in prices, which can be measured by the Consumer Price Index over months or years, and reflects the decreasing purchasing power of a currency (Kock and Grigorian, 2010).

under control, mainly due to price controls and wages freeze imposed in 1974[5]. However, a high rate of inflation emerged after the second Gulf War and the commencement of international sanctions, when the government began to finance its operations by printing money. Hence, the rapid rate of money growth caused inflation to rise from 6% in 1989 to approximately 450% in 1994 (Figure 4.7). As a result, Iraq suffered from a prolonged period of very high inflation, which can be labelled hyperinflation[6]. Despite the efforts of the CBI, through its monetary policy, to strengthen the exchange rate of the Iraqi dinar against the US dollar, the dinar depreciated from around 10 per dollar in 1991 to roughly 1,700 in 1995 (see Figure 4.4). The continued high rate of inflation has turned out to be one of the most challenging aspects of economic management in Iraq.

Figure 4.7: Inflation Rate of Iraqi Economy at Constant 2005 Prices. 1970-2010



Sources: CBI, Yearbook Bulletin (various issues); IMF (various years); WB (various years); COST (various years).

[5] After 1974, wage levels in the public sector were constant. On the other hand, living standards were supported by the government through the provision of education, healthcare and housing, subsidized food and utility prices, and sizeable energy subsidies (Sanford, 2003).

[6] Hyperinflation is defined as a devastatingly high increase in prices, of 50% or more per month, due to the near total collapse of a country's monetary system, making its currency almost worthless as a medium of exchange. Although hyperinflation is caused mainly by excessive deficit spending by a government (financed by the printing of more money), some economists believe that social breakdown leads to hyperinflation (not vice versa), and that its roots lie in political rather than economic causes (Barro, 1995).

The real interest rate[7] (RIR) has been negative at many times over the last three decades (see Figure 4.8). This happens especially when the rate of inflation exceeds the rate of growth. As a result, Iraqis abandoned the dinar as a store of wealth, holding gold or foreign currency instead. Since fewer people were willing to save, holding dinars in a bank account was also an unattractive proposition. All these factors had an adverse influence on gross investment, especially for private businessmen, who found it difficult to access credit.

The constant interest rate lowered the size of bank savings and led savers to redirect their capital towards speculation. Mahdy (1984) argued that the reason for the negative RIR was that the financial authority was not as sophisticated about nominal and real interest rates as it needed to be. Therefore, before 2003, one can conclude that the interest rate had a limiting effect on most economic activities and the level of investment.

However, since 2003, monetary policy has been aimed at activating the role of interest rates to counter inflation and the expectations resulting from it, in an effort to encourage domestic and foreign investment. By 2003, the interest rate had been liberalized, and it was used to counteract the expansion in the government's current expenditure and investment spending, as well as to control and restrict inflation rates related to such spending. For this purpose, the CBI set the interest rate at 6% in 2003, increasing it to 14% in 2006. The key objectives of liberalizing the NIR were to make it attractive for borrowers, to motivate saving in banks, to contribute towards reducing the burden of public spending, and to control domestic liquidity.

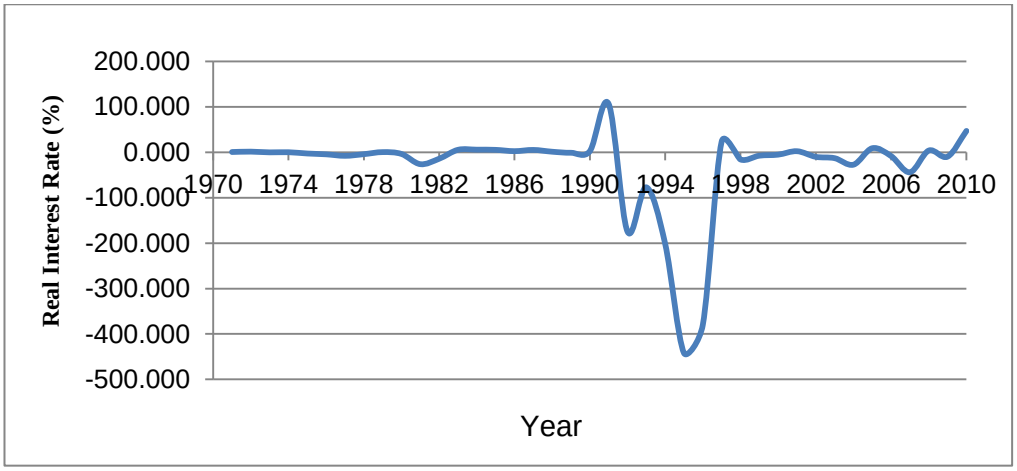
[7] The RIR is the NIR adjusted for inflation; it can be calculated as the NIR less the inflation rate.

However, the inflation rate turned out to be much higher than expected. For example, the consumer price index was 33.5% in 2003 and increased to 53.2% by 2006. Therefore, a stable exchange rate was a key tool of monetary policy, used later to keep the inflation rate in the single digits between 2009 and 2010. This policy strengthened the Iraqi dinar against the dollar. It was allowed to appreciate in November 2006, and the exchange rate is estimated to have been between 1,454 and 1,205 ID to the US dollar during the period of 2003-2008. By 2007, inflation had been capped through a mixture of fiscal and monetary policy, and it declined to 12.6% by the end of 2008 (IMF, 2003). It appears that a large part of the changes in the inflation rate since 2003 have derived from the volatile behaviour of energy and transportation prices, while the magnitude of financial support provided to most ration card commodities has also led to an increase in inflation rates (Grigorian and Kock, 2010).

The interest rate continued to rise to 19% in 2007. In 2008, the monetary authority accelerated reductions in the NIR to adapt it to reducing inflation levels and to motivate investment, so that the interest rate was subsequently reduced to 16% in 2009 and 14% in 2010. This development was expected to control the inflation rate to the same level and encourage more lending to private-sector companies, help create a stock market, and attract foreign investment.

Eventually, the inflation rate was reduced to 6.8% in 2009 and 2.8% in 2010, as proposed by the CBI, indicating the effectiveness of the monetary in reducing the severity of inflation. The annual reduction of inflation since 2007 also improved the purchasing power of the local currency, promoting private-sector involvement in the economy.

Figure 4.8: Real Interest Rate in Iraq (1970-2010)



Sources: CBI Quarterly Bulletin (various issues); IMF (various years); WB (various years); COST (various years).

4.5 Macroeconomic Indicators

4.5.1 Trend in Gross Domestic Product (GDP) and GDP Per Capita

As explained in Section 4.2, extensive development plans were adopted during the period of 1970-1979, which reflected positively on GDP growth and per capita income. Appendix B2 shows the average GDP growth to be about 12%, with GDP per capita income increasing significantly from US$998 in 1970 to US$2,018 in 1979, a 172% increase. This can also be attributed to a significant increase in oil prices, which led to a substantial increase in oil production at that time. It in turn supported the development of related industries, including petroleum refining, chemicals, and fertilizers.

The growth of the Iraqi economy has historically been linked to developments in the oil sector. Successive NDPs since the 1970s have laid emphasis on building a viable economy by diversifying and expanding the non-oil sectors, particularly non-oil tradable sectors such as manufacturing and agriculture. Table 4.4 shows the trend in the share of GDP of key sectors, reflecting the major structural changes in the economy. In the 1970s and 1980s, local production increased in

favour of agriculture and manufacturing, although crude oil continued to dominate as the source of foreign currency.

During 1980-1989, the state aimed to expand the two key sectors of agriculture and manufacturing, but put most emphasis on the agricultural sector. Therefore, the latter's share of GDP increased to 13.1%, while that of the manufacturing industry was around 10.2%. However, these two key sectors declined markedly after the 1990s, when the whole political situation changed and the country became engaged in successive wars, and there has been no significant recovery even since the wars.

The economic indicators were seriously affected by Iraq's involvement in the long war with Iran (1980-1988). For example, real GDP growth decreased significantly to negative figures (see Table 4.B.2) because of the stoppage of oil exports and decrease in oil production. The latter occurred when Syria, which supported Iran at the time, closed the 500-mile (650,000-bpd-capacity Banias pipeline), which had been a vital Iraqi access route to the Mediterranean Sea and European oil markets.

Table 4.4: Share of GDP of Key Economic Sectors, 1979-2009 (%)

Economic Sector	1972-1980 (Average)	1981-1989 (Average)	1990-2003 (Average)	2004	2005	2006	2007	2008	2009
Agriculture, Forestry, Hunting and Fishing	5	13.1	12.4	6.9	6.9	5.8	4.9	3.7	4.4
Mining and Quarrying	60.4	21.7	64.4	58	57.8	55.5	53.2	55.7	40.7
Crude Oil	60	21.3	64.3	57.9	57.6	55.3	53	55.5	40.4
Other Types of Mining	0.3	0.4	0.1	0.1	0.2	0.2	0.2	0.2	0.3
Manufacturing Industry	6.3	10.2	1.7	1.8	1.3	1.5	1.6	1.5	2.4
Electricity and Water	1	13	0.2	0.8	0.8	0.8	0.9	0.8	1.2
Building and Construction	1.8	11.3	1.2	1.3	3.7	3.6	4.4	3.8	5.1
Transport, Communication and Storage	3.1	6.6	6.9	8.3	8	7.1	6.6	7.7	10.2
Wholesale, Retail Trade, Hotels and Others	4.6	12.2	7.2	6.1	5.7	6.6	6.3	6.5	8.2

Finance and Insurance, Real Estate and Business Services	2.8	9.4	2.6	6.9	7.4	8.3	9.7	8.3	10.4
Banking and Insurance	2.5	5.6	1.3	0.6	0.7	0.7	1.4	1.3	1.7
Ownership of Dwellings	0.3	3.8	1.3	6.3	6.7	7.6	8.4	7	8.7
Social and Personal Services	18.2	18.6	4.6	10.4	8.9	11.2	12.8	12.4	18
General Government	18.2	17.4	3.5	8.5	7.1	9.4	11	11.1	16.3
Personal Services	0.1	1.1	1.1	1.8	1.7	1.8	1.8	14	1.7
Total by Activities	100.1	104.3	101.2	100.5	100.5	100.5	100.5	100.4	100.6
Less Imputed Bank Service Charges	0.1	4.3	1.2	0.5	0.5	0.5	0.5	0.4	0.6
GDP	100	100	100	100	100	100	100	100	100

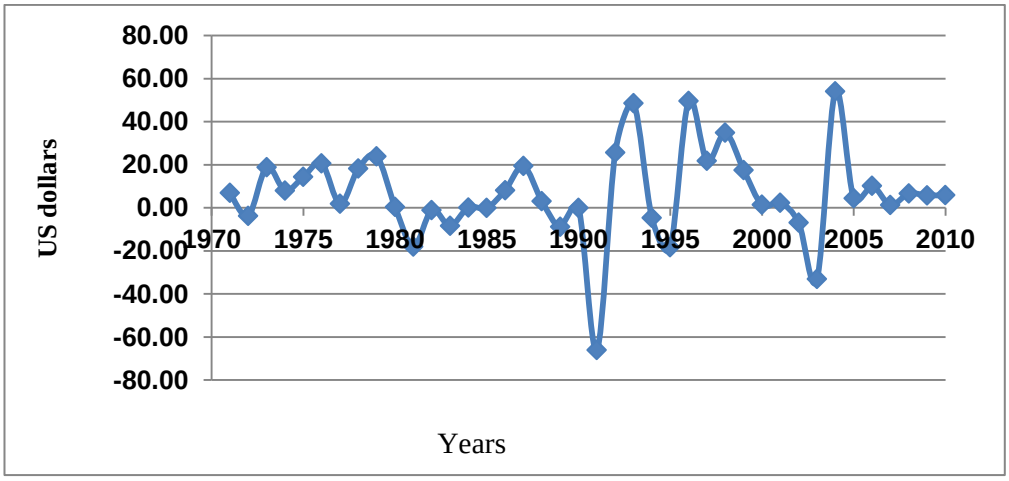
Source: WB (2011); CBI (various issues); COST (2010).

During 1990-2003, when Iraq faced the second Gulf War with the United States and close to a decade of harsh international sanctions, there were negative effects on GDP, with the real GDP fluctuating considerably during this period (Benson, 2012). These fluctuations noticeably influenced per capita income, which dropped sharply from US$1408.65 in 1990 to US$463.96 in 1991 (see Figure 4.10 and Appendix B2) before recovering to US$1,334.95 in 2002.

Alnasrawi (1994: p.81) discussed that, since a major portion of GDP was devoted to the military and similar forms of spending, “When people reached the stage where they started selling their private property such as jewellery, home furniture, statistically this means that they were approaching the famine stage”. Furthermore, other sectors of the economy, such as the manufacturing industry, electricity and water, and building and construction, were affected by a combination of the effects of the second Gulf War and the international sanctions. They were heavily dependent on budget support and thus the manufacturing industry’s share of GDP declined markedly to 1.7% (Table 4.4). That industry lost its competitiveness due to mismanagement, capital stock degradation, and the sanctions. Although the agricultural sector already comprised only a relatively

small share of the Iraqi economy, it has also been seriously affected in the last three decades by the burdens of military conflict. In the mid-1980s, agriculture accounted for only about 13.1% of the national GDP. After the imposition of UN sanctions and the Iraqi government's initial refusal in 1991 to participate in the UN's proposed Oil-for-Food Program, oil production fell, and agriculture's share of GDP rose to an estimated 35% by 1992 (Sanford, 2003). The sector was then affected by severe droughts in 1999 and 2000, while food prices were repressed by the imports of agricultural commodities under the aforementioned UN programme (Mahdi, 2007).

Figure 4.9: Real GDP Growth at Constant 2005 Prices, 1970-2010

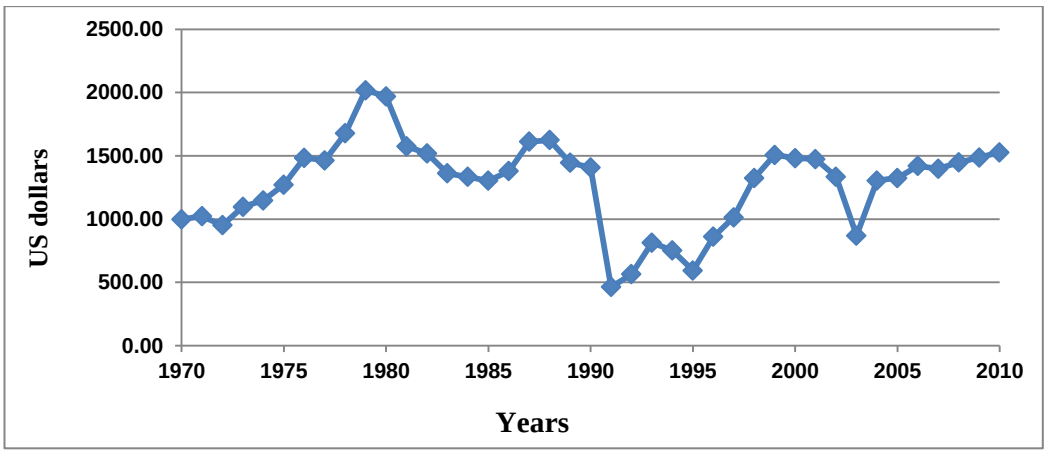


Sources: UNCTAD (various years); CBI (various years); IMF (various years); WB (various years); COST (various years).

By 2003, oil production and exports had yet to reach the pre-war levels, and the non-oil sectors remained sluggish. As a direct result of the conflict, real GDP growth between 2003 and 2010 was volatile and fragile. After reaching 54% in 2004, it saw a slowdown between 2005 and 2007, falling to 1.38% by 2007 (see Figure 4.9). As a result, real GDP per capita consistently averaged around US$1,416 during 2004-2010. Economic activities such as transport, construction, communication, and storage benefited from oil production and exports, and their contributions to GDP increased to 10.2%, while manufacturing saw a slight

increase to 2.4%, its highest figure since 2004 (Table 4.4). This indicates that Iraq's recovery and reconstruction is progressing at a much slower pace than expected.

Figure 4.10: GDP Per Capita at Constant 2005 Prices, 1970-2010



Sources: UNCTAD (various years); CBI (various years); IMF (various years); WB (various years); COST (various years).

4.5.2 Evaluating the Role of Public and Private Investment

Gross fixed capital formation (GFCF) is considered to be an essential engine of economic development. It refers to net additions of capital stock, such as equipment, buildings and other intermediate goods, within the measurement period. It does not account for the consumption (depreciation) of fixed capital. It is an element of the expenditure approach to calculating GDP (Todaro and Smith, 2009). The stages of fixed capital formation are considered strategic mechanisms, not only in terms of long-term but also short-term economic growth (Cavallo and Daude, 2011).

Since the early development of the oil industry, in addition to the general objectives of increasing the rate of potential growth, per capita income and social services, balanced growth has been adopted as a primary goal. This is based on the fact that oil is an exhaustible resource that must be used to develop a self-sustained economy capable of generating sufficient savings and investment for

continued growth without dependence on one economic sector (Mahdy, 1984) (see also Table 4.4). On the other hand, a new objective was adopted after the 1958 revolution that ended the monarchy. The key target was to create a socialist society. Thus, in 1964, the government nationalized all banks, insurance companies, and major private industrial and commercial enterprises. Furthermore, the state took control of the most important parts of economic activity, using the rapid increases in oil revenues and public investment to do so. However, the macroeconomic policy shifted again in the late 1970s, towards stimulating private-sector participation in the economy.

During 1970, there was a boom in oil revenue, due to rising world oil prices that led oil production to increase from 1.5 to 3.2 million bpd (see Appendix B1). This allowed the government to implement investment programmes outside the oil sector, which reflected positively on all of the non-oil sectors (Merza, 2011) (see also Table 4.4). The increase in oil revenues also allowed the state to adopt a five-year plan (1970-1974). Based on it, oil revenues were allocated equally between the investment programme and ordinary budgets. The development plan exhibited a shift in favour of public industry, and the state started to identify industrialization as the key sector for economic and social development (Ozlu, 2006). The government increased its participation in the economy based on the belief that industrialization was the engine of economic growth and key to the transformation of the traditional economy. Hence, this led gross public fixed capital formation (GPFCF) to increase from $591million in 1970 to $2,584 million in 1975, an average yearly growth rate of 40%. In contrast, Gross Domestic Private Fixed Capital Formation (GDPFCF) did not follow the same trend, which decreased from $491 million to $421 million (see Figure 4.11), indicating a lack of appropriate legal and regulatory arrangements for facilitating

private investment. Thus, the private sector was playing an insignificant and unclear role in the economy (Mahdy, 1984).

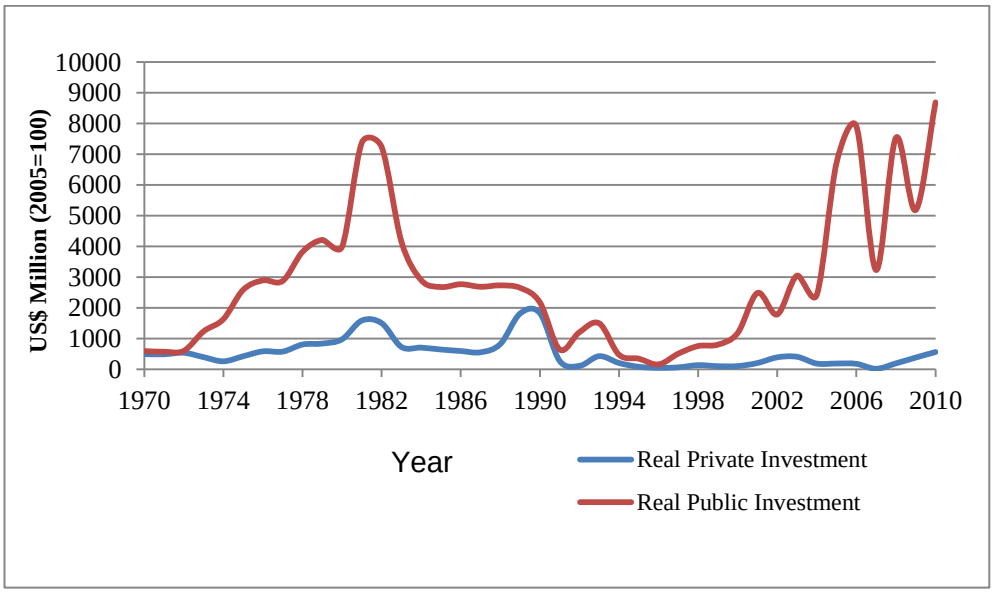
However, during 1975-1980, the government realized the importance of creating an attractive investment climate that would stimulate private investment. The Planning Authority allocated more of the income surplus to the investment plan after the consumption budget had been satisfied. As a result, both GPFCF and GDPFCF increased, with average growth rates of 27% and 18% respectively, as shown in Appendix B3. These figures may indicate that, during that period, public investment was "crowding in" private investment. As observed in chapter 3, increasing public investment can create more favourable conditions for private investment, for example by improving relevant infrastructure such as roads, highways, sewage systems, harbours and airports. The existence of such facilities increases the productivity of private investment, which can then take advantage of potentially improved business conditions.

With regard to non-oil exports during 1970-1979, although a large amount of the budget was allocated to investment during that period, the non-oil sector comprised only 1.8% of total exports, while oil exports dominated. This indicates that the government was unable to develop other important commodities to export in addition to crude oil. This was due, generally, to the concentration of the development efforts on import-substituting industries, which had only limited success (Mahdy, 1984).

A combination of several factors meant that private investment played a limited role in the economy. Iraq's national economy was centrally planned and largely state-owned; the public sector was a key sector and heavily regulated. In contrast, the private sector received less consideration from the state, and non-Arab foreign

direct investment was not allowed. This resulted in a lack of modern technology in the productive sector. Moreover, a poor financial market, common in developing countries, combined with political instability, formed a key issue that caused great uncertainty over the expected future returns of private investment.

Figure 4.11: Trends in Private and Public Capital Formation at 2005 Constant Prices, 1970-2010



Sources: UNCTAD (various years); CBI (various years); COST (various years).

In the 1980s, when the Iraqi government first became involved in conflict, the expectation was that the economy would continue with the development plan and achieve further decades of economic growth. However, as discussed earlier, all macroeconomic indicators, without exception, were influenced by the onset of the country's eight-year war with Iran. As a result, both GPFCF and GDPFCF experienced a remarkable decline in real terms. Appendix B3 and Figure 4.11 show that GPFCF declined significantly to $2,730 million in 1988, from $7,377 million in 1981. Meanwhile, GDPFCF also witnessed a decline from $1,585 million to $819 million over the same period, exhibiting 48% negative growth. This shows that the Iran-Iraq War had a negative influence on private investment. The growth of the Iraqi economy is strongly linked to developments in the oil

sector. Consequently, as soon as oil export revenues start to decrease, for any reason, government expenditure decreases, and the impact of this decline is directly transmitted via a multiplier effect to the rest of the economy. This is exactly what happened to Iraq's economy when war erupted.

In the first post-conflict stage, new situations caused by the war forced the state to play an essential role in increasing the level of private investment, rebuilding physical and human capital, and restoring the population's access to vital services. There was a significant shift in macroeconomic policies, redefining the role of public investment in the economy. The government abandoned a number of interventions in the economy, for example announcing its withdrawal from direct involvement in the agriculture sector in order to give more space to private investment (Mofid, 1990). The announcement of a motivational programme of trade liberalization and privatization represented a further step towards promoting private investment in other sectors of the economy. The key features of the privatization programme included the sale of most of the state lands, farms, and SOEs in the manufacturing industry to the private sector at very low prices. It was expected that privatization would enhance the capacity for specialization, the utilization of economic resources, and competition in the economy.

To achieve this goal, macroeconomic policies, in particular fiscal policies, were designed to help expand the level of private investment and accelerate development. This included incentives for private-sector enterprise, the facilitation of financial and administrative procedures, the creation of a stock exchange, and the opening up of the country to foreign investment. Along with these policies, due to the budget deficit caused by the reduction in oil revenues during the Iran-Iraq War, the government reduced its subsidies to SOEs and

removed policies that set price ceilings for commodities (Alnasrawi, 1994). As a result, in 1990, private capital formation increased to a peak of $1,825 million. Thus, the contribution of GDPFCF to GDP increased to 7.5%, while that of GPFCF was just 8.8% (see Appendix B3). The main thrust of the government's macroeconomic policies, in particular its fiscal policies, revolved around market-friendly reforms and the creation of an attractive climate for domestic and foreign investment (Ozlu, 2006).

As mentioned earlier, the efforts to continue with the privatization programme were unsuccessful because of the continuing conflict and lack of financing and support for private business owners in Iraq. Economic incentives and proposed policies aimed at expanding private investment were soon interrupted when Iraq became involved in the second Gulf War and when sanctions were imposed, forcing the country to cease exporting oil. The reduction in oil revenues noticeably influenced development spending and private and public capital formation, and the continued political turmoil increased the risk in the business environment. As a result, both public and private investment declined after 1990, and in 1996 they reached their lowest points ever. GDPFCF declined sharply and reached its lowest point of just $202 million, and the public and private sectors' shares of GDP were barely existent. Furthermore, the embargo imposed on Iraq by the UN as a result of the Kuwait invasion negatively impacted a wide range of economic activities, including the availability of inputs and capital goods that were essential to the operation of all sectors of the economy (Al-Roubaie and Elali, 1995).

