

DISSERTATION

DETERMINANTS OF DISAGGREGATE PRIVATE INVESTMENT IN AN
OIL BASED ECONOMY: Case of Saudi Arabia

Submitted by

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In partial fulfillment of the requirements

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ABSTRACT OF DISSERTATION

DETERMINANTS OF DISAGGREGATE PRIVATE INVESTMENT IN AN OIL BASED ECONOMY: CASE OF SAUDI ARABIA

This dissertation empirically investigates the determinants of Saudi Arabia non-oil private investment in disaggregated form using time series analysis. The main motive behind this work is that such analysis has not been attempted before. The impact of growth of output (aggregate demand), government investment, interest rate, and budget deficit on private investment behavior in construction equipment, transportation equipment, and machinery and equipment type of investment during the period 1969-2001 is examined. The Johansen and Juselius (1990) multivariate cointegration test was used to examine the relationship between private investment in each sector and its determinants. The test results indicate the existence of stable long-term relationships and the empirical results showed that private investment in all three sectors is positively influenced by increase in GDP growth (accelerator effect) and availability of credit to the private sector. Government investment showed a complementary effect on private expenditure for construction equipment and machinery and equipment. On the other hand, it exerted a crowding-out effect on private investment in transportation equipment. Interest rate was negatively related to private investment in the areas of construction equipment and transportation equipment.

In the case of budget deficits, that factor has a negative or crowding-out effect, on private expenditure on transportation equipment and machinery and equipment, but showed a positive impact on private investment in construction equipment.

The modified Granger Causality test in the Error Correction Model framework suggests bi-directional causality from private investment in construction equipment to change in output and credit available. Unidirectional long-run and short-run causality was found from private investment in this sector to budget deficit. While short-run unidirectional causality was found from interest rate to private investment in construction equipment.

In the case of the other two sectors, unidirectional causality was found from private investment in each one to change in output and government investment. This finding is consistent with economic theory, which suggests that private investment induces economic growth wherein changes in private investment have Granger cause effect on change in output

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List of Abbreviations

A&F	Agriculture and Fishing
ADF	Augmented Dickey -Fuller test Unit Root Test
AIC	Akaike Information Criterion
B&C	Building and Construction
CDS	Central Department of Statistics
ECM	Error Correction Model
EIU	Economist Intelligence Unit
EW&U	Electricity, Water, and Utilities
GARCH	Generalized Autoregressive Conditional Heteroskedasity
GCC	Gulf Cooperation Council Countries
GDP	Gross Domestic Product
GLS	Generalized Least Squares
GM	General Market Condition
GNP	Gross National Product
IMF	International Monetary Fund
LBD	Logarithm of Real Budget Deficit
LC	Logarithm of Real private investment in construction equipment
LCRD	Logarithm of Real Credit available
LGIC	Logarithm of Real government in construction
LM	Logarithm of Real private investment in machinery
LT	Logarithm of Real private investment in transportation
M&Q	Mining and quarrying
MOEP	Ministry of Economy and Planning
MOF	Ministry of Finance
SABIC	Saudi Basic Industries Corporation
SAMA	Saudi Arabian Monetary Agency
SAUDIA	Saudi Arabian Airlines
SEC	Supreme Economic Council
SIDF	Saudi Industrial Development Fund
SMEs	Small and Medium Enterprises
SPTCO	Saudi Public Transportation Company
SR	Saudi Riyal
T&C	Transport and Communications
WTO	World Trade Organization

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Economic growth is the result of interaction among factors of production such as capital, labor, natural resources, and technical progress. Modern growth models, which trace their roots back to the neoclassical framework of Solow (1956), represent a very important tool with which to study the growth experience of a country and describe the role of each factor in the growth process. In such a model, the rate of growth of output is related to the rate of capital formation (investment), labor force growth, and technical progress.

Almost every country in the world is trying to maintain high investment rates. High investment rates are regarded as a necessary condition for attaining a sustainable high economic growth rate. This condition is the product of sound economic management, including such elements as low inflation rates, low fiscal deficit, public expenditure targeted at productive areas, openness to trade, and efficient financial intermediation (Oner and McKay, 2003). There is a growing consensus among economists that private investment is the driving force behind economic growth. It is viewed as being more productive and having a stronger favorable effect on growth than public investment (Khan and Reinhart, 1990). As Milton Friedman has argued, "... every successful country (Taiwan, South Korea, Singapore, Hong Kong, Japan) has relied primarily on private enterprise and free markets to achieve economic development...." (Friedman, 1983 and as quoted in Sachs, 1985). Economic studies have suggested that a high share of capital formation in a country's GDP produces high

average growth rates. Some developing countries such as South Korea have maintained high private investment rates during the periods from 1980 to 1990. Private investment as percentage of GDP has gradually increased from 25.5 to 32.2 during that period.

Since the debt crisis during the 1980s, there has been a renewed interest in conducting empirical studies on the determinants of private investment in developing countries. In general, these studies have suggested that private investment is stimulated by real GDP growth, an increase in the volume of available credit and public investment, and a decline in interest rates. Another interesting result relates the important role played by inflation rates, government debt, real exchange rate, and current account deficit in determining private investment.

A recent study conducted by Bouton and Sumlinski (2000) on the growth and development of the private sector in developing countries highlighted the dominance of public investment. The impact of public investment on private investment is controversial. Some studies argue that public investment that results in large budget deficits may crowd out private investment because high fiscal deficits push interest rates up, or reduce the availability of credit, and lead to credit rationing and higher current or future tax burden on citizens (Ramirez, 1994). Others argue that in most developing countries government investments in infrastructure such as roads, ports, communications networks and health and education increase the rate of return on private investment so that public investment appears to be complementary with private investment (Aschauer, 1989). Thus, a good balance between public and private investment is very important for the overall production capacity of an economy and is also better for sustained progress.

Saudi Arabia is one of the developing countries in the world. The Saudi economy is characterized by heavy dependence on oil production and exports. Changes in oil production and prices influence government expenditure and economic growth in the non-oil sector. Government expenditure is considered the major stimulus for domestic demand that encourages domestic investment activity in the non-oil sector. Saudi investors are like other investors in the world in that their investment decisions are driven by the motives of maximizing profits and avoiding risky projects and environments. Because of the hesitancy of some Saudi entrepreneurs to invest in some sectors such as manufacturing and agriculture, the government has introduced a package of incentives such as subsidies and soft loans designed to increase profitability of this type of investment and reduce uncertainty for investment in these sectors (Askary, 1992).

1.2 Research Problem

The sharp decline in oil prices accompanied by depreciation of the US dollar in the mid 1980s resulted in large cuts in the government expenditures that had been the primary source of liquidity creation and demand growth in the Saudi economy. As a result, budget deficits remained high, and the country's national debt is estimated to be 630 billion Saudi Riyals, which represents 99 percent of the 2001 GDP (Borland, 2002). The low economic growth is becoming a chronic problem: GDP increased by 1.6 percent annually between 1990 and 2000 while the Saudi population grew at an annual rate of 2.7 percent during that period. This has produced a substantial decline in per capita income. Low growth rate of capital formation is one of the main reasons behind

the slowdown in economic growth. The relative growth of private investment as a percentage of GDP during 1976 was around 18 percent of the country's GDP, which then decreased by 1.40 percent in 1983. Since then, the private investment (private capital formation) share has declined gradually to reach 6.5 percent in 1990. However, it started to increase to 13 percent of GDP in 2001. The low level of private investment may result in a short-term slowdown in growth rates, which would reduce per capita income. Expanding the role of the private sector is necessary for diversifying the economy and reducing reliance on oil. In addition, it would have a positive impact on employment and growth.

1.3 Study Objectives

The existing studies on determinants of private investment in disaggregate form in developing countries are still very limited. Moreover, most of the existing studies are on aggregate private investment. A recent review by Rama (1993) underscored a clear regional imbalance; he noticed a major focus on studies of Latin American countries. Studying private investment in disaggregated form helps policy-makers to assess the impact of government expenditure on each type of investment on private investment behavior. This study will contribute to the literature by providing a review of an empirical study on Saudi Arabia that may help balance this focus. Furthermore, in order to assess what is wrong with economic policy with respect to investment in Saudi Arabia, it is necessary to understand what determines private investment behavior there. The main motive behind this work is that such analysis has not been attempted before. The purpose of the study will be as follows: First, specifying and estimating non-oil

private investment in Saudi Arabia in disaggregated form, using a variant of the flexible accelerator model will serve as the theoretical foundation for our empirical investment function. The neoclassical investment model cannot be applied directly to Saudi Arabia because of various “institutional and structural difficulties” such as lack of data on capital stock, depreciation rates, wages, and the large role played by the government in the economy. Second, within the framework of the model derived, the impact of macroeconomic policy on private investment behavior in construction, transportation, and machinery and equipment type of investment during the period 1969-2001 will be examined. Specifically, the study is an attempt to find answers to the following research questions:

1. Does the growth in demand (GDP growth) have a stimulative effect on private investment?
2. Does the rise of policy-induced macroeconomic instability indicators such as budget deficit have an effect on private investment?
3. How does private investment respond to changes in interest rates and credit availability?

In addition to that, the study will try to estimate the impact of public sector investment.

Does government investment complement or substitute the private investment?

1.4 Source of the Data

Data on gross private fixed capital formation consist of annual data for the four categories (1) Transportation equipment (2) Construction equipment (residential and

nonresidential) (3) Machinery and Equipment (4) Other capital goods. Each one is divided into government and private sector capital formation within each category. The fourth category will not be included in the analysis of this study because it doesn't have a clear definition of its contents. The main source for the data on fixed capital formation is found in various issues of *National Accounts*, published by the Saudi Arabia Ministry of Economy and Planning; Central Department of Statistics. The source for other variables will be the Saudi Arabian Monetary Agency (SAMA) Annual Report and the International Monetary Fund (IMF), International Financial Statistics yearbook (various issues). The study will include data covering the period 1969-2001, with a total of 32 observations.

1.5 Organization of the Study

Following this chapter, the study will be organized as follows: Chapter two will present a review of neoclassical theory of Optimal Accumulation of Capital and development of the flexible accelerator model. This leads to a modified version of the flexible accelerator model that can be applied to developing countries such as Saudi Arabia. Chapter Three will present a review of the empirical literature on both aggregate and disaggregate private investment in developing countries. The existing literature on private investment in Saudi Arabia will be reviewed. Chapter Four, "Methodology of the Study" will focus on the various econometric methods used to examine the relationship between private investment in each sector and its determinants. It will briefly review the different econometric techniques such as unit root test, cointegration test, and causality test.

Chapter Five will discuss current economic conditions and government economic policies influencing the Saudi Arabian private investment. It will also study the behavior of private investment and review the obstacles facing the private sector and the role played by the government in increasing private sector participation in the economic development process.

Chapter Six will introduce the empirical results and analysis of those results. This chapter will empirically examine the role of expected output, government investment, domestic credit available, interest rate, budget deficit, and general market conditions on private investment.

Chapter Seven will summarize the findings of the study and make policy recommendation.

CHAPTER TWO

DEVELOPMENT OF THEORETICAL MODEL

2.1 Neoclassical Theory of Investment

The neoclassical theory of optimal accumulation of capital was developed by Jorgenson in his seminal articles (1963, 1967, 1971). This theory of investment has served as a theoretical foundation for estimating the investment function in industrialized countries. The neoclassical flexible accelerator model has its origins in the neoclassical theory of capital. For each firm, the criterion for optimal capital accumulation is assumed to be the maximization of net worth. Capital is accumulated to provide capital services, which are inputs to the productive process. The relationship between inputs, including the input of capital services, and output is given by a production function. Following the work of Jorgenson the theory is presented as follows. For simplicity, the analysis is limited to a production process with single output, single variable input, and single capital input. Where Q , L , and I represent levels of output, variable input, and investment in durable goods and p , w , and q represent the corresponding prices, the flow of net receipt at time t , say $R(t)$, is given by:

$$R(t) = p(t) Q(t) - w(t) L(t) - q(t) I(t). \quad (2.1.1)$$

Assuming a constant discount rate r , the net worth of the firm, W , is the present value of net receipts

$$W = \int_0^{\infty} e^{-rt} R(t) dt. \quad (2.1.2)$$

Present value is maximized subject to two constraints. The first constraint states that net investment or the rate of growth of capital stock, \dot{K} , is investment less replacement where replacement is proportional to capital stock. It takes the form

$$\dot{K}(t) = I(t) - \delta K(t) \quad (2.1.3)$$

where $I(t)$ is the total investment at time (t) , δ is depreciation rate, and $K(t)$ is actual capital stock. The second constraint is the standard neoclassical (constant returns to scale) production function, which describes the technology of the firm.

$$Q_t = F(L_t, K_t) \quad (2.1.4)$$

To maximize the present value subject to constraints (2.1.3) and (2.1.4) we considered the Lagrangian expression:

$$L = \int_0^{\infty} [e^{-rt} R(t) + \lambda_0(t) (Q - F(L, K)) + \lambda_1(t) (\dot{K} - I + \delta K)] dt. \quad (2.1.5)$$

$$= \int_0^{\infty} f(t) dt,$$

Where

$$f(t) = e^{-\pi t} R(t) + \lambda_0(t) (Q - F(L, K)) + \lambda_1(t) (\dot{K} - I + \delta K)$$

The Euler necessary condition for maximum of present value subject to the constraints (2.1.3) and (2.1.4) are:

$$\partial f / \partial Q_t = e^{-\pi t} p_t + \lambda_0(t) = 0, \quad (2.1.6)$$

$$\partial f / \partial L_t = -e^{-\pi t} w_t - \lambda_0(t) \partial F / \partial L = 0,$$

$$\partial f / \partial I_t = -e^{-\pi t} q_t - \lambda_1(t) = 0,$$

$$\partial f / \partial K - d/dt \partial f / \partial \dot{K} = -\lambda_0(t) \partial F / \partial K + \delta \lambda_1(t) - d/dt \lambda_1(t) = 0$$

also

$$\partial f / \partial \lambda_0(t) = Q - F(L_t, K_t) = 0 \quad (2.1.7)$$

$$\partial f / \partial \lambda_1(t) = \dot{K}_t - I_t + \delta K_t = 0$$

Solving the necessary conditions (2.1.6) for $\lambda_0(t)$:

$$\lambda_0(t) = -e^{-\pi t} p_t \quad (2.1.8)$$

Combining the necessary conditions for labor and output, we get the marginal condition for labor services:

$$e^{-\pi t} w_t = -\lambda_0(t) \partial F / \partial L \quad (2.1.9)$$

Substituting equation (2.1.8) into (2.1.9) we obtain:

$$e^{-\pi t} w_t = e^{-\pi t} p_t \partial F / \partial L \quad (2.1.10)$$

Hence,

$$\partial F / \partial L = e^{-\pi t} w_t / e^{-\pi t} p_t = w_t / p_t = MPL \quad (2.1.11)$$

A similar marginal productivity condition for capital services may be derived. First solving the necessary conditions (2.1.6) for $\lambda_1(t)$:

$$\lambda_1(t) = -e^{-\pi t} q_t, \quad (2.1.12)$$

The necessary condition for the capital can be obtained by substituting equation (2.1.12) into the following equation we derived in (2.1.6):

$$-\lambda_0(t) \partial F / \partial K + \delta \lambda_1(t) - d/dt \lambda_1(t) = 0$$

We will have;

$$-\lambda_0(t) \partial F / \partial K - \delta e^{-rt} q_t - r e^{-rt} q_t + e^{-rt} \dot{q}_t = 0.$$

$$-\lambda_0(t) \partial F / \partial K = \delta e^{-rt} q_t + r e^{-rt} q_t - e^{-rt} \dot{q}_t \quad (2.1.13)$$

Substituting (2.1.8) in (2.1.13) we obtain

$$e^{-rt} p_t \partial F / \partial K = \delta e^{-rt} q_t + r e^{-rt} q_t - e^{-rt} \dot{q}_t$$

From (2.1.13), we can get marginal productivity condition for capital services:

$$\partial F / \partial K = [q_t (r + \delta) - \dot{q}_t] / p_t = c_t / p_t = MPK, \quad (2.1.14)$$

Where

$$c_t = q_t (r + \delta) - \dot{q}_t. \quad (2.1.15)$$

Expression (2.1.15) is defined as the rental value of capital services. If we assume $\dot{q}_t = 0$ or the price of capital goods remains constant, then c_t in equation (2.1.15) becomes:

$$c_t = q_t (r + \delta).$$

Jorgenson and his associates worked with the Cobb-Douglas form of production function to derive the investment model. Therefore, the production function will be as follows:

$$Q_t = A K_t^\alpha L_t^{1-\alpha} \quad [\alpha + (1-\alpha)] = 1 \quad (2.1.16)$$

Where A represents the effect of shifts in the production function due to technical change. Differentiating (2.1.16) with respect to K_t , we can get marginal productivity of capital goods:

$$\partial Q_t / \partial K_t = \alpha A K_t^{\alpha-1} L_t^{1-\alpha} = \alpha Q_t / K_t = c_t / p_t \quad (2.1.17)$$

α represent the elasticity of output with respect to capital goods. Multiplying both sides of equation (2.1.17) by K_t and p_t we obtain:

$$\alpha Q_t p_t = c_t K_t$$

Rearranging this term, we get the optimal capital stock K_t^* :

$$K_t^* = (\alpha Q_t p_t) / c_t \quad (2.1.18)$$

Finally, to derive the investment equation which is defined in term of variables measured in discrete time, we rewrite equation (2.1.3) as follows:

$$K_t^* - K_{t-1} = I_t - \delta K_{t-1} \quad (2.1.19)$$

$$I_t = K_t^* - K_{t-1} + \delta K_{t-1} \quad (2.1.20)$$

$$I_t = f(K_t^*, K_{t-1}) \quad (2.1.21)$$

Substituting equation (2.1.18) into equation (2.1.21) yields:

$$I_t = f(\alpha Q_t p_t / c_t, K_{t-1}) \quad (2.1.22)$$

1- From equation (2.1.14), we obtained $MPK = c_t / p_t$

2.2 Development of a Flexible Accelerator

The acceleration principle has a long history of use in economics. The simple accelerator model introduced by Clark (1917) is one of the earliest empirical models of investment spending. In his model, only output affects the desired capital stock.

$$K_t^* = \alpha Q_t \quad (2.2.1)$$

where Q_t is the desired level of output and α is the fixed capital-output ratio. In his model, capital stock is always optimally adjusted each time period, "instantaneous adjustment," implying $K_t^* = K_t$ and therefore that net investment I_{nt} equals

$$I_{nt} = K_t - K_{t-1} = \alpha(Q_t - Q_{t-1}) \quad (2.2.2)$$

This model has not fared well empirically due to the instantaneous adjustment assumption, Berndt (1991).

Chenery (1952) introduced a different accelerator principle by using the concept of "desired level of stock" represented by K_t^* . It added some flexibility to the simple accelerator. It assumes partial adjustment between K_t and K_t^* in any period.

$$I_{nt} = \beta (K_t^* - K_{t-1}) \quad (2.2.3)$$

where β is the partial adjustment coefficient, i.e., $0 < \beta \leq 1$. K_{t-1} is the actual level of stock in the previous period.

$$I_{nt} = K_t - K_{t-1} \quad (2.2.4)$$

$$I_{nt} = K_t - K_{t-1} = \beta K_t^* - \beta K_{t-1} \quad (2.2.5)$$

or

$$K_t = \beta K_t^* + (1 - \beta) K_{t-1}$$

Substituting equation (2.2.1) into (2.2.5), we obtain

$$K_t = \beta \alpha Q_t + (1 - \beta) K_{t-1} \quad (2.2.6)$$

The main idea behind the flexible accelerator is that a firm's rate of investment decreases if the gap between the existing capital stock and desired capital stock is small. This implies that the firm tries to close a fraction, β , or coefficient of adjustment of the gap between the actual and desired capital stock each period. The adjustment of capital stock to its desired level is assumed to occur with a lag.

2.3 Derivation of the Modified Flexible Accelerator

As mentioned in chapter one, the neoclassical investment model cannot be applied to developing countries such as Saudi Arabia because of some institutional and structural characteristics such as lack of well-functioning financial markets, data on capital stock or rate of depreciation, wage rate, and the role played by government in formulating capital formation. Therefore, the flexible accelerator investment equation (2.2.5) will be adapted in this study with some modification to capture some of the institutional and structural characteristics of developing country. Following the lead of Wai and Wong (1982), Blejer and Khan (1984), and Khan (1988), we will proceed to estimate determinants of private investment (disaggregate form) in Saudi Arabia using the modified flexible accelerator investment model used by Blejer and Khan (1984). The modified flexible accelerator model can be derived under the assumption that desired capital stock, K_t^* , is proportional to expected output (Q_t^*) as follows:

$$K_t^* = \theta Q_t^* \quad (2.3.1)$$

Where K_t^* is the capital stock that the private sector wishes to have in future periods and Q_t^* is the corresponding expected level of output in time t that can be thought of as future demand. While θ is assumed to be constant, K_t^* can be affected by various economic conditions. We specify the adjustment mechanism as:

$$\Delta K_t = I_{nt} = \beta (K_t^* - K_{t-1}) \quad (2.3.2)$$

or

$$K_t = \beta K_t^* + (1 - \beta)K_{t-1} \quad (2.3.3)$$

where β is the coefficient of adjustment, such as that $0 < \beta \leq 1$, and ΔK_t is the change in the actual capital stock or net private investment. In the above equation, β plays a major role in the investment equation by making the private investment equation respond dynamically to change in desired capital stock and the actual capital stock of the previous period. Gross private investment equals net investment plus depreciation of previous capital stock. So the gross private investment can be specified as:

$$IP_t = \Delta K_t + \delta K_{t-1} \quad (2.3.4)$$

where IP_t is the actual level of gross private investment and δ is the rate of depreciation of the previous capital stock. Equation (2.3.4) can be rewritten as:

$$IP_t = [1 - (1 - \delta)Z] K_t \quad (2.3.4b)$$

where (Z) is lag operator, that is, $(Z)K_t = K_{t-1}$. Writing equation (2.3.4b) in term of K_t yields:

$$K_t = IP_t / [1-(1-\delta)Z] \quad \text{and} \quad (2.3.5)$$

$$K_{t-1} = IP_{t-1} / [1-(1-\delta)Z]$$

Substituting equation (2.3.5) into equation (2.3.3) yields:

$$IP_t / [1-(1-\delta)Z] = \beta K_t^* + (1-\beta)IP_{t-1} / [1-(1-\delta)Z] \quad (2.3.6)$$

Solving equation (2.3.6) by multiplying both sides by $[1-(1-\delta)Z]$ we get :

$$IP_t = \beta [1-(1-\delta)Z]K_t^* + (1-\beta)IP_{t-1} \quad (2.3.7)$$

Substituting K_t^* in equation (2.3.1) into equation (2.3.7) yields the basic flexible accelerator model:

$$IP_t = \beta \theta [1-(1-\delta)Z]Q_t^* + (1-\beta)IP_{t-1} \quad (2.3.8)$$

An alternative way to derive equation (2.3.7) is to specify a partial adjustment mechanism for IP_t rather than K_t ,

$$IP_t = \beta IP_t^* + (1-\beta)IP_{t-1} \quad (2.3.9)$$

Where IP_t^* is the desired level of gross private investment. Equation (2.3.9) can be written as:

$$\Delta IP_t = \beta (IP_t^* - IP_{t-1}) \quad (2.3.10)$$

where ΔIP_t is the difference in actual and desired level of private investment between two periods. In the steady state², IP_t^* is given by:

² In steady state $IP_t = IP_t^*$ and $K_t = K_t^*$. Hence when we substitute Eq(2.3.4b) into IP_t , we get $IP_t^* = [1-(1-\delta)Z] K_t$.

$$IP_t^* = [1-(1-\delta)Z] K_t^* \quad (2.3.11)$$

Combining equations (2.3.10) and (2.3.11) and solving for IP_t , and then using equation (2.3.1), yields an equation exactly equal to equation (2.3.8) above.

We depart from the traditional neoclassical model of optimizing behavior and follow the cash flow approach suggested by Coen (1971), where it is argued that in order to achieve the desired level of investment, private investors react to the gap between desired and actual investment, as measured by the β coefficient in (2.3.10).

We argue that the reaction of private investors depends upon some economic variables that affect the ability of private investors to achieve the desired level of investment. We hypothesize that the response of private investors depends on three main factors:

(1) General market conditions (the difference between actual and trend output), (2) the availability of financing and interest rate (monetary policy), and (3) the level of public sector investment and budget deficit (fiscal policy). Thus, the coefficient of adjustment, β , will be specified as a function of these factors as follows:

$$\beta_t = \alpha_0 + [1 / (IP_t^* - IP_{t-1})] [\alpha_1 CRD + \alpha_2 r + \alpha_3 GI + \alpha_4 BD + \alpha_5 GM] \quad (2.3.12)$$

where:

CRD = domestic credit available to private sector

r = interest rate (using interest rate on Eurodollar proxy)

BD = budget deficit

GI = government investment

GM= general market condition ³

Equation (2.3.12) states that the response of private investment depends on the magnitude of the above factors measured in relative terms with respect to the size of the discrepancy between desired and actual investment ($IP_t^* - IP_{t-1}$). Substituting equation (2.3.12) in equation (2.3.10) yields:

$$\Delta IP_t = \alpha_0 (IP_t^* - IP_{t-1}) + \alpha_1 CRD + \alpha_2 r + \alpha_3 GI + \alpha_4 BD + \alpha_5 GM \quad (2.3.13)$$

since from equation (2.3.11) we show that $IP_t^* = [1-(1-\delta)Z] K_t^*$, and where $K_t^* = \theta Q_t^*$ as in equation (2.3.1). We can derive gross private investment as follows:

$$IP_t = \theta \alpha_0 [1-(1-\delta)Z] Q_t^* + \alpha_1 CRD + \alpha_2 r + \alpha_3 GI + \alpha_4 BD + \alpha_5 GM + (1-\alpha_0)IP_{t-1} \quad (2.3.14)$$

The expected output variable, Q_t^* , can be estimated in a variety of ways, for example, it can be estimated by a first-order autoregressive process (where the predicted values of the regression are defined as expected output), (Ramirez (1994)):

$$Q_t^* = \phi_1 Q_{t-1} + e_t \quad (2.3.15)$$

Where ϕ_1 is the autoregressive parameter and e_t is the error term.

