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ECONOMIC DEVELOPMENT UNDER PUBLIC ENTERPRISE: THE CASE OF IRAN

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A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

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degree of

Doctor of Philosophy

By

REZA VARJAVAND

Norman, Oklahoma

1983

ECONOMIC DEVELOPMENT UNDER PUBLIC ENTERPRISE:

THE CASE OF IRAN

APPROVED BY

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DISSERTATION COMMITTEE

ECONOMIC DEVELOPMENT UNDER PUBLIC ENTERPRISE: THE CASE OF IRAN

by

Reza Varjavand

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Chapter I

INTRODUCTION

It is generally believed that market alone can not provide solutions to the economic development problems of less developed countries (LDCs) which will be acceptable to both the people and those in power. The market mechanism may not work simply because of the existence of various imperfections and bottlenecks in both the commodity and capital market. Consequently, price can not function as an effective rationing factor for productive resources. The allocation of resources on the basis of price results in the expansion of such activities as the construction of luxury houses or development of assembly plants.[1] These activities which tend

[1] The development observers believe that the industrialization process in LDCs begins with replacement of the old and primitive workshops with the modern manufacturing industries. This makes the production of intermediate goods necessary. Because LDCs are not able to produce their own intermediate goods, the assembly plants will be established and expanded in various areas, basically automobiles, home appliances, electris motors, etc. The idea is fruitful if the basic industries such as metallurgical, chemical, machine tools, etc. are established simultaneously so the whole production process can be made domestic, and independent of foreign suppliers. The experiences of most LDCs has shown that the industrialization process stops at assembly plants and seldom jumps over to the next stages. In Iran, for example, in spite of the government program to promote the independent industries, the assembly plants are still present in almost all industrial activities: transportation equipment, chemical, pharmacuitical, tires, radio and television, home appliances, etc. The evidence shows that Iran receives only about 10% of

to be dominated by foreign companies are not favorable to economic development and are not beneficial to the masses of the poor. The operation of market may also lead to inequitable distribution of income which is caused by the dualistic nature of their economy[2] and is largely indicated by variation of income within urban and rural areas or by decreasing share of labor in national income.[3] This situation is not socially or politically desirable. Moreover, reliance on market can not achieve maximum mobility of resources, which is an essential requirement of economic development.[4]

Accordingly, the developmental forces should be created and directed toward the desired goals. It is conceivable that only the government has, or can acquire, the capability to perform this task in LDCs. Therefore, necessary steps

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value added of such industries. for further discussion see Manoucher Farhang. The Economic Life of Iran. Persion Eddition (Tehran, Iran: Kayhan Publishing Co., 1973), p. 158.

[2] See Irma Adleman, and Cynthia Taft Morris. Economic Growtth and Social Equity in Developing Countries (Stanford: Stanford University Press, 1973), pp. 17-21.

[3] This is especially evident in Iran. See Homa Katouzian. The Political Economy of Modern Iran: Despotism and Pseudo Modernism, 1926-1979, New York: New York University Press, 1981)

[4] Almost all the leading schools on economic development agree on the common characterisrics of LDCs' economy. First, the price system will not ensure optimum allocation of resources, because prices do not reflect the opportunity cost accurately. Second, there is a wide difference between private and social benefits, and between private and social cost of various projects in LDCs where the external economies and economies of scale are important relative to domestic market size. Third, complementary relationship among development projects are considered as the

should be taken by the government to create forces conducive to economic development, forces that can be used to accomplish social or economic objectives that are not otherwise achievable.

The use of public enterprises has been suggested by many economists and has been successfully experienced by different countries like India, Brazil, South Koria, Turkey, Algeria, and most European countries as one fruitful way to deal with the problem of achieving desired developmental goals. William G. Shepherd, one of the leading researchers in the area of the economics of public enterprise, relies on the role of these firms in correcting the serious departures of the economic system from Pareto optimality. He writes that:

> in a fine tuned world of reducing departures from Pareto optimality, the possible scope and value of public enterprises are bound to be small. But, if the more major and quite real problems are recognized, the scope for possible public enterprises is larger, and its directions of use are different.[5]

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main element of success in economic activities. For further discussion of related issues see John Lintner. "Economic Theory and Financial Management," in Idem ed. Y. Aharoni, and Raymond Vernon. State-Owned Enterprises in Western Economies (New York: St. Martin's Press, 1981), pp. 23-53. and Evertt E. Haggen, The Economics of Development (Homewood ILL: Richard D. Irwin Inc., 1975), pp. 194-197.

[5] W. G. Shepherd. "INTRODUCTION", in Idem ed. Public Enterprise Economic Analysis of Theory and Practice (Lexington, Mass: D. C. Heath and Company, 1976), p. xi.

The use of public enterprises, therefore, could be an effective response to the inability of the market system with serious constraints and problems in LDCs. They act as forces to push the economy out of market limitations and toward achievement of social or economic objectives to foster economic development.[6] Some of these objectives are redistributing income, exploiting new opportunities in industrial fields, providing essential commodities at low cost, promoting managerial efficiency, and most importantly creating incentives for the private sector through infrastructures and a healthy environment in which this sector can operate successfully.