Successive wars and economic sanctions had a number of consequences for the country, such as the devastation of its formerly large oil exporting capacity, the

destruction or damage of basic and heavy industries, extensive infrastructure damage, severe reduction in the labour force due to many serving in the military, and low industrial growth. Also, agriculture suffered a recession; many rural workers had enrolled in the army or moved to urban centres, the reliance on food imports increased, especially after Iraq's entry into the Oil-for-Food Programme, and development planning eventually ceased (Alnasrawi, 1994).

During 1990-2003, in addition to the above problems, an inefficient fiscal policy led to financial issues related to the public budget, and further exacerbated the crisis in the Iraqi economy, through a rapid increase in consumer prices and high rates of inflation and unemployment, which eventually led to a deterioration in the standard of living. As a result, the government shifted its focus from increasing the rate of private investment to stabilizing the living standard for Iraqi citizens, with policies including lowering prices, increasing subsidies to the agricultural sector, a law freezing the prices of some consumer goods, and a low cap on the profits of public-sector and mixed companies (Crocker, 2004).

Mahdi (2007) argued that the UN sanctions from 1990 to 2003 had a serious influence on Iraq's manufacturing sector, which not only declined in overall size but also became much less diverse, losing technologically advanced sub-sectors. Meanwhile, the chemical, vehicle manufacturing, small manufacturing, and scientific equipment industries all virtually vanished. As can be seen from Table 4.4, the majority of economic sectors declined due to the political instability.

In 2003, after decades of conflict and isolation, the eventual demise of Saddam Hussein's regime ended thirty years of economic destruction. It was expected that Iraq's economy would recover and overcome the effects of its prolonged conflicts. Decades of heavy state control over all kinds of economic activity in Iraq meant

that diversification through increased international trade was sorely needed. At the same time, however, the economy was confronted with enormous development challenges, necessitating a change in orientation marked by the formal adoption of development plans. The government introduced and implemented NDPs for the years 2005-2007. The NDPs were established based on four key objectives: sustaining economic growth, reviving the private sector, improving the quality of life, and establishing good governance and security. As the government made clear, the mechanism that would be used to achieve these four objectives would be high economic growth outside of the oil sector. The NDPs also marked the beginning of efficient government involvement in the economy.

However, despite the post-war efforts in 2003onwards to increase local and international private investment, GDPFCF in Iraq showed no noticeable progress. The private sector did not exceed $200 million, barely contributing to GDP, from 2004 until 2008, before increasing to $379 in 2009 and then $560 million in 2010. White (2012) argued that the share of the private sector was too low to generate a significant increase in economic activity and employment, while the oil sector – averaging around 98% of GDP – employs only 1% of all labour.

The new government's economic policies failed to increase private investment and its contribution to GDP. This can be attributed to the absence of an appropriate investment climate, and to political instability and poor security, caused by internal conflicts following the war. Moreover, in post-war 2003, the private sector experienced new setbacks, such as stoppages to private industrial projects, high production costs, and a lack of demand for local products due to local markets being filled with imported goods. The lack of security and threats to capitalists' families due to increasing street violence, led many capitalists to flee

to neighbouring countries such as Turkey and Jordan, in an effort to find stability and safety for their investments.

However, GPFCF showed positive results in 2003, although it did fluctuate between $2,500 and $8,600 million. The average annual contribution of GPFCF to GDP from 2004 to 2006 was around 15%.

It should be noted that, in spite of improved policies, the years that have followed the war have seen a further net deterioration, driven largely by the outcomes of the war, civil disorder, and weak and unstable Iraqi governments. The violence has increased steadily since power was transferred to the Iraqi authorities in 2004. This has forced both the coalition and the various Iraqi governments to allocate more and more resources to security and counterinsurgency, resulting in further weakening of various aspects of the infrastructure and the economy, and causing a continual threat to the nation’s oil exports, which has severely limited investment. The war has also left a legacy of growing sectarian and ethnic violence, crime, and continual shifts in the nature of central and local governance that have seriously harmed local development (Ozlu, 2006).

What can be concluded is that, in terms of the diversification of Iraq's economy, there is strong evidence that the agriculture and manufacturing, building and construction, and transport, communication and storage sectors all have very strong potential, based on observations from the 1970s and 1980s (Table 4.4). Private investment is needed to revitalize these sectors. There is a need for political stability and security, and for the redefinition of macroeconomic policies, in order to attract more private investment into the Iraqi economy.

4.5.3 Assessment of the Labour Force and Employment in Iraq

According to the arguments of endogenous growth theories, a considerable amount of attention must be given to human capital[8]. There is a broadly held belief that human capital positively affects the productivity of all other factors of production and may also generate innovative opportunities or products that support technological progress. The economic disruption in Iraq has led to a noticeable deterioration in its human development indicators (Leonard, 2009). It is well known that oil, the dominant sector of Iraq's economy, is capital intensive and generates less than 1% of the demand for labour in Iraq. Like any oil-based economy, Iraq faces the challenge of using its oil wealth to foster growth and job creation in the manufacturing and other economic sectors (Al-Saadi, 2006).

As was mentioned earlier, in the past three decades the contributions of most of the economic sectors to the economy have been influenced by the pressures of military conflict, particularly the 1980-1988 Iran-Iraq War and the 1991 Gulf War (see Table 4.4). Only the service sector has stayed stable to any extent. At the same time, the contributions of both the manufacturing and agriculture sectors have decreased, to 1.7% and 12% of GDP respectively. This has certainly influenced the structure of employment, and caused the labour force[9] to shift away from those sectors, which are labour intensive and produce commodities, towards service activities, which are also labour intensive but generate no commodities. Consequently, in 1996, the share of the labour force working in the service sector

[8] Human capital refers to people's knowledge, competence and ability with respect to providing labour. Factors such as formal education and training are important for human capital. The success of a business depends on the quality of human capital available (Baron, 2007).

[9] The total number of people who are eligible to work, whether currently employed or unemployed, in a country or region. The labour force is usually determined by the size of the population (Cain, 1978 and Montiel, 2011).

was about 66.4% ,while 17.5% were employed in the manufacturing industry, and 16.1% in the agriculture sector (Region, 2006). This caused a shortage in the supply of commodities and increased the country's imports of agricultural products and other consumer goods (Mahdi, 2007).

Therefore, the trends in and composition of the population and labour force have been greatly influenced by a number of demographic, economic, political and social factors. In 1980, the distribution of the labour force was also seriously influenced by the Iran-Iraq War. The armed forces' share of the labour force increased from 2.9% (62,000 workers) in 1970 to 13.4% (430,000 workers) in 1980. As a result of the expansion of the armed forces, industrial employment declined from 25% to 7.8%, while employment in the agriculture sector declined from 42% to 12.5% (Alnasrawi, 1994). This pattern of mobilization for wars has caused distortions in the labour market and reflected adversely on the economy and the labour force, leaving the population unskilled or semi-skilled (Yousif, 2006).

Moreover, as a result of the war, two distinguishing phenomena emerged in Iraq's labour force, specifically in the rural areas. The first was a reduction in the number of people who were economically active in rural areas, from 16% of the total labour force in the early 1990s to approximately 10% in 2000. This was due to broadly spread unemployment in the countryside, especially among young men. This is believed to have encouraged a continual migration of the labour force from the agriculture sector to the city. The second phenomenon was the increased dependence on women in agricultural labour. The share of women among all agricultural workers in 2000 was more than 50%, according to data from the Food

and Agriculture Organization (FAO), making them the main contributors to such work (IMF, 2003).

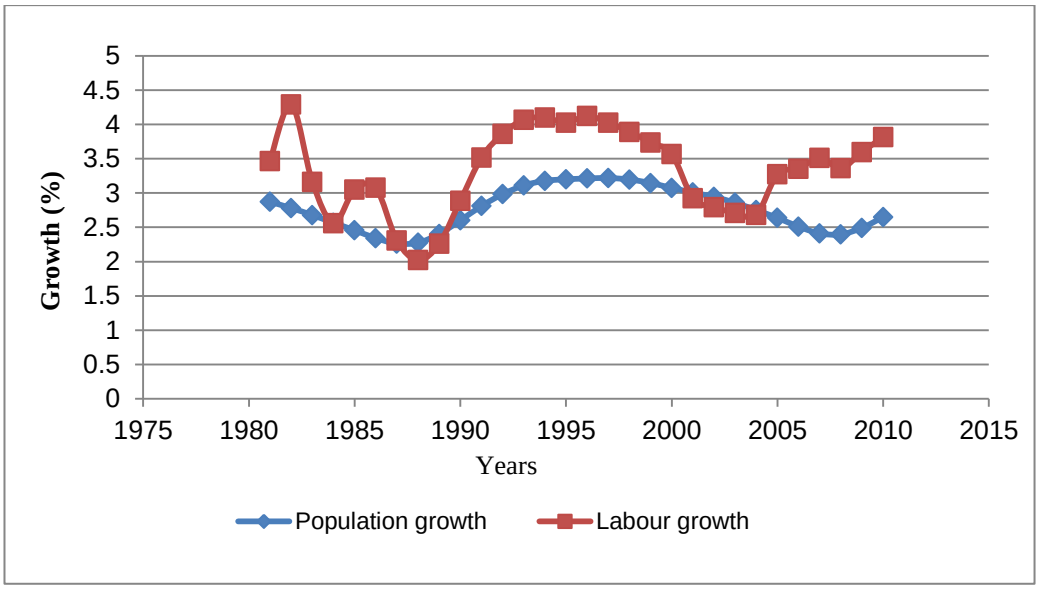
In 2003, Iraq's labour force was estimated at 6 million people. A statistical survey conducted in Iraq by the IMF and the WB confirmed a tangible change in the structure of the labour force in favour of certain economic activities in the post-war period. For example, labour that had previously worked in agriculture was now attracted to activities such as the police, security and the army, due to the higher incomes available and the deterioration of the agriculture sector. This led to clear disorder in the distribution of labour among other economic activities.

Furthermore, modernization has had a negative effect on labour force trends in Iraq. The percentage of labour involved in services (non-commodity activities) increased from 59% in 2006 to 82% in 2008, indicating the decreased share of the manufacturing and industrial sectors in the economy. The industrial sector used only 5.9% of the total labour force in 2006, increasing to 13.7% in 2008 (NDP, 2010). With regard to the employment structure by gender, the rate of female participation in economic activity is generally low, due to institutional, cultural, economic and legal factors.

Based on the population demographics, the Iraqi labour force is growing at an average rate of 3.0% per year, as shown in Appendix B4 and Figure 4.12, which means that Iraq's labour force is growing rapidly in the long term. In recent years, unemployment has become the social challenge with the most adverse influence on the economy and society as a whole. During 1980-1990, the unemployment rate was not prominent due to obligatory military service. Following the second Gulf War and the imposition of international sanctions on Iraq, the rate of unemployment increased rapidly. The economy was unable to provide enough

work, due to declining production in all economic sectors, which made job opportunities rare. Therefore, a large number of people were encouraged to emigrate abroad, seeking a better life.

Figure 4.12: Trends in Population and Labour Growth in Iraq, 1970-2010



Sources: UNCTAD (various years); CBI (various years); COST (various years).

Since the fall of Saddam Hussein's regime, many factors have contributed towards pushing the unemployment rate still higher. It is difficult to obtain accurate data on the exact rate of unemployment in Iraq. However, according to the formal data published by COST (2010), national unemployment in 2003, 2004, and 2005 stood at 28.1%, 10.5%, and 26.8% respectively. According to a World Bank (2006) report, Iraq had one of the highest unemployment rates in the region in 2010, at close to 30%, almost twice the MENA average. Apparently, the unemployment rate then decreased to 17.6% in 2007, before increasing to 18.3% in 2009 (Cordesman, 2010).

Opportunities for private-sector job creation have been limited by an unfavourable investment climate, an unconducive regulatory environment, a high dependence on oil revenues, and security issues such as violence and internal and external

displacement, causing low levels of economic activity in the public and private sectors (Merza, 2007).

The unemployment rate needs to be put in the context of Iraqi demographic conditions to provide the best understanding of the real situation. Iraq has a very young population. 40% of the 30 million citizens are under the age of 15 years and the mean age is an incredibly low at 23.8 years. Another significant factor is the low number of middle-aged men, mostly because of the Iran-Iraq War and more recent wars, and the high number of middle-aged women (Cordesman, 2010). The lack of middle-aged men creates a higher dependence on young Iraqi men. In fact, the Iraq Living Conditions Survey carried out in 2004 indicates that the average dependency ratio in Iraq is 73.97%.

What can be concluded is that increasing Iraq's labour force and reducing the unemployment rate is one of the biggest challenges facing Iraq's economy today. There is a need to establish solutions and constructive processes to alleviate unemployment. The key to sustainable job creation is investment in productive areas of the economy, including sectors other than oil. In the long run, strong job creation can be ensured only through economic diversification (particularly in service sectors such as tourism), efficient import substitution, and an export industry. Hence, Iraq's state needs to strengthen labour skills and the performance of the labour market by increasing both public and private investment. In doing so, it will also reduce the social problems associated with this issue (Bank, 1993).

4.6 Summary

After decades of a heavily state-controlled economy, the deterioration produced by a succession of wars, a decade of international sanctions, and the looting that followed the 2003 war, the post-2003 Iraqi state faces particular challenges in

striving towards reconstruction and development. Government commitment to a sound fiscal framework that will enhance both public and private investment is a necessary condition for robust economic growth and job creation. Macroeconomic stability needs to be maintained, regardless of the highly uncertain domestic and external environment. Since 2003, inflation has remained in the low digits and the exchange rate stable. In spite of these achievements, gross domestic investment is still too low due to a lack of appropriate infrastructure services, an inefficient public sector, a lack of skilled labour, and political instability. These are the major obstacles facing Iraq's economy.

Moreover, Iraqi recovery and reconstruction is progressing at a much slower pace than expected. The task of rebuilding the country after 2003 remains enormous and has been made harder by sectarian politics and prolonged violence. Iraq’s reconstruction requires not only the rebuilding of its infrastructure, but also of its economic and social institutions, and the creation of a business environment that will attract capital, and new technology and skills for modernizing the economy. Iraq’s huge oil reserves could, in principle, provide the revenues needed to finance the reconstruction, but strong institutions and a favourable business environment are needed if these resources are to be used effectively.

The key objectives for economic recovery are reconstructing the war-ravaged infrastructure, laying the economic foundations needed for generating faster and more efficient economic growth in all sectors, and giving Iraqi citizens access to a greater number of productive jobs. Economic reforms are needed to meet these key objectives, such as developing the financial system and bank sector, and adopting appropriate monetary and fiscal policies, so as to make Iraq's economy more business

friendly and further ensure economic diversification. Diversifying the economy will be an important part of Iraq's economic revitalization, as it will also create an alternative resource in the form of a tax base. The ultimate purpose will be to achieve an economic transformation from state domination to private entrepreneurship, from a closed to an open economy, and from oil dependence to diversification.

This chapter has provided a broad analysis of some macroeconomic indicators in Iraq in the last four decades. Following on from this, the next chapter addresses the methodology, based on which most of the indicators presented in this chapter will be examined in Chapters 6, 7 and 8 so as to draw policy implications.

CHAPTER 5 ECONOMIC MODELLING AND ESTIMATION APPROACH

5.1 Introduction

There is broad agreement that investment, in particular private investment, and economic growth are strongly associated with one another. Some key studies, such as Chirinko (1993) and Khan and Reinhart (1990), have confirmed that countries in which investment stays stagnant over a prolonged period of time have their future growth potential endangered due to the shortage of capital accumulation. This conclusion is worrying for a country like Iraq, which has shown some inconsistent and downward trends relating to private investment, in terms of both the total amount and in relation to GDP (Foote et al., 2004; Tadlock, 2004).

The theoretical underpinnings and empirical evidences relating to determinants of domestic private investment and public investment, and an evaluation of the role of both public and private investment in economic development, were discussed extensively in Chapters 2 and 3, Specific variables influencing the investment environment in Iraq and economic growth in the country were also assessed in chapter 4. This chapter aims to present the modelling and estimation-related issues regarding the relationship between domestic investment, public investment and economic growth in the case of Iraq. To address the key objectives specified in Chapter 1, three empirical models are modified to fit Iraq's economic structure, and then estimated. A simple growth model is formulated based on a neoclassical framework separating the effects of private and public investment, so as to examine the complementarity or substitutability of public capital versus private

investment in the case of Iraq. Secondly, a flexible accelerator model is developed to estimate the pattern of domestic private investment in Iraq and the key variables explaining it. Finally, based on recent empirical studies, a public investment model is developed and estimated in the context of Iraq.

For estimation purposes, yearly data from 1970-2010 are used to examine the behavioural equations of the model. However, before the macroeconomic situation of the Iraqi economy is evaluated, it is essential to examine whether the key macroeconomic variables in the behavioural equations contain a trend or not, and if so whether it is deterministic or stochastic. Therefore, each time series is checked using the stationarity test via two common unit root tests, the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP). The Johansen cointegration trace test and the maximum eigenvalue statistics are then used to establish the long-run equilibrium relationship among the variables in the models. A Vector Error Correction Model (VECM) is also used, to find the short-run dynamic relationship between the variables and to better understand the investment behaviour. Finally, in addition to the model specification, another important issue that is considered is whether there is a problem of multicollinearity in the models.

The remainder of this chapter is organized as follows. Section 5.2 deals with the philosophy of research. Section 5.3 presents research methodology. Theoretical and empirical specification of the growth investment model are explained in section 5.4. Section 5.5 presents the modelling of the domestic investment function. In this section, the theoretical framework, empirical model and hypotheses for the explanatory variables are described as well. The specification of the public investment model is presented in Section 5.6. The data set and sources are clarified in Section 5.7. The main approaches of the research

methodology, namely the stationarity, cointegration and VECM tests, are discussed in Section 5.8 while the final section provides a summary of the chapter.

5.2 The research philosophy

The word "methodology" means the theoretical analysis of the methods suitable for a field of study or the body of methods and principles particular to a branch of knowledge. The term “methodology", generally, refers to a strategy that can be followed in order to achieve the objectives of a study.

Creswell (2009) distinguishes between four research philosophies: positivism, social constructivism, participatory research or advocacy, and pragmatism. Positivism (alternatively post-positivism or the scientific method philosophy) assumes that causes probably determine results in the form of causal relationships but the outcomes can be different across research done in different countries. Thus, positivism and post-positivism are considered the traditional research paradigm. These approaches tend to be more quantitative than qualitative (Creswell, 2009). With this philosophy, researchers start with a theory, collect data, and then conclude that the findings either support or refute the theory. The assumptions of this philosophy mostly apply to quantitative research, such as economic research in which researchers describe causal relationships in terms of research hypotheses or questions. The researcher must be objective and check the methods for bias.

The second philosophy is social constructivism; this is the typical approach used in qualitative research. In this philosophy, researchers attempt to understand the real world in terms of the way people work and live. Qualitative open-ended questions are used to enable the participants to share their views and construct the

meaning in a situation. The process of qualitative research according to this philosophy is inductive; meaning is generated from the data that are collected and shaped according to the researcher's experience and background.

Participatory research, the third philosophy, can also be seen as a qualitative research approach, despite the fact that it can also act as a foundation for quantitative research. This type of research contains an action plan which may help to change the lives of the contributors and the institutions in which they work. Advocacy research is a voice through which participants can raise their agenda for change. Participatory studies usually start with an important issue or problem in society and the main purpose behind this is to create political controversy and discussion leading to change.

The fourth philosophy, pragmatism, deals with the research problem instead of the methods used to understand the problem. Many approaches can be used to expand knowledge about the problem. According to pragmatism, the researcher is free to choose any research methods, techniques and procedures that best meet their aims. Therefore, pragmatism can be distinguished as research that mixes quantitative and qualitative methods (Leech et al., 2010). In this philosophy, researchers start with assumptions, then collect and analyse data (Creswell, 2003). It is believed that pragmatism is an applicable philosophy for business and tourism research and it is commonly used in those areas (Jogulu and Pansiri, 2011).

The present research adopts a positivist approach as, based on the aforementioned descriptions, it appears to be the most suitable for achieving this study's research objectives.

5.3 Research methodology

The design of a research study begins with the selection of a topic and a paradigm. According to Creswell (1994), "A qualitative study is defined as an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting. Alternatively a quantitative study, consistent with the quantitative paradigm, is an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers, and analysed with statistical procedures, in order to determine whether the predictive generalizations of the theory hold true."

A paradigm is essentially a world view, which guides the researchers in their choice of relevant ontological and epistemological views as well as the methods to adopt (Guba and Lincoln, 1994). Furthermore, the paradigm of inquiry explains aspects of the research inquiry including its ontology, epistemology and methodology (Creswell, 2009). Ontological assumptions refer to the nature and form of reality that can be revealed (Eriksson and Kovalainen, 2008). The epistemological approach, meanwhile, clarifies what could be considered as valid knowledge (Hussey and Hussey, 1997), as well as the link between the researcher and the subject investigated (Guba and Lincoln, 1994). An ontological perception can be either objective or subjective. An objective ontological view regards the world and reality as independent and distinctive from the individuals in it, while a subjective ontology argues for the existence of a link and a dependence between reality and people (Eriksson and Kovalainen, 2008).

5.4 Private and Public Investment, and Economic Growth

5.4.1 Theoretical and empirical specification of the model

The majority of growth models for developing economies trace their roots to the neoclassical framework of Solow (1956). In recent years, a growing number of works (Khan and Kumar, 1997; Khan and Reinhart, 1990; Khan and Khan, 2007; Majeed and Khan, 2008) have expanded the framework, attempting to clarify the role of private and public investment in growth in developing countries. In order to address one of its key research objectives, this study investigates whether private-sector investment and public-sector investment have different impacts on Iraq's growth rate.

The Solow model starts with a production function framework, assuming that output is a function of physical capital, labour, and a variable that represents factor productivity:

$$y = A\, f(K, L, V) \qquad (5.1)$$

where *y* is the level of output, K is the stock of physical capital, L represents the labour force and V denotes a vector of other variables assumed to influence economic growth. The variable A denotes a measure of productivity that is assumed to be exogenous.

The signs of all of the partial derivatives of *y* with respect to the arguments of *f*(•) are expected to be positive. Equation (5.1) can be expressed as a growth model as follows (Khan and Reinhart, 1990: pp.3-4):

$$\frac{dy}{y} = \left[A.\frac{\partial y}{\partial K}\right]\frac{dK}{y} + \left[A\,.\frac{\partial y}{\partial L}\,.\frac{L}{y}\right]\frac{dL}{L} + \left[A\,.\frac{\partial y}{\partial V}\,.\frac{V}{y}\right]\frac{dV}{V} + \left[\frac{dA}{A}\right] \qquad (5.2)$$

Equation (5.2) can be simplified for estimation purposes, with the variable $\boldsymbol{dK}$ replaced with I, leading to the following:

$$\frac{\Delta Y}{y_{t-1}} = \beta_0 + \beta_1 \frac{I}{y_{t-1}} + \beta_2 \frac{\Delta L}{L_{t-1}} + \beta_3 \frac{\Delta V}{V_{t-1}} \qquad (5.3)$$

where $\beta_0 = \frac{dA}{A}$ represents the constant term assumed to capture the growth in productivity; $\beta_1 = A.\frac{\partial y}{\partial k}$ represents the marginal productivity of capital; $\beta_2 = A.\frac{\partial y}{\partial L}.\frac{L}{y}$ represents the elasticity of output with respect to labour; $\beta_3 = A.\frac{\partial y}{\partial V}.\frac{V}{y}$ represents the elasticity of output with respect to the other explanatory factors.

The more general specification of equation (5.3) is the most commonly used model in research of this nature. It has been utilized in various studies that have implemented this growth model for developing economies. A weakness of this model, from the perspective of market-based development and economic growth analysis, is that it does not distinguish between the independent effects of private and public investment on economic growth. Since the effects of each are combined into a single aggregate investment variable, it would be an impossible task to determine whether an increase in private investment with a simultaneous decline in public investment would encourage or stifle growth. Hence, when estimating the aggregate investment variable, any change in private and public investment would not be reflected in total investment. Therefore, several empirical studies (Khan and Kumar, 1997; Khan and Reinhart, 1990; Zou, 2006; Sakr, 1993) have suggested that public and private investment should be distinguished between, the argument being that these two types of capital stock exhibit different functions and productivity. Therefore, equation (5.3) can be rewritten as follows:

$$\frac{\Delta y}{y_{t-1}} = \beta_0 + \beta_1 \frac{PI}{y_{t-1}} + \beta_2 \frac{GI}{y_{t-1}} + \beta_3 \frac{\Delta L}{L_{t-1}} + \beta_4 \frac{\Delta V}{V_{t-1}} \quad (5.4)$$

where aggregate investment (I) is divided into private investment (PI) and public investment (GI) with PI +GI = I. Thus, one can distinguish between the effects of the two types of investment on economic growth. If their impacts are found to be the same, this could imply that the respective marginal productivities of private and public investment are equal, i.e. $\beta_1 = \beta_2$. However, if private investment is more efficient and productive than public investment, then the estimated coefficient of private investment will be larger than the public investment coefficient, $\beta_1 > \beta_2$, and vice versa (Ghura, 1997; Kandenge, 2007; Khan and Reinhart, 1990; Zou, 2006). Khan and Reinhart (1990), in particular, emphasize the need for caution when using the relative sizes of β_1 and β_2 to draw conclusions about the respective roles of private and public investment. This is due to some uncertainty about whether public-sector investment encourages or hinders private investment (i.e. has a crowding-in or a crowding-out effect), since private and public investment are related in developing countries.