By substituting predicted value of output from equation (2.3.15) into equation (2.3.14) and using lag operator Z on Q_t^* , we can derive the final equation that we desire to estimate as follows:

$$IP_t = \theta \alpha_0 \phi_1 [Q_t^* - (1-\delta) Q_{t-1}^*] + \alpha_1 CRD + \alpha_2 r + \alpha_3 GI + \alpha_4 BD + \alpha_5 GM + (1-\alpha_0)IP_{t-1} \quad (2.3.16)$$

3-The GM can be defined as $GM=Q-Q_T$ where Q is actual GDP and Q_T is the trend level GDP. Q_T can be calculated as $Q_T=Q_0e^{gt}$, where Q_0 is the initial value of output (1969), g is the average growth rate of output, and t is a linear time trend.

For the rate of depreciation (δ) that appears in equation (2.3.16) we use an arbitrary value of 5 percent per year, because no such rate is available from government sources. This value is a standard one in developing countries and has been widely used, for example, by Blejer and Khan(1984), Al-hasan(1993), and Ramirez (1994).

The justification for including these variables in the equation is summarized below:

1- Changes in output

Neoclassical investment theory suggests that changes in output are the most important determinant of private investment and influence private investment in a positive manner (Blejere and Khan, (1984); Greene and Villanueva, (1991)). This is also known as an accelerator effect. Therefore, the real GDP variable either one period lag or lagged change in real GDP could also be constructed as a proxy for expectations about future demand for output of the investments. In this study, real GDP will be used as the output variable. This variable is expected to have a positive impact on each type of private investment

2- Government Investment:

Public investment in infrastructure such as roads, ports, airports, education, communication facilities, water system, sewer, and health is assumed to have a complementary relationship with private investment (Aschauer 1989) on the other hand, when government investment creates positive production externalities, focus on enhancing innovation and research and development and/or stimulates the accumulation of private capital, these expenditures are said to have a complementary effect; i.e., public investment might crowd out private investment if it is used as a

substitute. This may occur when the government investment involves parastate enterprises producing goods that compete with the private sector, or when heavy spending for public capital projects leads to a high interest rate, severe credit rationing, or a heavier tax burden (Friedman,1978). Hence, the crowding –out effect can occur in two ways. First, limited market size in many developing countries implies government investment in marketable output that competes with private output, which would cause what we call crowding out. Second, financial crowding out may take place as both agents run for the same, often limited credit pool. The complementary effect of public investment may appear through the long-run efficiencies (profitability) effect of its infrastructure components on private investment. We expect to have different signs for this variable.

3- Budget deficits

This is the gap between public revenue and expenditure. National saving is the sum of private saving and public saving; national saving finances either domestic investment or foreign investment. When the government runs a deficit, public saving decreases unless it is fully offset by an increase in private saving. Lower savings mean that the country will either invest less in new plants and equipment or that it will increase the amount it borrows domestically or abroad. Lower investment will lead to a lower capital stock and reduce the county's ability to produce output in the future if we assume budget deficit increases by increasing government spending and the absence of perfect capital mobility. High budget deficits reduce national saving, and government borrowing to finance such deficit

(by selling government bonds) would compete directly with borrowing by private firms for the limited amount of savings available for borrowing. This would put upward pressure on interest rate so this increase reduces domestic investment the (crowding-out effect). Also a high budget deficit may signal a high tax burden in the future; this may discourage current investment expenditure. It important to note that budget deficits in themselves may not imply a macroeconomic problem if they are used for productive government expenditures such as spending on infrastructure projects. However, it cause problem if used for subsidization of inefficient state-owned enterprises or salaries and travel expenses for public servants. The growing budget imbalance in Saudi Arabia during the past two decades is causing increasing concern about the possible crowding out of private investment. Thus, this variable is expected to have a negative correlation with private investment

4- Availability of Domestic Credit

The availability of domestic credit will determine whether firms investment opportunities will be pursued. Easy access to credit leads to a higher level of investment. In developing countries, one of the major constraints on investment is the quantity rather than the cost of financial resources (Mckinnon, 1973). In developing countries, governments intervene in order to keep interest rates on loanable funds low. The effect of keeping the interest rate on loanable funds below the rate which clears the market discourages saving and, therefore, private investment. Earlier studies of private investment in developing countries highlighted the fact that financial markets in developing countries are repressed and this limits the financing of private investment to the use of retained profit, bank

credits, and foreign borrowing. Bank credit and foreign financing are the most important source of financing in developing countries. An increase in credit available to the private sector will encourage investment. Also, the availability of credit is necessary in countries where a large portion of machinery and equipment has to be imported for production. This variable will include commercial banks claims on private sector and government loans through specialized credit institutions. Thus, the availability of credit is expected to be positively correlated with each type of private investment.

5- Interest Rate:

Neoclassical theory suggests that high interest rates discourage investment by raising the user cost of capital. On the other hand, the demand schedule for capital shows the amount demanded to be an inverse of the rate of interest; i.e., a firm maximizes profit (under perfect competition) when it uses labor to the point where the labor's value marginal product equals the labor's price (wage). It likewise maximizes profit if it uses capital to the extent where the capital's value marginal product equals the capital's price (interest rate). According to studies conducted by Willson (1982) and Looney(1992), Saudi commercial banks increase the holding of foreign funds during periods of high real Euro-interest rates. High Euro-rates most likely divert funds away from domestic borrowers. The inclusion of the variable interest rate in this study is to examine the impact of an increase in the interest rate on the behavior of private investment, since the Saudi economy has no restrictions on capital mobility. Euro rate will be used as proxy variable for interest rate in Saudi Arabia. We expect a negative sign.

6- General Market Condition

According to Beljer and Khan, (1984 page 395):

During the expansionary phase of the cycle, when demand conditions are buoyant, private investors can be expected to respond more rapidly to changes in desired investment. If the trend or potential level of output is taken as an indicator of full capacity, however, then the reaction of investment to the discrepancy between the desired and actual rates of investment tend to be smaller when actual output is above capacity and more strain is put on available resources, leading to an increase in input prices.

On the other hand, if actual GDP falls short of the full capacity level, the private investors would react quickly to the discrepancy between the desired and actual level of investment. Hence, the effect of general market condition on private investment is ambiguous.

CHAPTER THREE

EMPIRICAL LITERATURE REVIEW

3.1 Introduction

Despite the recognition of the importance of private investment in the economic growth process in developing countries, there was little research on determinants of private investment until the 1980s. A number of studies have been conducted by World Bank and International Monetary Fund (IMF) staff. These studies tended to start off with the neoclassical model and attempted to reformulate it by incorporating variables that are supposed to have strong associations with investment, for example, using a variant of the flexible accelerator model where the speed of adjustment is influenced by these variables. The literature review on determinants of private investment in developing countries is divided as follows in the sections below.

3.2 Studies on Disaggregate Investment in Developing Countries

Using annual data from 1960 to 1986, Khan (1988) conducted a study on the impact of macroeconomic policy on private investment in Pakistan, applying a variant flexible accelerator-type model to estimate private investment in disaggregate form (total investment, manufacturing investment, and agricultural investment). Investment equation was found to be a function of growth rate of output, available credit, general market conditions, and government investment. Using government investment variable in the level as proxy for public investment in infrastructure, and change in

public investment variable as public investment in non-infrastructure and applying Ordinary Least Square (OLS), the result corresponding to the aggregate of private investment was that the coefficient of change in output was positive but insignificant. Response to general market conditions was strong and significant. The government investment coefficient (in the level) turned out to be significant and positive confirming the complementary effect, while change in public investment coefficient was negative and significant, implying a substitution effect. Regarding availability of credit to private investors, this variable has been positive and significant. The result was that corresponding private investment in manufacturing and agriculture showed that, as with total private investment, the accelerator effect of growth of output on manufacturing and agriculture has a positive and significant effect. The response of private investment in manufacturing to general market conditions appears to be significant and positive. Regarding availability of credit to private investors in the two sectors, and government investment in infrastructure, the coefficients were positive and significant, where changes in public investment coefficients were negative and insignificant.

DeLong and Summers (1990) conducted a study to examine the relationship between machinery and equipment investment and economic growth using data on components of investment drawn from United Nations International Comparison Projects between 1960 and 1985 for 61 countries (including 41 developing countries). In order to test their hypothesis that nations that invested heavily in equipment relative to other nations at the same stage of economic development enjoyed rapid growth,

they constructed a model consisting of: GDP per worker as a dependant variable and labor force growth; the share of GDP devoted to non-equipment investment; GDP share devoted to equipment investment; and GDP per worker gap as explanatory variables. The regression result implies that an increase of 3 percentage points (one standard deviation) in the share of GDP devoted to equipment investment led to an increase in the growth of GDP per worker of 1.02 percent per year. The paper concluded that machinery and equipment investment has a strong association with growth; each extra percentage of GDP invested in equipment is associated with an increase in GDP. Higher equipment investment drives faster growth.

Oner and McKay (2003) examined the determinants of private investment in the manufacturing sector in Turkey using a neoclassical-type model and macroeconomic data for the period 1950 to 1995. Investment equation is a function of output, wages, interest rates, credit available to private firms, and availability of foreign exchange. The finding showed that the accelerator effect of growth in output and availability of credit were two influential factors in the manufacturing industry in both the short run and the long run. Interest rate and wage were negative and insignificant; the availability of foreign exchange was less significant compared to growth in demand and credit available. The paper concluded that this result is consistent with some aggregate investment studies.

3.3 Studies on Aggregate Investment

A. Studies on Saudi Arabia and Countries in the Region:

Al-hamidy (1990) conducted a study on private investment in five Arab countries:

Egypt, Jordan, Morocco, Saudi Arabia, and Tunisia. He used a flexible accelerator-type model and an annual data span (1960-1972). For the study, private investment was taken to be a function of output growth, available credit, foreign capital inflow, export, and government investment. Government investment was disaggregated into infrastructure and non-infrastructure investment. The empirical results showed that private investment in these countries was positively correlated to output growth, available credit, foreign capital inflow, export, and government investment in infrastructure (complementary effect), and negatively correlated with government investment in non-infrastructure (crowding-out effect).

Looney (1992) conducted a study to determine factors that offset the potentially positive Hirschman-type inducement to private sector investment in the Saudi economy using annual data covering 1960-1988 and a modified version of the flexible accelerator. Private investment was seen as a function of non-oil GDP, oil revenue, available credit, government investment in infrastructure, and inflation. The paper suggests that the Saudi private sector responded more to shorter-run stimuli than to long-term advantages provided by infrastructure. Expected inflation, oil revenues, and credit all exerted a positive and highly significant effect on private investors.

Al-hassan (1993) studied the effect of public expenditure on private investment and the rate of return to private capital in the Saudi economy using annual data that cover the period 1970-1990. Ratio of private investment to GNP is a function of government

investment, marginal productivity of capital, and capacity utilization (the deviation of GNP from its long-term linear trend). The finding showed strong complementarity between public investment and private investment in the Saudi economy. The study concluded that the ability of the private investment sector to invest depends on public sector investment and that the availability of financing public sector investment through issuance of debt or taxes would crowd out private investment.

Al-hajhouj (1999) examined the impact of public policy on private investment in Saudi Arabia using annual data from 1965-1995. Applying a variant flexible accelerator-type model, the investment equation was found to be a function of change in expected GDP, credit available to the private sector, budget deficit, non-oil exports, general market conditions, government investment was disaggregated into infrastructure and non-infrastructure. The empirical results showed that private investment positively related to government investment in infrastructure, credit available, non-oil export, and general market condition. Budget deficit and government investment in non-infrastructure was found to be negatively related to private investment.

Shafik (1990) presented a model of private investment using a flexible accelerator model to estimate private investment behavior in Egypt for the period 1960-1986 using stationarity and cointegration techniques for testing the long-run equilibrium relationship between investment and its determinants. Key variables were non-oil GDP, real interest rates, relative cost of factor (which was represented by the ratio of discount rate to wage rate), the ratio of whole price index to an index of wage in the economy as proxy for "mark up," and government investment in infrastructure as the sum of public investment in agriculture, irrigation, electricity, transportation, construction, and

utilities. The econometric results showed that the demand (change in non-oil GDP), mark-up, cost of factors and government investment had a significant and positive effect on private investment while the interest rate had a negative and insignificant effect on private investment.

Schmidt and Muller (1991) looked for the impact of macroeconomic adjustment on private investment in Morocco using annual data from 1970-1988 and a neoclassical-type model. Private investment is a function of the GDP ratio, user cost of capital, capacity utilization (ratio of current GDP to trend GDP), flows of banking sector credit to private firms, term of trade, public investment, and an uncertainty variable that is a variance of debt to GDP ratio as a proxy of the higher risk of future macroeconomic instability. Econometric results indicated that private investment in Morocco was positively influenced by the increase in the level of aggregate demand (capacity utilization), bank credit, term of trade shocks, public investment, and a decline in cost of capital and uncertainty. The main conclusion of the paper was that a reduction in the increasing public sector deficit as an essential prerequisite for achieving investment levels was required for sustainable high growth rates.

Gali (1998) used annual data from 1963-1993 to study the impact of public investment on private capital formation in Tunisia. He used a neoclassical-type model with time series approach such as an applied error correction model to investigate the long-run effects of public investment on private capital formation. The variables used are GDP, private investment, and government investment. He found that public investment had a negative impact on private investment in both the long run and the

short run. The paper suggests that a shrinking of the public sector may stimulate private investment.

B. Studies in Other Developing Countries

Sundarajan and Thakur (1980) conducted one of the earliest studies on private investment behavior in developing countries. The study looked at public investment and growth and crowding-out in developing countries. They used a neoclassical-type model for India and Korea. User cost of capital and wage data from Korea and India allowed the authors to develop the model based on the neoclassical theory as being used in developed countries. OLS was applied to the model and the results showed that public investment exerts a negative influence on private investment. The study suggests substitutability between the public and private investment.

Wai and Wong (1982) conducted a study on determinants of private investment in developing countries. Their study was one of the pioneer studies of private investment in developing countries and used a modified version of the flexible accelerator model, particularly as it pertains to developing countries. They applied this model to annual data (1960-1975) from five middle-income developing countries: Greece, Mexico, Thailand, Korea, and Malaysia. The researchers assumed that the speed of adjustment depends positively on the change in bank credit and net capital inflow to the private sector and on government investment. The OLS method was applied to the model and the results showed that government investment has a contributory effect when there is less financial crowding-out, so it is the most powerful explanatory variable in Greece, Korea, and Malaysia. Bank

credit was important in Thailand, while capital inflow was the most important variable in Mexico. The paper concluded that government investment, the change in credit to the private sector, and capital inflow to the private sector play important roles in determining private investment.

In an attempt to apply investment theory to developing countries, Blejer and Khan (1984) examined the impact of government economic policy on private investment. They used a variant of the flexible accelerator model adopted to incorporate some institutional and structural characteristics of developing countries. They assumed that speed of adjustment is a function of government investment, change in available credit, and a cyclical factor or general market condition (depicted by the difference between actual and trend output). Annual data from 24 developing countries made up the pooled base. The study found that the level of private investment activity was positively related to the change in expected real GDP, the availability of funds, and negatively to the cyclical factor. The study also found that the level of private sector investment was a positive function of the trend level of government investment, which was taken as representing investment in infrastructure. The paper concluded that private investment in developing countries is constrained by the availability of financing and that the monetary policy can directly change private investment decisions by changing the flow of credit to the private sector.

Oshikoya (1994) studied the macroeconomic determinants of domestic private investment in Africa using a flexible accelerator-type model. The study divided the sample into two groups, middle income and low income, and each group was studied

in four countries. Private investment is seen to be a function of growth rate of real GDP, government investment, the change in credit to the private sector, inflation rate, change in terms of trade, index of real exchange rate, and lagged dependant variable. The empirical findings showed that an increase in real output growth had a positive and significant impact on private investment for the low-income countries, whereas the coefficient on GDP growth rate was positive and not significant for the middle-income countries. Public investment appeared to be positively related to private investment activity in both groups. The inflation rate had a strong and negative impact on the private investment rate in low-income countries, while in the middle-income countries the coefficient of the inflation rate on private investment showed a positive effect, and was insignificant. The effects of change in terms of trade on private investment for both groups of countries was insignificant and negative. Credit available to the private sector was a major determinant of private investment in both groups of countries. The real exchange rate had a positive and significant impact on private investment in the middle-income countries. In contrast, the effect of the real exchange rate was negative and insignificant in the low-income countries.

Chhibber and van Wijnbergen (1988) studied public policy and private investment in Turkey using a flexible accelerator model and annual data for 1970-1986. The speed at which the private investor achieved the desired level of investment, as measured by Beta, depended on the explanatory variables of capacity utilization index, real interest rate, stock available to the private sector, share of infrastructure and non-infrastructure public investment in public investment, and Gross National Product. The estimation results, after dropping the lagged dependant variable (which has a low t-

statistic), showed that private investment in Turkey was positively influenced by the growth of credit, infrastructure public investment, and capacity utilization, and was negatively influenced by high interest rates and public investment in non-infrastructure. The paper suggests that government policies have a marked impact on private investor behavior. Government can crowd out the private sector if it accumulates a large budget deficit that it cannot finance from abroad. Exchange rate policies and other export promotion policies have a major impact on private investment.

Greene and Villanueva (1991) conducted a study on how various macroeconomic factors affected private investment activity during the period 1975-1987 in 23 developing countries. The factors studied were economic growth, per capita income level, macroeconomic stability (represented by low inflation rate), the level of real interest rate, the size of the debt-services burden measured by debt-services ratio to GDP, and the rate of public sector investment. Econometrics evidence indicated that private investment was positively related to GDP growth, level of per capita GDP, public investment and negatively related to real interest rate, domestic inflation rate, and the rate of debt to GDP.

Matin and Wasow (1992) conducted a study on adjustment and private investment in Kenya using a modified version of the flexible accelerator model to assess the determinants of private investment and analyze how adjustment policies affect these determinants during the period 1968-1988. The paper's finding was that decline in credit to the private sector, falling stocks of public infrastructure capital, and the relatively lower level of import allocation are the main factors behind the decline in private investment in Kenya.

Serven and Solimano (1992, 1993) conducted a theoretical study on private investment and macroeconomic adjustment. In their study they discussed at length, from different theoretical viewpoints, the determinants of private investment in developing countries. The paper identified two key sets of factors affecting investment performance in developing countries. The first set included standard macroeconomic factors such as real output growth, monetary policy, fiscal policy, and exchange rate policy. The second set of factors was the perceived degree of uncertainty and credibility surrounding the macroeconomic framework. To investigate this, they used a neoclassical investment-type model and pooled cross-section time series data for a group of 15 developing countries for the period 1975-1987. These developing countries were divided into three groups of selected countries: Latin American countries that pursued structural reforms and liberalization (Chile, Mexico, and Bolivia); countries that did not pursue such ambitious reforms and that suffered severe macroeconomic instability (Argentina and Brazil); and the outward-oriented East Asian countries that adjusted to the adverse external shocks of the 1980s (Korea, Singapore, and Thailand). Real private investment is a function of real growth of output, the real exchange rate, real public investment, the foreign debt burden, and the degree of macroeconomic uncertainty (as proxied by either the variability of the exchange rate or the rate of inflation). Their empirical results showed that lagged growth in real output had a strong positive impact on private investment. Public investment also had a positive effect on private investment. Foreign debt burden had a strong negative effect on the private investment ratio. The effect of the real exchange rate was not significant. The two measures of instability carried a negative sign, so the change in macroeconomic

uncertainty (or instability) contributed to the change in private investment. The paper suggests that macroeconomic stability and policy credibility are important for the achievement of a strong investment response and that the availability of sufficient external resources may be important for easing the financing constraints on private investment and may raise the private sector's confidence in the viability of the adjustment effort.

Larrin and Vergara (1993) studied macroeconomic adjustment and private investment in four East Asian countries (Korea, Singapore, Thailand, and Malaysia) using a flexible accelerator-type model and annual data for the period 1975-1988. Private investment is a function of a lagged percent change in per capita GDP, real public investment, external debt, credit to the private sector (all as percentage of real GDP), real interest, rate and the coefficient of variation of the real exchange rate between year $t-2$ and year t as a proxy for instability. The econometric results indicated that growth in per capita GDP, credit to the private sector, and public investment have a positive sign and are highly significant. The external debt, interest rate, and instability variables have a negative and significant effect on private investment. The paper concluded that macroeconomic stability has been much higher in East Asia as a result of more stable and consistent policies.

Ghura and Goodwin (2000) conducted a study investigating the determinants of private investment in Asia, Sub-Saharan Africa, and Latin America using panel data for 31 countries. The sample of the countries included nine Asian countries, eight Sub-Saharan Africa (SSA) countries and 14 Latin American countries for the period 1975-1992. The key variables were private fixed investment as a function of domestic

available credit, inflation rate, the exchange rate, broad money (M2), external debt payment, the term of trade, exports, primary school enrollment, interest rate, and political freedoms measured using the Freedom House's political rights index. Generalized Least Squares (GLS) was applied and the results showed that private investment in these developing countries was stimulated by real GDP growth in Asia and Latin America, but its effect was not significant in SSA. While government investment stimulated private investment in SSA, it had the opposite effect in Asia and Latin America. In addition, private investment was stimulated by increased credit to the private sector in Asia and SSA, but not in Latin America. Increases in the rate of inflation were negative and significant on private investment in Latin America and positive in Asia and SSA. The effect of real interest rates was negative and significant in all regions. Increases in external debt payments were negative but not significant in Asia. External shocks (changes in the terms of trade and world interest rates) were significant only in SSA. The results also showed that primary school enrollment was significant in SSA and Asia. Finally, the political rights index variable was negative and insignificant in the study. The paper suggests that countries having greater political and social freedom are likely to enjoy higher levels of private investment.

Conway (1990) estimated the impact of relative price uncertainty (real exchange rate and interest rate) on Turkey's real investment using annual data from 1963-1986. Private investment was a function of public investment, real GDP, nominal exchange rate, inflation rate, and the standard deviation of relative prices as a proxy for uncertainty. The paper concluded that relative price uncertainty appears to have a strongly discouraging impact on private investment decisions

Serven (1998) estimated a private investment equation using panel data on a group of 94 developing countries spanning the years 1970 to 1995. His analysis is more comprehensive in terms of using five key macroeconomic variables: relative price of capital, the exchange rate, terms of trade, inflation, and output growth, along with the role of other determinants of private investment such as real GDP growth, available credit, and interest rates. Also, he was not measuring uncertainty through sample variability (standard deviation or the variance of the variable), but instead used Generalized Autoregressive Conditional Heteroskedasticity (GARCH) estimates of conditional variance for each variable and country separately by adding measures of uncertainty estimated from GARCH. He found that there is a negative relationship between uncertainty and private investment in developing countries.

CHAPTER FOUR
METHODOLOGY OF THE STUDY

4.1 Introduction

The equation used here is that of Blejer and Khan (1984), which was outlined and derived in chapter three as follows:

$$IP_t = \theta \alpha_0 \phi_1 [Q_t^* - (1 - \delta) Q_{t-1}^*] + \alpha_1 CRD + \alpha_2 R + \alpha_3 GI + \alpha_4 BD + \alpha_5 GM + (1 - \alpha_0) IP_{t-1} \quad (4.1.1)$$

Where IP_t , represent private investment in construction equipment, transportation equipment, or machinery and equipment. This means that we will have three equations, one for each type of private investment, as follows:

$$C_t = \theta \alpha_0 \phi_1 [Q_t^* - (1 - \delta) Q_{t-1}^*] + \alpha_1 CRD + \alpha_2 R + \alpha_3 GIC + \alpha_4 BD + \alpha_5 GM + (1 - \alpha_0) C_{t-1} \quad (4.1.2)$$

$$T_t = \theta \alpha_0 \phi_1 [Q_t^* - (1 - \delta) Q_{t-1}^*] + \alpha_1 CRD + \alpha_2 R + \alpha_3 GIT + \alpha_4 BD + \alpha_5 GM + (1 - \alpha_0) T_{t-1} \quad (4.1.2)$$

$$M_t = \theta \alpha_0 \phi_1 [Q_t^* - (1 - \delta) Q_{t-1}^*] + \alpha_1 CRD + \alpha_2 R + \alpha_3 GIM + \alpha_4 BD + \alpha_5 GM + (1 - \alpha_0) M_{t-1} \quad (4.1.3)$$

Where

C_t = Private investment in construction equipment as ratio of GDP

T_t = Private investment in transportation equipment as ratio of GDP

M_t = Private investment in machinery and equipment as ratio of GDP

GIC = Government investment in construction equipment as ratio of govt expenditure

GIT = Government investment in construction equipment as ratio of govt expenditure

GIM= Government investment in machinery and equipment as ratio of govt expenditure

4.2 Stationarity and Unit Root Test

Many time series variables can be characterized as non-stationary (Nelson and Plosser, 1982). A number of alternative tests are available for testing whether a series is stationary. A popular unit root test is the Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979 and 1981). To avoid the potential problem of estimating spurious relationships, it is necessary to test the time series properties of the variables under investigation for unit roots. If a variable is stationary, i.e., it does not have unit roots, it is said to be $I(0)$ (i.e., integrated of order zero). If a variable is not stationary in its level form but stationary in its first-differenced form, it is said to be integrated of order one, or $I(1)$. More generally, the series X_t will be integrated of order d —that is, $X_t \sim I(d)$. If it is stationary after differencing d times, then X_t contains d unit roots. In order to establish the order of integration of the variables in our data set, we will apply ADF tests. The following equations generate the Augmented Dickey- Fuller tests:

$$\Delta y_t = \delta y_{t-1} + \sum_{i=1}^k \alpha_i \Delta y_{t-i} + v_t \quad \text{without a constant} \quad (4.2.1)$$

$$\Delta y_t = \gamma + \delta y_{t-1} + \sum_{i=1}^k \alpha_i \Delta y_{t-i} + v_t \quad \text{with constant} \quad (4.2.2)$$

$$\Delta y_t = \gamma + \delta y_{t-1} + \beta T + \sum_{i=1}^k \alpha_i \Delta y_{t-i} + v_t \quad \text{with time trend} \quad (4.2.3)$$

where y_t is a variable,

v_t is an error term,

Δ is a difference operator,

k indicates the number of differenced terms used.