In the present study, the variable V in the model is expanded to include some other determinants of economic growth in addition to capital and labour, such as the real exchange rate, the inflation rate and the value of petroleum exports. Following Blejer and Khan (1984), equations (5.3) and (5.4) respectively can be simplified to a log-linear form with an error term μ_t for estimation purposes as follows:

$$\mathbf{LRGDP} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\mathbf{LGFCF} + \boldsymbol{\beta_2}\,\mathbf{LLABOUR} + \boldsymbol{\beta_3}\mathbf{LROX} + \boldsymbol{\beta_4}\mathbf{LREXR} + \boldsymbol{\beta_5}\mathbf{LINFL} + \boldsymbol{\mu_t} \quad (\mathbf{5.5}\boldsymbol{a})$$

$$LRGDP = \beta_0 + \beta_1 LRPI + \beta_2 LRPUI + \beta_3 LLABOUR + \beta_4 LROX + \beta_5 LREXR + \beta_6 LINFL + \mu_t \quad (5.5b)$$

where LRGDP represents the log of the real gross domestic product; LRPI represents the log of real private domestic investment, which is by proxied by the log of real private domestic fixed capital formation.; LRPUI represents the log of real public investment, which is proxied real public fixed capital formation; LLABOUR represents the log of the size of the labour market, comprising people aged 15-64; LROX represents the log of the real value of petroleum exports; LREXR represents the log of the real exchange rate; and LINFL represents the log of the inflation rate based on the GDP deflator. LGFCF is the log of the gross fixed capital formation which is the sum of private and public fixed capital formation.

μ_t is the error term, which is assumed to be normally and independently distributed with a mean of zero and a constant variance, capturing all other omitted explanatory variables that may affect economic growth but are not included in the model (Brooks, 2014). β_0, β_1, β_2, β_3, β_4, β_5, β_6 are the partial elasticities of the explanatory variables.

Equation (5.5b) represents the economic growth model used for estimation purposes in the context of Iraq over the period from 1970 to 2010.

5.4.2 Hypotheses for the economic growth model

The following hypotheses are tested with respect to the economic growth model (5.5b). The expected signs of the coefficients are shown in Table 5.1.

Table 5.1: Economic Growth Model (Measurement of variables and expected signs of the coefficients)

Variable	Variable measurement	Expected sign of coefficient	Sources
RGDP	Real gross domestic product in constant 2005 prices (US$ million).	Dependent variable	Wai and Wong, 1982; Khan and Kumar, 1997; Mlambo and Oshikoya, 2001; Sakr, 1993; Ghura and Goodwin, 2000; Greene and Villanueva, 1991; Naa-Idar et al., 2012; Ndikumana, 2000.
RPI	Gross domestic private fixed capital formation in constant 2005 prices (US$ million).	+	Ramirez & Nazmi, 2003; Oshikoya, 1994; Isaac and Samwel, 2012; Kandenge, 2007; Akanbi and Detroit, 2008; Havi et al., 2013; Baghebo and Edoumiekumo, 2012.
RPUI	Real public-sector investment in constant 2005 prices (US$ million).	+	Ramirea and Nazmi, 2003; Blejer and Khan, 1984; Frimpong and Marbuah, 2010; Naa-Idar et al., 2012.
LABOUR	Refers to the physical size of labour in the labour market, comprising people aged 15-64.	+	Blejer and Khan, 1984; Sachs and Warner, 2001; Moradi, 2009.
ROX	Refers to the oil export revenue, calculated in constant 2005 prices (US$ million).	+	Ghassemi, 1996; Auty, 2001; Gylfason, 2001; Nurkse, 1953.
[10]REXR	Nominal exchange rate multiplied by the ratio of the foreign to local-currency consumer price indexes.	-	Erden and Holcombe, 2006; Khan and Kumar, 1997; Majeed and Khan, 2008; Mallick, 2002.

[10] Various measurements are used to calculate the real exchange rate, but the most common is the nominal exchange rate (domestic prices of foreign currency) multiplied by the national price level (domestic price level divided by foreign price level) (Taylor, 2004; Acosta and Loza, 2005).

INFL	The rate of inflation based on the GDP deflator (%)	- +	Omoke, 2010; Krugman, 1995; Saaed, 2007; Ahmed and Mortaza, 2005; Baghebo and Edoumiekumo, 2012; Havi et al., 2013; Majeed and Khan, 2008. Sweidan, 2004; Mallik and Chowdhury, 2001.

Some studies (Blejer and Khan, 1984; Erden and Holcombe, 2006; Ghura, 1997; Khan and Reinhart, 1990) suggest that economic growth in developing countries is mainly explained by private investment, public investment, and size of the labour force, all of which have a positive effect on it; therefore, it is expected that the coefficients of private investment, public investment and the size of the labour force will all exhibit positive signs ($\beta_1 > 0,\ \beta_2 > 0,\ \beta_3 > 0$).

The empirical literature also indicates that discovering crude oil has, in most oil-producing countries, given rise to high expectations of enhanced prospects for rapid poverty reduction and economic development. In Iraq, economic growth is extensively influenced by the volume of petroleum exports. The oil sector dominates Iraq's economy, with oil exports accounting for over 90% of government revenue, 80% of foreign exchange earnings and about 75% of GDP (see Section 4.3). Therefore, it is necessary to include this variable as a determinant of Iraq’s economic growth, and it is expected that the coefficient will be positive ($\beta_4 > 0$).

Furthermore, price fluctuations and volatility in the real exchange rate are also considered to influence economic growth, but expectations regarding the signs of their estimated coefficients are ambiguous (Erden and Holcombe, 2006; Khan and Kumar, 1997; Majeed and Khan, 2008; Mallick, 2002). However, since a high

rate of inflation can be a sign of macroeconomic instability and the government's inability to manage the economy effectively, it is expected to have an adverse effect on the efficient allocation of resources and thus also on economic development. Economists have also long known that poorly managed exchange rates can be devastating for economic growth. Avoiding a large overvaluation of the currency is one of the most robust imperatives, strongly supported by cross-country empirical evidence (Easterly, 2005; Johnson et al., 2007; Rajan and Subramanian, 2011; Razin and Collins, 1997; Rodrik, 2008). The reason for this is that overvalued exchange rates are associated with shortages of foreign currency, rent seeking and corruption, and unsustainably large current account deficits, which are damaging to economic growth. However, devaluation of the real exchange rate may also harm economic growth by reducing the real income of the economy, thus causing production capacity and activity to decline (Isaac and Samwel, 2012; Kandenge, 2007). Thus, the coefficients of both the inflation rate and the real exchange rate are expected to be negative ($\beta_5 \; and \; \beta_6 < 0$).

5.5 Determinants of Domestic Investment in Iraq

The variables in this model are macroeconomic determinants highlighted in the theoretical and empirical studies that were described in Chapters 2 and 3. Generally, the theoretical and empirical literature suggests that there are two basic types of factors that influence private investment: economic and non-economic. Due to limited studies and difficulties in how to measure non- economic factors, only political instability, which is relevant to the case of Iraq, is considered in this study. Consequently, this study aims to identify the key macroeconomic variables affecting private investment in Iraq.

Since the start of the debt crisis in the early 1980s, there has been renewed interest in the determinants of private investment in developing countries. The theory on the determinants of private investment has proposed several hypotheses concerning the key macroeconomic variables that play a crucial role in explaining the investment behaviour in a country (see Chapter 2). Based on these hypotheses, a number of important studies have modelled the determinants of private investment in several developing countries, including Turkey, Malaysia, Iran, Nigeria, Ghana and others (Baghebo and Edoumiekumo, 2012; Bakare, 2009; Frimpong and Marbuah, 2010; Karagoz, 2010; Khan and Reinhart, 1990; Mellati, 2008; Naa-Idar et al., 2012; Yin, 2011).

5.5.1 Theoretical framework

As observed in Chapter 2, the theoretical literature on private investment theories is quite large and diverse. The major investment strands are associated with two common theories: that of Keynes, and the Jorgenson neoclassical model. The Keynesian accelerator model comes with the assumption that the underlying production function specifies a positive fixed relationship between the desired capital stock and the change in output, and that capital costs have no effect on the optimal capital stock (Khan and Khan, 2007; Mlambo and Oshikoya, 2001; Sakr, 1993; Ghura and Goodwin, 2000). In the same context, Greene and Villanueva (1991) asserted that private investment had a positive relationship with both per capita income and the growth of real output.

However, neoclassical theory and others later suggested that there was a missing component in the Keynesian model. Therefore, the neoclassical approach further assume that the investment function was proportional to the cost of capital (see Section 2.4). Although, in the theoretical literature, the cost of capital is argued to

depend on the interest rate, the price of capital goods, the rate of depreciation, and the tax structure, in various empirical studies only the interest rate has been used to represent the cost of capital. The real interest rate represents the usage cost of capital or the cost of credit for firms. A negative relation is expected because increases in the interest rate are likely to represent a disincentive for potential investors (Ang, 2010; Ribeiro and Teixeira, 2001, Khan and Khan, 2007; Nwosa Philip Ifeakachukwu, 2013; Sundararajan and Thakur, 1980; Wai and Wong, 1982). On the other hand, in the neoliberal approach, financial deepening and high interest rates are important for stimulating growth. According to this view, investment is positively related to the real interest rate (see Section 2.5). The basic notion behind this is that high interest rates increase savings through financial intermediaries and this raises the amount of investible funds. This is known as the McKinnon-Showan hypothesis and is based on the assumption that the quantity rather than the cost of financial resources is the main constraint on investment (Todaro and Smith, 2009).

At the theoretical level, public investment has an ambiguous effect on private investment. The relationship between the two can either be positive or negative. Keynesian economists often advocate a mixed economy, arguing that private-sector decisions sometimes lead to inefficient macroeconomic outcomes that require active policy responses from the public sector, in particular monetary policy actions from the central bank and fiscal policy actions from the government, in order for output to be stabilized over the business cycle (Arestis, 2011). According to Keynesian theory, public-sector capital has a positive impact on private investment, since higher public expenditure and lower taxes enhance aggregate demand through the multiplier effect (Ahmad and Qayyum, 2008; Yin,

2011). The enhanced demand is an incentive for the acceleration of investment and improved productivity from private investment (see Sections 2.3 and 3.2).

Generally, it is evident that in developing countries the government plays a substantial role in economic activity. The public sector can increase productivity by generating positive externalities such as investments in infrastructure and public services (e.g. health or education), which in turn can lead to an increase in the demand for private-sector inputs and services. The availability and quality of such services also attracts private investment since it improves the ease of doing business in a country. In this scenario, public and private can complement each other. As observed in Section 3.2, this is known in the economic literature as the "crowding in" effect. Contrary to this hypothesis, it is also argued that public investment may "crowd out" private investment, when the public sector competes with the private sector for both physical and financial resources, especially when additional public investment requires the financing of budget deficits through taxes and borrowing. In this case, private investment may decrease by the same amount as the increase in public expenditure (Karagoz, 2010; Khan and Kumar, 1997).

Recent theories have incorporated uncertainty into the explanations of investment behaviour. The theoretical expectations are different, but most of them predict a negative relationship between uncertainty and private investment. Different proxies are used to examine uncertainty, including economic instability (Aizenman and Marion, 1993; Mellati, 2008; Pindyck, 1991; Serven, 2002). In the case of developing countries, economic uncertainty can be measured in terms of the volatility of inflation, the real exchange rate and output growth (Section 3.4.4).

The real exchange rate is one of the elements that determine the real cost of imports and exports demand. The predicted effect of the real exchange rate on private investment is ambiguous. Devaluation of a currency would raise the cost of imported capital goods, reducing the profitability of investment and possibly causing investment to decline. In addition, the depreciation of a currency could lead to a reduction in the real income of the economy, causing the production capacity and activity to decline. On the other hand, a lower real exchange rate may have a positive influence on investment in sectors producing internationally traded goods. A lower real exchange rate may therefore raise the profitability of the tradable sector and increase the competitiveness and volume of exports (Serven, 1998, 2002, 2009) (see Section 3.4.3).

Many recent studies have shifted their focus to political instability and/or war, due to the fact that these variables have been identified as major obstacles to the achievement of economic development because they limit the volume of private investment. There is a number of empirical evidence supporting the view that non-economic factors such as political instability and wars have an adverse influence on private investment. The argument is that political instability increases uncertainty in the economy and discourages risk-averse entrepreneurs from taking advantage of profitable investment opportunities (Aysan et al., 2006; Bakare, 2009; Campos and Nugent, 2003; Kehinde et al., 2012) (see also Section 3.5).

5.5.2 Empirical specification of the Private Investment model

For developed countries, the investment function is often described from a neoclassical perspective, which was initially based on flexible accelerator models (Jorgenson, 1971; Monadjemi and Huh, 1998) (see Chapter 2). Various

researchers, such as Blejer and Khan (1984), Chhibber et al. (1992), Greene and Villanueva (1991), Sundararajan and Thakur (1980) and Wai and Wong (1982), have since modified the flexible accelerator model, in an effort to take account of factors that can best capture the behaviour of private investment decision making in developing countries (see also Sections 2.7 and 3.2.1). It should be noted that the flexible accelerator model has been confirmed by these studies as the most popular theory for applied work. However, a modified version of the flexible accelerator model has been used in most of these empirical studies in the context of developing countries, due to data limitations and structural constraints. Similarly, a flexible accelerator model will be applied in this study in order to clarify the pattern of investment behaviour in developing countries, taking Iraq as a case study.

The choice to use the modified accelerator model rather than the more conventional formulation of the neoclassical investment model was based on the fact that the traditional model of investment assumes enlightened government intervention and free market conditions, which are unrealistic in the context of developing countries, especially oil-exporting countries such as Iraq. The absence of asset and stock markets, structural constraints and the strong presence of the government in the economy through the huge oil export revenues are other reasons for selecting a flexible accelerator model. Moreover, the monetary policy in developing countries encourages the rate of interest rate to be lower than the market rate, while overvaluation of the local currency is pursued in an effort to slow down the inflation rate (see Section 4.2.2).

According to the accelerator model, the desired capital stock in any time period is assumed to be proportional to the expected level of output. In other words, a fixed

ratio (α) is assumed between the desired capital stock (K_t^*) and the expected output (Y_t^*). Mathematically, this proposition is expressed as follows (Eklund, 2013):

$$K_t^* = \alpha Y_t^* \qquad (5.6)$$

where K_t^* represents the desired capital stock held by the private sector in period t, Y_t^* is the expected output in period t and α is a constant denoting the capital output ratio.

The flexible accelerator makes the generalization that net investment is a given proportion of the investment needed to attain the desired capital stock. Thus, the desired level of gross fixed investment, in any period t, can be divided into two parts. The first consists of net investment, whereas the second consists of the replacement of capital, known as depreciation. The gross fixed investment can therefore be represented as:

$$\mathbf{I_t^* = \Delta K_t + D_t} \qquad (5.\mathbf{7})$$

where I_t^* is gross investment, which is equal to net investment (ΔK) plus replacement investment (D).

The standard assumption is that depreciation or replacement investment is a proportion of the existing capital stock (δK_{t-1}). Therefore, the above equation can be simplified as follows:

$$I_t^* = K_t^* - K_{t-1} + \delta K_{t-1} \; ; \Delta K_t = K_t^* - K_{t-1}$$

$$I_t^* = K_t^* - (K_{t-1} - \delta K_{t-1})$$

$$\mathbf{I_t^* = K_t^* - (1 - \delta) K_{t-1}} \qquad (5.\mathbf{8})$$

Introducing a lag operator (L) into the above equation ($LK_t^* = K_{t-1}$), equation (5.8) is revised as follows:

$$I_t^* = K_t^* - (1-\delta)LK_t^*$$

$$\mathrm{I}_t^* = [1-(1-\delta)\mathrm{L}]\mathrm{K}_t^* \qquad (5.9)$$

From equation (5.6), the accelerator principle is presented as $K_t^* = \alpha Y_t^*$. Substituting capital stock (K_t^*) into equation (5.9) we have:

$$\mathrm{I}_t^* = [1-(1-\delta)\mathrm{L}]\alpha \mathrm{Y}_t^e \qquad (5.10)$$

Where I_t^* is the desired level of investment in period t; δ, the rate of depreciation of capital stock; L, the lag operator; and Y_t^e, the expected level of output in period t.

This is simply the well-known flexible accelerator model, which assumes that, given flexible prices and partial adjustment toward the desired capital stock in each period, investment depends on output (Jorgenson, 1971). Lags are included in the capital stock due to the fact that the unit price of capital increases with the adjustment speed (Lucas, 1967).

In order to incorporate the effect of a time lag between the expected and actual period of an investment project, partial adjustment models were introduced in later versions of the flexible accelerator models of investment. In these models, actual gross investment is assumed to adjust in response to the difference between desired investment in period t and actual investment in period t-1. The adjustment process of such investment models can be represented thus:

$$\mathbf{(I_t - I_{t-1}) = \beta(I_t^* - I_{t-1})} \qquad (5.\mathbf{11})$$

where I_t, I_{t-1} denote the levels of capital stock in period t and in the previous period t-1 respectively, and β is the speed of adjustment, whose value is assumed to lie between zero and one (Eklund, 2013).

Several attempts have been made to determine the speed of adjustment with which private investment responds to the difference between desired and actual investment. Recent empirical works (Blejer and Khan, 1984; Chhibber et al., 1988) have identified such factors as GDP, government investment and the real interest rate as having crucial impacts on the ability and motivation of private investors to implement their investment projects, and thereby on the speed of adjustment. Based on the literature review in Chapters 2 and 3, and especially Section 3.3, additional variables are included in the model. These are the real exchange rate and the inflation rate. Based on Chapter 4, a dummy variable (DUM) is also included, to capture the effect of the wars on private domestic investment. Thus, this study attempts to model the speed of adjustment by incorporating the above factors into a mathematical formulation of the following form:

$$\beta = \beta_0 + \frac{1}{(I_t^* - I_{t-1})} (\beta_1 \mathrm{RGDP} + \beta_2 \mathrm{RPUI} + \beta_3 \mathrm{REXR} + \beta_4 \mathrm{RINTR} + \beta_5 \mathrm{INFL} + \beta_6 \mathrm{DUM} \quad (5.12)$$

where RGDP represents gross domestic product, RPUI is government investment, REXR is the real exchange rate, RINTR is the real interest rate, INFL is the inflation rate and DUM is as defined above.

By substituting the function for β from equation (5.12) into equation (5.11), we have

$$I_t - I_{t-1} = [\beta_0 + \frac{1}{(I_t^* - I_{t-1})} (\beta_1 \mathrm{RGDP} + \beta_2 \mathrm{RPUI} + \beta_3 \mathrm{REXR} + \beta_4 \mathrm{RINTR} + \beta_5 \mathrm{INFL} + \beta_6 \mathrm{DUM})] (I_t^* - I_{t-1}) \quad (5.13)$$

Equation (5.13) can be simplified as follows:

$$(\mathbf{I_t} - \mathbf{I_{t-1}}) = \boldsymbol{\beta_0}\,(\mathbf{I_t^*} - \mathbf{I_{t-1}}) + \boldsymbol{\beta_1}\mathbf{RGDP} + \boldsymbol{\beta_2}\mathbf{RPUI} + \boldsymbol{\beta_3}\mathbf{REXR} + \boldsymbol{\beta_4}\mathbf{RINTR} + \boldsymbol{\beta_5}\mathbf{INFL} + \boldsymbol{\beta_6}\mathbf{DUM} \qquad (5.\mathbf{14})$$

Substituting equation (5.10) into equation (5.14), we have

$$I_t = \beta_0\,[1-(1-\delta)L]\alpha Y_t^e + \beta_1 RGDP + \beta_2 RPUI + \beta_3 REXR + \beta_4 RINTR + \beta_5 INFL + \beta_6 DUM + (I - \beta_0)I_{t-1} \qquad (5.15)$$

Equation (5.15) above can be simplified (as shown below) by excluding the depreciation of capital goods due to the difficulties of measuring the depreciation rate in developing countries (see Section 2.7). This is the type of investment model that has been used in numerous empirical studies (see Section 3.2.1). This model attempts to incorporate variables that best capture private investment decision-making behaviour. The empirical model defined in equation (5.16) will be examined for Iraq. This will address the second objective from Chapter 1.

$$RPI = \beta_0 + \beta_1(RGDP) + \beta_2(RPUI) + \beta_3(REXR) + \beta_4(RINTR) + \beta_5(INFL) + \beta_6(DUM) + \mu_t \qquad (5.16)$$

A double-log functional form is estimated for equation (5.16) as follows:

$$LRPI = \beta_0 + \beta_1 LRGDP + \beta_2 LRPUI + \beta_3 LREXR + \beta_4 LRINTR + \beta_5 LINFL + \beta_6 DUM + \mu_t \qquad (5.17)$$

Where LRPI represents the log of real private investment, which is proxied by the log of real private fixed capital formation. LRGDP represents the log of the real gross domestic product. LRPUI represents the log of real public investment, which is proxied by the log of real public fixed capital formation. LREXR represents the log of the real exchange rate, calculated by multiplying the nominal exchange rate by the ratio of foreign to domestic prices using an appropriate index of prices (see Table 5.2). LINFL represents the log of the inflation rate based on the GDP deflator. In addition to these variables, based on the discussion in

Chapter 4, the long-run model includes one dummy variable to capture war or political instability (DUM = 1 for the war years 1980-1987, 1990-1992, and 2003, and 0 in other years) (see Table 5.1). DUM is treated as an exogenous variable in the model, whose value is specified outside the system. However, in the short-run model, two dummy variables are included: DUM1 captures the period of the Iran–Iraq War (1980-1988), while DUM2 captures the period when international economic sanctions were imposed on Iraq (1990-2003). β_0 is the intercept, β_1 to β_6 the estimated parameters, and μ_t an error term.

In these models, all time-series variables are transformed into their logarithms, symbolized by the letter L in the variable names.[11] In econometrics, it is common to take the natural logarithm of a time series if it seems to be growing over time. For example, the logarithmic transformation is an appropriate means of transforming a highly skewed variable into one that is more approximately normal (Gujarati, 2012). This is because series expressed in logarithms present roughly constant variances, while the variance of a level series tends to increase with the size of the sample (Ribeiro and Teixeira, 2001). Another justification for using the log transformation is a purely practical one, as it generally makes time series data better behaved (Koop et al., 2000).

5.5.3 Hypotheses regarding the determinants of private investment

The following hypotheses are tested regarding the determinants shown in the private investment model (5.17). The expected signs of the coefficients are presented in Table 5.2.

[11] Details about logarithms are given in any standard mathematical economics textbook (Enders, 2004; Griffiths et al., 2008). If a series, Y, is growing at a roughly constant rate, then the time series plot of ln(Y) will approximate a straight line. In this common case, ln(Y) will generally be well behaved (Brooks, 2014).
Note also that in regressions of logged variables, the coefficients can be interpreted as elasticities. It can also be shown that ln(Yt) - ln(Yt-1) is approximately equal to the percentage change in Y between periods t-1 and t. For all these reasons, it is often convenient to work with logged series (Griffiths et al., 2008).

H1: GDP is predicted to have a positive impact on private investment. The empirical evidence is consistent with this view and shows high output growth to be associated with high investment. Since there is no ambiguity regarding this variable in the empirical literature, we also predict this variable to exert a positive impact on private investment ($\beta_1>0$) (see Chapter 3).

H2: It has been suggested that public-sector investment affects private investment, though its impact remains ambiguous. Public investment may crowd in private investment via positive externalities of infrastructure (communication, transportation, roads, electricity, etc.). However, public investment may also crowd out private investment due to competition for both physical and financial resources, for example when additional public investment requires budget deficits to be financed through increased taxes and borrowing. Therefore, the sign of the coefficient of the public-sector variable could be positive ($\beta_2>0$), or negative ($\beta_2< 0$) (see Chapter 3).

H3: The coefficient of the exchange rate is expected to be negative ($\beta_3< 0$). This is because devaluation/depreciation of the local currency increases the real cost of purchasing imported capital. Thus, it lowers private-sector real wealth and expenditure through its effect on domestic prices. However, other arguments suggests that the supply side of currency devaluation/depreciation may have a positive impact on investment, particularly in sectors producing internationally traded goods, through greater international competitiveness and export volumes (see Chapter 3).

H4: The coefficient of the real interest rate could be negative ($\beta_4 < 0$) or positive ($\beta_4 > 0$) (see Table 5.2). Higher interest rates may be negatively associated with private investment due to

the fact that a high cost of borrowing investment funds may be associated with lower investment profitability. On the other hand, high interest rates may induce investment by encouraging savings, increasing the volume and availability of domestic credit (see Chapters 2 and 3.2.1).

H5: Macroeconomic instability increases uncertainty and have an adverse effect on capital formation. High inflation rates are an indicator of macroeconomic instability and are expected to have an adverse effect on private investment($\beta_5 < 0$) (see Section 3.4).

H6: The sign of the dummy variable is also predicted to be negative ($\beta_6 < 0$). Both war and political instability could have a massive impact, discouraging private investment by increasing macroeconomic instability (see Chapter 4).