The null hypothesis is: $H_0: \delta = 0$, which says a unit root exists in y_t . If it is rejected, then the variable is stationary.

4.3 Cointegration Test

The economic interpretation of cointegration is that if two (or more) series are linked to form an equilibrium relationship in the long run, then even though the series members themselves may contain a stochastic trend (i.e., be non-stationary), they will nevertheless move closely together over time and the difference between them will be stable (i.e., stationary) (Harris, 2003). This means that their relationship is the long-run equilibrium which, in an economic system, converges over time, and any disturbance can be interpreted as the disequilibrium error or the deviation from the long-run path. The following equation gives an example of the cointegrated variables:

$$Y_t = \alpha + B X_t + \varepsilon_t \quad (4.3.1)$$

Both Y_t and X_t are non-stationary, but the linear combination $Y_t - \alpha - B X_t = \varepsilon_t$ is stationary. Thus, the long-run relationship between Y_t and X_t is a cointegrating relationship. When extending the analysis of cointegration to more than two variables, several procedures have been suggested to estimate and test the multivariate cointegration model. The Johansen procedure for estimating a group of cointegrating relationships is the most widely used. In order to apply this method, we need to pretest

the variables for nonstationarity. Then we select the lag length (P) using the Akaike Information Criterion (AIC) or the Schwartz Bayesian Criterion (Enders, 1995).

This approach is summarized in the following Error Correction form:

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \dots + \Gamma_{k-1} \Delta X_{t-k+1} + \Pi X_{t-k} + \gamma + \varepsilon_t \quad (4.3.2)$$

where ΔX_t represent the vector of observations on all variable in the system at time t, the Γ s are estimable parameters in the short run, γ is some constant vector, ε_t is a vector of white noise, and the Π matrix contains the cointegrating relationships (Philips and Cutler, 1998).

4.4 Error Correction Models (ECMs)

The Error Correction Model (ECM) was first used in economic literature by Sargan (1964) and then by Davidson, Hendry and Yeo (1978). The main characteristic of ECMs is the notion of an equilibrium long-run relationship and the introduction of past disequilibrium as explanatory variables in the dynamic behavior of current variables (Maddala and Kim, 1998). A simple error-correction model can be represented as follows:

$$\Delta Y_t = \theta_0 + \sum_{i=1}^p \alpha_i \Delta X_{t-i} + \sum_{i=1}^p \beta_i \Delta Y_{t-i} + \rho_1 \varepsilon_{t-1} + \mu_{1t} \quad (4.4.1)$$

where ε_{t-1} represents an error-correction term lagged one period. It captures adjustment in a dependent variable which is dependent not only on the level of some explanatory variable, but on the extent to which an explanatory variable deviates from an equilibrium relationship with the dependant variable (Banerjee, Dolado and Hendry,

1993). In other words, this term captures the “speed of adjustment” of each variable in response to a deviation from the long-run steady state. It is worth mentioning that the larger the coefficient of error correction term, the greater the response to the deviation from long-run equilibrium (Pesaran and Pesaran, 1997).

Enders (1995, p.367), stated: “ ...the absence of Granger causality for cointegrated variables requires the additional condition that the speed of adjustment coefficient be equal to zero.” Thus, a variable with zero speed of adjustment is Granger non-casual in determining short-run dynamics of other variables.

4.5 Granger Causality Tests and ECM

Engel and Granger (1987) pointed out that if two variables are cointegrated, then Granger causality must exist in at least one direction. The conventional practice of examining the direction of causality between two variables has been done through the use of standard causality. According to this approach, a variable x_t is said to Granger-cause a variable y_t when using the past values of x_t and y_t together rather than using the past values of y_t alone. The following standard Granger causality involves estimating the following equations:

$$Y_t = \sum_{i=1}^p \alpha_i Y_{t-i} + \sum_{j=1}^p \beta_j X_{t-j} + \mu_{1t} \quad (4.5.1)$$

$$X_t = \sum_{i=1}^p \lambda_i X_{t-i} + \sum_{j=1}^p \delta_j Y_{t-j} + \mu_{2t} \quad (4.5.2)$$

Assuming μ_{1t} and μ_{2t} are uncorrelated, t denotes the time period, p lag length, and α , β , λ , and δ are coefficients to be estimated. Gujarati (1995) stated that four possible outcomes of causality can be distinguished.

First, unidirectional causality from X_t to Y_t if the null hypothesis of $\beta_j = 0$ is

rejected,
$$(H_0: \sum_{j=1}^p \beta_j = 0).$$

Second, unidirectional causality from Y_t to X_t if the null hypothesis of $\delta_j = 0$ is

rejected,
$$(H_0: \sum_{j=1}^p \delta_j = 0).$$

Third, bi-directional causality if both coefficients are significantly not equal to zero.

Fourth, if X_t and Y_t are causally independent, all the coefficients of X_t and Y_t in equations (4.5.1) and (4.5.2) are statistically insignificant. Both may grow, or move together, but neither influences the other.

Canova (1995) showed that this test procedure may give misleading results if the variables in the above equations contain a unit root (non-stationary). Granger (1988) pointed out that if time series are cointegrated, then conventional Granger causality tests are invalid. As a result, an Error Correction Model (ECM) should be used to investigate the causality since ECMs study the short-run dynamics of the variables in the system that are influenced by the deviation from the long-run equilibrium by analyzing how each variable in the cointegrated system responds (or adjusts) itself to the error from the cointegrating vector. It does this to avoid the

shortcomings of the standard causality in the sense that it ignores the stationary and cointegrating properties of the series. This work performs Granger causality in the framework of ECM following the work of Anwar, Davis and Sampath (1996), Bengali, Khan and Saddaqt (1999), Chuang (2000), and Narayan and Smyth (2004). The standard Granger causality test will be modified to incorporate the error-correction terms that are derived from the cointegration equation. The modified Granger causality test (causality in ECM form) consists of estimating the following:

$$\Delta Y_t = \theta_0 + \sum_{i=1}^p \alpha_i \Delta X_{t-i} + \sum_{i=1}^p \beta_i \Delta Y_{t-i} + \rho_1 \varepsilon_{t-1} + \mu_{1t} \quad (4.5.3)$$

$$\Delta X_t = \theta_1 + \sum_{i=1}^p \gamma_i \Delta X_{t-i} + \sum_{i=1}^p \lambda_i \Delta Y_{t-i} + \rho_2 \varepsilon_{t-1} + \mu_{2t} \quad (4.5.4)$$

where ε_{t-1} represents error-correction term lagged one period.

Granger causality in the ECM form implies that there are two sources of causality for Y_t and X_t : lagged Y_t and X_t ; that is, standard causality test, and ε_{t-1} . The causality test in this form centers on the speed of the adjustment coefficients, which are ρ 's. The inclusion of an error correction term that describes long-run causality gives an extra channel through which causality may be observed (Papapetrou, 2001). The inference of the causality in this procedure concerning causality between X_t and Y_t is based on the statistical significance of coefficients ρ_1, ρ_2, α_i and λ_i . As mentioned above, accepting the null hypothesis of $\rho_1 = 0$ and $\rho_2 = 0$ implies the absence of Granger causality.

According to Anwar et al. (1996), applying Granger causality on equations (4.5.3) and (4.5.4) requires three steps:

First, the following null hypotheses that $\rho_1 = \rho_2 = 0$ and $\alpha_i = \lambda_i = 0$ are tested. If we fail to reject the null hypothesis, no further testing is done and no causality is detected. If the null hypothesis is rejected, causality is inferred; however, an assessment of whether the causality is related to short-run stationary variation or to the error-correction term ε_{t-1} must be made.

The second step is to test the significance of α_i and λ_i , to check whether the source of causality is short-run. The final step is the analysis of the direction of the ρ 's to see if they infer a long-run equilibrium relationship. With this specification, change in X_t or Y_t can be attributed not only to the change in the rest of the explanatory variables in the equations, the standard causality inference, but also the long-run relationship among variables (Dakurah, Davies and Sampath, 2001). Toda and Philips (1994) termed testing $\alpha_i = \lambda_i = 0$ as short-run causality and testing the error correction term as long-run causality.

Testing for causality in Multivariate ECM is used in this study for causality between private investment in each sector and its determinants. Consider the following ($n \times 1$) vector of cointegrating series in the form of multivariate ECM:

$$\Delta X_t = \gamma_{it} + \sum_{i=1}^p \gamma_{1i} \Delta X_{1,t-i} + \sum_{i=1}^p \gamma_{2i} \Delta X_{2,t-i} + \sum_{i=1}^p \gamma_{3i} \Delta X_{3,t-i} + \dots + \sum_{i=1}^p \gamma_{ni} \Delta X_{n,t-i} + \rho_1 \varepsilon_{t-1} + \mu_{it} \quad (4.5.5)$$

Where $X_t = (X_{1t}, X_{2t}, X_{3t}, \dots, X_{nt})$. p is lag length and ϵ_{t-1} represent error-correction term lagged one period. It captures adjustment in a dependent variable which depended not only on the level of some explanatory variable, but on the extent to which an explanatory variable deviated from an equilibrium relationship with the dependant variable (Banerjee, et al. 1993). For the above multivariate ECM in equation (4.5.5), the Granger causality tests are applied to test whether the parameters of $\Delta X_{2,t-i}$, $\Delta X_{3,t-i}$ $\Delta X_{n,t-i}$ are significantly different from zero. They also test for significance of the coefficients of the lagged error-correction term of ρ_s .

CHAPTER FIVE

STRUCTURE OF THE SAUDI ECONOMY

5.1 Overview

Saudi Arabia has a small oil-based economy and the government plays an active role in promoting economic growth. The kingdom has an open, developing economy with exports contributing a significant percentage of the gross domestic product (GDP) and with imports playing an important role in domestic consumption. Over the past three decades, the country has experienced impressive economic development. Real GDP measured at 1999 constant prices increased from SR145 billion⁴ in 1970 to reach SR512 billion in 1980, but fluctuated thereafter. Since 1995, real GDP has increased steadily, reaching SR630 billion in 2002. The average growth rate of real GDP during the period 1970-2002 was 4.2 percent. Real GDP of non-oil sectors increased at an average annual growth rate of 5.6 percent, rising from SR50 billion in 1970 to SR311 billion in 1984, and then to SR441 billion in 2002. The real GDP of the oil sector grew from SR95 billion in 1970 to SR246 billion in 1980 and fell sharply to SR93 billion in 1985. In 2002, it increased to reach SR189 billion.

⁴ SR stands for the Saudi Riyal, where \$1=SR3.75.

5.2 Economic Development

Over the past three decades (1970-2000), the Saudi economy has witnessed a considerable transformation in economic, social and urban aspects of life. The transformation was brought about by extensive government investment within the framework of five-year development plans to lay down the social and physical infrastructure of the country. The First Five Years Development Plan, 1970-1975, focused on infrastructure and expansion of social services. The plan projected an annual rate of growth in GDP of 9.8 percent. However, when oil revenues increased sharply by the end of the fourth year of the plan, revisions were made and actual expenditures exceeded planned expenditures by 20 percent. The GDP increased by more than 10 percent per year, slightly faster than the anticipated growth. Planned budget allocations for the five years were SR41 billion, 45 percent of which were spent on capital projects. Planned expenditure was concentrated on defense, education, transportation, and utilities.

The Second Development Plan (1975-1980) was prepared under more favorable economic conditions, as the Kingdom's oil revenues increased substantially due to the increase of crude oil prices in international markets. The Second Plan focused on four major elements: (1) maximum possible expansion of transport, electricity, water, and housing infrastructure; (2) encouragement of energy-intensive industries; and (3) export of their high-value-added products. This direction was supported by the establishment of the Royal Commission for Jubail and Yanbu with the aim of providing infrastructure necessary for the hydrocarbon industry. The Second Development Plan also placed particular emphasis on developing financial and administrative policies and regulations

in conformity with development requirements and the progress of the national economy, as well as facilitating cooperation between the public and private sectors in order to realize higher growth rates. The fourth element (4) concentrated on supporting and encouraging the private sector through the establishment of specialized credit funds and a series of policies and measures supporting private sector activity (Ministry of Planning, 1985).

The Third Development Plan (1980-1985) focused on achieving structural changes in the national economy through defining oil and gas production levels to maintain national resources, continuing to build hydrocarbon industries, and completing the infrastructure projects. The plan also aimed at supporting growth factors and development potential in all regions of the Kingdom along with enhancing economic and management efficiency through improving administrative organization and government procedures.

The Fourth Development Plan (1985-1990) focused on the operation and maintenance of projects, diversification of the production base, and restructuring the national economy to enable the private sector to play a substantial role in the economic development process. The Fourth Plan also concentrated on the need to adapt to changing world oil market conditions and certain adverse impacts on the internal and external balance of the Saudi economy through the adoption of strict macroeconomic management policies.

The Fifth Development Plan (1990-1995) focused on encouraging the private sector to play a greater developmental role and to increase its participation in some areas where the government traditionally had provided services, such as some public

utilities and the transportation sector. The Fifth Plan also adopted important development initiatives such as improving the technical base in many economic sectors through the use of modern technologies and their adaptation to the requirements of the Kingdom. However, implementation of the Fifth Plan was adversely affected to some extent by the first Gulf War (1991; in the Middle East it is called the second Gulf war), which necessitated some adjustments to the priorities of government expenditures. This in turn affected private sector investment.

The Sixth Development Plan (1995-2000) stressed the need to realize the following three objectives: first, development of human resources through increasing the absorptive capacity of universities, educational institutions, vocational training, and technical colleges, with due emphasis on the quality and development of curricula at all education and training levels in order to meet the requirements of development and the needs of the private sector. The second objective was realization of economic efficiency in both public and private sectors as a prerequisite for the success of policies for diversifying the economic base and rationalizing government expenditures. Third objective called for enhancing the role of the private sector and encouraging it to invest, and thereby increase its contribution to the development process, through policies and regulatory initiatives, as well as starting the implementation of privatization programs.

The Seventh Development Plan (2000-2004) focuses on adopting a set of economic policies that fit into a long-term plan designed to develop human resources, raise the efficiency of manpower, and increase employment by both generating new jobs and replacing of non-Saudi manpower, and creating a good climate for attracting foreign direct investment. Special emphasis is placed on the privatization program's

strategic options for increasing private sector participation in the socioeconomic development process.

5.3 Major Economic Sectors

A- The Agricultural Sector

Through development plans, in diversification of the economic base as well as maintenance of food security, particularly in area of basic commodities, the government has introduced policies designed to reduce uncertainty and make private investment in the agricultural sector favorable. These policies consist of a package of incentives including soft loans, free lands, subsidies, and tariff protection. As a result of intensive government support, the Saudi agricultural sector has grown at an average rate of 8.7 percent since 1970, and accounted for 5 percent of 2001 real GDP. Wheat production increased from 26,000 tons in 1970 to reach 4.1 million tons in 1992, then started to decrease from 1994 to reach 1.9 million tons in 2000. This reduction was due to policies the government adopted to achieve an overall balance between water security and food security, such as suspending licenses for new fodder projects, enhancing water rationing programs, and diversifying agricultural production on the basis of the comparative advantages of different regions. The production of fruits and vegetables has increased significantly since 1970. Production of dates has grown from 240,000 tons in 1970 to 650,000 tons in 2000, an average annual growth rate of 3.7 percent. Production of grapes has increased from 24,000 tons to 142,000 tons over the same period, representing an average growth rate of 6.2 percent. The production of eggs increased from 7,000 tons in 1970 to reach 140,000 tons in 2000, representing an average growth

rate of 12.8 percent during that period. In 1989, the Kingdom achieved self-sufficiency in the production of wheat, eggs, and dairy products (MOEP, 2003). Despite significant gains in local production of agricultural products, the country is still considered a major importer of food in the Middle East due to the rapid increase in population.

B- The Industrial Sector

During the 1980s, the Saudi government established, virtually from scratch, a modern industrial sector. The industrialization process had two goals: first, the use of the Kingdom's enormous gas production as an industrial input to the production of chemicals and petrochemicals for export; and second, the construction of energy-intensive industries, some for export purposes and others to meet infrastructure needs. In addition to establishing industrial cities and facilities to support its industrial programs, including those at Jubail and Yanbu, industrialization in the Kingdom is carried out by the private and public sectors. Government dominates the industrial sector through its ownership (wholly and partially) of the Kingdom's oil refineries and its 70 percent ownership of the Saudi Basic Industries Corporation (SABIC). The government-owned Saudi Arabian Oil Company (ARAMCO) also owns and operates the Master Gas System (MGS), which produces the feedstock that is the basis for the Kingdom's petrochemical industry. The petrochemical industry started in the early 1980s with the establishment of SABIC, which remains the largest petrochemical producer in the Kingdom and the main catalyst for a number of downstream petrochemical projects. In 2001, SABIC's total production of basic chemicals reached 15.9 million metric tons, and its products were sold in over 100 countries worldwide.

Both SABIC and private downstream plastic companies are currently investing over SR154 billion in petrochemical projects. With access to enormous hydrocarbon feedstock, Saudi manufactures enjoy the advantage of producing plastic products at low cost (SAMA, 2002).

With the increasing scarcity of government resources, the government has attempted to encourage greater private sector investment in industry from both foreign and domestic sources. The private sector's participation in the manufacturing sector is growing; the number of existing industrial units in the Kingdom in 2002 reached 3,599, with total capital investment over SR247 billion. Table 5.1 shows a breakdown of the units by types of industrial activities and capital that indicates that 764 units were working in the chemical industries and plastic products industries, accounting for 62.4 percent of total financing of the units, followed by construction materials, ceramic and glass products (587 units) at 11.0 percent, manufacturing metal products and machinery (984 units) at 10.6 percent, and food and beverages (565 units) at 7.9 percent. These four industries (2900 units) accounted for 80.6 percent of total existing units and 91.9 percent of total financing. Other industries, such as paper products, wood, transport and storage represent 19.4 percent of total existing industrial units (SAMA, 2003). Figure 5-1 shows industrial licences by type of activity.

Table 5.1. Industrial Units by Type of Activity

Industrial activity	Licenses issued during 2002		Cumulative operating industrial units	
	Number of units	Total capital	Total number	Total capital*
Food & beverages	193	1,875.12	565	19,583.17
Textiles & leather	130	682.29	174	4,094.10
Wood products	104	556.35	193	2,812.00
Paper products	28	299.30	221	7,216.61
Chemical & plastic	369	23,159.79	764	154,494.78
Construction products	136	883.11	587	27,336.22
Basic metal	4	20.96	15	4,169.86
Manufactured metal	335	3,361.45	984	26,304.27
Other industries	31	176.20	80	1,398.22
Transport & storage	0	0.00	16	184.65
Total	1,330	31,015	3599	247,594

Source SAMA annual report for 2003* in million SR

C- Oil Sector

The oil sector, despite the increasing importance of the non-oil sector, continues to supply the growth momentum in the Kingdom, which holds the world's largest oil reserves at over 260 billion barrels, the equivalent to over one-quarter of the world's reserves. This level has been increasing continuously despite daily production that is typically in excess of 8 million barrels per day (Presely, 2001). This is due to new annual discoveries of oil. The oil sector contributes between 23 and 66 percent of real GDP and contributes over 79 percent of government revenues (Figure 5-2); oil prices and production still have a great influence upon business confidence, consumer demand, and the volume and size of contracts awarded to the private sector by the

government. For decades, the Kingdom's economic policy has been driven by the success of its oil industry. Table 5.2 shows actual government expenditures and oil revenues for the 1969-2001 period. Numbers presented indicate that oil revenue showed volatile fluctuations. During 1975, 94 percent of government revenues came from oil revenues, while in 1997, 56 percent of total revenues were generated from oil. Despite the improvement of non-oil revenues, oil revenue still represents a major source for government revenues. The sharp decline in oil prices during the mid 1980s caused the government to cut its expenditure sharply; this expenditure had been the primary source of liquidity creation and demand growth in the Saudi economy. As a result, budget deficits remained high, and the country's national debt is estimated to be 630 billion Saudi Riyals, which represents 99 percent of the 2001 GDP.

D- The Financial Sector

Saudi Arabia has established a sound regulatory and financial infrastructure based on financial standards and payment systems equivalent to those in major industrial countries. This has resulted in a strong banking sector that has benefited from strong management and the most sophisticated technologies, with very good levels of risk-weighted capital-to-assets ratios (Basel standard). The capital -to-assets ratio reached 21.3 percent at the end of 2002, twofold and a half more than the internationally prescribed standard (SAMA, 2003). The financial system in Saudi Arabia consists of the central bank, commercial banks, specialized credit institutions, the stock market, and 38 money changers engaged in foreign exchange transaction.

Banking is regulated under the Banking Control Law. The Council of Ministers issues licenses for the establishment of banks based on recommendations from the Minister of Finance after review by the central bank (SAMA).

Table 5.2. Oil Revenues and Government Expenditure in million SR

Years	Revenues		Total Revenue	Others/ Total (%)	Government Expenditure	Surplus (deficit)
	Oil	Other				
1969	5,119	549	5,668	9.68	6,079	(411)
1970	7,122	818	7,940	10.3	6,418	1,522
1971	9,685	1,435	11,120	12.9	8,303	2,817
1972	13,480	1,888	15,368	12.28	10,148	5,220
1973	39,285	2,420	41,705	5.8	18,595	23,110
1974	94,190	5,913	100,103	5.9	32,038	68,065
1975	93,481	9,903	103,384	9.57	81,784	21,600
1976	121,191	14,766	135,957	10.86	128,273	7,684
1977	114,042	16,617	130,659	12.71	138,048	(7,389)
1978	115,078	16,427	131,505	12.49	147,971	(16,466)
1979	189,295	21,901	211,196	10.37	188,363	22,833
1980	319,305	28,795	348,100	8.27	236,570	111,530
1981	328,594	39,412	368,006	10.71	284,650	83,356
1982	186,006	60,176	246,182	24.44	244,912	1,270
1983	145,123	61,296	206,419	29.69	230,185	(23,766)
1984	121,348	50,161	171,509	29.24	216,363	(44,854)
1985	88,425	45,140	133,565	33.8	184,004	(50,439)
1986	42,464	34,034	76,498	44.49	137,422	(60,924)
1987	67,405	36,406	103,811	35.1	173,526	(69,715)
1988	48,400	36,200	84,600	42.79	134,850	(50,250)
1989	75,900	38,700	114,600	33.77	149,500	(34,900)
1990	118,142	36,579	154,721	23.64	210,430	(55,709)
1991	246,297	70,342	316,639	22.21	457,477	(140,838)
1992	128,790	40,857	169,647	24.08	211,340	(41,693)
1993	105,976	35,469	141,445	25.1	187,890	(46,445)
1994	95,505	33,486	128,991	25.95	163,776	(34,785)
1995	105,728	40,772	146,500	27.83	173,945	(27,445)
1996	135,982	43,103	179,085	24.07	198,117	(19,032)
1997	159,985	45,515	205,500	22.15	221,272	(15,772)
1998	79,998	61,610	141,608	43.51	190,060	(48,452)
1999	104,447	43,007	147,454	29.2	183,841	(36,387)
2000	214,424	43,641	258,065	16.91	235,322	22,743
2001	183,915	44,244	228,159	19.39	255,140	(26,981)

Source: SAMA Annual Report, 2003.

The Central Bank

The Kingdom's central bank is the Saudi Arabian Monetary Agency (SAMA), which stands at the apex of the financial system. It acts as the government's bank, regulates and monitors commercial banks, and manages the country's foreign exchange reserves. It executes the Kingdom's monetary policy and issues the country's currency. SAMA and the banks have invested substantial resources in upgrading the Kingdom's banking technology to cover a wide range of items such as ATMs, electronic clearing, and shares trading. The objective of Saudi Arabia's monetary policy is to encourage the expansion of economic activity and maintain the stability of prices and the riyal/dollar exchange rate (Al-jasser and Banafe, 1999)

Commercial Banks

There are 11 commercial banks in the Kingdom (including the Gulf International Bank), most of which have foreign bank participation. Currently these banks have 1,210 branches spread throughout the country. Saudi banks have been participating in the growth process of the Saudi economy. They engage in short-term credit, and most loans granted by commercial banks go to the building and construction (B&C), commerce (comm) and miscellaneous (misc) sectors. Table 5.3 provides a summary of information on bank credit to the private sector by economic activity for selected years since 1970. From 1970 to 2000, these three sectors accounted for about 70 percent of the total credit given by commercial banks. The reason for this might be the ability of these sectors to pay back the loans in a short period of time. For the same period, the

manufacturing and processing (M&P) sectors accounted for 10.1 percent, while the agriculture and fishing (A&F) sectors accounted for 1.2 percent of the total credit granted by the commercial banks. Other sectors that shared a small portion of the credit given to by the commercial banks are: mining and quarrying (M&Q), electricity, water, and utilities (EW&U), services (serv), and transport and communications (T&C). Figure 5-3 shows bank claims on the private sector.

Table 5.4 shows that foreign assets held by commercial banks reached 53.2 percent of total assets in 1990, and then started to decline gradually to 21 percent in 2001. The banking system during the period from 1987-1990 was investing more than half of their total assets in foreign assets, which indicates that their participation in the domestic investment process was less than expected. The ratio of foreign assets to capital and reserves reached 1080 percent in 1977 and then declined to reach 213 percent in 1998. In 2001, commercial bank claims on the private sector represented less than 40 percent of their total assets, which is below expectation. Looking closely at numbers in table 5.4 and figure 5-4, we can conclude that an increase in foreign assets held by commercial banks leads to a decline in credit given to the private sector. Therefore, an increase in international interest rate (in this case, the Euro-dollar rate) leads to capital flight and divert funds from domestic investment.