Table 5.2: Private Investment Model (Measurement of variables and expected signs of the coefficients)

Variable	**Variable measurement**	**Expected sign of coefficient**	**Sources**
RPI	Gross domestic private fixed capital formation in constant 2005 prices in millions of US dollars	Dependent variable	Khan and Khan, 2007; Mlambo and Oshikoya, 2001; Sakr, 1993; Ghura and Goodwin, 2000.
RGDP	Real gross domestic product in constant 2005 prices in millions of US dollars	+	Bakare, 2009; Chirinko, 1993; Greene and Villanueva, 1991; Mlambo and Oshikoya, 2001; Naa-Idar et al., 2012; Ndikumana, 2000; Oshikoya, 1994.
	Real public-sector investment in constant	+	Afonso and St. Aubyn, 2009; Blejer and Khan, 1984;

RPUI	2005 prices in millions of US dollars	-	Frimpong and Marbuah, 2010; Naa-Idar et al., 2012; Sundararajan and Thakur, 1980. Chhibber et al., 1988; Rossiter, 2002.
REXR	Nominal exchange rate multiplied by the ratio of the foreign to the local currency consumer price index.	-	Duncan, 1999; Kehinde et al., 2012; Ribeiro and Teixeira, 2001; Rodrik, 2008; Zardashty, 2014.
RINTR	The real interest rate is the nominal interest rate adjusted for inflation; it can be calculated as the nominal interest rate minus the inflation rate.	+ -	McKinnon, 1973; Shaw, 1973. Blejer and Khan, 1984; Nwosa Philip Ifeakachukwu, 2013; Shaw, 1973; Sundararajan and Thakur, 1980; Wai and Wong, 1982.
INFL	The rate of inflation based on the GDP deflator (%).	+ -	Tobin, 1969. Dornbusch and Reynoso, 1989; Majeed and Khan, 2008.
War or political instability	A dummy for war/ political instability (DUM = 1 for for the years 1980-1987, 1990-1992, and 2003; and DUM = 0, otherwise).	-	Asante, 2000; Feng, 2001.

5.6 Determinants of Public Investment in Iraq

5.6.1 Specification of determinants of public investment

As discussed in Section 3.2.3, there is a substantial consensus among empirical studies that the provision of infrastructure services in oil-exporting countries is the government's responsibility. The government has a significant role in infrastructure development and recognizes that well-targeted infrastructure investment generates significant social and economic benefits. Investing in infrastructure helps to increase productivity and competitiveness and the capacity of the private and public sectors to deliver high-quality services. Eventually, it helps to establish a stronger economy, to increase real income and to improve community well-being (Blejer and Khan, 1984; Khan and Kumar, 1997; Majeed and Khan, 2008).

The current belief is that infrastructure investment is important to economic growth. The implications for policy makers seem to be clear: in cases where public investment has been found to have a positive effect on economic growth, public investment should be increased in order to boost the economy. Indeed, such policies have been strongly supported by politicians and international institutes such as the WB and the IMF as the right option for many countries (Clements et al., 2003).

Little research has been conducted, however, on the determinants of public investment in developing countries. Thus, the present study suggests that developing a model of the determinants of public investment in Iraq over the period 1970-2010 will be a significant contribution to the economic literature in developing countries. The lack of analysis is especially surprising since, in a great majority of countries all over the world, productive government services have

declined as a percentage of GDP due to the observation that public investment is less productive than private. Simultaneously, productivity growth has dropped worldwide. Aschauer (1989) assumed that this decrease in productive government services was crucial to explaining the decline in general productivity growth. This assumption has received a great deal of attention in the literature ever since (De Haan et al., 1996; Saghir and Khan, 2012; Välilä and Mehrotra, 2005).

Therefore, following prior empirical studies (Clements et al., 2003; De Haan et al., 1996; Saghir and Khan, 2012; Välilä and Mehrotra, 2005), this section focuses mainly on the determinants of public capital investment as a relevant factor in explaining economic growth on the one hand, and in providing positive externalities for private investment on the other hand.

Based on the above arguments, a particular emphasis will be placed on the likely effects of per capita income, government current expenditure and oil revenue in explaining public investment, as it is obvious from the earlier discussion that these effects could differ among countries and that the debate can only be settled with country-specific evidence. Public investment is assumed to be a function of real per capita income, real public current expenditure and real oil export revenue. The model specification is as follows:

$$\mathrm{RPUI} = \beta_0 + \beta_1 \mathrm{RGDPC} + \beta_2 \mathrm{RGC} + \beta_3 \mathrm{ROX} + \mu_t \qquad (5.18a)$$

$$\mathrm{LRPUI} = \beta_0 + \beta_1 \mathrm{LRGDPC} + \beta_2 \mathrm{LRGC} + \beta_3 \mathrm{LROX} + \mu_t \qquad (5.18b)$$

where RPUI represents real public investment, RGDPC real per capita income, RGC real public current expenditure and ROX real oil export revenue. The variables are transformed into their logarithms, as shown in equation (5.18b), for the purposes of the estimation.

With this model, a third objective of this thesis will be addressed through the discovery of the indirect impact of oil export revenue on private investment. It is clear that, in Iraq, the bulk of government revenues are raised through oil revenue. Taxation, as a fiscal instrument and source of government income, is negligible in the country's economy. Hence, this study suggests that oil revenue could provide an indirect boost to private investment through its effect on public investment in goods such as high-quality road infrastructure, electrical and gas facilities, public transportation, and so on, that in turn reflect positively on private investment.

5.6.2 Hypotheses regarding the determinants of public investment

The studies by Clements et al. (2003), Saghir and Khan (2012) and Tanzi and Hamid (1997) suggest that public investment in developing countries is strongly explained by real per capita income, which has a positive impact on it; therefore, it is expected that the coefficient of real per capita income will be positive ($\beta_1 > 0$).

Real public current expenditure (RGC) is expected to have a positive impact on public investment, thus $\beta_2 > 0$. According to the literature, the government's current expenditure, classified under non-productive or consumption expenditure, includes aspects such as defence, interest payments, law and order, public administration, public health and education, and the maintenance of government machinery. This sort of expenditure does not create any productive assets that might bring income or returns to the government (Todaro and Smith, 2009). On the other hand, this type of government expenditure helps to create a healthy environment for economic activity and increases aggregate demand. Due to economic growth, the government will then be able to generate income in the form of duties and taxes. Based on this argument, the theoretical and empirical

literature expects this variable to exert a positive impact on public investment in the long run.

As is well known, in the case of oil-exporting countries, public investment is strongly determined by oil export revenue, since a large proportion of government income is obtained from oil exports. Thus, a positive relationship is expected between oil export revenue and public investment in the case of Iraq ($\beta_3 > 0$).

Table 5.3: Public Investment Model (Measurement of variables and expected signs of the coefficients)

Variable	Variable measurement	Expected sign of coefficient	Sources
RPUI	Real public-sector investment in constant 2005 prices in millions of US dollars	Dependent variable	Clements et al., 2003; Saghir and Khan, 2012; Tanzi and Hamid, 1997; Ghassemi, 1996.
RGDPC	Real per capita income in constant 2005 prices in millions of US dollars	+	Clements et al., 2003; Saghir and Khan, 2012; Tanzi and Hamid, 1997.
RGC	Real government current expenditure in constant 2005 prices in millions of US dollars	+	Ghassemi, 1996; Saghir and Khan, 2012.
ROX	Real oil export revenue in constant 2005 prices in millions of US dollars	+	Ghassemi, 1996; Clements et al., 2003.

5.7 Data Sources

Time-series data on the selected macroeconomic variables for Iraq were collected for the period 1970-2010. All variables were calculated in real terms using a GDP deflator index (2005=100). Annual data were chosen because most of the data are reported annually. It is generally recommended that more observations are better when testing hypotheses. However, Shiller and Perron (1985) claimed that, when analysing the long-run characteristics of economic time series, the length of the time series is much more important than the frequency of observations. Moreover, Hakkio and Rush (1991) observed that cointegration is a long-run notion and thus requires a long span of data. Hence, they argued, there is little to be gained from increasing the number of observations by using a higher frequency within the same time span, but there is a gain to be made by using the same frequency of data over a longer time span. Kennedy (2003) also explained that the power of unit root tests relies far more on the span of the data than on the number of observations, claiming that ". . . for macroeconomic data where long business cycles are of importance, a long span of annual data would be preferred to a shorter span with, say, monthly data, even though the latter case may have more observations. . ." because ". . . the longer span has a greater chance of containing a structural break." (p. 353).

There are no direct sources available that provide all of the data. Thus, the data were derived from various sources. The time-series data for real GDP and labour size were obtained from the United Nations Conference on Trade and Development (UNCTAD) database. The data for private fixed capital formation (PFCF) and public fixed capital formation (PFCF) were obtained from the Handbook of Annual Statistics published by the Iraqi Central Bureau of Statistics.

Data on the exchange rate, inflation rate, and real interest rate were collated from various online sources, such as the World Development Indicators of the WB, and the International Financial Statistics (IFC) and Federal Reserve Economic Data (FRED) databases. Data on the value of Iraqi petroleum exports were collected from annual statistics series compiled by OPEC.

The time-series data are collected from a wide range of national and international sources, then validated and processed. The data cover long periods, with different measurements, for almost all economies of the world. All the sources have previously been used by key studies, attesting to their reliability. With regards to the PFCF and PUFCF from the Iraq Central Bureau of Statistics, this is the only source for these data and can be deemed fairly reliable. Until other sources become available, this appears to be the most appropriate source of data for this analysis.

5.8 Method of Analysis

Given that time-series data are used, a time-series econometric approach is applied, with a focus on cointegration (Gujarati, 2011; Koop, 2013). Before applying the cointegration test and the VECM, it is necessary to determine the order of integration of the variables. A cointegration relationship is present within a set of non-stationary time series when it is possible to identify a linear combination of those variables that gives stationary results. In other words, when the variables have unit roots, but some linear combination of them is stationary, then it can be concluded that the variables are cointegrated (Brooks, 2014; Koop, 2013; Martin, 2012). To determine this, a unit root test is conducted. According to theoretical econometrics, several methods can be used to test for stationarity (e.g., the Correlogram, the autocorrelation function, the Box-Pierce Q statistic and

Breusch-Godfrey serial correlation LM Test, the Jarque-Bera test statistics, and ARCH heteroskedasticity) (Brooks, 2014; Griffiths et al., 2008). However, this study employs the ADF and PP tests (Granger, 1986).

After the unit root tests for stationarity have been performed, the Johansen (1988) and Johansen and Juselius (1990) approach is employed to identify the number of cointegration vectors and to examine the long-run equilibrium relationship among the variables. As noted before, by definition, two or more series are said to be cointegrated if they exhibit a well-established long-term relationship. This normally implies that the variables must have long-term comovement (trending together). For time-series variables to exhibit cointegration, they may be non-stationary in levels, but their regression relationship must have a valid long-run relationship. Thus, testing for cointegration becomes very important when dealing with time-series data. Subsequently, the VECM is conducted to find the short-run dynamic relationship between the variables and better understand the investment behaviour. Finally, it is important to check for multicollinearity in the models. The empirical results and discussion of them are presented in the next chapter.

5.8.1 Tests for stationarity

To evaluate any long-run cointegrated relationships among the different variables by applying Johansen's maximum likelihood approach, it was necessary to test for the stationarity of the variables and to find the order of integration of each of the series used in the model. If variables are non-stationary, this leads to spurious regression (with a stochastic trend) which cannot be used for the intended purpose (Griffiths et al., 2008; Gujarati, 2012; Koop, 2013). As a result, confidence intervals and hypothesis tests would be unreliable (Gujarati, 2012). Although spurious regressions may have high R-squares and significant t- and F-statistics,

the estimated coefficients are unreliable, it is difficult to generalize from the results, and they may not have any economic meaning. Hence, in this study, two unit root tests, the ADF and the PP, were conducted on the individual series to offer evidence as to whether the variables were stationary and integrated to the same order.

5.8.1.1 Augmented Dickey-Fuller (ADF) test

First, a standard approach is used to examine the stationarity of the time series, in the form of unit root tests. Several procedures for the test of order of integration have been developed, of which the most popular is the ADF test. It relies on rejecting a null hypothesis of a unit root (the series are non-stationary) in favour of the alternative hypothesis of stationarity. The time-series variables are transformed into log form for easier analysis and interpretation. In most econometric analyses, the natural logarithm of the time series of each variable is preferred. This is because series expressed in logarithms present roughly constant variances, while the variance of a level series tends to increase with the size of the sample (Ribeiro and Teixeira, 2001).

It is necessary to test for stationarity and to find the order of integration of each series used in the model. The ADF test for a unit root is formulated by the following regression model, which is referred to as a random walk with drift (Gujarati, 2012):

$$\Delta \boldsymbol{Y_t} = \boldsymbol{\alpha_0} + \boldsymbol{\delta Y_{t-1}} + \boldsymbol{\beta_1}\Delta \boldsymbol{Y_{t-1}} + \boldsymbol{\beta_2}\Delta \boldsymbol{Y_{t-2}} \ldots\ldots\ldots + \boldsymbol{\beta_n}\Delta \boldsymbol{Y_{t-n}} + \boldsymbol{\varepsilon_t} \quad 5(5.19)$$

where Y represents respectively RPI, RGDP, RPUI, REXR, RINTR, and INFL, the set of macroeconomic variables under study. Δ represents the differencing operator. $\alpha_0, \beta_1, \beta_2, \beta_n$ are the estimated parameters and ε_t is white noise.

The null hypothesis (H_0) in this case can be described as follows:

H_0: $\delta = 0$ stipulates that Y_t has a unit root or has a stochastic trend, meaning that the time series is non-stationary.

Meanwhile, the alternative hypothesis (H_1) is as follows:

H_1: $\delta < 0$ stipulates that the time series Y_t is stationary.

A time trend can be added to the above equation (5.19) when Y_t is stationary around a deterministic linear process, referred to as a random walk with drift around a deterministic trend. The revised equation is written as follows:

$$\Delta Y_t = \alpha_0 + \gamma t + \delta Y_{t-1} + \beta_1 \Delta Y_{t-1} + \beta_2 \Delta Y_{t-2} \dots \dots \dots + \beta_n \Delta Y_{t-n} + \varepsilon_t \quad (5.20)$$

where t is the time trend and γ is the estimated parameter for the time trend.

An important feature of the ADF unit root test is to select an appropriate lag length. According to Enders (2004), a small number of lags means that the residuals in the regression equation are akin to white noise processes, while a high number of lags reduces the power of the test to reject the null of a unit root. This is because the increased number of lags requires the estimation of additional parameters and a loss of degrees of freedom. The econometric software package E-Views used in this study automatically selected an optimal lag length for each time-series variable based on the frequency of the data used.

5.8.1.2 Phillip-Perron (PP) unit root test

Phillips and Perron (1988) developed a more comprehensive theory of unit root non-stationarity by extending the Dickey-Fuller model and making a semi-parametric correction for autocorrelation. The PP test can be used as an alternative to the unit root process and is even more robust when there is weak

autocorrelation and heteroskedastic regression residuals. Enders (2004) suggests that the PP test can be utilized if the residual series of a unit root process is heterogeneous or weakly dependent. The PP unit root test is based on the same hypotheses as the ADF unit root test. The null hypothesis is that the series is non-stationary (H_0: $\delta = 0$) and the alternative hypothesis is that the series is stationary (H_1: $\delta < 0$) (Brooks, 2014). However, the key differences are that the PP unit root test incorporates an automatic correction to the ADF to allow for autocorrelated residuals, employs different lagged profiles for the estimated variables and sometimes produces low levels of significance. In the end, though, the test provides conclusions that are qualitatively the same as those produced by the ADF test (Gujarati and Handelshøyskolen, 2011).

5.8.2 Johansen cointegration test

The Johansen approach was developed by Johansen (1988) and Johansen and Juselius (1990) to examine the long-run equilibrium relationship among variables when a unit root is confirmed for a data series. Hence, once it has been determined that the variables under examination are integrated to the same order, the cointegration test can be implemented (Alexander, 2008). The null hypothesis is non-cointegration, against the alternative of the existence of cointegration, and is tested using the Johansen maximum likelihood procedure. In other words, the Johansen method uses maximum likelihood estimation to identify whether cointegrated vectors exist in non-stationary time series.

There is more than one method for performing cointegration tests. This study uses the multivariate cointegration method (Johansen, 1988; Johansen and Juselius, 1990). This approach is preferred to the Engle-Granger method, because the latter has several econometric limitations. Banerjee et al. (1993) and Davidson and

MacKinnon (1993) revealed that there is a substantial small-sample bias in estimates based on the Engle-Granger test. Banerjee (1998) confirmed that the size of the small sample bias is inversely associated with the value of the R-square in the Engle-Granger residual based on the cointegration regression. Moreover, according to Davidson and MacKinnon (1993), a relatively low value of R-square in the cointegration regression should be taken as a warning that the two-step Engle-Granger procedure might not operate well.

Additionally, the Engle-Granger cointegration procedure pays no attention to the probability of multiple cointegrating relationships. Economic variables can exhibit more than one long-run relationship in a cointegrated equilibrium space. The Engle-Granger method depends highly on super-convergence outcomes and conducts OLS estimation to derive the parameter estimates of the long-run or cointegration equations. However, OLS estimates are widely sensitive to the arbitrary normalization implicit in the selection of the dependent variable in the cointegration regression equation (Harris and Sollis, 2003). This implies that different arbitrary normalizations may provide different empirical results.

In addition, the Engle-Granger method omits short-term dynamics from the cointegrating regression. Doing so results in increased bias and might cause a loss of information and thus reduced efficiency of the parameters of interest in the cointegrating relationships. Finally, and most importantly, the Engle-Granger procedure does not allow testing for various restrictions or exclusions on individual variables of the observed cointegrating vectors. When examining the assumptions associated with long-run economic relationships, this shortcoming of the Engle-Granger procedure could create a severe problem.

However, the Johansen-Juselius approach is able to overcome these weaknesses

and offers a very flexible format for considering the properties of the estimators under different hypotheses about the underlying data-generating process. In addition, the Johansen-Juselius procedure operates more effectively than other estimators of long-run parameters, even in the presence of abnormal errors and unknown dynamics (Gonzalo, 1994). Another advantage of Johansen cointegration is that, unlike the Engle-Granger procedure, it is capable of identifying the number of cointegrating vectors in the relationship. According to Cuthbertson et al. (1992), the Johansen-Juselius approach is preferable in the case of more than two variables. It has also been found to be the most powerful approach even for the bivariate system (Gonzalo, 1994).

The cointegration test in the present study uses a version of the Johansen-Juselius approach that follows those in previous studies (Abdullahi et al., 2012; Atukeren, 2005; Oriavwote and Oyovwi, 2013). Two test statistics, the trace statistic (λ_{trace}) and the max-eigenvalue statistic ($\lambda_{\max}$), are employed to determine the appropriate rank and to identify the number of cointegration vectors. Then, all variables are treated as potentially endogenous and a vector autoregressive specification is used. The likelihood ratio statistic for the trace test (λ_{trace}), as proposed by Johansen (1988), is

$$\lambda_{\text{trace}}(\text{r}) = -\text{T}\sum_{i=r+1}^{n} Ln(1-\lambda_{\text{i}})$$

where r = 0, 1, 3, ….p-1, the symbol λ_{i} denotes the largest predicted value of the characteristic root (eigenvalue) achieved from the estimated matrix (π), and T is the number of observations that can be used in the model.

The λ_{trace} statistic examines the null hypothesis that the number of distinct characteristic roots is less than or equal to *r*, against the general alternative. The

value of λ_{trace} in this statistical test will be lower when the values of the characteristic roots are close to zero. In other words, the value of λ_{trace} will be larger when the values of the characteristic roots are further from zero (Griffiths et al., 2008).

The maximum eigenvalue $\lambda_{\max}$ statistic, as proposed by Johansen, is as follows:

$$\lambda_{\max}(\mathrm{r}, \mathrm{r}+1) = -\mathrm{T}\sum_{i=r+1}^{n} Ln(1-\lambda_{\mathrm{r}+1})$$

The $\lambda_{\max}$ statistic examines the null hypothesis that the number of r cointegrated vectors is a r value against the alternative of r+1 cointegrated vectors. Therefore, the null hypothesis of r=1 is tested against the alternative of r=2, and also r=2 will be against the alternative r =3 and so on. This implies that, when the estimated value of the characteristic root is near to zero, the value of $\lambda_{\max}$ will be small.

The Johansen cointegration tests are well known for being quite sensitive to the choice of lag length. Thus, Akaike information criterion (AIC) is used to choose the number of lags in the cointegration test. Briefly, many lag length selection criteria have been employed in economic study to determine the Autoregressive (AR) lag length of time series variables. such as the Akaike information criterion (AIC), Schwarz information criterion (SIC); Hannan-Quinn criterion (HQC); final prediction error (FPE) and Bayesian information criterion (BIC), (for an overview of these criteria see Liew, 2004).These criteria managed to pick up the correct lag length at least half of the time in small sample. With relatively large sample (120 or more observations), HQC is preferred to outdo the rest of correctly identifying the true lag length. In contrast, AIC and SIC should be a better choice for smaller sample and they produce the least probability of under estimation among all criteria under study.

5.8.3 Vector Error Correction Model (VECM)

Following prior studies (Alhajhoj, 2007; Khan and Reinhart, 1990; Majeed and Khan, 2008; Olayiwola and Okodua, 2009), if the variables are cointegrated, the next step is to estimate and identify a VECM, including the error correction term, to investigate the dynamic behaviour of the model and better understand the behaviour of the dependent variable. In the short run, once in equilibrium, the VECM explains how the tested model is adjusted in each time period towards its long-run equilibrium condition. Therefore, when the variables are cointegrated, in the short run, deviations from this long-run equilibrium will respond to changes in the dependent variables in order to force their movements towards the long-run equilibrium condition.

Hence, the cointegrated vectors from which the error correction terms are derived each show an independent direction in which a stable long-run equilibrium condition exists. The VECM specification forces the long-run behaviour of the endogenous variables to converge to their cointegrated relationships, while adjusting the short-run dynamics (Engle and Granger, 1987).

The form of the error correction model for this study was selected according to the approach suggested by Maddala and Lahiri (1992). The general form of the VECM is as follows:

$$\Delta Y_t = \beta_0 + \beta_{1i} \sum_{i=1}^{n} \Delta Y_{t-i_{i,t}} + \beta_{2i} \sum_{i=1}^{n} \Delta X_{t-i_{i,t}} + \beta_{3i} \sum_{i=1}^{n} \Delta Z_{t-i_{i,t}} + \cdots + \lambda ECM_{t-1} + \varepsilon_t \quad (5.21)$$

where Δ is the first difference operator, the coefficients $\beta_{1i,}\ \beta_{2i} \ldots\ \beta_{ni}$ of the explanatory variables are the parameters of the model to be estimated, λEC_{t-1} is the error correction term, which is lagged by one period, ε_t is the white noise

term, and λ is the short-run coefficient of the error correction term, which reflects the speed of adjustment parameter. It should be noted that an error correction model can be used not only to overcome the problem of spurious regression, but also to correct for this deviation from the long-run equilibrium.

The common belief with the error correction model is that λ should satisfy ($-1 \leq \lambda \leq 0$) and should be statistically significant in order for the long-run relationship among the variables to be confirmed.

5.9 Summary

This chapter is highly important in that it gives comprehensive details covering several key issues related to the methodology of this study. The chapter initially addresses the first objective regarding the development of an economic growth model based on the neoclassical Solow growth framework for the purpose of examining the relationship between private and public investment and economic growth. The empirical model is extended to enable an investigation of whether private and public investment have different impacts on Iraq's economic growth rate, and also the identification of any crowding-in or crowding-out effect. The second objective is addressed through the development of a private investment model based on the neoclassical flexible accelerator model. The empirical model also includes additional variables specific to developing countries and particular relating to Iraq. A public investment model for the context of Iraq is developed based on recent empirical studies, although few studies have been conducted in this area, for the purpose of addressing the third objective of the study.

Next this chapter describes how time-series data on the selected macroeconomic variables for Iraq were collected from various sources for the period 1970-2010. Two common unit root tests, the ADF and the PP, used to test the stationarity of

each time series, are explained, as well as the Johansen cointegration trace test and the maximum eigenvalue statistics, which were used to investigate the long-run equilibrium relationship among the variables in the models. Finally, this chapter explains how the VECM was used to determine the short-run dynamic relationship between the variables. The results and discussion of them will be presented in the next chapter.

CHAPTER 6 COMPARATIVE ROLES OF PUBLIC AND PRIVATE INVESTMENT IN ECONOMIC GROWTH IN IRAQ

6.1 Introduction

As discussed in Chapters 3 and 4, investment is crucial to economic development as it enhances technological progress and productivity and increases employment. In the last few decades, one of the most important issues in macroeconomics and development economics – and one of renewed consideration in the academic literature – has been the impact of public and private investment on economic growth. There is a general consensus that these two elements of investment have different impacts on economic growth and social conditions. Since the distinction between public and private investment matters for economic growth, it is essential to understand the linkages between them. This is especially the case for Iraq, in whose economy public investment plays a large role.

In recent years, a large body of empirical research has investigated the interaction between private and public investment and economic growth for developed and developing countries. This chapter aims to provide some empirical evidence on this interaction in the case of Iraq over 1970 - 2010. Investigating how the two sources of investment contribute to economic growth may provide new information for policy makers that could help them to have a good balance between the two sources and thus enhance their benefits to economic growth. The outcomes also contribute to the empirical literature on economic growth, especially for oil-rich developing countries.