Figure 5-1: Industrial Licenses by Type of Activity

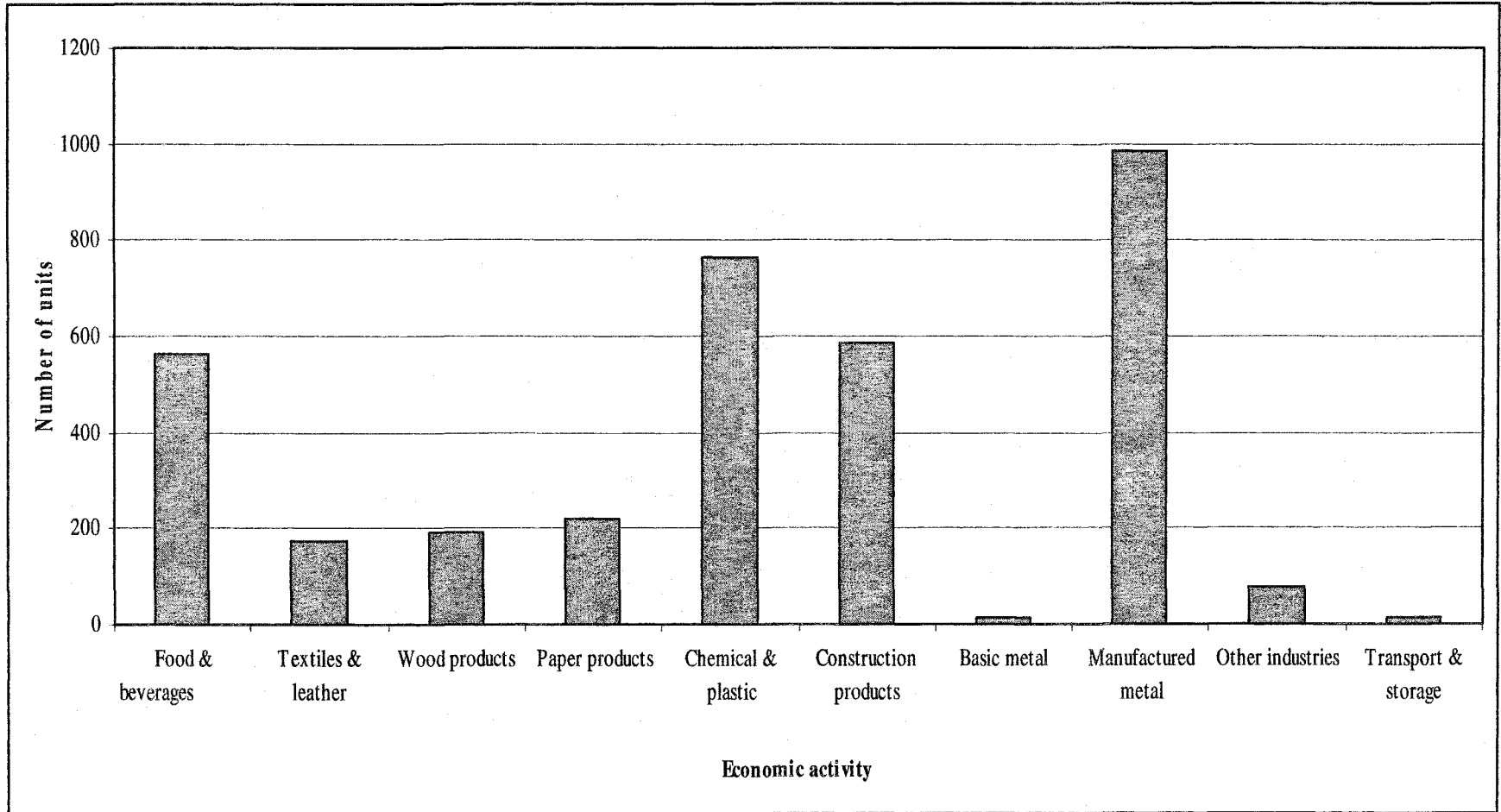


Figure 5-2: Average Share of Oil Sector and Other Sectors in Total Revenue (1969-2001)

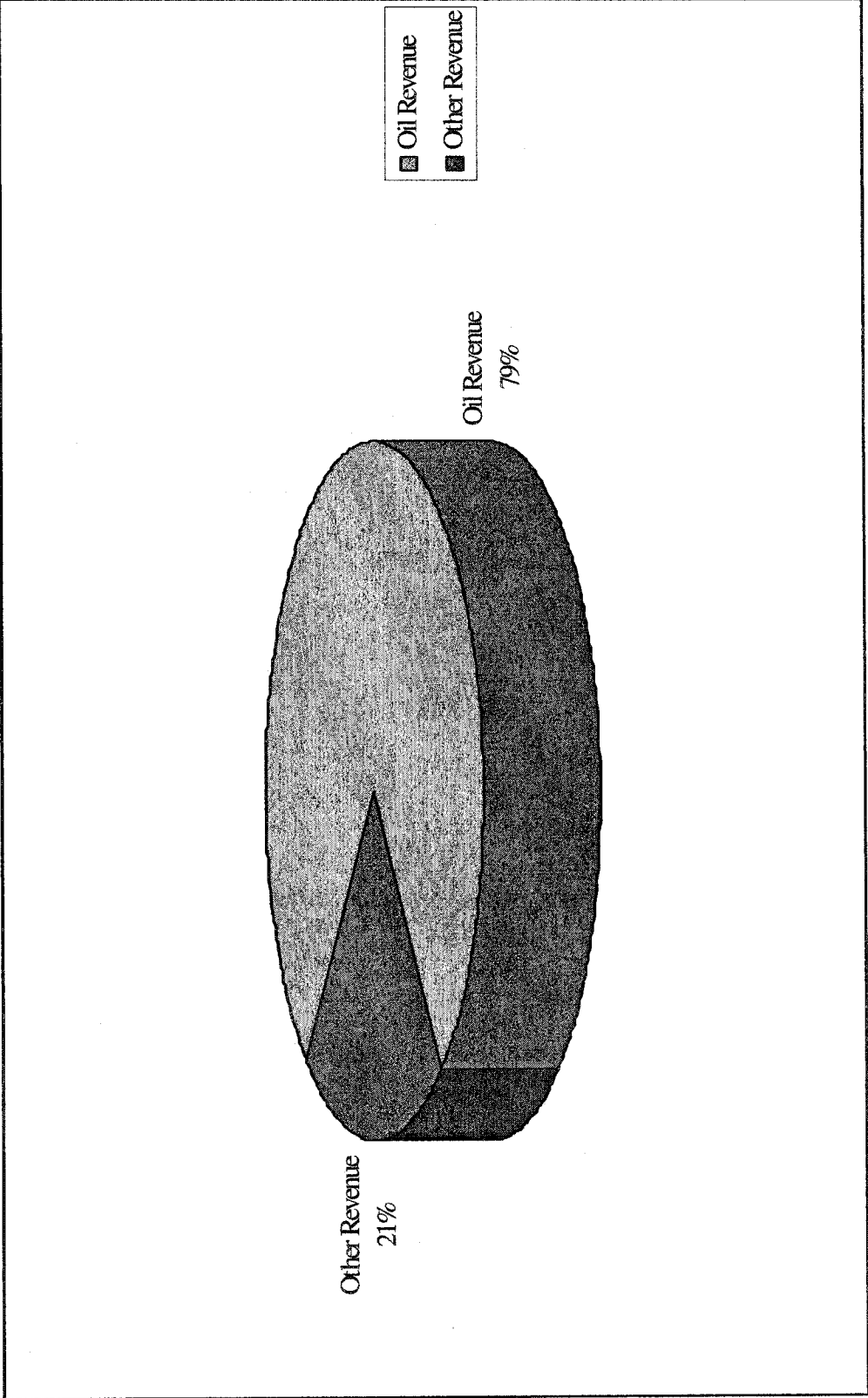


Table 5.3. Bank Credit to the Private Sector by Economic Activity (million SR)

Period	A&F	M&P	M&Q	EW&U	B&C	Comm	T&C	Finan.	Serv.	Misc.	Total
1970-75	123	2,296	204	697	4,394	7,202	613	611	416	4,274	20,830
%	0.59	11.02	0.98	3.35	21.09	34.58	2.94	2.93	2	20.52	100
1976-80	660	9,883	1,648	3,246	21,574	36,896	2,390	2,310	3,427	19,845	101,879
%	0.65	9.7	1.6	3.19	21.18	36.22	2.35	2.27	3.36	19.48	100
1981-85	3,952	26,283	1,735	4,476	61,201	92,228	16,356	7,331	11,090	50,610	275,262
%	1.44	9.55	0.63	1.63	22.23	33.51	5.93	2.66	4.03	18.39	100
1986-90	5,293	23,548	1,816	3,478	56,911	93,938	23,724	29,734	18,715	76,626	333,783
%	1.59	7.05	0.54	1.04	17.05	28.14	7.11	8.91	5.61	22.96	100
1991-95	10,905	48,268	3,001	10,423	63,649	121,271	28,537	52,804	29,092	142,821	510,771
%	2.14	9.45	0.59	2.04	12.46	23.74	5.59	10.34	5.7	27.95	100
1996-2000	7,317	97,245	6,358	16,273	87,826	190,558	22,143	32,491	46,801	206,560	713,572
%	1.03	13.63	0.89	2.28	12.31	26.7	3.1	4.55	6.56	28.95	100
Avg	1.24	10.07	0.87	2.26	17.72	30.48	4.5	5.28	4.54	23.04	100

Source: calculated by author from SAMA Annual Report, various issues

Table 5.4. Foreign Assets Held by Commercial Banks as Ratio of Total Assets and Capital and Reserves in Million SR

years	Foreign Assets	Total Assets	Foreign Asset/Total(%)	Claims on private/ total Assets(%)	Foreign assets /capt&Res (%)
1969	479	2,724	17.6	61.8	287
1970	624	2,963	21.1	54.3	337
1971	1,115	3,768	29.6	41.7	563
1972	719	5,281	13.6	32.3	341
1973	1,419	7,570	18.7	40.4	498
1974	2,370	11,786	20.1	39.0	473
1975	5,425	21,690	25.0	38.2	672
1976	9,432	35,194	26.8	23.5	847
1977	14,689	52,514	28.0	19.7	1,080
1978	12,962	52,561	24.7	34.2	651
1979	23,937	65,513	36.5	41.5	680
1980	41,010	93,623	43.8	40.7	847
1981	53,570	117,721	45.5	39.2	810
1982	66,001	138,136	47.8	36.3	775
1983	71,052	145,247	48.9	39.7	708
1984	73,400	152,566	48.1	40.4	617
1985	72,770	154,529	47.1	39.6	559
1986	92,571	176,129	52.6	33.2	698
1987	96,532	188,831	51.1	33.7	709
1988	114,741	216,239	53.1	32.8	767
1989	118,844	233,585	50.9	31.8	756
1990	123,467	232,055	53.2	28.9	711
1991	118,951	258,330	46.0	32.8	633
1992	101,566	273,572	37.1	39.5	405
1993	111,586	320,754	34.8	37.4	370
1994	98,147	332,231	29.5	40.3	295
1995	97,971	341,158	28.7	40.4	282
1996	106,171	357,947	29.7	37.3	287
1997	99,515	381,787	26.1	39.1	259
1998	85,944	404,306	21.3	44.2	213
1999	91,487	415,228	22.0	40.1	216
2000	101,204	453,272	22.3	38.3	233
2001	99,364	472,431	21.0	39.7	227

Source: Calculated from SAMA annual report, 2003.

Stock Exchange

The Saudi Arabian stock market has developed substantially over the past decade, and is now the largest in the Arab world, with a capitalization of SR302 billion in 2002. When rated by the World Bank group, the Saudi market won high marks for its efficiency, transparency, and quality of regulation. The stock market operates through a computerized, order-driven, continuous screen-based trading system that is supervised by SAMA. The number of joint stock companies that trade shares has risen steadily with the implementation of the government's privatization policy. Presently, there are over 75 firms listed on the stock market. The companies listed in the market include firms from the banking, industrial, agricultural, cement, and utilities sectors. A major opening of the Saudi stock market to foreigners was initiated during 1997, as SAMA approved the participation of international investors in the Saudi stock market through mutual funds. The Saudi American Bank (SAMBA) is the first of the Saudi banks granted approval to offer an investment fund based on Saudi shares to foreign investors. The new, closed-end Saudi Arabian Investment Fund (SAIF) is listed on the London Stock Exchange. Previously, only Saudi nationals could deal in or own shares in the fund, although Gulf Cooperation Council (GCC) nationals were also allowed to own Saudi stocks in certain sectors. By examining table 5.5, we can see that from 1985 to 2002 the Saudi market grew tremendously. The number of listed companies increased from 44 in 1985 to 75 companies in 2002. The market capitalization increased from SR67 billion in 1985 to reach SR302 billion in 2002.

Table 5.5. Stock Market Indicators

year	Number of listed companies	Number of shares in million SR	Value of shares traded	Market value of the share in billion SR	General Index (1985 = 1000)
1985	44	4	67	67	691
1986	46	5	63	63	646
1987	51	12	73	73	781
1988	52	15	86	86	892
1989	54	15	107	107	1,087
1990	56	17	97	97	980
1991	58	31	181	181	1,765
1992	58	35	206	206	1,889
1993	64	60	198	198	1,793
1994	66	152	145	145	1,283
1995	69	117	153	153	1,368
1996	70	138	172	172	1,531
1997	70	313	223	223	1,958
1998	74	293	160	160	1,413
1999	74	528	229	229	2,029
2000	74	555	255	254	2,258
2001	74	691	275	276	2,430
2002	75	987	281	302	2,518

Source: SAMA Annual reports various issues

Specialized Credit Institutions

In addition to commercial banks, there are several domestic specialized credit institutions that disburse interest-free loans to Saudi individuals and companies. Those institutions are:

The Saudi Arabian Agricultural Bank (SAAB)

The SAAB was established in 1964 to provide both medium and long-term interest-free loans to agricultural companies and farmers. Loans are typically provided for up to 50 percent of an agricultural producer's equipment. The cumulative value of loans provided by the SAAB since its inception amounted to SR28,404 million by the end of 2001. Total loans disbursed during 2001 were SR1,104 million (MOF.2003).

The Public Investment Fund (PIF)

The PIF was created in 1971 to arrange loans and equity participation to meet the long- and medium-term financial needs of industrial and commercial projects in the government sector. To encourage private sector participation in economic development, the government entered into partnership with the private sector by creating joint stock companies. The PIF holds the government shares in those companies, including SABIC, and more recently has acquired shares in the National Commercial Bank. The Fund extended SR1,759 million in loans during 2001, a substantial increase over the previous year's figure of SR681 million. The cumulative value of loans disbursed since its inception amounted to SR66,049 million (MOF, 2003).

The Real Estate Development Fund (REDF)

The REDF was established in 1974 to provide medium- and long-term interest-free loans to assist Saudi individuals in building private and commercial housing projects. During its history, the REDF provided over SR127,298 million in loans through 2001. In 2001 alone, it provided SR2,232 million (SAMA, 2002).

The Saudi Credit Bank (SCB)

The SCB was established in 1971 to provide interest-free, medium-term loans for social and economic purposes, loans it provides through its 24 branches located throughout the Kingdom. The cumulative value of loans disbursed from its inception until 2001 amount to SR6,932 million. The institution made an extra SR100 million available in 1999 to small-and medium-sized businesses, particularly for financing micro-enterprises (MOF, 2003).

The Saudi Industrial Development Fund (SIDF)

The SIDF was created in 1974 to provide medium- and long-term capital of up to 50 percent of the total cost of a project. The SIDF also provides marketing, financial, and technical advice and monitors its borrowers' projects when possible. In 2001, SR965 million worth of loans were disbursed. By the end of 2001, total SIDF loans to the industrial sector had risen to more than SR71,050 million.

The Ministry of Finance Program (MOFP)

During the mid-1970s, the Ministry of Finance established a lending program for private sector projects that are not eligible for lending from the specialized credit institutions mentioned above such as hotels, hospitals, mechanized bakeries, contractors, cold storage facilities, and date factories. This program provides interest-free medium- and long-term loans. The cumulative value of loans provided by this program since its inception amounts to SR4,826 million (MOF, 2003). Table 5.6 shows that total disbursement by these institutions from their inception until 2001 reached SR303,886 million. Figure 5-5 shows the average investment credit disbursed by each government credit institution. REDF is the highest and SCB is the lowest.

Table 5. 6. Investment Credit Disbursed by Government Specialized Financial Institutions to Private Sector and Public Corporations (in Million SR)

Year	SAAB	SCB	SIDF	REDF	PIF	MOFP	Total
1969	10	0	0	0	0	0	10
1970	17	0	0	0	0	0	17
1971	17	0	0	0	0	0	17
1972	20	0	0	0	134	-	154
1973	36	9	0	0	263	-	308
1974	146	40	35	0	603	-	824
1975	269	82	1,699	2,159	1,512	118	5,839
1976	490	158	2,275	8,901	3,884	33	15,741
1977	586	103	4,341	7,534	6,267	22	18,853
1978	709	57	7,657	5,724	3,893	21	18,061
1979	816	48	6,816	7,435	3,311	635	21,040
1980	1,247	123	6,573	8,336	3,538	-	19,817
1981	2,310	445	6,157	7,223	8,141	-	24,276
1982	2,648	269	5,043	7,625	10,163	-	25,748
1983	3,011	236	4,641	8,500	7,050	-	23,438
1984	3,254	245	5,260	8,912	5,211	301	23,183
1985	2,035	267	1,453	7,645	2,386	139	13,925
1986	1,296	277	750	5,734	315	82	8,454
1987	694	273	554	3,972	382	85	5,960
1988	627	288	440	3,389	130	37	4,911
1989	651	324	828	2,978	2,520	22	7,323
1990	664	274	667	2,445	364	5	4,419
1991	601	276	1,050	1,740	44	101	3,812
1992	690	280	1,179	2,678	20	64	4,911
1993	769	331	1,055	3,235	6	34	5,430
1994	547	283	1,341	4,761	0	55	6,987
1995	362	296	2,006	3,732	118	73	6,587
1996	262	315	2,002	2,401	300	99	5,379
1997	430	337	2,012	2,228	542	46	5,595
1998	605	353	1,922	1,633	930	87	5,530
1999	691	304	1,246	2,265	1,185	115	5,806
2000	790	321	1,083	1,881	1,078	-	5,153
2001	1,104	318	965	2,232	1,759	-	6,378
Total	28,404	6,932	71,050	127,298	66,049	2,174	303,886

Not available (-) Source: Data from 1969 to 1986 and data on MOFP from plan achievement MOEP, and other data from SAMA annual report, 2003.

5.4 Government Policy and the Private Sector in Saudi Arabia

From 1973 to 1983, the country enjoyed the benefits of high oil revenues. At that time, more attention was given to investment in infrastructure development than to anything else. Since then, the situation has changed significantly, and it has been recognized that diversification is needed to stimulate the economy and reduce the uncertainty of future income. Diversification away from oil was needed to reduce the risk associated with dependency on one export commodity. Relying on one source or sector for revenue would put the economy in a risky position in times of adverse economic shocks. Therefore, the government realized it was important to encourage the private sector to play a vital role in achieving diversification; and in order to have a strong reliable private sector, the government established a package of direct and indirect incentives for this purpose. During the third and fourth plans, the government planners emphasized the role of the private sector in diversifying the economy by stimulating private investors to increase their activities in the economy. The economic policies followed by the government have focused on the provision of basic infrastructure services, as well as other business and financial services, in order to create a favorable environment for the establishment of world-standard national firms that can compete in global markets.

The contribution of the private sector to real GDP during the past three decades has varied, recording its highest level of 52 percent in 1985 and its lowest level of 13 percent in 1970. Despite the government support, the current rate of private sector growth is low, although increasing, in large part due to the decline in oil output. In 1970, oil accounted for 66 percent, and non-oil products for 34 percent, of GDP; of the

non-oil component, the government accounted for 62 percent, and the private sector for 38 percent. During the sharp decline in oil prices in 1985, oil accounted for 23 percent and non-oil products for 77 percent of real GDP; of the non-oil component, the government accounted for 33 percent and the private sector for 67 percent. In 2000, the private sector share declined to 65 percent of the non-oil component, as shown in table 5.7. Figure 5-6 shows the share of government and private sector non-oil GDP. By examining table 5.8, we can say that the growth in the non-oil sector of the Saudi economy has been largely determined by responses to rising demand for non-traded goods and services, especially for the non-government services and construction sectors. These two sectors have expanded their share in total non-oil GDP in 1980 and 1985. The relative growth of the service sector reflects the changes in the economy as infrastructure development has been largely completed and housing requirements have been met. In addition to the above, table 5.8 contains a summary of sector shares of non-oil GDP for selected years; it reflects the periods of transition in the Saudi economy. Despite steady expansion in producing sectors such as manufacturing, agriculture, electricity, gas, and water, their share in the total decreased in 1980 and 1985 due to the sharp decline in construction activity. However, their share has increased since then. Figure 5.6 shows that both private and government sectors had a static share in real GDP during the fifth and sixth development plans (1990-2000). Despite that, increasing the role of the private sector and reducing the government role was one of the main objectives of these plans.

Table 5.7. Real GDP by Oil and Non-Oil Sectors (in million SR)

Year	GDP	Share of oil in GDP(%)	Total non-Oil Sector	Non-oil Sector Private	Non-oil Sector Govt.	Private /non-Oil GDP (%)	Govt./non-Oil GDP (%)	Private/GDP(%)
1970	145,037	65.75	49,675	18,753	30,922	37.75	62.25	12.93
1975	365,829	46.88	194,321	130,689	63,632	67.25	32.75	35.72
1980	512,403	47.98	266,560	187,841	78,719	70.47	29.53	36.66
1985	404,685	22.86	312,160	208,543	103,617	66.81	33.19	51.53
1990	476,225	35.71	306,149	197,041	109,108	64.36	35.64	41.38
1995	549,963	37.63	342,990	217,644	125,346	63.45	36.55	39.57
2000	623,237	34.12	410,585	266,437	144,148	64.89	35.11	42.75

-Source: Calculated by author based on data from SAMA annual report, 2003.

Table 5.8. Sector Share of Non-Oil Real GDP (in Million SR)

	Sector share 1975	Sector /non-oil GDP (%)	Sector share 1980	Sector /non-oil GDP (%)	Sector share 1985	Sector/ non-oil GDP(%)	Sector share 1990	Sector/non -oil GDP(%)	Sector share 2000	Sector/ non-oil GDP(%)
Producing Sector										
Agric.	7,186	3.7	10,386	3.68	17,865	5.47	29,150	9.06	35,789	8.28
Mining	1,564	0.75	1,405	0.50	1,657	0.51	1,648	0.51	2,517	0.58
Manuf.	8,652	4.18	12,707	4.50	22,697	6.95	23,168	7.20	47,134	10.90
Const.	44,339	21.40	56,008	19.85	39,489	12.09	31,483	9.78	41,755	9.66
Utilities	761	0.37	2,552	0.90	3,624	1.11	4,564	1.42	8,561	1.98
Sub total		30.17		29.44		26.14		27.98		31.41
Service sector										
Trade	11,539	5.57	25,873	9.17	33,633	10.30	31,535	9.80	48,183	11.15
Transp	10,602	5.12	16,271	5.77	21,666	6.64	21,492	6.68	29,015	6.71
Real estate	40,180	19.39	57,611	20.42	53,722	16.45	41,193	12.80	43,176	9.99
Finan &Ins	16,141	7.79	23,652	8.38	27,787	8.51	27,298	8.48	33,369	7.72
Govt	66,217	31.96	75,699	26.83	104,361	31.96	110,223	34.26	142,767	33.03

-Source: Calculated by the author based on data in SAMA annual report, 2003.

Figure 5-3. Banks Claims on Private Sector by Economic Activity

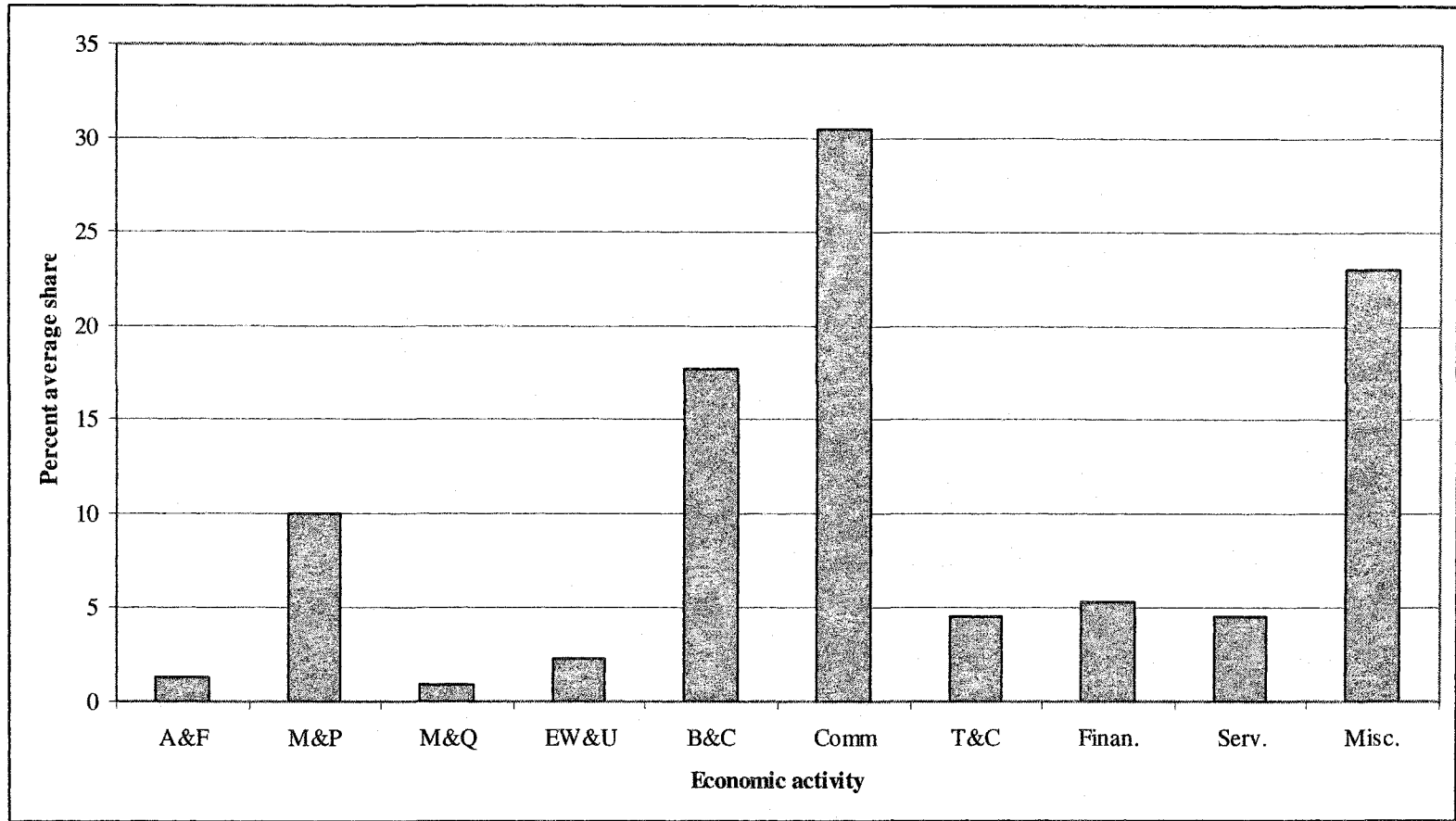


Figure 5-4. The Relationship between Foreign Assets held by Banks and Credit to Private Sector

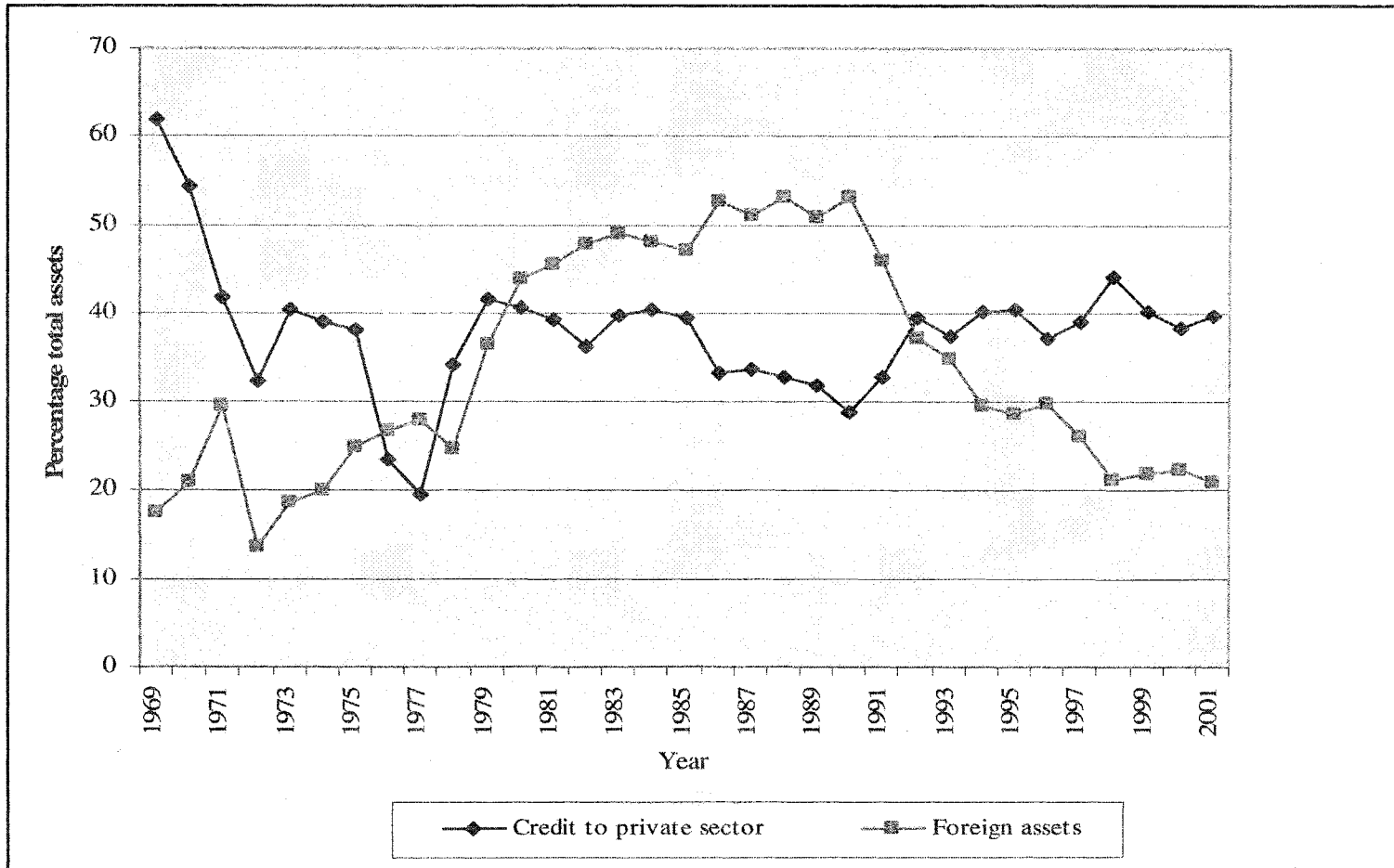


Figure 5-5. Average Investment Credit Disbursed by Government Credit Institutions

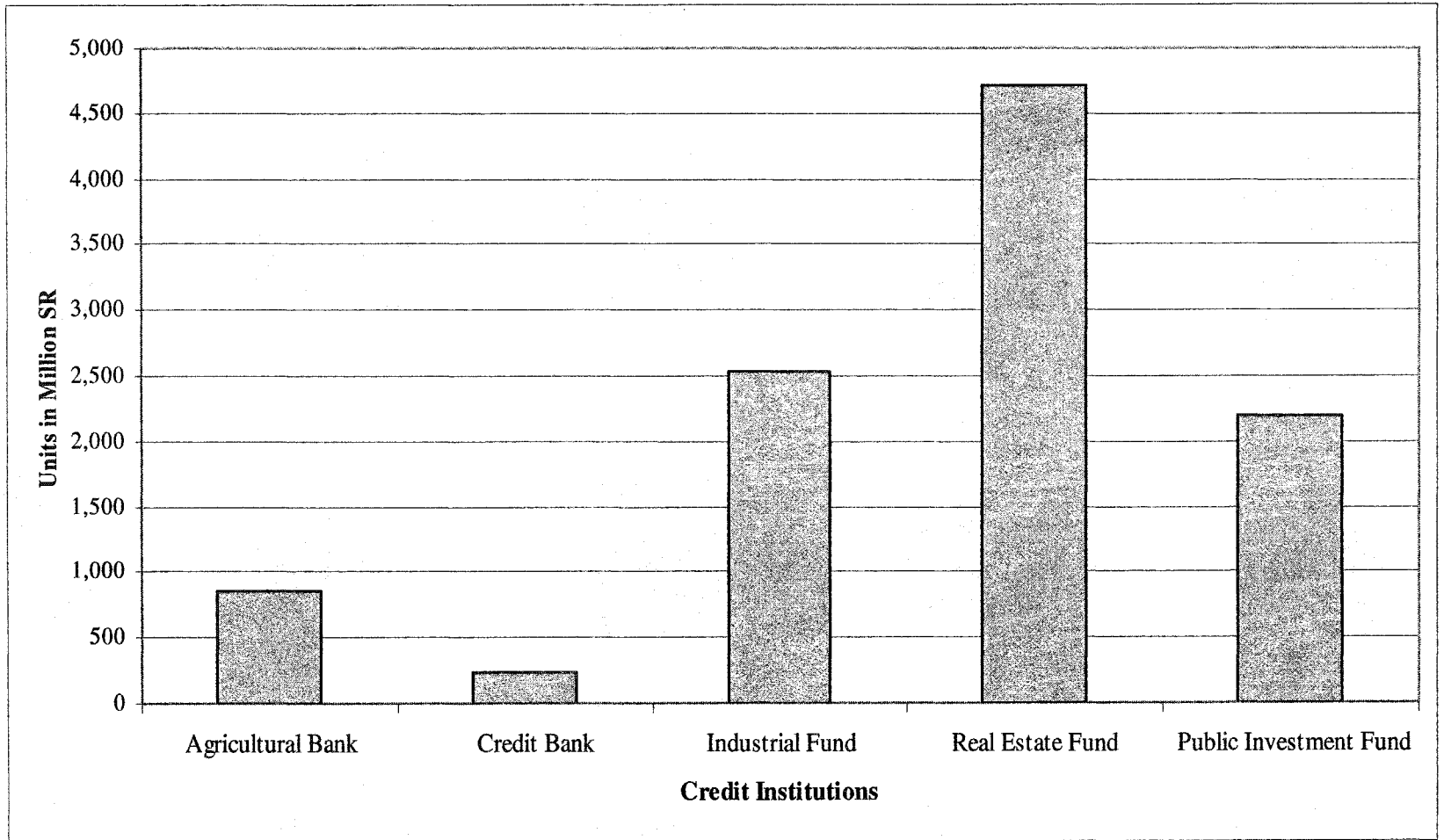


Figure 5-6. Non-Oil Private, and Non-Oil Government Sectors in Non- Oil GDP

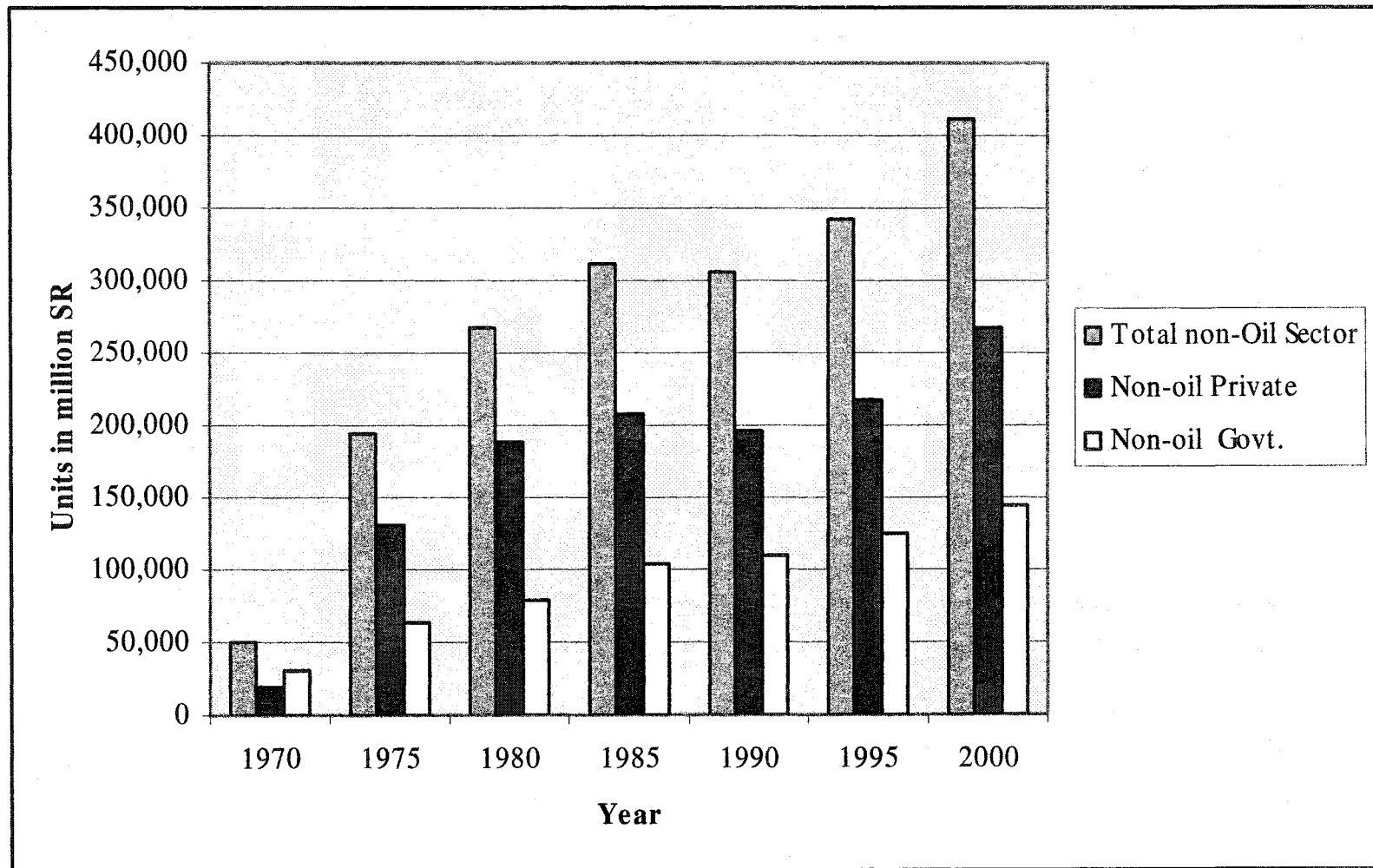
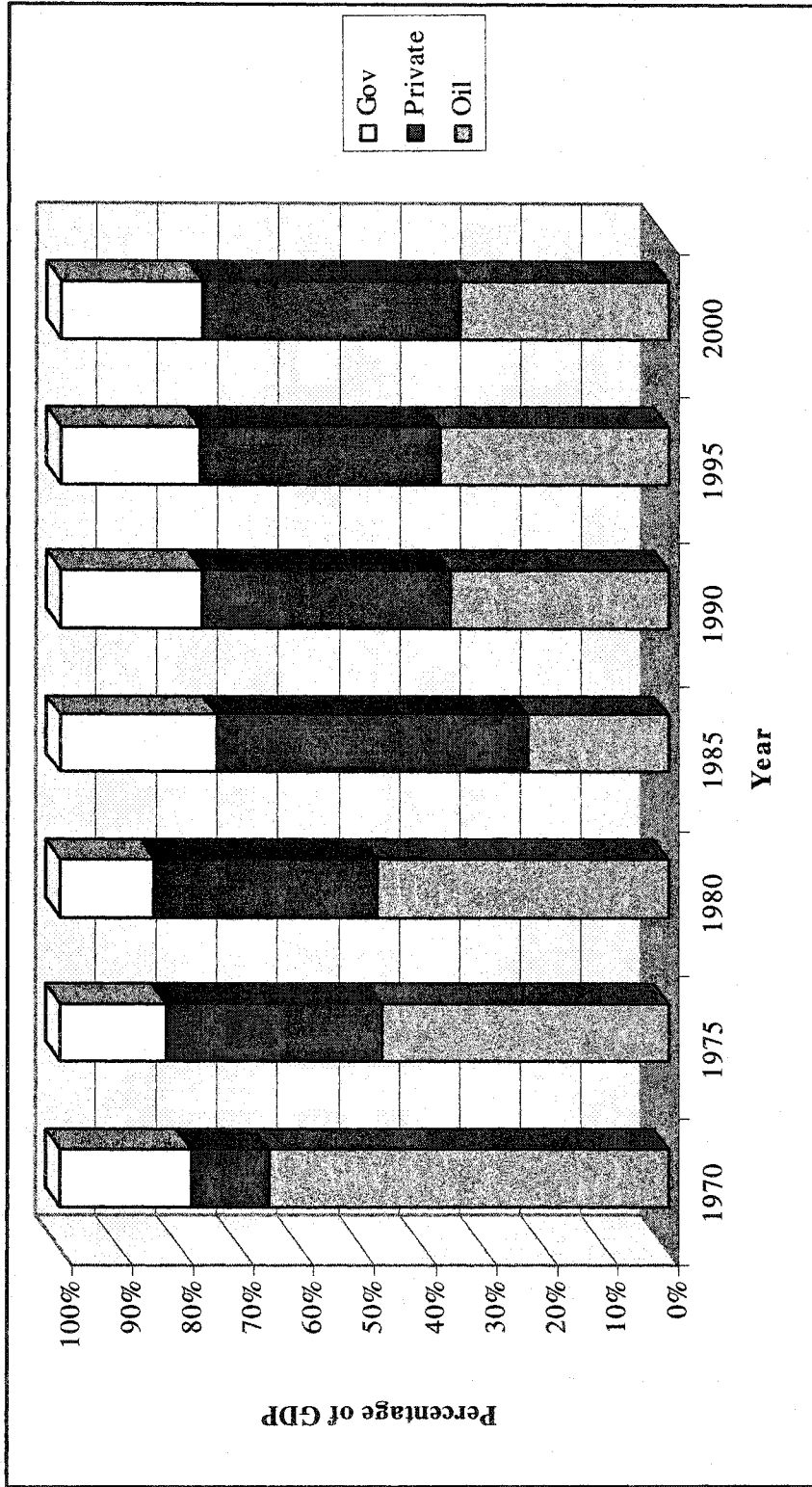


Figure 5-7. Share of Private, Government and Oil Sectors in GDP



5.5 Incentives to the Private Sector

Among the government incentives provided to the private sector (industrial and agricultural) are:

1- Long-term leasing of industrial sites: In addition to the two cities affiliated with the Royal Commission for Jubail and Yanbu, the government has established eight well- equipped industrial parks in major cities. These sites in the parks are available to owners of licensed industrial projects at a nominal rent (US\$0.03/sq.m) that is far less than is found outside the parks. In addition to that, industrial projects are being provided water, electricity, and other fuels at low prices.

2- Exemption from Customs Duties: All commodities entering the country as inputs for industrial production and spare parts are exempt from customs duties.

3- Industrial Loans: The Saudi Industrial Development Fund provides interest-free medium- and long-term loans to industrial establishments for up to 50 percent of the total cost of the project. If the Saudi share is less than 50 percent, fund financing will be granted at a proportionately reduced level. The payback period is up to 15 years, with a 2-year grace period from the start of production.

4- Preferential treatment for locally manufactured goods in government procurements. The government gives preference to national products and joint ventures, with at least 25 percent Saudi equity for this preference. Specifically, government institutions must give priority to national products in drafting specifications for government projects, as long as they are available at prices no more than 10 percent higher than those of foreign goods. A 5 percent preference is given to goods produced

(with at least 40 percent value added) in Gulf Cooperation Council countries by a company that is at least 51 percent owned by GCC nationals. Requirements include:

- Government advertisements should announce that government institutions give priority to national products.
- The use of national products must be specified in public works contracts between government institutions and contractors.

5- Tariff protection: To encourage domestic products, protection is granted from competing imports to similar locally produced items.

6- Exporting: The government actively encourages the private sector to increase Saudi exports to the foreign markets. The following are incentives to Saudi exporters to enter foreign markets:

- The establishment of the Saudi Exports Program (SEP) in 1999 to provide financing, guarantee, and insurance facilities in order to enhance the export of non-oil products and services.
- Bilateral trade agreements with some Arab countries that give market access to Saudi products.
- Bilateral “double taxation” relief agreements with some countries.
- Fifty percent reduction of ports fees on all exports of national industries.
- Ten-day exemption from storage fees for exported goods after clearing Saudi customs.

5.6 Trends in Private Investment

Table 5.9 represents trends of real gross fixed capital formation for both government and private sectors in three categories: construction equipment, transportation equipment, and machinery and equipment. Changes in the behavior of private investment in Saudi Arabia during the period 1969-2001 reflect the sensitivity of private investor decision to the instability in government expenditure. Looking closely at the numbers presented in table 5.9, it may be observed that the behavior of private investment is linked closely to changes in government expenditure, which fall into three phases.

The first was during the 1970s and early '80s (1970-1983). This period was characterized by increasing trends in investment behavior due to an increase in oil revenue that led to an increase in government expenditure on infrastructure projects such as roads, bridges, schools, hospitals, ports, airports, electricity system, refineries, housing, communication, desalination projects, agricultural business, and petrochemical plants. Looney stated, the "Saudi government has spent more on infrastructure in the period (1970-1985) than any nation in history over a similar time span" (Looney, 1994). As a result, aggregate private investment increased from SR14,098 million in 1969 to SR84,919 million in 1983.

Private investment in construction equipment had the largest share in terms of value relative to the other two categories. It increased from SR11,961 million in 1969 to SR50,462 million in 1983 (322%) with an average annual growth rate of 12 percent.

Private expenditure on transportation equipment increased from SR1,566 million in 1970 to SR21,581 million in 1977 (1,277%) with an annual average growth rate of 25

percent. Private investment in machinery and equipment increased from SR548 million in 1969 to SR15,028 million in 1983 (2,473%) with an annual average growth rate of 38 percent. Government investment in construction equipment increased from SR5,492 million in 1969 to SR97,996 million in 1982 (1,684%) with a 30 percent annual average growth rate, while government investment in transportation equipment increased from SR173 million in 1969 to SR1,428 in 1978 (725%) and recorded the lowest average growth rate at 12 percent. Government investment in machinery and equipment increased from SR368 million in 1969 to SR19,303 million in 1981 (5,145%) with an annual average growth rate of 53 percent. Much of the induced domestic investment over this period was in the provision of non-traded inputs to the service and construction sectors. In addition, this period witnessed the introduction of a package of incentives to the private sector such as subsidies, soft loans, etc.

The second period, from 1984 to 1990, recorded a decline in trends. Both public and private investments fell since the mid-1980s. A major reason for this was the sharp decline in oil revenues that was reflected in government expenditures. Aggregate private investment dropped from SR84,919 million in 1980 to SR27,824 in 1990 (-67%). Private investment in construction equipment had the most severe drop, declining by 64 percent from SR50,462 million in 1983 to SR18,044 million in 1989. The transportation equipment sector dropped from SR19,429 million in 1983 to SR 5,155 million in 1990, representing a decline of (-77%). Private expenditure on machinery and equipment decreased from SR15,028 million in 1983 to SR4,164 million in 1990, a decline of (-72%). These sectors showed negative growth, respectively, of 13, 16, and 16 percent. Government expenditure on construction equipment dropped

from SR97,996 million in 1982 to SR22,299 million in 1988, (-77%); government expenditure on transportation equipment dropped from SR1,428 million in 1978 to SR134 million in 1984 (-90%); and machinery and equipment expenditure dropped from SR19,303 million in 1981 to SR1,501 million in 1990 (-92%).

During the third period, from 1991 to 2001, private investment showed positive growth rates due to improvement in oil revenues and government expenditure. Aggregate private investment increased from SR28,006 million in 1990 to SR86,805 million in 2001, a gain of 210 percent. Private expenditure on construction increased from SR18,044 million in 1989 to SR46,032 million in 2001 (155%), with an annual average growth rate of 10 percent. Machinery and equipment expenditure increased from SR4,164 million in 1990 to SR21,164 million in 2001 (408%), with an annual average growth rate of 20 percent. Transportation equipment expenditures increased from SR5,156 million in 1990 to SR19,584 million in 2001 (280%), with an annual average growth rate of 14 percent. On the other hand, government investment in construction showed a negative annual growth rate of 4.1 percent while, transportation showed positive growth of 58 percent. Expenditures on machinery and equipment showed a positive growth rate of 23 percent. Figures 5-9 and 5-10 present private investment in machinery and equipment and private investment in construction equipment during the period 1969-2001; preliminary examination of these graphs show that private investment in these two sectors follows the same trend as government investment, indicating high dependence on government investments. On the other hand, private investment in transportation equipment in figure 5-8 shows a trend opposite to

government investment. This may lead one to conclude that a crowding-out effect is supported by the data, particularly during the periods 1975, 1985, 1991, and 1994.

5.7 Barriers Facing the Private Sector in Saudi Arabia

1- The lack of skilled human resources

This deficiency has always been a main weakness in Saudi Arabia. The problem was not confined to the small size of the population, and resulting small supply of labor, but also to the unwillingness of local manpower to join the private sector (some industrial and service sector). Both high school and university graduates, as well as unqualified locals, prefer government careers because of security and prestige.

2- Inadequacy of funding

In spite of the abundant liquidity in Saudi Arabia, the problem of finance is, thus far, among the main obstacles facing private investors. The commercial banks are quite conservative when financing some private projects, particularly in the case of small and medium enterprises sector (SMEs). Commercial banks are not investment oriented and the banking sector is dominated by a small numbers of banks (11 banks) compared to some countries in the region such as the United Arab Emirates (UAE) with 46 institutions and Lebanon with 70.

3- Lack of information

Private investors usually face difficulties in finding precise data or statistics, and the published data usually differ from one economic organization to another to an extent

that makes it difficult for investors to plan their projects. Added to this, the number of domestic research houses that specialize in conducting industrial studies or feasibility studies is small, and most of them are not up to global standards in terms of experience and quality of service.

4-Business environment

The performance of all firms, small and large, is affected by the business environment in which they operate. Bureaucratic barriers, rules for hiring workers, and the lack of a legal framework for commercial dispute resolution and enforcement are all issues that constrain the growth of the private sector and, in particular, the attraction of foreign direct investment in Saudi Arabia⁵

5- The limited domestic market size and high dependence on government

Another factor hindering the growth of the private sector is the small size of the domestic market. This represents a major obstacle for the private sector. It is obvious that a local free market opens the door for imports from all countries to compete with domestic products.

⁵ In fact the legal system in Saudi Arabia has been described by the Economist Intelligence Unit as arcane, and many businesses points to the difficulty of obtaining equitable arbitration in commercial disputes as key obstacle to business development.