The analysis in this chapter, as discussed in Chapter 3, is based on the neoclassical framework adopted by Aschauer (1989), Khan and Reinhart (1990), Ramirez and Khan and Kumar (1997) and Nazmi (2003), who attempted to investigate empirically how public and private investment affect economic growth. In Chapter 5, a simple analytical model was developed for Iraq, including additional theoretical determinants of growth, such as labour force, macroeconomic instability, and exchange rate policies, which have received significant attention in the recent literature and have to be taken into account when assessing this issue. More importantly, the analysis examines the respective impacts of public and private investment on economic growth.

Following a similar structure to that of Chapter 5, the rest of this chapter is organized as follows: Section 6.2 provides a discussion of the unit root test results, including the ADF and PP tests. Section 6.3 presents the long-run dynamics of the determinants of economic growth based on the application of the Johansen (1988) and Johansen and Juselius (1990) cointegration test. Section 6.4 discusses the short-run dynamics of economic growth. The last section presents the main conclusions derived from this chapter.

6.2 Results of Unit Root Tests

As a preliminary analysis of the data, the ADF test and the PP test were used to examine each individual variable for stationarity, in both the intercept without trend and intercept with trend models (see Section 5.6.1). Testing for unit roots in time-series data conventionally precedes cointegration. If the variables are non-stationary, this can lead to a “spurious regression” and the estimated coefficients will be biased (Griffiths et al., 2008); as a result, confidence intervals and hypothesis tests will be unreliable (Granger and Swanson, 1974). The ADF and

PP tests are often employed to determine the degree of integration of variables, so as to identify how many times each time series should be differenced in order to attain stationarity (Griffiths et al., 2008). The core purpose of these tests is to verify the null hypothesis of non-stationarity, the rejection of which requires a negative and significant test statistic. The optimal lag length for the lagged differences of the tested variables is determined by minimizing the AIC.

Table 6.1 shows the results of the ADF and PP tests of stationarity that were applied to each individual variable. The results show that all of the variables in the growth model (LRGDP, LRPI, LRPUI, LLABOUR, LROX, LREXR, and LINFL) are non-stationary in both cases (intercept without trend and intercept with trend models) at a 5% or lower level of significance. These results confirm that the variables need to be differenced once to attain stationarity. After computing their first differences, the null hypothesis of non-stationarity is rejected for all first-differenced variables. This means that all of the time series are integrated of order one in the first differences at either a 5% or 1% significance level.

Table 6.1: ADF and PP Unit Root Tests - Economic Growth Model

Series	ADF intercept without trend		ADF intercept with trend		PP intercept without trend		PP intercept with trend	
	Level	First differences	Level	First differences	Level	First differences	Level	First differences
LRGDP	-1.712	-6.436**	-2.385	-6.348**	-1.712	-6.459**	-2.445	-6.366**
LRPI	-2.567	6.701**	-2.934	-6.625**	-2.605	-7.851**	-2.939	-7.565**
LRPUI	-1.708	-7.029**	-1.711	-6.931**	-1.657	-7.029**	-1.666	-6.932**
LLABOUR	0.658	6.903**	-0.658	-6.808**	0.658	6.903**	-2.707	-6.808**
LROX	2.127	6.894**	-2.871	-6.816**	2.127	7.164**	-2.897	-7.065**
LREXR	0.890	4.866**	-1.632	-4.804**	-0.998	-4.845**	-1.899	-4.778**
LINFL	-1.610	-5.693**	-1.605	-4.975**	-1.349	-6.359**	-1.226	-6.281**

Note: (1) The lag length in both tests is based on the AIC. (2) * and ** imply that we can reject the null hypothesis that the time series contains a non-stationarity or has a stochastic trend at 5% and 1% respectively.

6.3 Results of Johansen Cointegration Test and Long-Run Dynamics of Economic Growth Model

The Johansen approach was developed by Johansen (1998) and Johansen and Juselius (1990) for examining the long-run equilibrium relationships among variables (see Section 5.6.2). The objective of the cointegration test is to determine whether a group of non-stationary series is cointegrated or not; when all of the variables are integrated of the same order, I(1), a cointegration analysis is justified. Furthermore, it can be argued that the basic idea behind the cointegration approach is that if, in the long run, two or more series are cointegrated (move closely together), even though the series themselves are trended, then the differences between them are constant. Thus, it is possible to regard these series as having a long-run equilibrium relationship, since the differences between them are stationary (Hall and Henry, 1989). The Johansen approach represents an advancement over the single-equation estimation technique, since it offers the possibility of dealing with more than one cointegrating vector (Johansen, 1995).

Table 6.2 displays the Johansen cointegration results based on the trace statistics and maximum eigenvalue statistics. Both trace and maximum tests show the existence of five cointegrating vectors between the variables at the 1% critical level. Hence, the null hypothesis of zero cointegrating vectors is rejected against the alternative of one cointegrating vector at the 1% significance level. Similarly, the null hypotheses of at most one, at most two, at most three, and at most four cointegrating vectors are also rejected against their respective alternative hypotheses. Thus, it can be concluded that there are five cointegrating vectors specified in the model.

The existence of five cointegrating vectors implies that there are long-run equilibrium relationships between the GDP and the explanatory variables. Accordingly, it can be concluded that the GDP and its determinants – private investment, public investment, labour force size, the value of petroleum exports, the real exchange rate, and the inflation rate – are moving together in the long run.

Table 6.2: Johansen Cointegration Rank Test (Trace) – Economic Growth Model

Unrestricted Cointegration Rank Test (Trace)				
Null hypothesis	Eigenvalue	Trace statistic	5% critical value	Prob.**
None *	0.956953	224.5021	111.7805	0.0000
At most 1 *	0.928977	149.0112	83.93712	0.0000
At most 2 *	0.776097	85.53724	60.06141	0.0001
At most 3 *	0.649133	49.62022	40.17493	0.0043
At most 4 *	0.599325	24.48386	24.27596	0.0471
At most 5	0.092224	2.533366	12.32090	0.9017
At most 6	0.008761	0.211185	4.129906	0.7024
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Null hypothesis	Eigenvalue	Maximum eigenvalue statistic	5% critical value	Prob.**
None *	0.956953	75.49089	42.77219	0.0000
At most 1 *	0.928977	63.47393	36.63019	0.0000
At most 2 *	0.776097	35.91702	30.43961	0.0094
At most 3 *	0.649133	25.13635	24.15921	0.0368
At most 4 *	0.599325	21.95050	17.79730	0.0112
At most 5	0.092224	2.322181	11.22480	0.8847
At most 6	0.008761	0.211185	4.129906	0.7024

Note: (1) Trace statistics and maximum eigenvalue statistics indicate five cointegrating equations at the 5% level. (2) * denotes rejection of the hypothesis at the 5% level. (3) ** MacKinnon-Haug-Michelis (1999) p-values.

The estimated coefficients expressed in terms of the normalized cointegrating coefficients of the economic growth model (equation 5.5b) are given in Table 6.3, showing the long-run relationship amongst the variables. In general, the signs of the estimated coefficients for all variables are strongly consistent with the

macroeconomic theory, as well as being statistically significant. Since the natural logarithms are used for all of the variables in the estimation, the estimated coefficients of all variables can be described as their long-run elasticities.

Table 6.3: Normalized Cointegrating Coefficients - Economic Growth Model

Variable	Coefficient	Standard Error	t-Statistic
LRPI	0.0488	0.019	-2.5684
LRPUI	0.3997	0.023	-17.3783
LLABOUR	0.0052	0.0014	-3.7143
LROX	0.2830	0.0189	-14.9735
LINFL	-0.0295	0.0058	5.0863
LREXR	-0.0249	0.0076	3.2763

The cointegration equation can be written as follows:

$$LRGDP = 0.048LRPI + 0.399LRPUI + 0.005LLABOUR + 0.283LROX - 0.03LINFL - 0.025LREXR$$

To determine whether real public investment is more productive or efficient than real private investment, the two coefficients can be compared according to the approach adopted by Khan and Reinhart (1990) and Khan and Kumar (1997). Although the estimated coefficients of both the private and public investment variables show a positive and significant effect on the GDP in the long run, the coefficient of real public investment is greater than that of real private investment. Therefore, based on the theoretical argument, it can be concluded that, in the long run, real public investment is more productive than real private investment in encouraging GDP growth in Iraq over the time period analysed.

The RPI elasticity of RGDP is 0.048, which is less than the RPUI elasticity of RGDP of 0.399, suggesting that a 1% increase in RPUI will bring about a 0.339% increase in RGDP, while a 1% increase in RPI will bring about 0.048% increase in RGDP. These findings are similar to other empirical results that have implied

that a higher impact should be expected from public investment in the case of low-income countries than in the case of high-income countries (Khan and Kumar, 1997; Ramirez and Nazmi, 2003). It has been widely discussed in empirical studies that the roles of public and private investment, and their relationship with economic growth, might differ across countries, due to numerous factors such as differences in incomes, level of development, population growth rates, the degree of technical support, the availability of basic services, and macro stability (social, economic and political) (Agarwal, 2009; Brandt and Rawski, 2008; Erden and Holcombe, 2006; Poirson, 1998).

The results presented above are completely consistent with the literature's argument that increasing public investment may complement private investment, since both coefficients have a positive sign (Khan and Kumar, 1997; Khan and Reinhart, 1990). It has been argued by a number of studies that increasing public investment will be beneficial for the development of the private sector. The government sector, for instance, has a great capacity to invest in infrastructure projects with large sunk costs, which require long lead times in order to become profitable. The private sector might benefit from spillovers from such public investments, during and after their completion. For example, a better-developed infrastructure for roads and railways reduces transportation costs, and hence facilitates the creation of a better business environment. Furthermore, public infrastructure investments in education and health care facilities help improve the level and quality of human capital in an economy (Aschauer, 1989; Atukeren, 2005; Blejer and Khan, 1984; Kandenge, 2007; Naqvi, 2002; Sundararajan and Thakur, 1980; Zou, 2006).

A number of empirical works have concluded that the assumption of the crowding-in hypothesis holds when there is a shortage of public infrastructure investment, or when economic resources are underemployed, as often occurs in developing countries (Akanbi and Detroit, 2008; Baghebo and Edoumiekumo, 2012; Havi et al., 2013; Isaac and Samwel, 2012; Kandenge, 2007). Since Iraq has a large deficiency in public infrastructure investment, due to its involvement in several wars (see Chapter 4), it is more likely that increasing public investment would not crowd out private investment in the case of Iraq.

With crowding in, a rise in public investment causes a rise in domestic investment (see Chapter 7). Thus, any reduction in public investment may crucially compromise economic growth, both directly, and indirectly through private investment. As suggested by Khan and Reinhart (1990), even if private investment is found to be directly more productive than public investment, any conclusion about making adjustment strategies aimed at increasing private investment should be qualified with the consideration of the relationship between public and private investment. Indeed, if the crowding-in hypothesis holds, a fiscal adjustment that reduced public investment would imply a contraction in fixed capital formation and a slowdown in economic performance.

This could be true in the case of Iraq; for example, increasing the level of public investment might facilitate and stimulate private investment, as the results in Chapter 7 will indicate, through the provision of infrastructure support. This could raise the productivity of capital and expand the overall availability of resources by increasing output. Furthermore, the results presented in this chapter may not necessarily mean that real public investment is more efficient or productive than private investment in the context of Iraq, but might suggest that a high rate of

public investment is crucial at this stage of Iraq's economic development. Public investment might complement rather than compete with private investment.

Unlike in the neoclassical model, Lucas (1988) emphasized that human capital plays a significant role in determining economic growth. It has also been indicated by a number of studies that labour force, which used as proxy for human capital, can be considered a complementary input to physical capital (Anaman, 2004; Blejer and Khan, 1984; Khan and Reinhart, 1990; Mallick, 2002). Hence, the size of the labour force is an important factor that positively influences the economic growth process, and might affect the productivity of all other factors of production, or lead to the generation of new products or ideas that support technological progress. As indicated in Table 6.3, the parameter estimate for the labour force variable, although positive, exhibits only a slight impact on economic growth, such that a 1% increase in the size of the labour force will cause a 0.0052% increase in economic growth. The estimated results for the labour force strongly support the Solow growth model, suggesting that growth in the labour force impacts the economic growth rate in the expected positive direction. Similar outcomes have been obtained by Khan and Reinhart (1990), Khan and Kumar (1997), Anaman (2004) and Kandenge (2007), showing that an increased emphasis on education and the improvement of human capital skills is likely to play an important role in stimulating both investment and the sustainability of long-term economic growth.

In the models formulated in the 20th century, based on the neoclassical perspective, outputs are mainly a function of capital and labour, constrained by the level of technology (Solow, 1956). There are some criticisms of the neoclassical model in the literature, such as that a significant part of economic

growth is not explained by the contributions of capital and labour alone. Therefore, a new growth theory has been developed, including natural capital, which is also said to play a significant role in differentiating economic performance (Moradi, 2009; Sachs and Warner, 2001). Nurkse (1953) and Rostow (1960) indicate the positive role natural resources play in economic development, confirming that primary products can promote economic growth, and increased oil revenue, for example, may accelerate economic growth through the provision of basic infrastructure and improvements in the legal framework (Lewis, 1989), and if the foreign exchange gained from resource exports is used to import the capital goods required to build a modern economy.

Supporting the above argument, the estimated coefficient of the petroleum variable is both positive and significant (0.2830), indicating that a 1% increase in oil revenue would increase GDP by 0.28% percentage points. The oil sector continues to provide the basic means for growth and stability in the medium term in Iraq, accounting for over 90% of government revenue and a 75% share of GDP, as discussed in Chapter 4.

There is a strong consensus among many economists, international institutions such as the WB and IMF, and policymakers in central banks that one of the essential objectives of macroeconomic policies in both developed and developing economies is to sustain high economic growth with a low level of inflation (Omoke, 2010). This is because a high level of inflation hinders the functioning of a market economy (Krugman, 1995). As shown by the estimated coefficient in Table 6.3, inflation is seen to influence real GDP negatively and significantly in the long run, with a 1% rise in the inflation rate predicted to result in a 0.029% reduction in GDP. This outcome is consistent with the theory (see Chapters 3 and

5) and previous empirical studies such as Saaed (2007), Ahmed and Mortaza (2005), Malla (1997), Baghebo and Edoumiekumo (2012) and Havi et al. (2013), suggesting that high inflation rates adversely affect the process of economic growth. Since a high rate of inflation can be a sign of macroeconomic instability and the government's inability to manage the economy effectively, it is expected to have an adverse effect on the efficient allocation of resources and thus also on economic development. According to this, for Iraq to achieve sustained economic growth, it would need to control its inflation rate. However, the results contrast with Sweidan (2004) and Mallik and Chowdhury (2001), who found a positive association between a high level of inflation and economic growth.

Traditionally, the real exchange rate has not received any attention in the analysis of economic growth. It was assumed to have no effect on economic growth in the neoclassical growth models (Solow, 1956), which mainly focused on savings and investment as determinants of economic growth (Eichengreen, 2007). However, recent empirical studies have shifted their attention to the exchange rate as a determinant of economic growth, arguing for a robust relationship between the real exchange rate and economic growth, and that undervaluation of the currency might stimulate economic growth. Furthermore, it is well known among economists that poorly managed exchange rates can be devastating for economic growth. Avoiding a heavy overvaluation of the currency is one of the most robust imperatives, strongly supported by cross-country empirical evidence (Easterly, 2005; Johnson et al, 2007; Rajan and Subramanian, 2011; Razin and Collins, 1997; Rodrik, 2008). The reason behind this is that overvalued exchange rates are associated with shortages of foreign currency, rent seeking and corruption, and unsustainably large current account deficits, which are damaging to economic growth. However, devaluation of the real exchange rate may impact economic

growth negatively by reducing the real income of the economy, thus causing production capacity and activity to decline (Isaac and Samwel, 2012; Kandenge, 2007).

The results of this study show that the real exchange rate has a negative and significant effect on real GDP. The estimates suggest that a 1% increase in the real exchange rate would cause a 0.0295% reduction in real GDP. This result is consistent with other empirical studies (Akanbi and Detroit, 2008; Kandenge, 2007). Given the above argument and the discussions in Chapter 4 regarding how the real exchange rate has been poorly managed by the Iraqi government in the last few decades, it seems clear that growth has been negatively affected by the real exchange rate. What can be concluded here is that this variable is directly associated with investment, and that a high real exchange rate may produce greater uncertainty in the economy, depressing economic development as a result.

6.4 Short-Run Dynamics of Economic Growth in Iraq

The short-run dynamics among the variables were explored using a VECM. Error correction allows the introduction of the previous disequilibrium as an independent variable affecting the dynamic behaviour of the current variables. Based on empirical studies (Baghebo and Edoumiekumo, 2012; Havi et al., 2013; Kandenge, 2007), when the cointegrated time series between GDP and the explanatory variables exhibit a long-run equilibrium relationship at the 5% critical level, then the VECM can be employed to find the short-run dynamics of the economic growth model.

The results of the short-run VECM are shown in Table 6.4. These results associate the changes in real GDP to changes in the one-period-lagged variables and the disturbance term of the lagged period. As discussed earlier in the Section 5.6.3,

the common belief with the error correction model is that the value of the error term should be lie in the range $-1 \leq ECM_{-1} \leq 0$ and should be statistically significant in order for the long-run relationship among the variables to be confirmed. The coefficient of the speed of adjustment is negative and significant and the magnitude of this coefficient, -0.5459, suggests that approximately 54% of the disequilibrium in economic growth is corrected in the following year. The significance of the coefficient associated with the error correction term further supports the acceptance of the cointegration hypothesis (Harris and Sollis, 2003).

Table 6.4: VECM for the Economic Growth Model

Variable	Coefficient	Standard error	T-statistic
D(LRGDP(-1))	0.1470	0.4147	0.3545
D(LRPI(-1))	0.0839	0.0764	1.0981
D(LRPUI(-1))	0.1419	0.0668	2.1251
D(LROX (-1))	0.1248	0.0887	1.4075
D(LLABOUR(-1))	0.0469	0.1988	0.2359
D(LREXR(-1))	-0.0925	0.0135	-6.8483
D(LINFL(-1))	-0.043	0.0312	-1.3771
ECM(-1)	-0.5459	0.1624	-3.3611
R-squared	0.9289	Sum squared resid	0.5038
Adjusted R-squared	0.9137	S.D. dependent var	0.4567
S.E. of regression	0.1341	Akaike info criterion	-1.0031
F-statistic	3.4531	Prob (F-statistic)	0.0000

According to Table 6.4, in the short run the estimated coefficients of all the explanatory variables have the same signs as in the long run. In the short run, private investment, public investment, growth in the labour force, and growth in the value of petroleum exports still exhibit positive impacts, while the real exchange rate and inflation rate volatility still have negative impacts on economic growth.

The variables that appear to influence economic growth most significantly are public investment and the real exchange rate. The estimated coefficients suggest that a 1% increase in the previous year's public investment will cause real GDP to grow by 0.14%, whilst an increase in the real exchange rate will cause real GDP to decrease by about 0.09%. The other explanatory variables do not exhibit significant impacts on economic growth in the short run.

Additionally, in order to test whether the model is correctly specified, several diagnostic tests were conducted on the residuals from the model; the results of these diagnostic tests are as follows: The Jarque Bera test statistic is 3.77, which confirms that the residuals are normally distributed. The F-statistic for the Breusch-Godfrey serial correlation LM test is 0.9, indicating that no serial autocorrelation is present. The ARCH heteroskedasticity test results (F-statistic 0.31, p-value 0.28) show the absence of heteroskedasticity. Thus, we can conclude that the model is correctly specified.

6.5 Summary

This chapter has examined the macroeconomic determinants of long-run economic growth in Iraq, based on a Solow growth framework. The empirical analysis employed a cointegration approach using time-series data from 1970 to 2010. The results of the Johansen's cointegration test indicate that there are several significant relationships between GDP growth and the explanatory variables examined here. In the long run, the empirical results suggest that both forms of investment (public and private), growth in the labour force, and the value of petroleum exports are important in explaining economic growth in Iraq as the coefficients have the expected signs and are highly significant, whilst the real exchange rate and macroeconomic instability, as proxied by the inflation rate, are

shown to negatively and significantly affect GDP. However, in the short run, only public investment and the real exchange rate are found to have significant effects, positive and negative respectively, on real GDP. The analysis also assessed the distinction between the impacts of public and private investment on economic growth, and found public investment to have contributed more to economic growth in Iraq than private investment between 1970 and 2010.

CHAPTER 7 ANALYSIS AND DISCUSION OF DETERMINANTS OF DOMESTIC PRIVATE INVESTMENT IN IRAQ

7.1 Introduction

As discussed in Chapter 3, private investment is a powerful instrument for innovation, economic growth and poverty reduction. Countries with deeper and wider private-sector investments demonstrate accelerated economic growth. Undoubtedly, in many developing countries such as Iraq, investment rates are still too low, the motivation to innovate is insufficient and returns on investment are not very predictable, which are some of the main reasons for the slow growth in most developing countries.

The purpose of this chapter is to address the second research objective from Chapter 1 by empirically examining the pattern of domestic private investment and the key variables explaining that pattern in Iraq over the period, 1970 - 2010, and more importantly by examining the crowding-in or crowding-out effect of public investment. The ADF and PP unit root tests are employed to test for the stationarity of the data, and the variables are found to attain stationarity after first differences. The Johansen cointegration tests, using trace and maximum eigenvalue statistics, are used to establish long-run equilibrium relationships among the variables in the model. Also, an error correction model is estimated based on the cointegration. The significance of the coefficient of the error correction term confirms the long-run relationship between the explanatory variables and private investment.

An essential question is how public policy can affect private investment. Generally, academic research suggests that public investment in human capital and infrastructure services, such as transportation, communication and sanitation, crowds in private investment, by increasing the latter's productivity and thus having a significant positive impact on economic growth. This means that public investment may not only stimulate economic growth directly, as established in chapter 6, but also indirectly by promoting private investment (Aschauer, 1989; Erden and Holcombe, 2006; Erenburg, 1993; Pereira, 2001; Seitz and Conrad, 1994). However, some empirical literature (Monadjemi, 1993; Zou, 2006) suggests that public investment may also crowd out private investment by over utilizing scarce resources and reducing the aggregate amount of savings available for private investment; in this case, public investment would be deemed to have an adverse effect on economic growth (see Section 3.2.2).

The long-run empirical results of the analysis in this chapter show real GDP and real public investment to be positively associated with private investment. However, the real exchange rate, real interest rate and inflation rate are found to have negative impacts on the growth of private investment. The findings also indicate that war and political uncertainty serve as severe obstacles to the attraction of private investment. This chapter also examines the short-run dynamics of the model, including two dummy variables in an effort to make a distinction between the effects of the Iran-Iraq War and of international sanctions. The results show that only two variables are significant in explaining private domestic investment in the short run, namely, public investment and international sanctions.

The rest of the chapter presents a detailed discussion of the results and is organized as follows: Section 7.2 discusses the unit root test results, including the ADF and PP tests. Section 7.3 presents the long-run dynamics of the determinants of private domestic investment by employing the Johansen (1988) and Johansen and Juselius (1990) cointegration test. Section 7.4 discusses the short-run dynamics of private investment, and concluding remarks are made in Section 7.5.

7.2 Results of Unit Root Tests – Private Investment Model

A similar approach was used to that described in Section 6.2. The results of the unit root tests for the private investment model are shown in Table 7.1. Similar to Table 6.1, the ADF and PP tests indicate a non-rejection of the null hypothesis, suggesting a unit root or non-stationarity in the time series of the variables (LRPI, LRGDP, LRPUI, LREXR, LRINTR and LINFL) at the level in both the intercept without trend and intercept with trend models, with the exception of LRINTR which is found to be stationary at the level (having no stochastic trend) only in the PP test. The null hypothesis can therefore be rejected for this variable at the 1% significance level. However, all time-series data were tested again at the first differences for all variables found to be non-stationary at the level. The results show that the null hypothesis (suggesting non-stationarity of unit roots in the time series) should be rejected for the first differences. This implies that all the time-series variables are integrated of order one at first differences based on the ADF test, having the same integration level of I(1) at the 5% and 1% significance levels, except for LRINTR which has a zero order of integration in the PP test only.

Table 7.1: ADF and PP Unit Root Tests for Private Investment Model

Series	ADF intercept without trend		ADF intercept t with trend		PP intercept without trend		PP intercept with trend	
	Level	First differences	Level	First differences	Level	First differences	Level	First differences
LRGDP	-1.712	-6.436**	-2.385	-6.348**	-1.712	-6.459**	-2.445	-6.366**
LRPI	-2.567	6.701**	-2.934	-6.625**	-2.605	-7.851**	-2.939	-7.565**
LRPUI	-1.708	-7.029**	-1.711	-6.931**	-1.657	-7.029**	-1.666	-6.932**
LREXR	0.890	4.866**	-1.632	-4.804**	-0.998	-4.845**	-1.899	-4.778**
LINFL	-1.610	-5.693**	-1.605	-4.975**	-1.349	-6.359**	-1.226	-6.281**
LRINTR	-1.612	-6.709**	-1.978	-6.627**	-3.576**	-7.072**	-3.572*	-6.907**

Note: (1) The lag length in both tests is based on the AIC.

(2) * and ** imply that we can reject the null hypothesis that the time series contains a non-stationarity or has a stochastic trend at 5% and 1% respectively.

7.3 Results of Johansen Cointegration Test and Long-Run Dynamics of Domestic Private Investment in Iraq

Following the ADF and PP tests, it is confirmed that the variables under examination are integrated to the same order, I(1). Thus, the cointegration test can be implemented (Koop, 2013). Following on from the unit root results, the AIC was applied to select the optimum lag length (1) in the Johansen cointegration test.

The cointegration test in the present study used a version of the Johansen-Juselius approach, following the lead of previous studies (Abdullahi et al., 2012; Atukeren, 2005; Oriavwote and Oyovwi, 2013). According to Cuthbertson et al. (1992), the Johansen-Juselius approach is preferable when there are more than two variables. It has also been found to be the most powerful approach even for the bivariate system. Two test statistics, the trace statistic and the max-eigenvalue statistic, were employed to determine the appropriate rank and to identify the number of cointegration vectors. Then, all variables were treated as potentially endogenous. The Johansen cointegration test results are shown in Table 7.2. It can be

concluded that the cointegrated time-series variables have the same common trend.

Table 7.2: Johansen Cointegration Test Results – Private Investment Model

Unrestricted Cointegration Rank Test (Trace)				
Null Hypothesis	Eigenvalue	Trace statistics	5% critical value	Prob.**
None *	0.915272	220.5060	134.6780	0.0000
At most 1 *	0.899557	156.3301	103.8473	0.0000
At most 2 *	0.852740	96.57786	76.97277	0.0008
At most 3	0.667996	46.77341	54.07904	0.1904
At most 4	0.329270	18.10559	35.19275	0.8350
At most 5	0.178380	7.721482	20.26184	0.8464
At most 6	0.095617	2.613066	9.164546	0.6552
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Null hypothesis	Eigenvalue	Maximum eigenvalue	5% critical value	Prob.**
None *	0.915272	64.17593	47.07897	0.0003
At most 1 *	0.899557	59.75222	40.95680	0.0002
At most 2 *	0.852740	49.80445	34.80587	0.0004
At most 3 *	0.667996	28.66782	28.58808	0.0488
At most 4	0.329270	10.38411	22.29962	0.8040
At most 5	0.178380	5.108416	15.89210	0.8787
At most 6	0.095617	2.613066	9.164546	0.6552

Note: (1) Trace statistics and max-eigenvalue statistics indicate three and four cointegrating equations, respectively, at the 5% level. (2) * denotes rejection of the hypothesis at the 5% level.

(3) ** MacKinnon-Haug-Michelis (1999) p-values.

Furthermore, identifying multiple cointegration vectors with theoretical economic relationships is possible when using the Johansen cointegration approach. The Johansen cointegration test revealed that trace statistics and max-eigenvalue statistics indicate three and four cointegrating vectors, respectively, at the 5% level of significance. The presence of cointegration vectors confirms that there exist unique long-run equilibrium relationships between private investment and

the explanatory variables (Gujarati, 2012). Furthermore, once a cointegrating relationship has been confirmed, it is possible to apply an error correction model that reconciles the short-and long-run properties of the estimated model.

In general, the confirmation of cointegrating vectors implies that domestic investment and its determinants (GDP, public investment, the exchange rate, the interest rate and inflation) are moving together in the long run. The signs of the estimated coefficients for the variables RGDP, RPUI, REXR, RINTR, INFL, and the dummy for war are strongly consistent with the economic theory, even though they are not all statistically significant. Again, since all variables are transformed into their natural logs, the estimated coefficient of each variable can be described as the long-run elasticity. The normalized cointegrating vector for the long-run

Table 7.3: Normalized Cointegration Coefficients - Private Investment Model

Variable	Coefficient	Standard Error	T-statistic
LRGDP	1.1647	-0.1446	8.0565
LRPUI	0.0175	-0.0524	0.3331
LREXR	-0.2091	-0.0115	-18.1179
LRINTR	-4.0829	-0.6688	-6.1049
LINFL	-0.4832	-0.0644	-7.5025
DUM	-0.6886	-0.0866	-7.9512

The cointegration equation can be written as follows:

$$LPRI = 1.165\ LRGDP + 0.018\ LRPUI - 0.210 LREXR - 4.083 LRINTR - 0.483 LINFL - 0.689 DUM$$

As explained in the section on theoretical background in Chapter 2, the flexible accelerator model proposes that private investment is influenced positively by expected demand, namely that investors take initiative when there is increased market demand (Ahmad and Qayyum, 2009). It has also been suggested by a

number of empirical studies focusing on developing countries that private investment is positively associated with the growth of real GDP, indicating that high economic growth will lead to higher investment rates (Mlambo and Oshikoya, 2001).

The estimated coefficient of the GDP growth rate, in the current study, shows a positive and significant effect of that variable on private investment in Iraq. The GDP elasticity of private investment is 1.1647, suggesting that a 1% increase in GDP will bring about a 1.1647% increase in domestic investment. This result of the long-run analysis strongly supports the accelerator principle, confirming that private investment is strongly impacted by growth in GDP, a proxy for an increase in aggregate demand (Khan and Reinhart, 1990; Mlambo and Oshikoya, 2001). Similar outcomes have been obtained by Greene and Villanueva (1991), Unteroberdoerster and Guimarães (2006) and Ahmad and Qayyum (2008). There is no evidence among empirical studies confirming increased GDP will decrease private investment.

As discussed in Section 3.2.1, the issue of the association between public and private investment in the case of developing countries has been a focus of attention in the literature for the last four decades, and is still subject to a large amount of controversy. According to the literature, public investment or government expenditure has an ambiguous effect on private domestic investment. Khan and Kumar (1997) analysed the potential complementary effects might raise in the case of public investment in infrastructure such as the construction of roads and the provision of public goods. The idea here is that, if public infrastructure capital is complementary to private capital, then an increase in public investment will not only attract more private investment, thus enhancing capital

accumulation, but will also increase the marginal product of private investment. However, public investment in infrastructure may not automatically have a beneficial influence on private investment and growth. Instead, it may compete with private investment, it may be of a dubious quality, or it may be financed by taxes or a deficit, which will have a negative impact on credit availability, the cost of inputs, and macroeconomic stability (Acosta and Loza, 2005; Cavallo and Daude, 2011; Rossiter, 2002).

The estimated results from the current study reveal some, albeit not very strong, evidence of crowding in effects of public investment on private investment in the long run, in the context of Iraq. The coefficient of public investment has a positive sign, although it is statistically insignificant. It implies that a 1% increase in fixed government capital formation is accompanied by a 0.0175% increase in domestic investment. This result provides a further support to previous result in section 6.3, indicating crowding in effects of public investment to private investment in Iraq. Although there are no data available on infrastructure investment in most developing countries, it is well known that the provision of infrastructure services and public goods in oil-producing countries is a government responsibility and comes under the government investment framework. Hence, the positive coefficient of public investment indicates that there is a complementary link between these two types of investment but the high allocation of Iraqi government expenditure to military spending in the past few decades may account for public investment not showing up as statistically significant in explaining private investment. In order to motivate private investment in Iraq, more public investment should be directed towards infrastructure and public goods, and public spending policies need to be designed that target sectors in which an extra unit of

public spending will contribute positively to the private sector's expected profitability.

The results obtained in this study are similar to those of previous studies confirming that most of the fiscal and financial resources used by the public sector exert a positive impact on private investment, and raise the marginal productivity of private capital (Blejer and Khan, 1984; Everhart and Sumlinski, 2001; Greene and Villanueva, 1991; Sundararajan and Thakur, 1980). A positive relationship was also found by Aschauer (1989), who argued that the net effect of public investment (particularly non-military spending) is positive. On the other hand, the results contrast with studies in other countries, such as Shafik (1992) in the context of Egypt, and Bakare (2009), Majeed and Khan (2008) and Yin (2011) in the context of Nigeria, Pakistan and Malaysia respectively, all of whose results indicated that increasing the level of public investment had a negative effect on the private investment rate.

Another variable considered in this study for explaining Iraq’s domestic investment in the long run is the real exchange rate. As discussed in the empirical literature in Chapter 3, there are two arguments as to how the real exchange rate might affect private investment. On the demand side, depreciation of the real exchange rate might cause private-sector real wealth and expenditure to decrease by increasing the real cost of imported capital goods and in turn domestic prices (Rodrik, 2008; Zardashty, 2014). In other words, depreciation of the real exchange rate might influence the real prices of imported inputs that are used in conjunction with capital goods to produce outputs, and might also affect interest rates, which in turn would affect private investment. This could lead firms to

revise their expectations of future demand and thus lower investment through the accelerator effect (Acosta and Loza, 2005).

However, on the supply side, devaluation can have a positive impact on investment in sectors producing internationally traded goods with high competitiveness and high export volumes. In other words, devaluation may stimulate investment in the tradable goods sector and depress capital formation in the non-tradable goods sector (Montiel, 2011; Todaro, 1977). Furthermore, the volatility of the real exchange rate can be used as a measure of uncertainty, which in theory will have an adverse impact on investment, if investment is to some extent irreversible (Dixit and Pindyck, 1994; Pindyck, 1991).

As shown in Table 7.3, the estimated coefficient for the net effect of the real exchange rate in the long run is negative (-0.2091)and statistically significant. In the long run, a 1% change in the real exchange rate would cause a reduction of about 0.2091% in private investment in Iraq. This result is consistent with studies by Bakare (2011) and Naa-Idar et al. (2012) in the context of Nigeria and Ghana respectively, which also found a negative association between the real exchange rate and private investment.

This suggests that a depreciation of the exchange rate will have a negative influence on private investment. Such depreciation will hinder the acquisition of foreign exchange for the importation of the inputs needed for investment. In other words, it will increase the cost of imported inputs and raw materials crucial for domestic investment in the developing world (see Section 3.4.3). The negative sign shows there is a stronger effect from the demand side. This is because the economy of Iraq relies heavily on imported capital goods, and because the mismanagement of the exchange rate policy in Iraq in the last decades may have

been a cause of great concern for investors. Hence, fluctuations in the real exchange rate might cause uncertainty for investors, and thereby discourage private investment in Iraq.

The sign of the real interest rate (RINTR) is an empirical matter and depends on whether the data support the McKinnon–Shaw hypothesis or Keynes' traditional theory (see Chapter 2). The estimated coefficient has the expected sign (negative) and it is statistically significant (-4.0829), indicating that a 1% increase in the real interest rate will decrease domestic investment by 4.0829%. This result conforms to Keynes' traditional theory of investment. It has been confirmed by various studies that the real interest rate captures the cost of financing investment decisions. With higher real interest rates, fewer investment projects have potential returns high enough to justify borrowing to finance them, and therefore private investment is generally unattractive. This result is consistent with prior findings (Isaac and Samwel, 2012; Majeed and Khan, 2008).

Since investment is sensitive to the cost of capital, following the implementation of monetary policy reforms in Iraq in late 2003, which led to an increase in real interest rates, the cost of funding investment projects was expected to play an inhibiting role in private investment (see Chapter 4). Erden and Holcombe (2006) argued that the real interest rate can be a poor proxy for the cost of capital, in light of the severe controls on nominal interest rates often imposed by the governments of developing countries, which cause real interest rates to simply reflect changes in inflation rates.

It is well known that macroeconomic stability plays an important role in an economy. An economy grows much faster when there is stability in economic factors such as inflation and the currency exchange rate (Ribeiro and Teixeira, 2001). The inflation rate has been identified by a number of empirical studies as an indicator of macroeconomic instability, and high inflation generally has an adverse effect on private saving and investment. The results in this study show that the inflation rate has a negative effect (-0.4832) in the case of Iraq. The variation in inflation is also significant in determining private investment levels, indicating that uncertainty in the economy is instrumental in decreasing investment, by distorting price signals and the information content of relative price changes, and increasing the riskiness of longer-term investment (Serven, 1998). This implies that prudent fiscal policies, as well as disciplined monetary policies, are needed to deal with the issue (Montiel, 2011). The results obtained here are consistent with a number of prior empirical findings showing a negative association between inflation and private investment (Ahmad and Qayyum, 2009; Anders and Hemando, 1997; Greene and Villanueva, 1991; Pfeffermann and Madarassy, 1999; Valadkhani, 2004). However, they are contrary to the findings of Naa-Idar et al. (2012) on the effect of the inflation rate on private domestic investment in the context of Ghana.

Furthermore, the negative impact of increasing domestic prices will reduce the purchasing power of money; as a result, household demand for money will rise in order to keep the same purchasing power. It is not surprising that high inflation has an adverse effect on expected profitability, since high inflation will raise the cost of local production by

increasing the prices of resources entering the production process. This also implies that local products may be relatively more expensive than foreign products.

As mentioned earlier in Section 5.3, war and political instability have harmful effects on private investment, by increasing the riskiness of long-term investment. This influence is measured by a dummy variable in this study. In econometric theory, the Johansen cointegration test is quite sensitive to the number of dummy variables used; therefore, including more than one dummy variable may deplete the power of the tests to find the proper cointegrating rank. It was therefore preferable to include one dummy variable representing the years of war[12]. The dummy variable has a negative and significant coefficient (-0.6886), confirming an adverse impact. The results suggest that war is likely to lead to a reduction in domestic private investment by about 0.68% in Iraq. Not surprisingly, this suggests that the political instability in Iraq may have created a climate that is hostile to private investment. A similar negative result has been observed in previous studies (Bakare, 2011; Frimpong and Marbuah, 2010; Kehinde et al., 2012).

The empirical investigations have produced evidence that reductions in real private investment in the context of Iraq are explained by political instability as well as the previously mentioned factors. This is due to the fact that, since the 1980s, Iraq has experienced several wars, and later international sanctions, which have led to the deterioration and paralysis of the majority of economic sectors, and the isolation of Iraq's economy from all kinds of trade and business with the

[12] The dummy variable represents the years of war, including the first Gulf War from 1980 to 1988, the second Gulf War during 1990 and 1991, and finally the 2003 invasion of Iraq.

world. This has left the country with a poor quantity and quality of investment, leaving it entirely reliant on oil export revenue.

7.4 Short-Run Dynamics of Private Investment in Iraq

Similar to Chapter 6, the Johansen-Juselius test results presented in Section 7.3 showed that the time-series variables were cointegrated. Thus, the VECM was employed to examine the short-run dynamics of the explanatory variables. For the short-run dynamics, in addition to the macroeconomic variables (including RGDP, RPUI, REXR, RINTR, and INFL), two dummy variables[13] were included as exogenous variables in order to identify the effect of the Iran-Iraq War and the international sanctions, respectively.

The results of the VECM in Table 7.4 show that the estimated coefficient of the error correction term (ECM-t) is highly significant with the theoretically correct sign, indicating that approximately 59% of the disequilibrium in private fixed capital formation is corrected in the following year. This suggests a high speed of convergence to equilibrium if a disequilibrium shock appears. Thus, the result provides further support for the acceptance of the cointegration hypothesis. This is because the statistical significance of the coefficient also confirms the existence of a long-run equilibrium association amongst the time-series variables.

Moreover, exploring the determinants of private investment, the latter seems to have been affected mainly, in the short term, by public investment, and by DUM2 that captures the effect of international sanctions. Unlike in the long run, public investment crowds out private investment in the short run.

[13] DUM1 represents the Iran-Iraq War from 1980 to 1988. DUM2 represents the international sanctions imposed on Iraq between 1990 and 2003.

Surprisingly, international sanctions appear to have had a positive effect on private investment in the short run. This result supports the observations made in Chapter 4, concerning how the Iraqi government had been forced to establish a privatization policy due to the fact that the country had been prevented from conducting any sort of international trade or economic business with the world during the period of international sanctions. Furthermore, economic reforms were adopted in the late 1980s, when the government provided subsidies and tax exemption for private sectors such as agriculture, industry and construction, aiming to encourage the economy to be self-sufficient. This indicates that the international sanctions had a positive impact on private investment. However, although the coefficient of DUM1 (Iran-Iraq War) has the expected negative sign, which is consistent with economic theory, it is insignificant in explaining private investment in the short run.

Table 7.4: VECM for the Private Investment Model

Variable	Coefficient	Standard error	t-statistic
D(LRPI(-1))	0.0039	0.1992	0.0195
D (LRGDP(-1))	-0.7309	0.5289	-1.3819
D (LRPUI(-1))	-0.4392	0.1929	-2.2761
D (LREXR(-1))	-1.303475	0.82729	-1.57559
D (LRINTR (-1))	-0.713706	0.85709	-0.83271
D (LINFL(-1))	-0.020865	0.08418	-0.24787
D(DUM1(-1))	-0.064719	0.14845	-0.43595
D(DUM2(-1))	0.570064	0.19754	2.88588
ECM(-1)	-0.5926	0.1528	-3.8792
R-squared	0.7015	Sum of squared resid	1.1817
Adjusted R-squared	0.6477	S.D. dependent	0.3979
S.E. of equation	0.2807	Akaike information criterion	-1.6602
F-statistic	3.5250	Prob (F-statistic)	0.0000

As part of the specification model, various diagnostic tests were applied to check for any mis-specification in the model. The estimated model passed the diagnostic

tests. According to the Q-statistics used to detect serial correlation in the model, the null hypothesis is accepted. The P-values for the Q-statistics are more than 5%, indicating that there is no serial correlation. The F-statistic for the Breusch-Godfrey serial correlation LM test is 1.8, which indicates the absence of serial correlation. The Jarque Bera test statistic is 2.38, which confirms that the non-normality hypothesis can be rejected. The ARCH heteroskedasticity test results (F-statistic 0.35, p-value 0.55) show that the estimates are both consistent and efficient (Brooks, 2014).

7.5 Conclusion

This chapter has addressed the second objective of this study by examining the macroeconomic factors that influence the private investment function within the context of Iraq. The specific objective was to investigate the determinants of private investment and their relationships with private investment, more importantly examining whether there is a crowding-in or a crowding-out effect from public investment. Similarly to Chapter 6, the analysis in this chapter employed the techniques of Johansen cointegration and error correction modelling to determine the long-run and short-run relationships between the variables.

The estimated results based on annual data for the period 1970-2010 indicate that the real GDP, real exchange rate, real interest rate, inflation rate, and political instability are important in explaining domestic private investment in the long run for Iraq. The estimated coefficients of the variables that affect private investment in the long run all have the expected signs, consistent with the economic theory discussed in Chapters 2 and 3. The empirical results suggest that political instability (increasing military government expenditure) and the cost of capital, a weak currency and macroeconomic instability all exert a negative impact on

domestic investment. However, increasing GDP, which leads to higher demand, has a positive impact on private investment. The empirical results also show a complementary (crowding-in) effect coming from government investment, although it is statistically insignificant. Confirming various prior empirical studies, public investment, particularly in infrastructure projects, raises the profitability of private production, while non-infrastructure projects may have the opposite effect. However, only public investment and international sanctions are significant in the short run.

CHAPTER 8 DETERMINANTS OF PUBLIC INVESTMENT IN IRAQ

8.1 Introduction

In developing countries, the rapid growth in public capital over the past few decades has been seen as an essential means of accelerating the pace of economic growth. In most developing countries, the public sector now accounts for a noticeable share of total production and investment (see Section 3.2.3). However, the contribution of the public sector to growth has been far below expectations. In many cases, the public sector needs large subsidies from the government and may impose a significant fiscal burden on the economy, which has led to the emergence of the idea that the private sector is much more productive than the public sector (Everhart and Sumlinski, 2001a; Sarmad and Mohiuddin, 1991) (see also Section 3.3).

Furthermore, it is discussed in a number of empirical studies that infrastructure services in oil-exporting countries are the government's responsibility. The government has a role in infrastructure development and recognises that well-targeted infrastructure investment generates significant social and economic benefits. Infrastructure investment helps to increase productivity and competitiveness and the capacity of the private and public sectors to deliver high-quality services (see Section 3.2.3). Eventually it helps with the establishment of a stronger economy, rising real incomes and improvements in community well-being (Blejer and Khan, 1984; Khan and Kumar, 1997; Majeed and Khan, 2008).

Additionally, as discussed in Section 7.3, public and private investment may be linked by a complementary relationship if public capital provides positive

externalities for the private sector. Many channels may be affected: first, the availability of economic and social infrastructures may create favourable conditions for private investment decisions, by offering essential services to the production system both in the short and the long run (transportation, communication, education, and so on); second, higher public capital may lead, on the one hand, to a boost in total factor productivity and, on the other, to a reduction in production costs (through the availability of roads, electrical and gas facilities, public transportation, and so on); finally, public investment, by increasing total demand, may give rise to profit and sales expectations, incentivising private investment.

As discussed in Chapters 3 and 5, in spite of its potential direct and indirect importance for economic growth, only a few studies have been conducted on the determinants of public investment in developing countries. The implications for policy makers seem to be clear: in cases where public investment has been found to have a positive effect on economic growth, public investment should be increased in order to boost the economy. Indeed, such policies have been strongly supported by politicians and international institutions such as the WB and the IMF for many countries (Clements et al., 2003).

Therefore, following prior empirical studies (Clements et al., 2003; De Haan et al., 1996; Saghir and Khan, 2012; Välilä and Mehrotra, 2005), this chapter is mainly focused on the determinants of public capital investment, with such an investment being an important factor in explaining economic growth on the one hand, and in providing positive externalities that impact upon private investment on the other hand. The empirical results in Chapter 6 indicate that public investment has a positive and significant effect on economic growth. The results

in Chapter 7 then show some evidence that a complementary relationship exists between private and public investment. These results provide a motivation for the current study to develop a further empirical model, based on the various prior empirical studies, of the determinants of public investment in Iraq's economy. Another objective of this chapter is to ascertain the indirect impact of oil export revenue on private investment. This study argues that oil revenue could provide an indirect boost to private investment through its effect on public investment. Since the availability of economic and social infrastructure is the government's responsibility in most oil-producing countries, an increase in the level of public investment as a result of higher oil revenue will reflect positively on private investment (see equation 5.19a).

Following the pattern of the two previous chapters, the rest of this chapter is organized as follows: Section 8.2 discusses the unit root test results (ADF and PP). Section 8.3 presents the long-run dynamics of the determinants of public investment by employing the Johansen cointegration approach. Section 8.4 discusses the short-run dynamics of public investment. Section 8.5 provides some conclusions.

8.2 Results of Unit Root Tests – Public Investment Model

A similar approach is followed to that of the last two chapters, beginning with two commonly applied unit root tests, the ADF and PP. Table 8.1 illustrates the results; both the ADF and PP show a non-rejection of the null hypothesis indicating a unit root or non-stationarity in the time series of two of the variables (LRGDPC and LROX) at the level in both the intercept without trend and intercept with trend models, while the variable LRGC is found to be stationary at the level when including the intercept with trend mdoel. This implies that LRGC

is stationary at the level (having no stochastic trend). The null hypothesis can therefore be rejected for this variable at the 5% significance level. However, after running both ADF and PP on the first differences, all variables are found to be non-stationary at the level. The results show that the null hypothesis (suggesting non-stationarity of unit roots in the time series) should be rejected for the first differences. This implies that all the time-series data of the variables are integrated of order one at first, having the same integration level of I(1) for all variables at the 5% significance level, except for LRGC which has zero order of integration. This means that all of the time series are integrated of order one in the first differences at the 5% significance level.

Table 8.1: ADF and PP Unit Root Tests for the Public Investment Model

SERIES	ADF intercept without trend		ADF intercept t with trend		P-P intercept without trend		P- P intercept with trend	
	Level	First differences	Level	First differences	Level	First differences	Level	First differences
LRGDPC	-2.477	-6.479**	-2.449	-6.3391**	-2.536	-6.526**	-2.508	-6.429**
LROX	-2.013	-6.558**	-2.632	-6.487**	-2.013	-6.639**	-2.622	-6.560**
LRGC	-1.959	-8.787**	-3.784**	-8.673**	-1.723	-8.979**	-3.748*	-8.859**

Note: * and ** imply that we can reject the null hypothesis that the time series contains a non-stationarity or has a stochastic trend at 5% and 1% respectively.

8.3 Results of Johansen Cointegration Test and Long-Run Dynamics of Public Investment in Iraq

Following a similar approach to that used in Chapters 6 and 7, the Johansen cointegration test is applied, and the results for the eigenvalue and trace statistics are shown in Table 8.2. It can be observed that the cointegrated time-series variables have the same common trend. The conclusion of cointegration is confirmed by the result of the Johansen procedure, which also reveals (through both the trace and max-eigenvalue statistics) the existence of a cointegrating

vectors. According to the unrestricted cointegration rank test (trace and max-eigenvalue), the null hypotheses of non-cointegrating vectors are strongly rejected at the 5% significance level against the alternative hypotheses of the existence of cointegrating vectors. The results of the presence of cointegrating vectors confirm that there exist long-run equilibrium relationships between public investment and the explanatory variables.

Table 8.2: Johansen Cointegration Test Results for the Public Investment Model

Unrestricted Cointegration Rank Test (Trace)				
Null hypothesis	Eigenvalue	Trace statistics	5% critical value	Prob.**
None *	0.607651	78.08301	63.87610	0.0020
At most 1*	0.430239	43.46569	42.91525	0.0440
At most 2	0.315375	22.65181	25.87211	0.1196
At most 3	0.208106	8.633110	12.51798	0.2042
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Null hypothesis	Eigenvalue	Maximum eigenvalue	5% critical value	Prob.**
None *	0.607651	34.61732	32.11832	0.0242
At most 1	0.430239	20.81388	25.82321	0.1998
At most 2	0.315375	14.01870	19.38704	0.2529
At most 3	0.208106	8.633110	12.51798	0.2042

Note: (1) Trace statistics and max-eigenvalue statistics indicate two and one cointegrating equations, respectively, at the 5% level. (2) * denotes rejection of the hypothesis at the 5% level. (3) ** MacKinnon-Haug-Michelis (1999) p-values.