Domestic competition among local industries has pushed the latter to react in one of two ways--either to sacrifice quality to be able to compete with cheaper imports or to sacrifice profits to compete with good imports. In addition to that, the Saudi private sector has shown a historical dependence on government expenditure, particularly on the part of contracting companies, that affects its ability to diversify its production activities that are independent of government expenditures.

5.8 Economic Reforms and private investment

One of the major challenges facing Saudi economic policy-makers is persuading Saudi investors to invest a large part of the private capital they now have overseas. According to estimates, this totals around \$250 billion in foreign banks and another \$600 billion in investments (Cordesman, 2002). In order to attract this investment capital to the domestic market, the Saudi government is pursuing some economic policies and reforms that should help attract more of the domestic and foreign investment it needs. The economic reforms include the creation of the Supreme Economic Council (SEC), to ensure coordination among the various agencies and integration of their activities with respect to economic issues; the General Investment Authority, to promote foreign direct investment; and the Supreme Tourist Authority, to develop and expand the tourism industry. The government created a Fund for National Manpower Training in 2000. It also approved an amendment to the social insurance system to make it easier to transfer workers between government and private jobs, and issued regulations to allow the private sector to finance and operate private colleges. In 2001, the government gave the SEC the mission of coordinating and supervising

privatization and creating a plan and time schedule for privatizing sectors like communication (30 % of the, company was sold to the public in 2002) and the postal service as well as the electricity sector (Appendix A presents the government privatization strategy). The government is also planning to privatize the General Railway Organization and a number of facilities of the General Port Sector. Membership in the World Trade Organization (WTO) and greater foreign investment will also require greater opening-up of sectors such as banking, advertising, and public relations. With new capital markets and with a new mining code either enacted or in the process of being adopted, a positive environment will be created in which industry and commerce can develop.

Table: 5.9. Trends of Government and Private Investment (million SR)

Year	TP	TG	MP	MG	CP	CG
1969	1,589	173	548	368	11,961	5,492
1970	1,566	178	572	460	12,251	17,895
1971	1,597	193	608	521	13,358	20,236
1972	2,188	302	648	244	16,028	27,415
1973	3,433	544	815	1,118	18,011	36,498
1974	7,033	1,197	822	1,457	32,576	58,163
1975	13,845	775	3,186	3,982	29,039	75,573
1976	2,034	1,415	3,190	10,053	31,120	71,539
1977	21,581	1,308	3,237	9,182	28,569	94,293
1978	18,718	1,428	3,266	7,759	28,374	106,324
1979	17,888	1,123	3,644	12,736	31,499	118,319
1980	14,283	1,141	7,037	16,976	36,466	117,351
1981	15,431	1,088	10,134	19,303	37,739	92,262
1982	16,416	1,316	1,114	16,401	41,162	97,996
1983	19,429	209	15,028	12,413	50,462	93,434
1984	14,904	134	11,336	9,299	39,221	65,434
1985	10,587	2,686	9,979	8,222	37,066	115,654
1986	10,209	2,398	7,957	5,632	28,039	27,487
1987	9,142	2,515	6,776	4,683	27,410	29,309
1988	8,180	2,236	6,197	3,858	23,027	22,299
1989	6,857	2,039	6,153	4,179	18,044	24,383
1990	5,155	6,684	4,164	1,501	18,505	33,700
1991	6,860	6,950	5,460	1,552	21,311	33,846
1992	10,710	1,131	5,515	4,216	36,964	26,750
1993	12,659	1,854	10,303	4,225	40,390	24,697
1994	11,786	1,784	9,197	3,592	34,126	19,321
1995	10,022	1,547	6,108	3,140	33,908	19,581
1996	9,654	1,540	7,860	3,147	34,402	20,538
1997	14,226	367	10,134	2,744	36,746	25,822
1998	15,278	225	18,333	955	41,138	9,432
1999	18,213	2,294	20,033	2,044	42,673	7,276
2000	19,287	474	20,843	3,724	46,018	10,787
2001	19,585	504	21,164	3,958	46,032	11,471

-TP is real private investment in transportation, MP is real private investment in machinery and equipment, CP is real private investment in construction, TG is real government investment in transportation, MG is real government investment in machinery and equipment, CG is real government investment in construction.

- Source: National Accounts, Central Department of Statistics, MOEP, various issues.

Figure 5-8. The General trend of Private and Public Investment in Construction Equipment

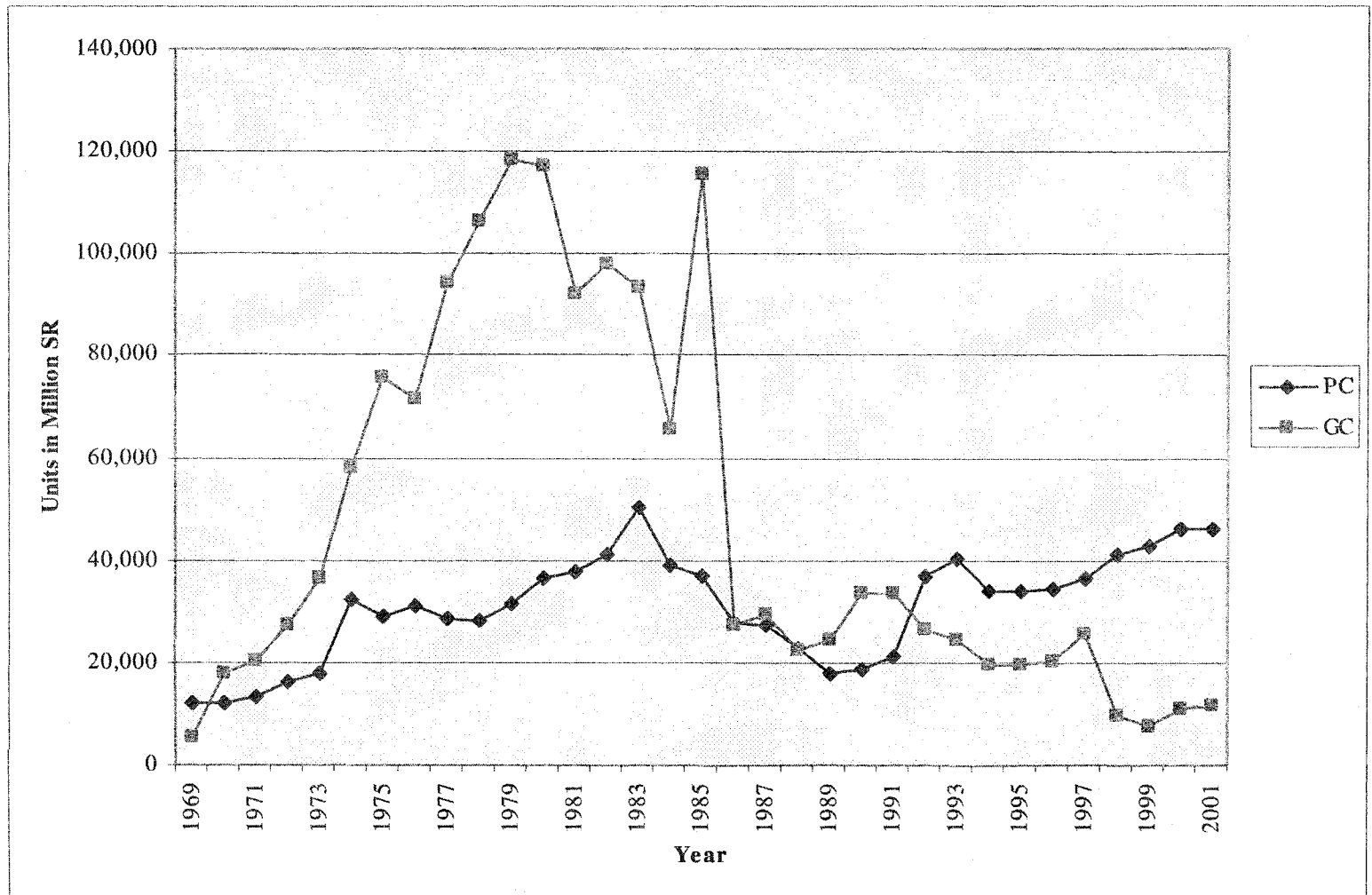


Figure 5-9. The General Trend of Private and Public Investment in Machinery and Equipment

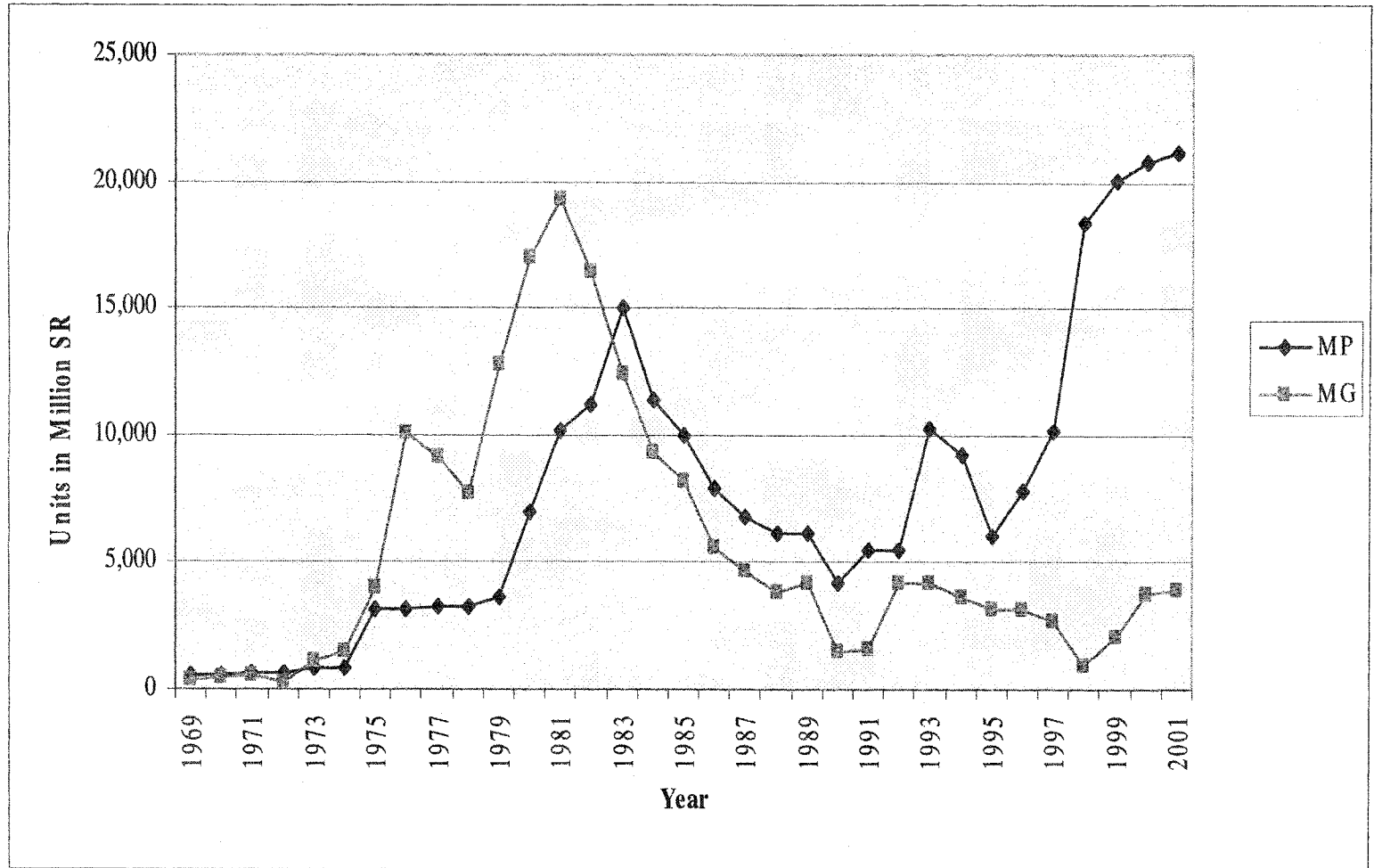
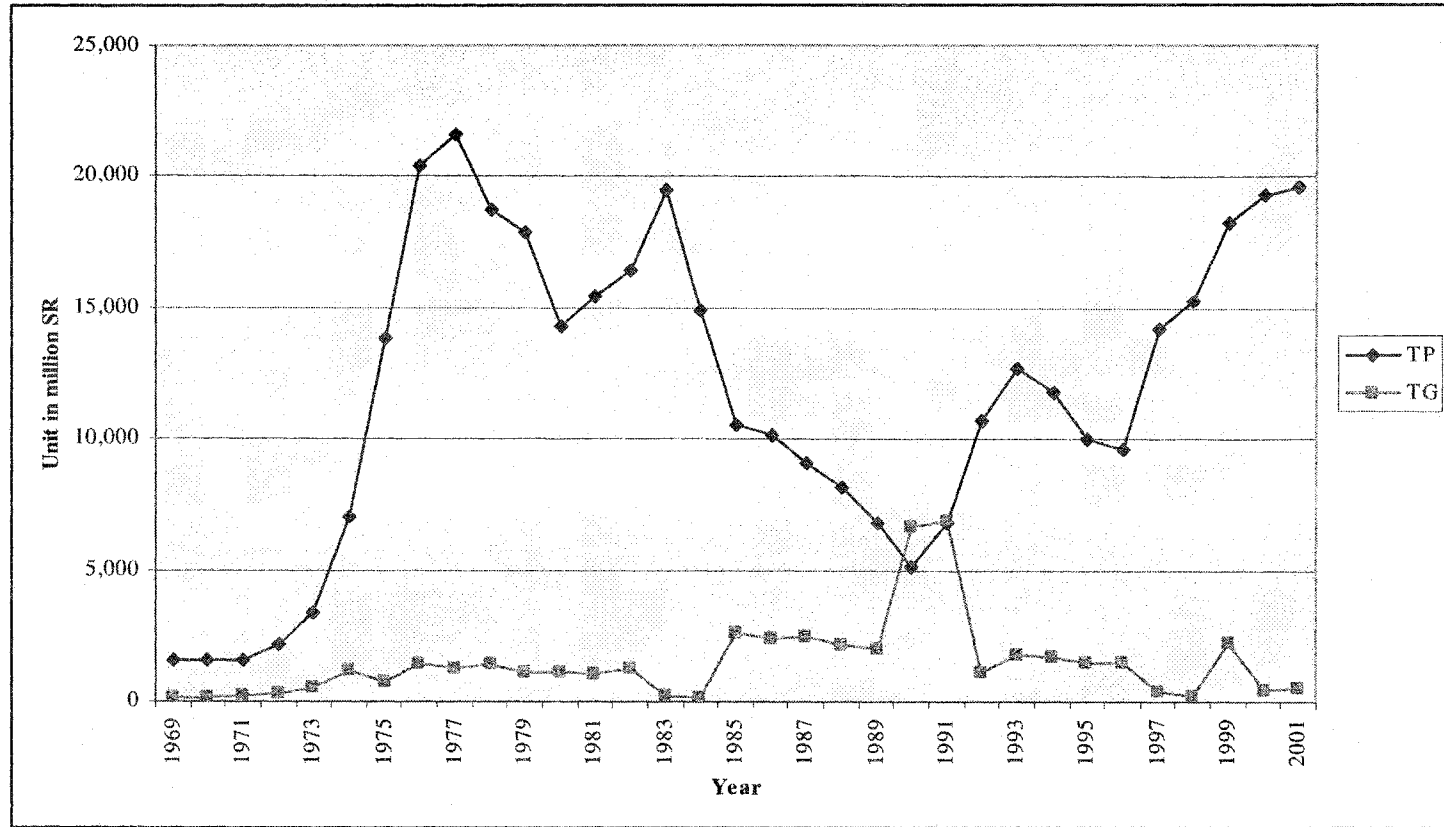


Figure 5-10. The General trend of Private and Public Investment in Transportation Equipment



CHAPTER SIX EMPIRICAL ESTIMATION AND RESULTS

6.1 Introduction

This chapter is devoted to explaining the empirical results we obtained by applying the Johansen and Juselius (1990) maximum likelihood approach for cointegration to determine whether there exists a stable long-run relationship between private investment in categories such as construction equipment, machinery, and equipment and transportation equipment and their determinants. Specifically, the purpose of the empirical study carried out in this dissertation is to examine the dynamic relationships among macroeconomic variables suggested by economic theory and previous empirical studies that determine private investment behavior. In addition to the results of the cointegration test, this chapter also presents the empirical results of the Granger causality test in the Error Correction Model (ECM).

6.2 The Model

Based on the review of the literature and the equation which was outlined and derived in chapter three, we can specify the following general form .

$$I_{it} = f (Q_t, CRD_t, R_t, GI_t, BD_t, GM_t) \quad (6.2.1)$$

Where, $i = C_t$ is private investment in construction equipment, M_t represents private investment in machinery and equipment, and T_t , stands for private investment in transportation equipment. The independent variables are: Q_t , change in output; CRD_t ,

credit available to the private sector; R_t , interest rate; BD_t , budget deficit; GM_t , general market condition; and GI_t , government investment for each type of investment. The model for each type of private investment will be as follows:

$$C_t = \theta \alpha_0 \varphi_1 [Q_t^* - (1 - \delta) Q_{t-1}^*] + \alpha_1 CRD + \alpha_2 R + \alpha_3 GIC + \alpha_4 BD + \alpha_5 GM + (1 - \alpha_0)C_{t-1} \quad (6.2.2)$$

$$T_t = \theta \alpha_0 \varphi_1 [Q_t^* - (1 - \delta) Q_{t-1}^*] + \alpha_1 CRD + \alpha_2 R + \alpha_3 GIT + \alpha_4 BD + \alpha_5 GM + (1 - \alpha_0)T_{t-1} \quad (6.6.3)$$

$$M_t = \theta \alpha_0 \varphi_1 [Q_t^* - (1 - \delta) Q_{t-1}^*] + \alpha_1 CRD + \alpha_2 R + \alpha_3 GIM + \alpha_4 BD + \alpha_5 GM + (1 - \alpha_0)M_{t-1} \quad (6.6.4)$$

We then take the log of each variable; the reason for taking their natural logs is to reduce the variation of the series (Pindyck and Rubinfeld, 1991).

6.3 Data source and variables description

This study covers the period from 1969-2001; the data used for estimation are annual observations. Gross fixed capital formation represents the total value of new or existing fixed assets during the accounting period (MOEP, 2003). Data on gross private and public fixed capital formation for each sector are obtained from National Accounts, various issues published by the Saudi Arabia Ministry of Economy and Planning; Central Department of Statistics (CDS); and figures are deflated by the CDS capital formation deflator.

Expected output, Q , is proxied by real Gross Domestic Product (GDP). Nominal GDP is taken from the SAMA annual report for 2003 and converted into real terms by

the GDP deflator (1999=100). Nominal credit to private sector, CRD, nominal budget deficit, BD, and government expenditure are also taken from the SAMA annual report for 2003, converted by the GDP deflator. Nominal interest rate, R, is proxied by the Euro-dollar interest rate obtained from the International Monetary Fund International Financial Statistics (IFS) yearbook (various issues).

The dependant variable is private investment for each sector expressed as ratios to real GDP. The government investment variable for each sector is expressed as a ratio to real government expenditure.

6.4 Cointegration test

Cointegration is a technique used to test whether or not there exists a long-run relationship between non-stationary economic variables. There are two methods for estimating the cointegration variable—the Engle and Granger’s cointegration test procedure and the Johansen maximum likelihood procedure. The first test approach is limited to bivariate analysis, while the other test is developed to test multivariate series. The latter is the most widely accepted procedure for cointegration analysis in the current literature. The Johansen maximum likelihood procedure is summarized in the following Error Correction form:

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \dots + \Gamma_{k-1} \Delta X_{t-k+1} + \Pi X_{t-k} + \gamma + \varepsilon_t \quad (6.4.1)$$

where ΔX_t represent the vector of observations on all variables in the system at time t, the Γ s are estimable parameters in the short run, γ is some constant vector, ε_t is a vector of white noise, and the Π matrix contains the cointegrating relationships. All

variables must be non-stationary in levels. It is hypothesized that $\Pi = \alpha \beta$, where the cointegrating vectors are in the β matrix and the α matrix, describes the speed of adjustment for each variable change to return to their long-run equilibrium (Philips and Cutler, 1998). However, before applying this technique, the degree of integration of each variable must be determined. To do this, the Augmented Dickey Fuller test (ADF) is used.

6.5 Test results for unit roots

The first step in the process of applying cointegration is to establish whether the series are non-stationary. A common technique used to determine this is the ADF approach.⁶ According to the results in Table 6.1, the null hypothesis of the unit root is accepted for the level of the series except for the general market condition variable (GM). As a result, this variable is excluded from the analysis. The decision rule is, if the absolute calculated values are lower than the absolute critical values, then the series have a unit root or are non-stationary.

According to the result in Table 6.2, the null hypothesis of unit root is rejected at the 1 percent, and 5 percent levels. This suggests that each variable is non-stationary in the level and stationary in the first difference. No further tests are performed. We therefore maintain the null hypothesis that each variable is integrated of order one. The lag length for each series is determined based on Schwarz Bayesian Criterion (SBC) and Akaike Information Criterion (AIC)

⁶ Consider the relation $Z_t = a_1 Z_{t-1} + v_t$. If $a_1 = 1$, then the series is I(1) but if $a_1 < 1$, then the series is I(0). Subtracting Z_{t-1} from both sides results in $\Delta Z_t = \gamma Z_{t-1} + v_t$, where $\gamma = a_1 - 1$. If $\gamma = 0$, then the series is non-stationary and if $\gamma < 0$, then the series is stationary.

Table 6.1. Augmented Dickey-Fuller Tests, in Level

Variables	ADF: intercept	ADF: Intercept &Trend	ADF: None
LQ	-2.39	-2.84	1.13
LR	-2.47	-3.20	-0.89
LM	-1.27	-1.94	-1.25
LC	-2.35	-2.56	0.46
LCRD	1.70	-2.31	1.08
LGIT	-2.76	-3.15	-0.07
LBD	-1.98	-2.23	-2.37
LGIC	-0.56	-4.06	-0.89
LGIM	-1.98	-3.19	- .01
LT	-3.25	-3.16	-1.01
GM	-3.707	-3.7	-2.73

critical values	intercept	Intercept &Trend	None
	1% -3.66	1% -4.28	1% -2.64
	5% -2.96	5% -3.56	5% -1.95
	10% -2.62	10% -3.21	10% -1.61

Table 6.2. Augmented Dickey-Fuller Tests, in First Difference

Variables	ADF: Intercept	ADF: Intercept & Trend	ADF:None
LQ	-8.56	-8.69	-8.35
LR	-3.93	-3.86	-3.96
LM	-5.71	-5.61	-5.58
LC	-5.07	-5.02	-5.16
LCRD	-5.11	-5.39	-6.03
LGIT	-6.11	-5.98	-6.10
LBD	-4.20	-4.66	-4.21
LGIC	-8.11	-7.89	-7.29
LGIM	-5.78	-5.67	-5.77
LT	-3.10	-3.85	-3.10

Critical Values:	Intercept:	Intercept & Trend:	None:
	1%:3.66	1%:-4.28	1%:-2.64
	5%:2.96	5%:-3.56	5%:-1.95
	10%:2.61	10%:-3.21	10%:-1.61

6.6 Test results for cointegration

There are two Johansen cointegration tests. First, the maximum likelihood estimation procedure provides a likelihood ratio test called a trace test, which evaluates the null hypothesis of most r cointegration vectors versus the general null p cointegrating vectors.

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^n \ln(1 - \hat{\lambda}_i) \quad (6.6.1)$$

The second likelihood ratio test is the maximum eigenvalue test, which evaluates the null hypothesis of r cointegration vectors against the alternative of $r+1$ cointegrating vectors (Harris, 2003).

$$\lambda_{max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1}) \quad (6.6.2)$$

Where;

$\hat{\lambda}_i$ = the estimated values of the characteristic root (eigenvalues)

T= the number of observations

In this study we prefer the maximum eigenvalue test result in determining the number of significant cointegrating vectors, following Enders (1995, p. 393), who stated, "The maximum eigenvalue test has the sharper alternative hypothesis. It is usually preferred for trying to pin down the numbers of cointegration vectors." Also,

Maddala and Kim (1998, p. 211) stated, "Johansen and Juselius (1990) suggest that the maximum eigenvalue test may be better."

The null hypothesis of no cointegration among variables (i.e., $r = 0$) was rejected; the maximum eigenvalue test statistic exceeded both the 95 and 90 percent critical values. For $r \leq 1$, we fail to reject the null hypothesis since the calculated values of λ_{\max} are less than the corresponding critical value at the 5 percent level for all three sectors. Thus, the results of the maximum eigenvalue test conclude that there is one cointegrating equation (CE) for each sector.⁷ Tables 6.3, 6.4, and 6.5 illustrate test results for construction equipment, transportation equipment, and machinery and equipment private expenditures.

Table 6.3. Maximum Eigenvalue Test for Construction Equipment

Null Hypothesis	Alternative Hypothesis	Test Statistic	95% Critical value	90% Critical value
$r = 0$	$r = 1$	44.7	39.83	36.84
$r \leq 1$	$r = 2$	32.79	33.64	31.02
$r \leq 2$	$r = 3$	27.19	27.42	24.99
$r \leq 3$	$r = 4$	17.31	21.12	19.02
$r \leq 4$	$r = 5$	13.1	14.88	12.98
$r \leq 5$	$r = 6$	2.13	8.07	6.5

⁷ The trace test indicated the existence of two cointegrating vectors for construction equipment and machinery and equipment, and one for transportation equipment

Table 6.4. Maximum Eigenvalue test for Transportation Equipment

Null Hypothesis	Alternative Hypothesis	Test Statistic	95% Critical value	90% Critical value
$r = 0$	$r=1$	52.45	39.83	36.84
$r \leq 1$	$r=2$	23	33.64	31.02
$r \leq 2$	$r=3$	20.66	27.42	24.99
$r \leq 3$	$r=4$	14.16	21.12	19.02
$r \leq 4$	$r=5$	7.02	14.88	12.98
$r \leq 5$	$r=6$	3.89	8.07	6.5

Table 6.5. Maximum Eigenvalue test for Machinery and Equipment

Null Hypothesis	Alternative Hypothesis	Test Statistic	95% Critical value	90% Critical value
$r = 0$	$r=1$	88.75	39.83	36.84
$r \leq 1$	$r=2$	23.81	33.64	31.02
$r \leq 2$	$r=3$	22.71	27.42	24.99
$r \leq 3$	$r=4$	11.52	21.12	19.02
$r \leq 4$	$r=5$	7.68	14.88	12.98
$r \leq 5$	$r=6$	6.15	8.07	6.5

Note: The letter r represents the number of cointegrating vectors

Based on the unit root test result, the GM variable was excluded. Hence, equations (6.2.2)-(6.2.4) will be estimated without GM variables.

Before interpreting the cointegration results, it is necessary to consider the statistical property of the estimated equations. These equations were tested for normality and serial autocorrelation. The results, reported in Table 6.6, suggest that the residuals are normally distributed, and the null hypothesis of no autocorrelation existing in the residuals of all equations was accepted. R-square for construction shows that 66 percent of variation is explained by the model, 60 percent of variation in transportation equipment equation is explained, and, in the case of machinery and equipment, 58 percent of variation in is explained by the model. D-W statistics indicates, the rejection of positive auto-correlation.

Table 6.6. Diagnostic Tests

Diagnostic Tests	Construction equipment Eq	Transportation equipment Eq	Machinery and equipment Eq
Serial correlation	0.0925	1.03	0.264
Normality test	1.1	1.24	0.089
R-square	.66	.60	.58
DW-statistics	1.98	2.0	1.90

The estimated cointegrating (long-term) equations normalized on dependant variables are reported below with standard errors. The signs on the variables in table 6.7 are reversed because they are on the left side of the equation. The error term ε_t describes departure from the long-run equilibrium.

The results in Table 6.7 indicate that we have three cointegrating equations, one for each sector, and that each is normalized on the dependent variable. Each equation shows that the variables are moving together toward a stable long-run equilibrium state, indicating the direction where such equilibrium exists. The economic interpretation of a long-run relationship between variables by the cointegration equations will be as follows:⁸

1- Change in income (expected change in output) has a positive significant stimulative effect at the 1 percent level on private investment on all three cointegration equations, the large coefficient indicating a strong accelerator effect by creating a direct demand for private investment output. This finding indicates that a rapidly growing economy would boost private sector expectations and enhance private investment, while a recessionary economy causes pessimistic expectations. This leads investors to postpone investment until recovery takes place.

⁸ A n effort has been made to include a dummy variable for the years from 1973 to 1985. The t-values for this variable were low and the significance level of other variables such as government investment were affected. Therefore, we dropped this variable from the regression.

Table 6.7. Cointegrated Equations

$1.0 LC - .57 LQ_{-1} - .25 LCRD_{-1} + .30 LR_{-1} - .11 LGIC_{-1} - .05LBD = \varepsilon_{cons} \quad (6.6.3)$ <p style="text-align: center;"> (.13)** (.04)** (.07)** (.05)* (.03)* </p>
$1.0 LT - 3.5 LQ - .35 LCRD_{-1} + .99 LR_{-1} + .35 LGIT_{-1} + .45 LBD = \varepsilon_{trns} \quad (6.6.4)$ <p style="text-align: center;"> (.68)** (.16)* (.33)** (.10)** (.17)** </p>
$1.0 LM - 1.7 LQ - 1.66 LCRD + .48 LGIT_{-1} - .40 LGIM + .39 LBD = \varepsilon_{mach} \quad (6.6.5)$ <p style="text-align: center;"> (.17)** (.16)** (.04)** (.11)** (.05)** </p>

LC= log real private investment in construction as ratio of GDP,

LT= log real private investment in transportation as ratio of GDP,

LM= log real private investment in machinery as ratio of GDP

LQ= log change in real output

LCRD= log real credit available

LR =log interest rate

LGIC= log real government investment in construction as ratio of govt expenditure

LBD= log of real budget deficit

LGIT= log real government investment in transportation as ratio of govt expenditure

LGIM= log real government investment in construction as ratio of govt expenditure

a) Standard error in parentheses

b) *Significant at 5 percent level, and ** significant at 1 percent level

Note: Microfit 4.0 used for empirical estimation

2- Government investment was found to be positive and significant at the 1 percent level in private investment in machinery and equipment and at the 5 percent level in construction equipment. This suggests that government investment has a complementary effect on private investment in those sectors. This means that government investment raises the effective demand, which encourages investors to invest because it may lead to a rise in profitability. Furthermore, government investment complements private investment because it targets activities that have strong links with the rest of the economy. For example, during the period 1972-1985, government invested heavily in nonresidential construction and machinery equipment, activities that have played a major role in developing the kingdom's physical infrastructure such as roads, airports, hospitals, schools, electricity, and water desalination plants. These investments have acted as an important catalytic agent by dramatically reducing certain costs of production and distribution for the private sector (Wai and Wong, 1982). This finding is consistent with reality, where government spending on infrastructure and incentives given to the private sector such as low-cost utilities and production inputs such as feed stock have a stimulative effect on private investment in those sectors.

In the case of the transportation equipment equation (6.6.4), government investment was negative and significant at the 1 percent level, suggesting a crowding-out effect. Theoretically, the crowding-out effect takes place when the public sector competes with the private sector either in the goods market or the financial market. This finding indicates that expansion of public investment leads to decline in private investment in transportation. This result is realistic in the case of Saudi Arabia, where

the transportation sector, such as public transportation, is dominated by three government organization: Saudi Airline (SAUDIA), Saudi Public Transportation Company (SAPTCO), and Saudi Arabian Government Railroads Organization (SAGRO), in addition to the General Seaport Authority. These agencies are heavily subsidized by the government and produce output similar to the private sector. The high negative coefficient on the budget deficit variable in equation (6.6.4) supports the hypothesis that government investment in transportation crowds out private investment directly through producing output that competes with the private sector in the goods market and indirectly through borrowing in the local credit market. The crowding-out effect of public investment in transportation support our analysis of the private investment trend discussed in chapter five.

3- Domestic credit availability was found to be positive and statistically significant at the 1 percent level in equations (6.6.3) and (6.6.5), and at 5 percent level in (6.6.4), which implies that monetary policy plays a direct role in influencing private investment behavior. This finding emphasizes the significant role of credit in stimulating investment and growth in the economy. The positive significant coefficient of this variable indicates that, despite the abundant liquidity in this economy, the private sector suffers from an inadequate supply of funds. This is clear from the low level of commercial banks lending to the private sector, especially in machinery and transportation, as described in chapter five. In this regard, it could be argued that there is an adverse effect caused by the shortage of credit to the private investors that represents a constraint on the development of the domestic economy. Therefore, lack of sufficient credit could suppress the level of production, as firms have to rely on their

own savings to finance expansion or replace working capital. Shortages or unavailability of credit to private investors can prevent a higher level of investment and economic growth (Wai and Wong, 1982; Blejer and Khan, 1984; Khan, 1988).

4- Interest rate was found to be negative, indicating an adverse impact on private investment, and was consistent with our analysis of commercial banks' foreign assets in chapter five, where the high Euro rate results in capital flight and diverts investment funds into foreign assets. This finding suggests that a high interest rate increases the cost of capital and crowds out private investment. This is also consistent with Looney (1994), who found that the interest rate has a significant negative effect on aggregate private investment decisions in Saudi Arabia. A possible explanation for this significant effect is that government lending that is considered a better substitute for commercial loans has experienced a great reduction since 1984 and, therefore, some private investors have no option but to accept the going interest rate to obtain adequate funds.

5- The budget deficit variable was negative and significant at the 1 percent level in equations (6.6.4), and (6.6.5), and at the 5 percent level in equation (6.6.3). This finding supports the hypothesis that a high budget deficit reduces private investment when government finances its expenditures by selling government bonds, competing with private firms' borrowing, which would increase the cost of funds. Contrary to expectations of a budget deficit, equation (6.6.3) seems to support private investment rather than discourage it. A possible explanation is that government expenditures such as maintenance expenses, salaries, and housing allowances, which represent 80 percent

of government expenditure in 1997, increase the demand for private sector output in this sector.

6- An attempt has been made to estimate the impact of other government investments on the behavior of private investment equations—for example, including government investment in construction in equations (6.6.4) and (6.6.5). The results were high standard error (multicollinearity) and wrong signs. Also, the diagnostic tests indicate the existence of serial autocorrelation (except for government investment in transportation), it showed a better result in terms of significance level and diagnostic tests in equation (6.6.5).⁹ Government investment in transportation equipment in equation (6.6.5) was negative and significant at the 1 percent level, indicating that the expansion of public investment in this sector leads to a decline in private investment in machinery and equipment. This finding suggests a crowding-out effect; however, it does not imply that it substitutes for private investment in machinery. When we consider that public sector subsidizing or financing of state-owned economic enterprises in the transportation sector come through borrowing from domestic banks, this may reduce the quantity of credit available to private investment. The cointegration test results show that one of the main finding is that an expanding budget deficit and subsidies to state-owned enterprises such as the transportation sector lead to a decline in private investment.

⁹ We tried to include interest rate in private investment in machinery and equipment equation (6.5.5), but the coefficient was insignificant with wrong sign. Also, the standard error for other variables such as output was high.

This result is consistent with recommendations the IMF made to the Saudi government concerning reducing the budget deficit and subsidies to inefficient state-owned enterprises.

6.7 Causality tests in ECM framework

As we noted in the methodology chapter (chapter four), the existence of cointegration among the estimated variables entails the use of ECM in order to examine causality relationships between private investment in each sector and its determinants. The following equations are examples of testing for causality in ECM for the construction equipment equation between two variables, LC and LQ.

$$\begin{aligned} \Delta LC = & \theta_1 + \mu_{1t} + \sum_{i=1}^n \alpha_{11(i)} \Delta LQ_{t-i} + \sum_{i=1}^n \alpha_{12(i)} \Delta LCRD_{t-j} + \sum_{i=1}^n \alpha_{13(i)} \Delta LR_{t-i} \\ & + \sum_{i=1}^n \alpha_{14(i)} \Delta LGIC_{t-i} + \sum_{i=1}^n \alpha_{15(i)} \Delta LBD_{t-i} + \sum_{i=1}^n \alpha_{16(i)} \Delta LC_{t-i} + \rho_1 \varepsilon_{t-1} \quad (6.6.1) \end{aligned}$$

$$\begin{aligned} \Delta LQ = & \theta_2 + \mu_{2t} + \sum_{i=1}^n \alpha_{21(i)} \Delta LQ_{t-i} + \sum_{i=1}^n \alpha_{22(i)} \Delta LCRD_{t-j} + \sum_{i=1}^n \alpha_{23(i)} \Delta LR_{t-i} + \\ & \sum_{i=1}^n \alpha_{24(i)} \Delta LGIC_{t-i} + \sum_{i=1}^n \alpha_{25(i)} \Delta LBD_{t-i} + \sum_{i=1}^n \alpha_{26(i)} \Delta LQ_{t-i} + \rho_2 \varepsilon_{t-1} \quad (6.6.2) \end{aligned}$$

Where n is lag length, the ε_{t-1} is the error-correction term lagged one period derived from the long-run relationship; it represents the disequilibrium residuals of the cointegrating equation. The inclusion of the error correction term in equations (6.6.1)

and (6.6.2) gives an extra channel through which causality may be observed. The error-correction coefficient is expected to capture the adjustment of ΔLC and ΔLQ to their long-run equilibrium (speed of adjustment). On the other hand, μ_{1t} is the disturbance error term, as in the conventional Granger causality test. A Wald Chi-square test was applied to test the joint significance of the sum of the lags of the explanatory variables, and the t-test is applied on error correction terms. The non-significance of the error-correction term refers to a long-run non-causality, and the absence of short-run causality is established from the non-significance of explanatory variables.

Table (6.8) reports the result of the short-run Granger causality test in the ECM framework. The important factors causing change in private investment in construction equipment are output, credit available, interest rate, and budget deficit. Private investment in this sector showed a strong long-run and short-run bi-directional causality effect on change in credit available and output, implying that growth in private investment has an effect on credit availability and output growth, and the opposite is true. Unidirectional long-run and short-run causality was found from private investment in construction equipment to budget deficit, while short-run unidirectional causality was found from interest rate to private investment.

In the case of machinery and equipment, the null hypothesis that output, credit available, budget deficit, and government investment do not Granger-cause private investment in this sector in both the short run and the long run was accepted. On the other hand, the unidirectional long-run and short-run causality from private investment in this sector to output and government investment in machinery and equipment was found. We can say that the change in private investment in machinery

and equipment helps predict future growth in output. A possible explanation for causality from private investment to government investment is if we assume that it occurs when private investors establish large industrial projects somewhere in the country. This induces the public sector to provide essential investment (economic infrastructure) such as electricity, telephone lines, water pipes, etc.

Again, the null hypothesis that output, government investment, credit available, budget deficit, and interest rate do not Granger-cause private investment in transportation in both short-run and long-run was accepted, while unidirectional long-run and short-run causality was found from private investment in this sector to output and government investment in transportation equipment. Tables (6.9)-(6.11) report long-run causality results for each sector and tables (6.12)-(6.14) show causality directions.

Our causality test findings are consistent with economic theory, which suggests that private investment induces economic growth. Changes in private investment have positive Granger-cause effects on change in output. Also, the bi-directional Granger causality, for example from output to private investment in construction, implies the importance of using proper management of aggregate demand. Therefore, balanced expansion of aggregate demand is critical to the success of private investment-led growth policy. Our finding is found to be consistent with DeLong and Summers (1990), who found evidence that investment in machinery and equipment has an influence on economic growth.

Table 6.8. Result of Short-run Granger Causality Test in ECM Form

Null Hypothesis	short-run Chi-square	p-value	decision
LQ doesn't Granger Cause LC LC doesn't Granger Cause LQ	6.19 6.02	.030 .029	Reject the null Reject the null
LCRD doesn't Granger Cause LC LC doesn't Granger Cause LCRD	4.98 8.8	.026 .003	Reject the null Reject the null
LR doesn't Granger Cause LC LC doesn't Granger Cause LR	3.39 4.59	.066 .101	Reject the null Accept the null
LBD doesn't Granger Cause LC LC doesn't Granger Cause LBD	1.96 3.14	.162 .076	Accept the null Reject the null
LGIC doesn't Granger Cause LC LC doesn't Granger Cause LGIC	.059 .006	.807 .98	Accept the null Accept the null
LQ doesn't Granger Cause LM LM doesn't Granger Cause LQ	9.13 5.07	.003 .024	Accept the null Reject the null
LCRD doesn't Granger Cause LM LM doesn't Granger Cause LCRD	1.38 .590	.24 .44	Accept the null Accept the null
LGIM doesn't Granger Cause LM LM doesn't Granger Cause LGIM	.016 8.1	.89 .004	Accept the null Reject the null
LQ doesn't Granger Cause LT LT doesn't Granger Cause LQ	1.98 7.9	.158 .005	Accept the null Reject the null
LT doesn't Granger Cause LGIT LGIT doesn't Granger Cause LT	6.67 1.98	.010 .158	Reject the null Accept the null

Table 6.9. Long-run Causality for Construction Equipment

Dependant variable	ε_{t-1}	T-value
LC	-.53	2.8
LQ	.26	4.11
LCRD	.48	2.1
LR	-.04	.18
LGIC	-.13	.24
LBD	1.8	2.5

Table 6.10. Long-run Causality for Transportation Equipment

Dependant variable	ε_{t-1}	T-value
LT	-.01	-.50
LQ	.18	4.23
LCRD	.30	1.47
LR	.27	1.29
LGIT	-1.92	2.12
LBD	.16	.20

Table 6.11. Long-run Causality for Machinery and Equipment

Dependant variable	ϵ_{t-1}	T-value
LM	-.38	1.37
LQ	.10	2.63
LCRD	.08	.461
LGIM	1.01	2.30
LGIT	.97	1.2
LBD	-.25	.32

Table 6.12. Direction of Causality in Construction Equipment

Variable	Direction	Variable	Decision
LQ	↔	LC	Bi-directional causality
LCRD	↔	LC	Bi-directional causality
LR	→	LC	Unidirectional from LR to LC
LGIC		LC	No causality
LBD	←	LC	Unidirectional from LC to LBD

Table 6.13. Direction of Causality in Transportation Equipment

Variable	Direction	Variable	Decision
LQ	←	LT	Unidirectional from LT to LQ
LCRD		LT	No causality
LGIT	←	LT	Unidirectional from LT to LGIT
LBD		LT	No causality
LR		LT	No causality

Table 6.14. Direction of Causality in Machinery Equipment

Variable	Direction	Variable	Decision
LQ	←	LM	Unidirectional from LM to LQ
LCRD		LM	No causality
LGIM	←	LM	Unidirectional from LM to LGIM
LGIT		LM	No causality
LBD		LM	No causality

CHAPTER SEVEN

CONCLUSION AND POLICY RECOMMENDATIONS

Private investment is viewed as the driving force behind economic growth in many developing countries. Therefore, understanding determinants of private investment in developing country such as Saudi Arabia helps in designing future economic policies targeted to expanding the role of the non-oil private sector in economic growth. The main motive behind this work is that such analysis has not been attempted before. Following the introductory chapter, chapter two of this study explains the neoclassical theory of Optimal Accumulation of capital and development of the flexible accelerator model. This leads to a modified version of the flexible accelerator model of private investment that is applied to developing countries such as Saudi Arabia. Chapter three presents a review of the empirical literature on determinants of aggregate private investment in developing countries. The majority of this literature suggests that private investment is stimulated by real GDP growth, an increase in the volume of available credit and public investment, and a decline in interest rates. Other studies discussed the important role played by inflation rates, government debt, real exchange rate, and current account deficit in determining private investment. In Chapter four, the methodology chapter, we cover some theoretical foundations of cointegration technique, stationarity, and causality tests that are used in this work. Chapter five describes the structure of the Saudi economy and government policies that influence private investment behavior; it also covers the historical trends of private expenditure in all three sectors under consideration between 1969 and 2001.

The analysis done in this chapter has shown that, despite the generous incentives given to the private sector that have been considered the driving force behind its rapid expansion, this sector still faces some financial and administrative obstacles such as lack of funding, legal framework for commercial dispute and bureaucratic barriers.

Chapter six empirically investigates the determinants of non-oil private investment in disaggregated form using time series analysis. The impact of growth of output (aggregate demand), government investment, interest rate, and budget deficit on private investment behavior in construction, transportation, and machinery and equipment type of investment during the period 1969-2001 is examined. The Johansen and Juselius (1990) multivariate cointegration test was used to examine the relationship between private investment in each sector and its determinants. The test results indicate the existence of stable long-term relationships and the empirical results show that private investment in all three sectors is positively influenced by increase in GDP growth (accelerator effect) and availability of credit to the private sector. This result is consistent with other empirical studies such as Blejer and Khan (1984) and Greene and Vilanueva (1991). Government investment shows a complementary effect on private expenditure for construction and machinery equipment. On the other hand, it exerts a crowding-out effect on private investment in transportation. Interest rate is negatively related to private investment in construction and transportation equipment. In the case of budget deficit, that factor has a negative or crowding-out effect on private expenditure on transportation and machinery equipment, but shows a positive impact on construction equipment investment.

The modified Granger Causality test in the error correction model form suggests bi-directional causality from private investment in construction equipment to change in output and credit available. In the case of the other two sectors, unidirectional causality was found from private investment in each one to change in output and government investment. This finding is consistent with economic theory, which suggests that private investment induces economic growth wherein changes in private investment have a Granger-cause effect on change in output.

Policy Recommendations

From information contained in this study, the recommendations concerning policy are as follows:

First, policy recommendations based on the empirical findings:

1- Change in output was found to be an important factor affecting private investment. This finding implies that it is important to use proper management to aggregate demand. For example, government policies expanding output should be oriented toward encouraging investment, and government spending should be focused on economic infrastructure rather than on consumption.

2- A budget deficit shows a negative relationship with private investment in both transportation and machinery and equipment, implying the importance of minimizing budget deficit through reducing nonproductive government expenditures such as wages, bill and reducing subsidies to inefficient public sector companies as

well as the reduction of custom duty exemptions. In addition, increasing custom duties on some selected consumer goods such as tobacco helps increase non-oil revenue

3- Our empirical findings show that the availability of funding plays an important role in private investment behavior. The descriptive analysis indicates that the private sector does not have adequate funds to pursue its projects. In 2001, commercial banks' claims on the private sector represented less than 40 percent of their assets. This finding suggest that the monetary authority, in this case SAMA, through its regulatory power should encourage commercial banks to increase their loans to the private sector and allocate a certain percentage of funds to small and medium enterprises that are facing difficulties in meeting conditions for loans and other types of credit from banking system and government specialized credit institutions.

4-Saudi society is an Islamic society where interest rate is prohibited. Therefore, in order to attract more savings that would be directed towards investment, the monetary authority should encourage the creation of alternative financial sources such as Islamic financial institutions with Islamic modes of financing (Modaraba¹⁰) that may help provide the necessary credit to private investors according to Islamic codes.

¹⁰ Modaraba: An agreement between two or more persons whereby one or more of them provides finance, while the other(s) provide entrepreneurship and management to carry on any business venture, whether trade, industry or service, with the objective of earning profits. The profit is shared in an agreed proportion. The loss is borne by the financiers only in proportion to their share in the total capital (Khawaja, 1994).

5- The current rules and regulations related to private sector activities should be reviewed and developed so that procedures can be streamlined and optimal overcome can be assumed. In this context, property rights should be established, and all laws and regulations and announcements regarding government projects that relate to domestic firms should be published and made available to all firms. This can be attained through introducing so-called Electronic Government (E-government), where decisions on approving new firms' licenses and publishing new laws are done through the Internet.

6- Government should continue its program of transferring ownership of government corporations, especially those enterprises with little public goods characteristics (privatization), such as in the airline sector. This process is expected to enhance private economic activity and increase the availability of opportunities for private investment. Moreover, it can be an effective means to expand the participation of Saudi citizens in the ownership of productive assets in public enterprises and projects.

Second, other policy recommendations

1- There is need to reform the existing incentive system in order to create a better environment for small and medium-sized firms to promote efficiency. The current incentives such as soft loans, subsidized water and power, cheap lands availability, and protection from foreign competition are conditioned on obtaining an industrial license. Firms with a capital base less of than one million Saudi Riyal (US\$ 266,000) cannot obtain the industrial license; consequently, they will be prevented from being eligible for these incentives.

2- The accession to the WTO will require opening up some economic sectors such as the service sector, which will lead to a gradual increase in competition as foreign enterprises enter these sectors. Therefore, merger of small firms with similar activities to achieve economic efficiency and strengthen competitiveness of this kind of investment should be encouraged through adopting regulations that support small firms that wish to change their legal status and restructure their activities.

3- The Saudi government should introduce more incentives to the private sector such as expanding the number of industrial zones and exerting efforts to strengthen intellectual property rights in order to bring back the Saudi capital currently invested abroad.

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APPENDIX A

The following appendix is on privatization strategy issued by the Supreme Economic Council decision No. 13/22 dated on November 3, 2001.

Privatization Strategy

Chapter 1

Privatization Objectives and Policies

Introduction:

Council of Ministers Decision No. 60 dated August 6, 1997 specified eight objectives of privatization in Saudi Arabia and determined the principles to be taken into account in order to achieve these objectives. Council of Ministers Decision No. 257 dated February 5, 2001 states that the Supreme Economic Council shall be responsible for supervising the privatization program and monitoring its implementation, in coordination with the competent government agencies, and for determining which activities are to be privatized. A list of the activities to be privatized shall be issued by decree of the Resolution, and the Supreme Economic Council shall develop a strategic plan and timetable for this purpose.

A. Principles for Preparing the Strategy

Based on the foregoing, the privatization strategy for Saudi Arabia was prepared in accordance with the provisions of the Council of Ministers Decision No. 60 dated August 6, 1997 to ensure a continued increase in the share of the private sector and to expand its participation in the national economy, by adopting the best available modality including transferring certain types of economic activity to the private sector, enhancing the participation of the private sector in economic development, and enabling it to carry out its investments and financing role in accordance with the national development plan. The general objectives and strategic principles of the Seventh Development Plan, issued by Council of Ministers Decision No. 58 dated July 13, 1999 defined the eighth objective as "increasing the participation of the private sector in activities related to economic and social development." The third strategic principle

stated, "To continue the policy of enabling the private sector to carry out many economic and social functions, provided that this results in real benefits in terms of reduced cost, good performance, and employment of citizens."

B. Definition of Privatization

Privatization is the process of transferring the ownership or management of public enterprises, projects and services to the private sector, relying on market mechanisms and competition, through a number of methods including contracts for managing, operating, leasing, financing, or selling all or part of the governments' assets to the private sector.

C. Privatization Objectives and Policies

Council of Ministers No. 60 dated August 6, 1997 defined the objectives of privatization, each of which will be reviewed and discussed prior to determining the policies needed to achieve these objectives, with due consideration of the need for complementarity and avoiding non-duplication, as described below:

First Objective: Improving the efficiency of the national economy and enhancing its competitive ability to meet the challenges of regional and international competition.

The Economic efficiency of the economy can be strengthened by subjecting projects to market forces. Enhancing competitiveness is closely linked to the general strategy of developing the private sector in Saudi Arabia. Important measures taken so far to create a favorable climate for investment, such as developing the capital and labor market will help achieve this objective. It is important that all enterprises in a single sector be required to operate under the same conditions of competition.

Second Objective: Encouraging private sector investment and effective participation in the national economy, and increasing its share of domestic production to achieve growth in the national economy.