In general, the confirmation of cointegrating vectors implies that public investment and its determinants (RGDPC, RGC, and ROX) are cointegrated in the long run. The signs of the estimated coefficients for the explanatory variables meet expectations and are strongly consistent with the economic theory discussed in Chapters 3 and 5. They are also statistically significant, except in the case of LRGDPC which is found to be insignificant in influencing public investment in the long term in the context of Iraq. The normalized cointegrating vector for the long-run relationship is given in Table 8.3.

Table 8.3: Normalized Cointegration Coefficients for the Public Investment Model

Variable	Coefficient	Standard Error	t-Statistic
LRGDPC	1.15914	1.36143	0.851414
LRGC	3.90808	1.14152	3.423578
LROX	1.79705	0.59838	3.003185

Based on the above result, the cointegration equation can be written as follows:

LRPUI = 1.159LRGDPC +3.908LRGC +1.797LROX

With respect to individual coefficients, a large proportion of the empirical literature uses GDP or per capita income (PCI) as a proxy for the level of economic development in explaining public investment (Clements et al., 2003; Saghir and Khan, 2012; Tanzi and Hamid, 1997). The estimated results for this variable reveal evidence of positive effects on public investment in the long run, in the context of Iraq. The coefficient has a positive sign, although it is statistically insignificant. It implies that a 1% increase in LRGDPC is accompanied by a 1.16% increase in public investment.

The results obtained in this study are similar to those obtained in previous studies (Clements et al., 2003; Saghir and Khan, 2012; Tanzi and Hamid, 1997), the positive coefficient possibly reflecting that countries with higher RGDPC can generate greater tax revenues and thus provide higher levels of public investment. However, the reason why the estimated coefficient of RGDPC was shown to be insignificant in influencing public investment could be attributable to the fact that tax revenue is not generally believed to affect fiscal policy in oil-producing countries like Iraq. The belief is that taxation is not a good means by which to affect government revenue, prices, incomes, welfare and the allocation of resources, since increasing taxes might reduce aggregate demand and decrease the

profitability of businesses, which would in turn impact negatively on potential investment and long-run growth (see the Wagner's Law, as discussed in chapter 3.2.3) (Blejer and Khan, 1984; Nwosa Philip Ifeakachukwu, 2013).

In the above model, the real public current expenditure (RGC) is also considered as a way to explain Iraq's public investment in the long run. As discussed in Chapter 5, the government's current expenditure comes under non-productive expenditure. This is expenditure on categories such as defence, interest payments, law and order, public administration, public health and education, and the maintenance of government machinery (see the Wagner's Law, as discussed in chapter 3.2.3). This sort of expenditure does not create any productive assets that might bring income or returns to the government (Todaro and Smith, 2009). However, this type of government expenditure helps to create a healthy environment for economic activity and increases aggregate demand. Due to an increasing rate of economic growth, the government may generate income in the form of duties and taxes from those with higher per capita income or the owners of large businesses. Thus, the theoretical and empirical literature argues, this variable exerts a positive impact on public investment in the long run.

The estimated coefficient of this variable is consistent with the theoretical and empirical literature (see Chapters 3 and 5), indicating that current public expenditure has a positive effect (3.91) and is statistically significant. This implies that a 1% increase in current public expenditure will increase public investment by about 3.91% in the long run. A similar positive result was found by Ghassemi (1996).

As discussed in Chapter 4, in the case of oil-exporting countries, public investment is largely influenced by oil export revenue, since a large proportion of

government income is obtained from oil exports. In line with this, a positive relationship is confirmed between oil export revenue and public investment. As shown in Table 8.3, the estimated coefficient for the impact of oil export revenue on real public investment in the long run is (1.79). This means that, in the long run, a 1% change in oil export revenue will cause an increase of about 1.79% in public investment in Iraq. This result supports findings by Saghir and Khan (2012) and Ghassemi (1996) for Pakistan and Iran respectively. The empirical results in Chapter 6 showed that, since oil export revenue has a positive impact on public investment, it may have the same effect on private investment. This is due to the fact that public investment is a major way to affect the level of private investment in oil-producing countries.

It has been suggested by various researchers that other macroeconomic variables may influence public investment in developing countries, such as external debt, fiscal deficit, foreign aid, debt servicing and institutional variables (Clements et al., 2003; Sturm, 2001; Tanzi and Hamid, 1997). In our empirical analysis of public investment we excluded these variables for two reasons. First, some of these variables play an insignificant role in explaining public investment in Iraq. Second, and more importantly, there is a deficiency of available data.

Following a similar approach to that pursued in Chapters 6 and 7, various diagnostic tests were applied to check for any misspecification in the model. The Jarque Bera test statistic is 2.89, which confirms that the non-normality hypothesis can be rejected. The ARCH heteroskedasticity test results (F-statistic 1.59, p-value 0.21) show that the estimates are both consistent and efficient (Brooks, 2014).

8.4 Short-Run Dynamics of the Public Investment Model

Similarly to Chapters 6 and 7, the Johansen-Juselius test results presented in Section 8.3 show that the time-series variables are cointegrated. Thus the VECM test was employed to examine the short-run dynamics of the explanatory variables. The results reported in Table 8.4 show the short-run dynamics and the set of short-run coefficients in the VECM. The VECM associates the changes in public investment with changes in other, lagged variables and the disturbance term of the lagged period.

The most important result of the short-run model is that the estimated lagged error correction term (ECM -1) is negative and statistically significant. The coefficient is 0.11, suggesting a slow adjustment process in government investment. Approximately an 11% adjustment in the disequilibrium of the previous period takes place each year towards the long-run equilibrium. The short-run response of the lagged change in government investment is negative, which shows that the previous period's growth in government investment brings about a negative change in the government's investment over the short run. However, the estimated coefficient is not significant.

Similarly to the long-run model, both explanatory variables (LRGDPC and LRGC) show positive, although statistically insignificant, impacts on public investment. However, the estimated coefficient of oil export revenue is negative, while also statistically insignificant. Unlike in the long-term model, in which all variables were significant and had the expected signs, none of the explanatory variables are found to be significant in explaining the public investment in the short run.

Table 8.4: Results of Short-Term VECM for the Public Investment Model

Variable	Coefficient	Standard error	T-statistic
D(LRPUI(-1))	-0.1870	0.1685	-1.1099
D(LRGDP(-1))	0.2577	0.6075	0.4242
D(LRGC(-1))	0.2479	0.2363	1.0495
D(LROX (-1))	-0.3406	0.3717	-0.9163
ECM -1	-0.1142	0.0511	-2.2325
R-squared	0.519	Sum squared resid	17.7559
Adjusted R-squared	0.4812	S.D. dependent	0.961633
S.E. of equation	0.6927	Akaike Information Criterion	2.1965
F-statistic	13.3597	Prob (F-statistic)	0.0000

8.5 Summary

Generally, during 1960-1980, public investment was treated as one of the most important factors contributing to economic growth in developing countries. This view has gradually changed in recent years. There is some uncertainty about the effects of public investment, in terms of whether it induces or decreases private investment (see Chapter 3). However, public investment is associated with the development of infrastructural support and the provision of public goods and services. This kind of government expenditure can be complementary to private investment, and can raise the productivity of capital and expand the overall availability of resources by increasing output (see Chapters 6 and 7). On the other hand, public investment may crowd out private investment. This occurs if public investment is enabled by raising taxes, interest rates, and the issuance of debt, or if it creates inflationary pressure because of shortages of resources. Furthermore, private investment may be crowded out by public investment when the public sector produces goods that directly compete with private output (Aschauer, 1989; Blejer and Khan, 1984). The crowding-out effect can also occur when the distortion of the public sector is too large.

Based on the above arguments, it can be concluded that it is important to find out which variables determine public investment in the case of Iraq, since public investment has a very powerful and large effect on private investment and economic growth. Both the level and composition of public investment can affect private investment, providing a powerful instrument for encouraging or discouraging the latter. As recently pointed out by the IMF and the WB, a better understanding of the relationship between public and private investment is also crucial for policy makers, if they are to address the objective of accelerating economic development (Clements, et al., 2003).

Therefore, this chapter has addressed the third objective of the current study by examining the macroeconomic factors that influence the public investment function within the context of Iraq (see Chapter 1). The specific objective was to investigate the determinants of public investment in both the long and the short term. The analysis was based on the techniques of Johansen cointegration and error correction modelling, which provide mechanisms for overcoming problems associated with unit roots and time-series data analysis in general.

The estimated results, based on annual data for the period 1970-2010, indicate that both current real government expenditure and real oil export revenue are significant in explaining public investment in the long run for Iraq. The coefficients of the variables that affect public investment in the long run all have the expected signs consistent with economic theory, except for RGDPC which is found not to be statistically significant. The empirical results suggest that increasing the real per capita income, current government expenditure and oil export revenue all have a positive effect on public investment, with the last two more significant. However, all explanatory variables are found to be statistically

insignificant in explaining public investment in the short run. The short-run estimated lagged error correction term (ECM -1) is found to be consistent with the theory, as it is negative and statistically significant.

CHAPTER 9 SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

9.1 Introduction

This study has investigated investment behaviour in Iraq and how it relates to economic growth. Only a few studies have examined the behaviour of investment in Iraq, due to data limitations and difficulties in applying classical investment theories. The lack of a relatively open market over the last few decades, the absence of asset and money markets, and the fluctuation of the domestic currency have been some other deficiencies in this regard. The unavailability of some data, such as the real return on private investment, the rates of unemployment and employment, and nominal wages, have been other restrictions on the adoption of a more reliable macroeconomic model in this regard. In spite of the above difficulties, carefully informed by the theoretical and empirical literature this study adopted three empirical models to identify major elements influencing economic growth and domestic private and public investment in Iraq, as a developing country and a member of OPEC, over the period 1970-2010. The empirical analyses were based on key studies in developing countries, such as Wai and Wong (1982), Aschauer (1989), Mlambo and Oshikoya (2001), Ghura and Goodwin (2000) and Greene and Villanueva (1991). For economic growth, the studies consulted were Zou (2006), Greene and Villanueva (1991), Mlambo and Oshikoya (2001), Sakr (1993) and Ghura and Goodwin (2000). For private investment, Serven and Solimano (1992), Havi et al. (2013), Naqvi (2002), Sundararajan and Thakur (1980), Sakr (1993), Khan and Kumar (1997), Khan and Khan (2007) and Blejer and Khan (1984). Finally, for public investment, the

analyses made use of Clements et al. (2003), Saghir and Khan (2012), Tanzi and Hamid (1997) and Ghassemi (1996).

The estimation of macroeconomic models made it possible to identify a number of economic policies that are essential for enhancing private investment, targeting public investment and ensuring long-term economic development and economic stability. These policies will not necessarily achieve the above objectives and cannot encourage private investment unless the government enacts relevant macroeconomic reforms, which for example, aimed at enhancing the rate of foreign investment, ensuring political stability, privatizing nationalized industries, structuring public enterprises and improving banking services. A summary of the findings of the empirical macroeconomic model estimations is discussed in the next section. Section 9.3 summarizes the major economic policies that will be needed to enhance private investment and economic development based upon those model estimations. It will also answer the following two questions: (1) In which sectors will private investment be more effective in order to have a maximum effect on economic growth (see Chapter 4)? (2) Which key areas should be targeted by public investment so as to enhance its impact on private investment and economic growth? The last section suggests a number of issues for future studies to tackle.

9.2 Summary

9.2.1 Macroeconomic environment in Iraq

One of the objectives of this study was to review the historical trends of key macroeconomic indicators and evaluate the role private and public investments have played in Iraq's performance over the period 1970-2010. The discussion on this topic in Chapter 4 suggests the significance of oil in the Iraqi economy. This

stems from its role as a major source of government revenue, exports and foreign exchange. Also, a major share of national income is derived from the oil sector. Consequently, since the early 1950s, most of the macroeconomic indicators have been influenced by oil production and oil price developments. These indicators include government revenue and spending, real GDP, exports, the current account, various monetary variables (the money supply, inflation, the interest rate and the exchange rate) and investment. Large oil resources allowed the country to allocate a high proportion of its oil revenue for development purposes. A broad development plan commenced in early 1950s and lasted until 1961, producing multiyear plans with an emphasis on the three major fiscal priorities: agriculture, transportation, and communication and construction. The plan proposed a large amount of capital investment in the agriculture sector.

However, in 1968 the political situation changed, as the Baath Party took over ruling the country, and introduced different economic and social objectives. Nationalization of the oil industry in the early 1970s provided Iraq with a source of sustainable financial strength, leading to the adoption of expansionary fiscal policies that stimulated economic activity. This led the new government to formulate its own mid-term plans. Thus, the first national development plan (NDP 1970-1974) was established. It followed the same approach as the previous ones, by emphasizing the agriculture sector and giving less attention to other important sectors such as manufacturing and the development of human capital.

By the late 1970s, the NDP (1976-1980) had shifted its attention slightly to the industrial sector, allocating a large proportion of the government budget to capital-intensive industries. This plan’s target was to achieve balanced growth and a self-sustaining economy. Despite the centrally planned economy, in which the

public sector was the key sector, the government observed the importance of creating an investment climate that would attract private investment. This plan sharply expanded public current expenditure and capital expenditure, which increased aggregate demand dramatically. As a result, in the 1970s, the country had an impressive annual economic growth rate of over 10% in real terms, and similarly large growth in investment. This reflected highly on the country's standard of living, and allowed the population to enjoy economic and social prosperity. The country witnessed middle-income status, with modern infrastructure and good education and healthcare systems.

However, the formulation of NDPs and the financing of investment projects were halted when the Iraq-Iran War began in the 1980s. The country encountered major challenges in terms of declining oil prices and production, and ultimately oil revenue. It was difficult for the government to manage the structural imbalance in the economy and the fiscal deficit due to the substantial increase in military spending. Oil production almost stopped in the month after the war began, and Iraq's Gulf port facilities were destroyed. All macroeconomic indicators, without exception, were affected and Iraq experienced various economic crises in the years after the war, such as reductions in economic growth, capital accumulation and national income, and increases in the rate of unemployment and poverty.

By 1987, in the first post-conflict stage, new situations caused by the war forced the state to work to enhance the level of private investment, by improving the country's physical and human capital, and increasing the population's access to social services. There was a significant shift in macroeconomic policies, aimed at redefining the role of public investment in the economy. The announcement of a programme of trade liberalization and privatization represented a further step

towards promoting private investment performance in other sectors of the economy. The key features of the privatization programme included the sale of most of the state lands, farms, and the state-owned manufacturing industry to the private sector at very low prices. It was expected that privatization would operate as an instrument for enhancing the capacity for specialization, the utilization of economic resources, and competition in the economy.

By 1991, Iraqi occupation of Kuwait had caused a new war, which ended in defeat by a US-led coalition. This defeat devastated the already weak Iraqi economy, damaged the country's infrastructure, and led to the imposition of strict economic sanctions (Bilmes and Stiglitz, 2008). The government had failed to overcome the economic difficulties of the previous three decades and had even caused other problems, particularly following the second Persian Gulf War in 1990-1991. As a result, the economy experienced an absolute decline in real GDP, and in GDP per capita, with a high fiscal deficit due to the interruption of oil revenues and increased military spending requirements. Hence, the UN embargo, which involved the ceasing of Iraqi exports and the freezing of Iraq's foreign currency accounts, caused many economic difficulties, such as a heavy debt burden, high inflation, currency depreciation, a non-responsive private sector, stagnant output, and a lack of funds for reconstruction.

Therefore, the government pursued another approach, financing its operations by printing money. This situation caused the money supply to grow much faster than the output of goods and services, leading to hyperinflation, with inflation rising from 6% in 1989 to nearly 448% in 1994. The Iraqi dinar depreciated from around 4 dinars per dollar in 1990 to more than 1,700 in 1995. This caused chronic

inflation, a depreciation of the local currency, a lack of domestic investment, a rise in unemployment, and eventually a drop in living standards.

In 2003, after decades of conflict and isolation, it was expected that Iraq's economy would start to recover and overcome the effects of its prolonged conflicts. Decades of heavy state control over all kinds of economic activity in Iraq meant that diversification through increased international trade was sorely needed. At the same time, however, the economy was confronted with enormous development challenges, necessitating a change in orientation marked by, once again, the formal adoption of development plans. Therefore, the government introduced and implemented NDP 2005-2007. This plan was established on the four key objectives of sustained economic growth, a revival of the private sector, improved quality of life, and the establishment of good governance and security.

However, these efforts have again been hampered by the preceding decades of socialist economic policy, which have strongly bound Iraq's economy to the state. Consequently, the private sector today has a limited presence, and the motivation for its expansion is barely existent. Because of the state's long dominance, credit systems and access to finance are severely limited, and there is general insecurity. As a result, Iraq suffers from unsteady electricity and water supplies, the transport system remains underdeveloped, and its agricultural and industrial capacities are severely limited. These key challenges must be addressed in order for Iraq to truly fulfil its economic potential.

9.2.2 Empirical analysis

In recent years, a growing number of studies, including Khan and Kumar (1997) Khan and Reinhart (1990), Khan and Khan (2007) and Majeed and Khan (2008), have expanded the neoclassical framework to clarify the role private and public

investments have in determining economic growth in developing countries. Following these studies, the first objective of examining the comparative effects of private and public investment on economic growth in the context of Iraq in the long and short run was addressed in Chapter 6. This study developed a simple analytical model that included other theoretical determinants of growth, such as labour force which used as proxy for human capital, macroeconomic stability and the exchange rate, variables that have received extensive attention in the recent literature.

The empirical findings indicated that, although the estimated coefficients of both the private and public investment variables showed positive and significant effects on GDP in the long run, the coefficient of the real public investment variable was greater than that for real private investment. It can therefore be concluded, based on the theoretical arguments and the empirical evidence, that, in the long run, real public investment is more productive than real private investment in encouraging GDP growth in Iraq. Thus, any fiscal adjustment that reduces public investment implies a reduction in the gross fixed capital formation and a slowdown in economic performance.

The estimated results of the human capital variable strongly supported the Solow growth model, suggesting that growth in the labour force has a positive influence on economic growth. The findings also suggested that oil revenue has a positive and significant effect on economic growth, confirming that a high ratio of oil revenue can facilitate economic development as long as the rent is used to enhance the level of investment and as long as the foreign exchange rate is managed so as to increase the country's capacity to import the capital goods required to build a modern economy. However, the results for economic

instability, captured by the exchange rate and the inflation rate, revealed that both exert a negative influence on the real GDP in the long run. The conclusion that can be drawn is that both variables are inversely associated with investment, because they produce high uncertainty in the economy. Thus, poorly managed exchange rates and inflation can be devastating for investment and economic growth. In contrast to the long-run results, in the short run only public investment and the real exchange rate were found to significantly influence real GDP, with positive and negative effects respectively.

The second objective of this study was to empirically assess the impact of macroeconomic variables on private fixed capital formation, in order to examine domestic investment in Iraq (Chapter 7). The empirical domestic investment model was roughly based on accelerator model studies in developing countries (among others, Blejer and Khan, 1984; Frimpong and Marbuah, 2010; Greene and Villanueva, 1991; Karagoz, 2010; Sundararajan and Thakur, 1980; Wai and Wong, 1982; Yin, 2011).

The choice of explanatory variables for the private domestic investment model was informed by the theoretical and empirical studies discussed in Chapters 2, 3 and 5. According to these studies, GDP, public investment, real exchange rate, inflation rate, real interest rate, credit availability, foreign direct investment, foreign debt burden, and economic and political instability are the factors that most strongly explain private investment behaviour. Due to institutional and structural constraints such as data problems, the absence of well-functioning markets, the relatively strong role played by the government in capital formation, and economic and political instability, not all of these variables were considered in this analysis.

In this study, the domestic investment empirical model focused on the key macroeconomic variables of GDP, real public investment, real exchange rate, real interest rate, inflation rate, and political instability as the most important variables influencing private investment in Iraq over 1970-2010. The empirical results for the long run showed that increases in real GDP and public investment had contributed significantly to increases in private investment. Moreover, the analysis revealed that real public investment was positively associated with private investment, supporting the crowding-in hypothesis in the long run. On the other hand, real interest rate, real exchange rate and the inflation rate were all found to have adversely affected private investment. The findings also indicated that war and political instability, that had caused increased military expenditure by the government and uncertainties, had both been severe obstacles to the attraction of private investment. The short-run dynamics, for which the model included two dummy variables to capture the effects of the Iran-Iraq War and the international sanctions, revealed only two variables as being significant in influencing private investment, namely public investment and international sanctions.

The third objective of the study was to empirically determine the effect of per capita income, government current expenditure and oil export revenue on public investment (see Chapter 8). Various empirical studies that had already been conducted on this issue in the context of developing countries were consulted in developing a public investment model for the context of Iraq (Clements et al., 2003; De Haan et al., 1996; Saghir and Khan, 2012; Välilä and Mehrotra, 2005). Since (1) the Iraqi economy was centrally planned for decades and public investment played a large role in economic growth, and (2) the results in Chapters 6 and 7 had confirmed public investment's positive impact on economic growth and private investment, it was essential to identify the key factors that had

influenced public investment over the period 1970-2010. Another objective of this analysis was to investigate the indirect impact of oil export revenue on private investment. This study has argued that oil revenues could provide an indirect boost to private investment through its effects on public investment. Since the availability of economic and social infrastructure is the government's responsibility in most oil-producing countries, increasing the level of public investment should have a positive indirect effect on private investment.

The empirical findings showed both government current expenditure and oil export revenue to have a positive effect on public investment and to be statistically significant. However, per capita income was found to be insignificant in explaining public investment. The result for oil export revenue implies that it has a positive, indirect impact on private investment via public investment. This is due to the fact that greater oil revenue will enable the government to spend more on social and economic services, which in turn will increase private investment and economic growth. In the short run, all explanatory variables were found to be statistically insignificant in explaining public investment.

As recently pointed out by the IMF and the WB (2001a), understanding the relationship between public and private investment is also crucial for policy makers' objective of accelerating economic development. In order to address the above objectives, the Johansen cointegration and VECM techniques were employed, respectively, to assess the long and short-term relationships between the variables.

9.3 Policy Implications and Recommendations

The effects of the oil-driven state development, conflict, sanctions and delayed reforms have significantly shaped Iraq's economy and limited the potential for private-sector-led growth over the past 40 years. It has been suggested by international institutions such as the IMF and WB that economic growth will be difficult to maintain in Iraq without significant contributions from both public and private investment through an increased rate of capital investment. This would help to increase the national capacity and output, to fulfil domestic needs and for export purposes. It is important for Iraq to adopt sustainable policies so as to attract both local and foreign investment in the country. Based on the findings of the present study, the following suggestions and recommendations can be made, for improving the investment climate for both public and private investment, and for maintaining long-term economic growth in Iraq.

I. **High-Quality Infrastructure**: Infrastructure, transport and telecommunications have been devastated in Iraq, due to several wars and severe international sanctions over the last four decades (see Chapter 4). Thus, public investment should focus on integrating and improving the infrastructure, as a key element for improving the investment climate and in turn expanding the level of private investment in Iraq. Access to a reliable electrical supply, water and sewage treatment, efficient transport and modern telecommunication systems are needed to provide incentives to the private sector. In line with this, Hallward-Driemeier et al. (2006) indicated that the positive link between infrastructure and private investment is particularly strong in countries with a worse stock of infrastructure. To expand and rebuild Iraq's infrastructure, investments

must continue to be made, by both the state and the private sector. Furthermore, a stable government, legal and regulatory environment will help Iraq's private sector to invest sustainably in infrastructure expansion and rehabilitation. Additionally, the state will need to provide support to small and medium-sized enterprises, through regulations and incentives aimed at improving their competitiveness and potential for productivity.

II. **Public-Sector Reforms:** In Iraq, as in any other country, development and steady economic growth require a steady increase in total investment, private as well as public. As discussed in Chapter 4, in the last four decades Iraq's government has failed to achieve stable economic growth due to low contributions to GDP from both private and public investment. Economic diversification in Iraq should be linked with the reform of the public sector and the development of Iraq's non-oil private sector in order to motivate investment activity as a whole. According to the results presented in Chapter 6, public investment has contributed more than private investment to economic growth in Iraq. Based on this result, government investment should be expanded and directed towards productive activities such as agriculture and manufacturing, and to the construction of linkages between them. Thus, public expenditure needs to be directed towards providing proper physical, technological and financial infrastructure in the country so as to put the economy on the path towards long-term growth. This will work as a complement to the private sector. Eventually, it will enhance the overall level of capital formation, which will in turn help to bring institutional stability and improve the general performance of the economy, facilitating its integration with the global economy.

III. **Quality of the Public Sector:** The estimated results presented in Chapter 7 reveal that public investment has a “crowding-in” effect on private investment in the long run. In order to motivate private investment in Iraq, more public investment should be directed towards infrastructure and public goods, and public spending policies need to be designed that target sectors in which an extra unit of public spending will contribute positively to the private sector's expected profitability. This implies that not only is the quantity of public investment important in encouraging private investment but also the quality. Hence, a rationalization of government expenditure can be achieved through a reduction in unproductive and wasteful spending, a reduction in unnecessary subsidies on various goods and services, and a review of the enormous amount of government expenditure currently assigned to public administration. In addition, a precise cost-benefit analysis needs to be undertaken to ensure an optimal spending policy.