Mature and strong private sectors participation is essential for Saudi Arabia, as the private sector is able to develop comparative advantage and provides a better opportunity for diversifying the economic base away from the dependence on oil. The private sector can direct efficiently capital investments towards more lucrative and commercially sustainable sectors. In order to expand private sector participation, privatization must adopt the management methods used in the private sector, based on commercial principles, even when an entity is converted into an enterprise in which the government retains the majority ownership. The privatization program must also include streamlining of procedures to encourage the private sector investment and ensure that privatized projects are able to achieve self-growth.

Policies necessary to achieve this objective:

- Privatization of public projects, enterprises, and services that are appropriate for private sector participation and encouraging competition.
- Ensuring that privatization increases self-sustainable direct investment.
- Managing wholly or partially privatized project on commercial basis.
- Expediting the review of all regulations and procedures related to private sector activities to create a suitable environment, including the streamlining of procedures and harnessing obstacles.

Third Objective: Enlarging the ownership of productive assets by Saudi citizens.

Privatization can be effective means to expand the participation of Saudi citizens in the ownership of productive assets in public enterprises and projects, by using the method

of public subscription in the privatization, which is considered the most important privatization method to develop the domestic capital market.

Policies necessary to achieve this objective:

- Encourage participation of a large number of citizens to participate in various types of activities transferred to the private sector by using the privatization method of subscription whenever possible.
- Adoption of clear and transparent procedures to implement all privatization activities.
- Utilizing all media types to promote the objectives of privatization and the benefits of private sector participation for the national economy and the welfare of society.

Fourth Objective: Encourage domestic and foreign capital to invest locally.

Privatization reflects the government's commitments to economic reform and a positive image to attract foreign investments. Privatization also helps develop the capital market, create new mechanisms for mobilizing capital and attracting national capital outside the country, in addition to attracting foreign capital and domestic savings of residents in the Kingdom.

Policies necessary to achieve this objective:

1. Facilitating the participation of foreign investments in the ownership of projects and various types of privatized productive activities, in accordance with the applicable rules.

2. Continuous developments of the financial market to provide opportunities for additional domestic and foreign investments and mobilizing additional channels to induce savings

Fifth Objective: Increasing employments opportunities, optimizing the use of the national work force, and ensuring the continued equitable increase of individual income.

Developing the nation's human resources is a basic element of national development; therefore, the privatization program will attach particular importance to it, including Saudization, by developing appropriate regulations and incentives to encourage the private sector to hire Saudi citizens. The privatization of certain projects may reveal that the number of employees exceed the number actually needed. In most cases employees can be retrained or their skills can be upgraded. The potential growth of privatized projects and the opening of sectors to competition also help to deal with the problem of excess labor. In the short-run, privatized enterprises can agree to keep their employees until they study their future expansion requirements to meet increased demand for their services, which will reveal their actual requirements for employees. Programs can also be developed to deal with excess labor by further training them, or granting them shares in the capital of the privatized enterprise as part of their compensation, or by other methods.

Policies necessary to achieve this objective:

- Take steps to ensure that the privatization process includes the enterprises of new direct investments to help absorb the national workforce.

- Enhance the national workforce, increase rates of Saudization, and provide opportunities for training the national workforce to meet expansion requirements.
- Ensure fair treatment for excess employment resulting from transferring activities to the private sector.

Sixth Objective: Provide services to citizens and investors in a timely and cost-efficient manner.

Privatization, particularly of investments that have monopolistic concession rights, may lead to increased prices and a reduction in the quality of services, because some enterprises (services) receive government subsidies prior to being privatized. As this is an extremely important issue, an independent regulatory agency should be established to deal with such matters.

Policies necessary to achieve this objective:

- Establishment of an independent regulatory agency to deal with the social, regulatory, and supervisory aspects to protect the interests of consumers, such as the provision, quality, and cost of services.
- Establishment of a systematic method for determining the fees for services, taking into consideration their cost that will result in continuous provision of services and financing for the investments of the enterprises. The governments may provide support when necessary.

Seventh Objective: Rationalizing public expenditure and reducing the burden on the government budget by giving the private sector opportunities to finance, operate, and maintain certain services that it is able to provide.

The government budget is expected to benefit from reduced allocations for operating expenditures as a result of the privatization of public enterprises or from transferring the management of public utilities to the private sector through contracts for management, leasing, or contracts for construction, and operation by the private sector.

Policies necessary to achieve this objective:

- Evaluation of infrastructure projects and public utilities to determine the feasibility of transferring their management to the private sector, while preserving the government's role in providing certain essential services.
- Suspend any additional government investments in public projects after it has been agreed to privatize them, with the exception of any necessary investment, required maintenance, and the revision of their financial, legal, and operational regulation in preparation for selling them.

Eight Objective: Increasing governments revenues from returns on participation in activities to be transferred to the private sector, and from financing compensation obtained, for example, from granting concessions and from proceeds of the sale of part of government share.

The government aims at achieving positive financial results from privatization, either from proceeds from the sale of an entire public project or participation in the profits and obtaining the proceeds of the sale of part of its ownership of the project. In general, participation in the profits of, and maintaining partial ownership in a project provide better revenue to the government resulting from an increase in the value of the remaining shares it holds owing to the improved performance of the privatized project, in addition to the government's share of profits distributed among shareholders.

Policies necessary to achieve this objective:

- Make public projects that are to be privatized open to competition.
- Develop mechanisms to ensure that the government obtains sustainable income from privatized projects, whenever possible.
- Develop procedures to ensure that the government obtains an appropriate return from the sale of public enterprises to the private sector.

D. Administrative and Implementation Arrangements for the Privatization Strategy

Council of Ministries Resolution No. 257 dated February 5, 2001 provides that the Supreme Economic Council shall be responsible for supervising the privatization program and monitoring its implementation, in coordination with the competent government agencies, and for determining which activities are to be privatized, in addition to the recommendations of other government agencies for privatizing certain activities. The Council of Ministries Resolution shall issue a list of the activities to be privatized, and the Supreme Economic Council shall develop a strategic plan and timetable for that purpose. The agency responsible for supervising each activity to be privatized shall prepare an implementation program based on the required studies. The procedures and steps necessary to complete the privatization process shall be implemented in accordance with the pertinent regulations. Resolution No. 6/22 issued by the Supreme Economic Council on August 2, 2001, which provided for the reorganization of the Privatization Committee within the Supreme Economic Council, under the chairmanship of the Council's secretary-general, with members representing the Ministry of Finance and National Economy, the Ministry of Industry and Electricity, the Ministry of Commerce, and the Ministry of Planning, in addition to two members

from the Advisory Board for Economic Affairs. In order for the Committee to carry out the required activities and functions necessary for the discharge by the Council of its duties and responsibilities with respect to privatization, it shall:

- Recommend a privatization strategy to be approved by the Supreme Economic Council.
- Recommend the public enterprises, projects, and services to be privatized and set the priorities.
- Define the regulatory and implementation framework for the privatization process.
- Monitor and supervise the implementation of privatization activities.

Chapter 2

Privatization Methods and Regulations

A. Methods of Privatization

Methods of privatization comprise a number of tools that can be used to privatize public enterprises, projects, and services, taking into consideration a broad definition of the privatization process. These methods include transferring of ownership, contracting for management and operation, leasing, and financing, either range from sale through public subscription, or sale to a principal investor. Each method has its own consequences, regulations, and factors that contribute to its success or failure. Generally, more than one method is utilized to achieve the targeted objectives. It is therefore important to choose the method of privatization in accordance with the specified objectives being the best means to be achieved. Various methods of privatization are described below.

1. Management contracts

With this method, responsibility for managing, operating, and developing an entity is transferred to a contractor or investor from the private sector for period of time and an amount of money to be agreed upon. This method is usually used in cases that require high levels of specialized experience in management, operation, and marketing, or when the government has a large investment in the project's assets and prefers to keep the investment rather than sell it; that is, ownership of the assets is not transferred to the private sector. Although the contractor takes over the tasks of monitoring and daily supervision of operations, he does not assume any commercial risks (operating

losses), if they occur, which are borne by the owner (the government). Among the negative aspects of this method is the possibility of the contractor's misusing the project's assets, because management contracts, in the majority of cases, stipulate payment of a fixed sum to the contractor in exchange for specific services, regardless of profitability, and this is not a sufficient incentive for the contractor to maintain the assets in a good condition and improve performance.

2. Leasing contracts

Leasing contracts are agreements between the government and the private sector whereby the latter provides the government enterprise with administrative and technical expertise for a specific period of time, in exchange for an agreed-upon financial remuneration. The private sector investor leases and utilizes the assets or facilities owned by the government, and the contract determines the amount of the condition to be paid to the government as well as the responsibilities of each party towards the other. The distinctive feature of leasing contracts is that the investor assumes all the commercial risks associated with operating the assets, which is an incentive for the investor to reduce expenses and maintain the assets in good condition. The investor is also obliged to maintain and repair the used assets, or to contribute to the cost of doing so, in accordance with an agreed timetable. The amount to be paid by the private sector is generally linked to the condition of the assets and the expected income from their utilization. Under such contracts, the investor appoints the people who work with him, including current employees of the government enterprise, in accordance with the agreed terms of the leasing contract.

3. Financing contracts

Financing contracts represent a more advanced method of privatization compared to previous methods. Under such contracts the investor assumes responsibility for providing the capital, operating, and investment expenditure unlike lessee. This method is generally considered better than leasing contracts, but implementation is more complicated owing to the large amount of financing needed for expansionary obligations. There are several kinds of financing contracts, including lease-build-operate (LBO), build-transfer-(operate) (BT, BTO), build-(own)-operate-transfer (BOT, BOOT), buy-build-operate (BBO), and build-own-operate (BOO) (Appendix). If one of these types of financing contracts is adopted as option, it must be carried out in accordance with the following:

- An appropriate regulatory and legal framework must be put in place to guarantee the rights of all parties (financier, government, and consumer)
- The project must be made open to general competition to which qualified parties from specialized enterprises are invited to bid, whether they are from inside or outside Saudi Arabia.
- The government shall not offer sovereign guarantees unless absolutely necessary.

4. Sale contracts

a. Direct sale to the private sector through public subscription

This method is suitable to enterprises that are characterized by stability, continuity of activities, a sound financial position, and commercial feasibility, or enterprises that can become commercially feasible in the short-run. Either the entire entity or some of its

shares are sold to the private sector by offering them for public subscription. This method is also adopted by large public enterprises and projects, which would be converted into an enterprise in harmony with the customary conversion procedures, such as designing the general legal framework for purposes of the project, separating the non-commercial activities, amending the tariff systems, transferring the assets and liabilities to the enterprise after verifying that they are in order, establishing the article of association and accounting system, and the basis for assimilating the employees. The success of this method depends on a number of factors, including:

- The entity must be continuing in carrying out its activities, most have a sound financial position, and be profitable or capable of becoming profitable in the short-term.
- It must have a reasonable amount of liquidity.
- Existence of an active capital market.

This makes it possible to expand the ownership base and attract additional investments, which in turn stimulate the shares market by opening the door to investors with limited financial capacity. The requirements for this method are focused on the procedures for offering shares for subscription, including choosing the appropriate time for the public offer, along with the need for a good regulatory and marking framework and a well-developed capital market.

b. Sale to a principal investor

Using this method, the government sells the enterprise to a principal investor who is capable of providing the required financing, management efficiency and

technology for production and marketing development. The method has the advantages of ensuring the direct availability of the required financing as well as the financial and administrative expertise needed for technical and administrative development, in addition to providing new expertise and modern production and management techniques. In most cases the principal investor is an international enterprise or operator with extensive experience in the field. The negative aspects of this method are that it deprives small investors of opportunities for investment, does not expand the ownership base, and increases the possibilities of creating problems related to the work force. In addition to the above-mentioned methods, there are a number of other mechanisms and instruments such as offering the enterprise for sale to its employees or allocating a portion of its shares for sale to its employees at market prices. These methods are usually used to privatize enterprises with low profitability or productivity, in order to encourage employees to improve their performance of the enterprise. Another mechanism is a debt swap, whereby the debts are valued and converted into shares in the name of the creditors.

B. Rules for the Privatization of Public Enterprises and Projects

The basic principles that must be taken into consideration when implementing the privatization process are:

- Disclosure and transparency.
- Expeditious implementation.
- Changing the management pattern.

1. Disclosure and transparency

To ensure proper disclosure and efficiency in the privatization process, the privatization program should be guided by:

All Activities should be carried out in a clear and transparent manner, and announced in accordance with recognized commercial standards. When there are no legal rights involved in the case of joint venture, direct sales or preliminary negotiations based on a special agreements shall take place only after bids have been obtained through public tenders. Prior to and during completion of the sale, the public must be aware of all aspects of the process to the extent possible, by means of the following:

- Preparing a memorandum of information and advertising it in connection with the offer for sale of any project
- Publishing complete information on the financial, administrative, and other aspects of the enterprises to make them readily available to investors.
- Preparing and publishing standards for the classification of bids.
- Public opening the bids.
- Publishing the valuation of assets and details of the bids.
- Publishing the names of investors, the amounts paid, and conditions of the sale after it is completed.
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2. Expeditious implementation

Expeditious implementation is extremely important for the success of the privatization process, and a realistic timetable should be established for each stage of the privatization process, as activities that proceed slowly are more susceptible to failure.

3. Changing the management style

Bringing about effective change in the style and methods of management is considered a basic objective of every privatization process. Without such change, it is not possible to achieve the desired benefits of privatization. This does not necessarily mean replacing the current managers, but rather involves improving performance and implementing private sector management practices.

C. Basic Steps for a Model Privatization of a Public Project or Enterprise

- Studying the feasibility of privatizing the enterprise or project proposed for privatization: The competent government agency, in coordination with the Privatization Committee of the Supreme Economic Council, conducts a study of the financial and operational position of the enterprise, its subsidiary sectors, the justifications for privatization and the expected returns, alternatives to privatization and obstacles to its implementation, and hence an assessment of the possibility for privatizing this project or enterprise. The competent agency submits the results of this study and its recommendations to the Privatization Committee.

- The Privatization Committee issues a recommendation to privatize the enterprise or activity.
- If a decision to privatize the activity is issued, the government agency responsible for supervising this activity prepares an implementation program for privatization, based on the required studies. After the Supreme Economic Council approves it, the procedures and measures required to complete the privatization procedure are implemented.

The implementation program includes:

- The defining elements of the government's policy for the sector, the appropriate regulatory frameworks, and the steps and timetable required for implementation.
- Defining and addressing the obstacles to implementation, and the extent of the need to restructuring the enterprise (conversion to an enterprise, financial structure, and settlements of employees), the steps and timetable required for implementation.
- Developing a preliminary plan for privatizing the enterprise, including the percentage to be sold and method of sale, and a timetable for completing the process. The preliminary plan serves as a basis for choosing a general advisor to assist with implementation of the plan.

4. The concerned government agency, under the supervision of the Privatization Committee of the Supreme Economic Council, manages the program for privatization, in cooperation with other government agencies, as deemed necessary by the Privatization Committee. Managing the implementation program involves the following elements, by way of example:

- Defining the terms of reference of the general advisor and the selection method.
- Selecting the general advisor and other technical advisors.
- Developing an implementation plan for the privatization process.
- Implementing steps for restructuring the enterprise.
- Auditing and evaluating the position of the enterprise.
- Preparing the documents required for selling the enterprise.
- Managing the sale process (e.g. marketing the process, qualifying the investors, inviting bids by investors, evaluating the bids, negotiating terms of the sale, and preparing the sale contracts).
- Method for addressing manpower questions: Employees must clearly understand the method for dealing with the manpower aspect in the privatization process and its impact on them. There are a number of methods for dealing with the workforce in the privatization process, some of which are:
 - Employee participation in ownership of the enterprise, which could induce them to support restructuring and privatization.
 - Fair compensation for employees who retire voluntarily or are terminated.
 - Obtaining a commitment from the investor to retain current employment.
 - Training and upgrading the qualifications of employees.
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Chapter 3

Basic Issues to Be Dealt With in the Privatization Process

Regulatory Framework for Privatized Sectors

Developing a regulatory framework for the privatized sectors is one of the most important elements of the entire privatization process, particularly in sectors where one enterprise enjoys concession rights that enable it to monopolize the market or control a large portion of it. Basic infrastructure enterprises are among those that most urgently require regulation.

The objectives for establishing regulatory frameworks are summarized below:

- To protect consumers from the possibility that service providers (enterprises) with monopolistic concessions may exploit their position to raise prices, limit the provision of services, or reduce quality.
- To protect investors by insuring that government intervention in the activity is within what has been agreed upon and does not impose additional burdens on investors that could adversely affect their returns, particularly given that investors sometimes invest large sums that can take years to produce any return.
- To encourage production efficiency and increase competition among various companies in the sector.
- The regulatory agencies generally grant licenses to service providers, coordinate with them and monitor implementation on the basis of the licenses granted.

Regulatory agencies:

Establishing the regulatory agencies is an integral part of the privatization process, particularly in the public services sector. There are three models for these agencies:

- A separate regulatory agency for each service in a single sector (e.g., establishing an independent agency to regulate telecommunications services and another to regulate postal services, etc.)
- A single regulating agency for each sector, that is, establishing a single regulating agency for the energy sector (electricity, gas) and another for the transportation sector (railroads, aviation, roads, and navigation)
- A single regulating agency for a group of sectors, such as energy, telecommunications, and transportation.

The appropriate model will be selected on the basis of a careful and comprehensive study of its objectives, positive and negative aspects, and appropriateness for Saudi Arabia. The Privatization Committee of the Supreme Economic Council will recommend selection of the appropriate model upon completion of the study by the competent agencies.

Autonomy of the regulating agencies:

Autonomy of the regulating agencies is one of the most important factors in guaranteeing the success of efforts to decide on issues involving rights, duties, and common interests, as well as enjoying the confidence of all parties involved in the sector, including the government, investors, employers, and consumers.

These agencies shall have legal personality and shall enjoy both administrative and financial autonomy.

B. Fees For Providing Services

Fees for services vary among public enterprises because the government, based on the necessity and importance of the services provided, subsidizes some of them. Where there is no clear mechanism for determining fees for the services of public enterprises that reflects their cost, the implementation of the privatization process is hindered, particularly from the point of view of the investors. The government subsidies affect the price levels for public services, particularly certain subsidies that are considered fundamental obstacles to privatization and a principle source of economic inefficiency. Therefore, a systematic method must be established to set tariffs for services that takes into consideration their cost, allows for that stable provision of services, and makes it possible to finance the investments of enterprises that provide them, while allowing the government to provide subsidies as needed.

C. Preparing and Restructuring the Sectors and Public Enterprises to be Privatized

The issue of restructuring public enterprises or projects that are to be privatized, is generally raised before the privatization process is implemented, and it is generally preferred to leave the main restructuring issues to the new owners. However, it is sometimes not possible to avoid restructuring, as there may be large liabilities that adversely affect the project's value, and it may be necessary to split up the enterprise in

order to improve the overall structure of the sector. Preparation and restructuring activities generally fit in to one, or more of the following categories:

- Financial restructuring: This includes either adding or removing assets or liabilities to improve the financial standing of the enterprise.
- Restructuring of manpower: This involves transferring employees or workers from the public enterprise to the privatized enterprise and dealing with the employees' situation on the basis of a comprehensive study and clear plan developed by the enterprise in accordance with its future requirements.
- Technical restructuring (splitting up): Splitting up [an enterprise, or sector] often helps create an effective regulated environment. For example, in the electricity sector, it may be preferable to separate production, transmission and distribution activities from each other, as the value of the parts may be greater than the value of the whole. There are also cases that require the merging of various enterprises before they are privatized, in order to increase their productivity.

D. Strategic Partners

The magnitude of issues and the complexity of procedures facing public enterprises and projects that are targeted for privatization are very large, and the task of reform is consequently also large. The required tasks are often beyond the capacity and manpower of their current management, as they include improving performance, adjusting prices, and developing commercial methods of operation, in addition to the ability to compete at the domestic and international levels. The strategic partner, whether Saudi or foreign, plays an important role by providing the needed capital, sharing the risks, offering advanced technology and administrative expertise to improve performance and create added value. This mandates that the strategic partner must have

sufficient financial capability and experience in managing firms similar in size to the enterprise that is to be privatized, it must be able to provide a sufficient number of technical and managerial experts, and must have a good reputation.

E. Creating a Suitable Climate for the Success of the Privatization

Program

The success of the privatization program depends on the effectiveness of the climate aimed at private sector development. There are three important elements of this environment: the capital market, human resources development, and the regulatory development, and the regulatory environment.

1. Capital markets

Developing the capital market is one of the most important policies that will be pursued to achieve some of the goals of the privatization process, which includes expanding the scope for participation by Saudi citizens in the ownership of productive assets and public enterprises and projects, as well as encouraging local investments of domestic and foreign capital. There is a strong connection between privatization and the capital market, as privatization leads to development of the capital market by encouraging investors and investment companies to diversify their portfolios by investing in companies that are well managed, and in diverse sectors such as telecommunications, electricity, cement, banking, and transportation. Small investors are also attracted, which will lead to the creation of investment tools of a joint nature and a balance in the liquidity position between banks and the financial market, as well

as opportunities to invest the funds of social security and retirement pension agencies and other financial institutions. The existence of a developed financial market helps ensure the success of the privatization process when certain enterprises are privatized through public subscriptions in the capital market. This requires a number of specific elements in capital market, including:

- The regulatory and legal framework, which protects the rights of investors and defines the basis for regulating the market on that basis of clear, published regulations, and instructions.
- A strong infrastructure is required to develop a robust financial market that is appropriate for the economic capabilities, in terms of the management system and the required technical apparatus.
- A sufficient number of investment tools that allow for the participation of large and small investors, including Saudis and non-Saudi residents.

2. Human resources development

The existence of well-developed, highly productive manpower is a critical factor in the success of the privatization program. Many Saudi human resources currently face difficulties in finding employment owing to lack of skills and competition from foreign workers, in addition to the problem of excess labor beyond the requirements of enterprises that are targeted for privatization. In order to develop manpower and enhance skills and competitiveness, enterprises targeted for privatization should be required to develop appropriate training programs to retrain their workers, develop their skills, and help keep their jobs or find employment with other companies or enterprises.

3. Regulatory environment

The regulations and procedures related to investments and private sector activities, the capacity of the agencies responsible for their implementation, and the speed at which the related disputes can be settled are among the most important elements that must be revised, modernized, and integrated to create a suitable environment in which the private sector can operate effectively to meet the challenges of regional and international competition. Transparency in these regulations and procedures, as well as the ease of their implementation, will increase the confidence of investors and obviate the need for requesting the government to provide more guarantees, which are often required in the face of incomplete regulations and unclear procedures.

Chapter 4

Criteria for Setting Priorities and Continued Implementation of the Privatization Program

In accordance with Council of Ministries No.257 dated February 5, 2001, the Supreme Economic Council shall determine which activities are to be privatized, in addition to those recommended for privatization by other public enterprises. A list of the activities to be privatized shall be issued by Resolution of the Council of Ministers. The Privatization Committee of the Supreme Economic Council, in coordination with the competent agencies, shall begin privatizing the recommended projects on a selective basis and in accordance with the criteria for selecting projects to be privatized.

Approval of the Council of Ministers is required for the implementation of the sale, upon the recommendation of the Supreme Economic Council. Approval may also be required from the Royal Court with respect to matters that obstruct the implementation of the privatization program, such as issues related to restructuring, conditions of sale, or government returns.

A. Criteria for Determining Priorities in Selecting Enterprises to be Privatized

With the goal of enhancing the productive capacity of large public enterprises and projects, the priorities for selection for privatization are based on:

- Positive effect on the national economy.
- Readiness of enterprise for privatization.
- Social benefits of privatizing the enterprise such as increasing employment opportunities, making optimal use of the workforce, and ensuring the continuation of just increases in individual incomes.

- Inadequacy of the services provided by the public enterprises.
- The absorptive capacity of the Capital market.

B. Continued Implementation of the Privatization Process

After the enterprises and projects to be privatized here have been selected on the basis of the above-mentioned criteria, an implementation program will be developed comprising a sequencing of the various activities in the privatization process: selecting a group of public enterprises and projects, beginning the privatization procedures, and developing and adhering to a timetable, leading to the creation of a privatization program that ensures coordination and control of the timing for offering shares of the privatized company for sale, in a manner that does not adversely affect the capital.

The List of Utilities, Economic Activities, and Services to Be

Privatized*

The private sector will participate in the utility sectors, economic activities and services that are listed below. The method, size, and the timing of this participation will be determined by the Privatization Strategy.

- 1. Water and sewerage.**
- 2. Saline water conversion (Desalination).**
- 3. Telecommunications.**
- 4. Aviation and its services.**
- 5. Railroads.**
- 6. Roads such as:**
 - A. Managing, operating, and maintaining of existed highways that have alternative routes.**
 - B. Building and operating of new highways.**
- 7. Airport services.**
- 8. Postal services.**
- 9. Grain silos and flour mills.**
- 10. Seaport services.**
- 11. Industrial cities services.**
- 12. Government shares in corporations, including Saudi Electricity Company, banks, Saudi Basic Industries Corporation (SABIC), Saudi Arabian Mining Company (Ma'aden), Saudi Telecommunications Company, and government shares in domestic oil refineries.**
- 13. Government shares in joint investment companies with Arab and Islamic countries.**

* Saudi Council of Ministers, November 2002

14. Government owned hotels.

15. Sports clubs.

16. Municipalities services such as:

A. Building and operating of slaughterhouses.

B. Building and operating of public markets and shopping centers.

C. Building, operating, and maintaining of public parks.

D. Public transportation services and municipalities revenue collections.

E. Cleaning and waste management services.

17. Educational services such as:

A. Building and maintaining of educational buildings.

B. Printing of educational books.

C. School transportation.

D. Student housing.

E. Renting and operating of public school and university facilities.

18. Social services such as:

A. Managing and operating of social welfare institutions.

B. Recruitment services of Saudi nationals in the private sector.

19. Agriculture services such as:

A. Services of health isolation sites, veterinary diagnostic laboratories and clinics.

20. Medical services such as:

A. Building and operating of medical facilities.

B. Patient transportation services.