IV. **Good-Quality Institutions:** As is well known, Iraq has experienced a high number of conflicts and has low-quality institutions (see Chapters 4 and 5). The state has been unable to provide the institutions required to attract foreign and domestic investment. It needs to provide a climate conducive to investment by establishing stable macroeconomic reforms, and providing adequate legal and institutional arrangements for the protection of private property. Investors need to be encouraged to invest due to anticipating smooth returns on their invested funds and assurances need to be made against the risk of nationalization, dispossession and seizure. This implies that facilitating the movement of capital both into and out of the

country would have significant benefits for long-term economic growth and boost the standard of living.

V. **Political Stability:** The results presented in Chapter 7 showed that political instability had exerted a negative influence on private investment due to the destruction of capital stock and the interruption of production processes during times of war and other episodes. Political crises have created a hostile climate and a lack of security, which have in turn damaged private investment in Iraq. This is apparent when looking at the Kurdistan region in the north of Iraq, which has been significantly more peaceful, stable and prosperous than the rest of the country, and has enjoyed a relatively stable and self-contained economic system. Private investment, both domestic and foreign, has thus flourished. In 2010, there were over 1,200 private foreign firms in Kurdistan, 730 of them Turkish, reflecting the huge volume of trade with Turkey. Additionally, there is about $1.5 billion invested in joint ventures between Kurdish and foreign firms, and nearly $22 billion has been invested in projects in the region by Iraqi investors, mostly Kurds (WB, 2012). Based on the above, political stability is a high-priority objective that needs to be achieved in order to enhance the growth of Iraq's domestic investment. The government should work to remove or at least minimize the political conflict at all levels in the country. By doing so they will encourage investment.

VI. **Monetary Policy Reforms:** There is evidence, confirmed by the empirical results presented in Chapter 6, suggesting that the cost of borrowing is vital for domestic investment. The monopoly power of the government in developing countries, including Iraq, gives public-sector investment

advantages over private investment when competing over resources. Thus it seems that the financing of irregular government expenditure by any kind of resources such as oil revenue or interring market as borrower reduces the financing available for private investment and in turn causes the rate of interest to rise, which crowds out (or discourages) private investment. Therefore, policies that reduce the interest rate and the cost of financial intermediation, such as tax policies and complex procedures need to be considered to facilitate the access to credit.

VII. **Exchange Rate Policies:** Based on the results regarding the real exchange rate presented in Chapters 6 and 7, policy makers and the central bank in Iraq should take steps to ensure the stability of the local currency against other currencies. This sort of policy will produce a positive response from domestic investment. Thus, this study proposes that pursuing a devaluation policy for the domestic currency is not appropriate in the case of a country like Iraq, since it is not developed in terms of producing international goods. Furthermore, it would increase the cost of capital for the private sector. Devaluation of the domestic currency should decrease the demand for non-capital imports and increase the demand for domestic products due to the higher cost of the imported goods, and thus encourage private investment. Finally, a more liberalized exchange regime should be adopted to ease international transfers.

VIII. **Achieving Macroeconomic Stability:** Macroeconomic instability is a sign of the government's inability to control the economy. The empirical results presented in Chapter 6 showed that inflation had an adverse influence on economic growth. It has been confirmed by several studies that

macroeconomic instability and uncertainty about the future will decrease investors' motivation to grow their projects. Chapter 7's empirical results also indicated that the high inflation rate in Iraq has damaged domestic investment activities by increasing the riskiness of long-term investment projects since, in high-inflation conditions, investors will prefer to wait rather than invest today. In other words, uncertainty about the future has a substantial effect on the investment decision and leads investors to adopt a wait-and-see attitude. Hence, despite the reforms that have been adopted recently regarding this issue, it is highly important that Iraq adopts an effective macroeconomic policy that will allow it to maintain an inflation rate in the single-digit or low two digit range, in order to reduce the long-run riskiness and help the private sector to play a major role.

IX. **Rational Management of Oil Revenue:** In Iraq, the majority of government revenues for economic-related and government expenditure are raised through oil revenue rather than alternative financial resources. Depending on oil has created problems for successive Iraqi governments, due to fluctuating world oil prices. For example, decreasing oil prices in 2009 forced the government to cut its budget by 25% and fund the deficit from the reserves. Most of Iraq's economic sectors, including agriculture and manufacturing, education and health, were influenced as a result. Taxation, as a fiscal instrument of government income, is negligible in the country's economy. Thus, the government should minimize its reliance on oil revenue by using alternative resources, for example taxation and other public revenue, to finance its unproductive expenditure, such as public current expenditure. Public investment could also be financed by borrowing from either domestic or foreign sources, rather than with oil

revenue. Thus, expanding public investment would lead to a fast accumulation of public capital and higher non-oil growth.

X. **The Effectiveness of Public Investment:** This relies on institutional factors, such as the capacity to implement, select and evaluate projects. These features are highly associated with the business climate, the availability of skilled human capital and corruption. Despite the abundance of its oil revenues, Iraq – like most developing countries – has large social and infrastructure gaps and faces institutional inefficiencies and absorptive capacity constraints in managing its public investments. The positive impacts of public investment on economic growth and private investment have been confirmed in Chapters 6 and 7. Thus, there is a need to effectively manage oil revenues.

XI. **Enhancing the Capacity of the Domestic Private Sector:** Due to the limited capacity of private investment in Iraq to produce job opportunities, the number of workers in the public sector has increased since 2005. The government currently provides approximately 60% of full-time employment, with high public-sector salaries and benefits draining the public budget. This raises the fear that high operational spending could be preventing the availability of investment and development funds. Jobs in the public sector are typically more desirable than private-sector jobs in oil-producing countries, due to the fact that the government has the ability to offer better benefits (such as pensions, scholarships, continuing education, government-subsidized housing, and a stable monthly income). Therefore, there is an urgent need to increase the capacity of private

projects in various sectors, in order to minimize the pressure on the public sector and the government budget.

XII. **Improving the Quality of Human Capital:** Human capital in Iraq is underdeveloped (see Chapter 4). Moreover, Chapter 6 revealed that the labour force has a positive impact on economic growth. This suggests that the human capital in Iraq must be improved through the strengthening of educational institutions so as to produce the graduates required by the domestic manufacturing sector, the non-oil export trade, and banking and financial institutions. The academic research of government departments and institutions also needs to be upgraded in order to develop an appropriate level of research infrastructure. Currently, Iraq allocates a low proportion of its budget to research and development, compared to Asian countries such as Singapore, Korea and Japan. Increased spending on research and development is necessary so as to address issues related to sustainable economic growth and development in the country, including emerging socio-economic problems.

In addition to aforementioned recommendations which based on the outcome of the study, some others suggestions have been recommended as follow;

XIII. **Good Governance:** The low level of private investment in Iraq can also be attributed to the poor efficiency of the government in managing the economy. Thus, good governance is a highly important factor for improving the investment climate in Iraq. Good governance contributes to the effective delivery of public services, which are necessary for productive business. It has also been confirmed that countries with good

governance (low corruption, strong property right) have higher levels of private investment than countries with poor governance (Khan and Khan, 2007; Morrissey and Udomkerdmongkol, 2012; Udomkerdmongkol and Morrissey, 2008).

XIV. **Well-Functioning Financial System:** Generally, poor performance of the financial system is common in developing countries, and this is particularly so in Iraq (see Chapter 4). This, in addition to institutional development, in order to achieve product and service diversification, the financial system has to be developed to ensure capital growth. There is a need to develop the infrastructure of the financial system by introducing electronic banking and financial services. Financial services need to be reformed in order to create an efficient and progressive financial sector. It is also important that Islamic banking be allowed to play a role in the economy, based on the Islamic legislation and law, to boost credit availability to the private sector.

XV. **Integration of Local Industries:** As was observed in Chapter 4 (see Table 4.4), in the 1970s and 1980s key sectors such as agriculture, manufacturing, building and construction were highly emphasized by the government. This provides evidence that these sectors have very strong potential for the diversification of Iraq's economy. Improving the local environmental conditions for domestic products, not only for local consumption, but also for international business, is crucial. It will also be beneficial to increase the capacity of domestic firms to respond to new investment opportunities and to expand business associations with foreign investors. This will help to increase investment in leading sectors, which

will in turn increase investment in other subordinate sectors. For instance, the agriculture sector can help to improve the agro-industrial sector by providing it with raw materials. Public-sector partners in Iraq countries can be motivated to engage more with the private sector, for instance through public–private partnership.

XVI. **Target the Private Sector:** Finally, a conclusion of this study is that the private sector in Iraq can contribute to the areas of priority related to the country's abundant natural resources, its geographical location, its tourist attractions and its enormous need for reconstruction, and improved health and education services, in the following ways:

(1) Agriculture was once Iraq's largest sector after oil, but has diminished greatly. Only 58% of irrigable land is exploited (13.2 million acres of a potential 22.9 million) (WB, 2012). Although agriculture currently accounts for approximately 2-4% of GDP (decreasing from 9% in 2002), and provides 25% of overall employment, Iraq continues to import 80% of its food supply. According to a recent International Labour Organization and United Nations survey, agriculture comprises 10% of activity by small and medium-sized enterprises in the north, 4% in the south, and none in the centre. The potential for private-sector-led growth in the agricultural sector is thus significant. However, long-term economic growth and development beyond subsistence farming will be dependent on government stability, a consistently favourable agricultural policy and significant infrastructure investment.

(2) Iraq's physical location and resources grant it the potential for significantly expanded trade associations. Iraq's ports in Basra Province alone have important potential for growth: 35 million tons of goods cross Iraq annually, via Iraq's borders with Syria, Turkey and Europe. This number could potentially rise to 60 million tons. Trade with the eastern Mediterranean states is poised to grow as Iraq expands its ports and transport infrastructure, especially at the Al-Faw peninsula on the Persian Gulf, with an annual planned capacity of 99 million tons. Consequently, Iraq's ports hold great potential for major private-sector activity and a productive crossroads between East and West, with Iraq having the further advantage of significant land trade with Turkey, an access point to the European Union.

(3) With political stability and security achieved, the tourism sector has and could become a significant sector in the economy after the oil sector, the country having received over 1.5 million international tourists in 2010, up from fewer than 900,000 in 2008. The Shi'a holy cities of Najaf and Karbala already receive millions of pilgrims each year and Najaf was further designated the Capital of Islamic Culture for 2012 by the Islamic Educational, Scientific and Cultural Organization. Other religious sites, including those of Sunni and Christian significance, as well as Iraq's renowned archaeological sites, the greener regions in Kurdistan and the thousand-year-old historical monuments and castle in Erbil, each hold substantial potential for tourism. Currently, there is a lack of hotels and other tourist infrastructure, but this has been a key area for investment and continued private-sector engagement. Over $400 million was invested

in 2011 alone, with most projects located in Erbil, Mosul, Basrah and Najaf. The potential for increased private-sector engagement in tourism is thus significant.

(4) Although the operations in the construction sector are mostly conducted by foreign contractors at present, this sector provides great potential for private Iraqi firms. 154 senior international business leaders surveyed by the Economist Intelligence Unit viewed construction as the most favourable non-energy sector in Iraq, with over $14 billion of real estate deals and over $6.7 billion of infrastructure projects already planned (WB, 2012). The construction sector will certainly grow further as it benefits from Parliament's 2011 agreement to invest $37 billion in infrastructure, offering significant potential to a thriving private sector to get actively involved.

9.4 Limitations and suggestions for further research

This study, like any other study, has some limitations. First, it is well known that data for developing countries such as Iraq can be scarce or non-existent. Due to this deficiency of data, a number of macroeconomic variables such as external debt, fiscal deficit, foreign debt and debt services, which are highly related to public investment, are excluded from the models. Furthermore, for the same reason, this study was unable to identify different types of public investment, such as infrastructure and non-infrastructure, to determine which has more influence on private investment and growth. Doing so might provide new insights for future studies and more effective policies for enhanced economic growth.

Secondly, although non-economic factors such as institutional quality, governance and a secure environment can play a complementary role alongside the traditional

economic factors in explaining private and public investment, these variables were not considered in this study. This was due to a lack of long-term time-series data for these variables. Moreover, the collection of primary data to support the analysis and discussion was impossible because of the conflicts and insecurity in most parts of the country.

There are other variables that have been ignored by this study due to data limitations, such as credit availability, unemployment, and the balance of payments and trade. It would be beneficial if they were included in future studies. Including them in our models could make this study's findings more robust and extensive. Furthermore, a comparative study is suggested, between Iraq's private investment and that of other countries, especially those whose economies have similar features to Iraq's.

The sample period for this study was 1970-2010, which included various economic and political transformations in Iraq. Thus, it is important that future studies examine the private and public investment model for the period following the economic liberalization in 2003, including additional macroeconomic factors along with social economic indicators such as quality of institutions, good governance, etc.

Finally, investigating the determinants of foreign direct investment in Iraq since the liberalization of its economy would also be recommended. Applying the model to the Kurdistan region in North Iraq, where foreign investment has been attracted successfully, would be useful.

List of Appendices

Appendix A: Map of Iraq

Appendix B1

Real Oil and Non-oil Revenue for the Public Budget as a Percentage of GDP

Years	Oil production (1,000 bpd)	Oil Revenue % of GDP	Oil GDP (2005=100) US$ millions	Non-Oil GDP (2005=100) US$ millions
1970	1495.8	16.99	1682.14	8218.61
1971	1618.9	23.22	2458.51	8129.38
1972	1436.1	16.83	1715.40	8477.09
1973	1925.8	30.24	3665.57	8456.03
1974	1849	59.09	7739.74	5358.48
1975	2058.8	51.63	7734.29	7245.93
1976	2241.1	51.01	9218.80	8853.73
1977	2167.4	44.21	8137.17	10268.56
1978	2384.4	41.86	9109.53	12652.36
1979	3247	96.58	26047.52	922.37
1980	2482	71.83	19451.80	7628.53
1981	872	33.4	7418.79	14793.15
1982	846	29.63	6510.48	15462.11
1983	702	25.36	5110.46	15041.20
1984	867	26.34	5317.38	14870.09
1985	1085.4	28.13	5677.78	14506.29

Appendix B1

Real Oil and Non-oil Revenue for the Public Budget as a Percentage of GDP				
Years	Oil production (1,000 bpd)	Oil Revenue % of GDP	Oil GDP (2005=100) US$ millions	Non-Oil GDP (2005=100) US$ millions
1986	1393.5	17.74	3871.99	17954.35
1987	1717	26.95	7022.05	19033.80
1988	2095	27.34	7341.11	19510.05
1989	2260	31.58	7727.42	16741.94
1990	1596	43.8	10719.40	13754.11
1991	39	45.3	3756.11	4535.53
1992	60.7	49.8	5187.74	5229.40
1993	59.2	53.9	8342.08	7134.88
1994	60	58.2	8591.64	6170.63
1995	63.5	64.5	7778.18	4281.02
1996	88.1	69.8	12595.56	5449.66
1997	746.6	72.95	16044.67	5949.39
1998	1417.6	74.93	22224.66	7435.90
1999	2130.9	74.73	26062.50	8813.05
2000	2039.8	91.32	32296.30	3069.78
2001	1710.2	98.94	35797.85	383.52
2002	1494.6	90.64	30531.90	3152.90
2003	388.6	92.8	20912.18	1622.50
2004	1450	96.6	33558.08	1181.13
2005	1853.2	98.94	35883.51	384.44
2006	2020.1	92.52	36963.71	2988.42
2007	2150.3	83.96	34005.90	6496.60
2008	2280.5	85.39	36870.77	6308.49
2009	2336.2	68.69	31382.76	14304.77
2010	2358.1	69.08	33409.53	14954.00

Sources: World Bank (various years); Organization of Petroleum Exporting Countries (OPEC) (1980; 2003; 2012).

Appendix B2

GDP and GDP Per Capita for Iraq from 1970-2010				
Years	GDP (2005=100) US$ million	Population (millions)	GDP Per Capita US$	GDP Growth %
1970	9900.75	9917982	998.26	
1971	10587.88	10255904	1022.17	6.94
1972	10192.49	10599846	952.55	-3.73
1973	12121.60	10951169	1096.99	18.93

Appendix B2

GDP and GDP Per Capita for Iraq from 1970-2010				
Years	GDP (2005=100) US$ million	Population (millions)	GDP Per Capita US$	GDP Growth %
1974	13098.22	11312304	1147.91	8.06
1975	14980.22	11684585	1271.27	14.37
1976	18072.53	12068300	1484.90	20.64
1977	18405.73	12461337	1464.35	1.84
1978	21761.89	12859762	1677.78	18.23
1979	26969.89	13258367	2018.02	23.93
1980	27080.33	13653358	1970.41	0.41
1981	22211.94	14045450	1574.57	-17.98
1982	21972.59	14435914	1519.80	-1.08
1983	20151.66	14822565	1361.65	-8.29
1984	20187.47	15202850	1333.60	0.18
1985	20184.07	15576396	1304.11	-0.02
1986	21826.35	15941197	1379.82	8.14
1987	26055.85	16301879	1611.95	19.38
1988	26851.16	16672907	1624.56	3.05
1989	24469.36	17073500	1445.55	-8.87
1990	24473.51	17517521	1408.65	0.02
1991	8291.64	18009865	463.96	-66.12
1992	10417.14	18547047	565.60	25.63
1993	15476.96	19123947	814.23	48.57
1994	14762.26	19731733	751.88	-4.62
1995	12059.20	20363138	594.39	-18.31
1996	18045.22	21017108	860.41	49.64
1997	21994.07	21693597	1014.17	21.88
1998	29660.56	22387179	1323.18	34.86
1999	34875.56	23091408	1506.92	17.58
2000	35366.07	23801156	1482.39	1.41
2001	36181.37	24516842	1473.66	2.31
2002	33684.79	25238267	1334.95	-6.90
2003	22534.68	25959531	869.56	-33.10
2004	34739.21	26673536	1305.08	54.16
2005	36267.95	27377045	1325.61	4.40
2006	39952.13	28064095	1419.71	10.16

Appendix B2

GDP and GDP Per Capita for Iraq from 1970-2010				
Years	GDP (2005=100) US$ million	Population (millions)	GDP Per Capita US$	GDP Growth %
2007	40502.51	28740630	1398.54	1.38
2008	43179.26	29429829	1447.94	6.61
2009	45687.53	30163199	1487.00	5.81
2010	48363.53	30962380	1527.03	5.86

Sources: World Bank, (various years); UNCTAD, (various Years); IMF, (various years).

Appendix B3

Gross Public Fixed Capital Formation, Gross Domestic Fixed Capital Formation, and Gross Fixed Capital Formation at Constant 2005, (1970-2010)							
Years	GPFCF (US$ Millions)	GDFCF (US$ Millions)	GFCF (US$ Millions)	GPFCF/GDP (%)	GDFCF/GDP (%)	GPFCF Growth (%)	GDFCF Growth (%)
1970	591.020	490.986	1082.007	5.969	4.959		
1971	568.819	485.865	1054.684	5.372	4.589	-1.043	-3.756
1972	599.202	535.409	1134.611	5.879	5.253	10.197	5.341
1973	1232.597	392.473	1625.071	10.169	3.238	-26.697	105.707
1974	1630.065	258.008	1888.073	12.445	1.970	-34.261	32.246
1975	2584.590	421.898	3006.488	17.253	2.816	63.521	58.557
1976	2892.592	582.728	3475.319	16.005	3.224	38.120	11.917
1977	2875.315	574.180	3449.495	15.622	3.120	-1.467	-0.597
1978	3820.718	804.310	4625.028	17.557	3.696	40.080	32.880
1979	4209.044	836.070	5045.114	15.606	3.100	3.949	10.164
1980	3990.006	975.596	4965.602	14.734	3.603	16.688	-5.204
1981	7377.152	1584.986	8962.138	33.213	7.136	62.463	84.891
1982	7234.880	1499.868	8734.748	32.927	6.826	-5.370	-1.929
1983	4154.160	725.669	4879.829	20.614	3.601	-51.618	-42.581
1984	2899.732	702.862	3602.594	14.364	3.482	-3.143	-30.197
1985	2676.314	641.007	3317.321	13.260	3.176	-8.801	-7.705
1986	2767.452	592.693	3360.144	12.679	2.715	-7.537	3.405
1987	2683.927	551.553	3235.480	10.301	2.117	-6.941	-3.018
1988	2730.188	818.951	3549.140	10.168	3.050	48.481	1.724
1989	2649.721	1812.773	4462.493	10.829	7.408	121.353	-2.947
1990	2176.854	1825.143	4001.998	8.895	7.458	0.682	-17.846
1991	641.366	270.662	912.028	7.735	3.264	-85.170	-70.537
1992	1206.026	108.021	1314.046	11.577	1.037	-60.090	88.040
1993	1493.018	425.100	1918.118	9.647	2.747	293.536	23.797
1994	471.437	203.164	674.601	3.194	1.376	-52.208	-68.424
1995	342.616	79.002	421.619	2.841	0.655	-61.114	-27.325

Appendix B3

Gross Public Fixed Capital Formation, Gross Domestic Fixed Capital Formation, and Gross Fixed Capital Formation at Constant 2005, (1970-2010)							
Years	GPFCF (US$ Millions)	GDFCF (US$ Millions)	GFCF (US$ Millions)	GPFCF/GDP (%)	GDFCF/GDP (%)	GPFCF Growth (%)	GDFCF Growth (%)
1996	157.953	44.246	202.199	0.875	0.245	-43.995	-53.898
1997	507.183	60.009	567.192	2.306	0.273	35.627	221.097
1998	755.184	132.250	887.434	2.546	0.446	120.384	48.898
1999	800.826	98.680	899.505	2.296	0.283	-25.384	6.044
2000	1178.658	101.771	1280.429	3.333	0.288	3.133	47.180
2001	2483.571	201.711	2685.283	6.864	0.558	98.201	110.712
2002	1783.822	386.970	2170.792	5.296	1.149	91.844	-28.175
2003	3048.876	404.567	3453.443	13.530	1.795	4.547	70.918
2004	2425.195	183.364	2608.559	6.981	0.528	-54.676	-20.456
2005	6731.009	186.356	6917.366	18.559	0.514	1.632	177.545
2006	7909.823	175.473	8085.297	19.798	0.439	-5.840	17.513
2007	3230.053	15.263	3245.316	7.975	0.038	-91.302	-59.164
2008	7537.519	190.562	7728.082	17.456	0.441	1148.533	133.356
2009	5182.098	378.756	5560.854	11.342	0.829	98.757	-31.249
2010	8689.493	560.567	9250.060	17.967	1.159	48.002	67.683

Sources: Central Organization for Statistics and Information Technology (COST), (1984; 1991; 2006; and 2010); UNCTAD (various years).

Appendix B4

Population and Labour Size in Iraq over the Period of 1970-2010				
Years	Population (thousands)	Population Growth	Labour Size (thousands)	Labour Growth
1980	13653.36	2.979	3107.368	
1981	14045.45	2.872	3215.115	3.467
1982	14435.91	2.780	3353.177	4.294
1983	14822.57	2.678	3459.174	3.161
1984	15202.85	2.566	3547.808	2.562
1985	15576.40	2.457	3656.006	3.050
1986	15941.20	2.342	3768.517	3.077
1987	16301.88	2.263	3855.556	2.310
1988	16672.91	2.276	3933.504	2.022
1989	17073.50	2.403	4022.436	2.261
1990	17517.52	2.601	3842.067	-7.728
1991	18009.87	2.811	3842.067	3.515
1992	18547.05	2.983	3990.482	3.863
1993	19123.95	3.110	4152.894	4.070
1994	19731.73	3.178	4323.191	4.101

Appendix B4

Population and Labour Size in Iraq over the Period of 1970-2010				
Years	Population (thousands)	Population Growth	Labour Size (thousands)	Labour Growth
1995	20363.14	3.200	4497.2	4.025
1996	21017.11	3.212	4682.629	4.123
1997	21693.60	3.219	4871.171	4.026
1998	22387.18	3.197	5060.77	3.892
1999	23091.41	3.146	5249.892	3.737
2000	23801.16	3.074	5437.231	3.568
2001	24516.84	3.007	5596.349	2.926
2002	25238.27	2.943	5752.673	2.793
2003	25959.53	2.858	5908.614	2.711
2004	26673.54	2.750	6067.018	2.681
2005	27377.05	2.637	6265.636	3.274
2006	28064.10	2.510	6475.789	3.354
2007	28740.63	2.411	6703.32	3.514
2008	29429.83	2.398	6928.685	3.362
2009	30163.20	2.492	7177.92	3.597
2010	30962.38	2.650	7451.771	3.815

Source: UNCTAD, (various Years).

Appendix B5
Data Sources :

1. World Bank data base (http://www.worldbank.org/)
2. United Nations Conference on Trade and Development data base http://unctad.org/en/pages/Statistics.aspx)
3. International Monetary Fund (http://www.imf.org)
4. CBI Quarterly Bulletin, selected issues: 1980, 1990, 1994, 2005, and 2010.
5. International Monetary Fund (http://www.imf.org).
6. World Bank data base (http://www.worldbank.org/).
7. COST annual reports:1984, 1991, 2006, and 2010.

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