1.1 THE DEFINITION OF PUBLIC ENTERPRISE

The term "public enterprise" which is used here can not be described in a single definition. The forms and the operation of public corporations in different countries are so heterogeneous that no one set of common principles can be found as the basis for a universal definition. There is a set of criteria that must be considered in order to judge the degree of "publicness" of public enterprises. The most important criteria used by various authors are the "owner-

[6] using the state owned firms has been a policy tool for direct investment of the government to overcome the deficiencies in capital market and the sluggishness of the private sector. For additional debate on these and other rationales for pupblic enterprises see John B. Sheahan. "Public Enterprise in Developing Countries," in Idem ed. Public Enterprise: Economic Analysis of Theory and Practice (Lexington, Mass: D. C. Heath and Company, 1976), pp. 205-234, and Yair Aharoni. Planning and Development (Cambridge, Mass: Ballinger, 1977), pp. 170-171, 275-280.

ship" and "control". In a study conducted by the United Nations, a public enterprise is defined as an "enterprise in which the government has the majority interest of ownership and/or control."[7] Albert H. Hanson defines public enterprise in a more restrictive sense to mean "the state ownership and operation of industrial, and commercial undertakings."[8] Leroy Jones has emphasized four criteria in identifying the definitional elements of public enterprises: ownership, control, autonomy, and marketness. Public enterprise in his study is basically defined as: "a productive entity which is owned and/or controlled by public authorities and where output is marketed"[9]

The ownership and control are the main elements in the scope of definition of public enterprise. The ownership, of course, implies control, and the balance between control and flexibility is indispensable to the successful operation of these firms. Strict control may not be suitable for public enterprise if they are expected to operate more on a commercial basis and to establish a sound financial system. As president Roosevelt once said in relation to the Tennessee Valley Authority, the public corporation ought to be

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[7] United Nations. Organization, Management, and Supervision of Public Enterprise in Developing Countries. (New York: United Nations Publications, 1974), p. 2.

[8] Albert H. Hanson. Public Enterprise and Economic Development. (London: 1965), p. 115.

[9] Leroy Jones. Public Enterprise and Economic Development The Korean Case. (Seoul, Korea: Korea Development Institute, 1975), p. 23.

"clothed with the power of government, but possess the flexibility and initiative of private enterprise."[10]

The present study is basically concerned with the Iranian public enterprise sector with particular attention and frequent references to large industrial corporations. These enterprises such as public utilities or those in infrastructures are usually owned entirely by the government. In a few instances the government shares the ownership with multinational corporations such as petrochemical complexes. But, in any case the law requires that the control of these enterprises remains in the hands of the Iranian government.

1.2 THE PURPOSE OF THIS STUDY

This study is designed to investigate the impact of government investment on output and on investment of the private sector. Its purpose is to test empirically the supposition that goverment investment creates a strong stimulus to capital formation and output. The main concern is to find out whether or not the growth of government capital spending in Iran has been complementary to the growth of the private sector, or competitive with it. In other words, is the growth of government investment inappropriate in the sense of squeezing out the growth of the private sector? The author intends to measure both positive and negative effect of

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[10] David E. Lilienthal. Tennessee Valley Authority: Democracy on The March. (New York, 1944), p. 50.

government investment on private output and investment.[11] The working hypothesis for this study is that the positive effects are strong enough to offsets the negative effects within a short period of time. Therefore, the overall rate of economic growth would not decline as a result of government investment. This will be accomplished by examining the relationship between private investment, output, and government capital spending in a model which is applied to Iran. This country has an extensive experience with government investment in public enterprises which have played a leading role in Iran's recent economic growth.

1.3 METHODOLOGY AND THE MODEL

The main concern of the methodology is to construct a dynamic model which can be used to test the correlation between government investment and some other variables for the Iranian economy. The basic statistical technique of this study will be multiple regression which is the most frequently used method to estimate the regression parameters, and to make some references about the behavior of the variables. The desired goal is to establish a functional relationship between private investment and output on the one hand, and, on the other, some independent variables- most importantly the governmenat investment- using time series data for Iran. The complete list of variables and specified equations will

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[11] The sources of both type of effects are fully described in Chapter VI.

be presented in Chapter VI.

We should keep in mind that no comprehensive study or detailed statistical data are available on individual Iranian public enterprises. The statistical data which will be used in this study are aggregate figures derived from various sources[12] Most importantly the annual report of Iran's central bank (Bank Markazi), its quarterly bulletins, different publications of Iran's Plan Organization (Sazman Barnameh), The United Nations Statistical Yearbooks, and other available sources.

The national accounting systems of most LDCs are young and still in the process of developing. The data for Iranian national accounts start from 1959. Before this date, the statistical data for Iranian industries or national income accounts, were only available piecemeal and were usually based on speculation, brief survey, or pure guess. The central bank of Iran started the publication of systematic fig-

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[12] These sources include: 1. Bank Markazi Iran (the central bank of Iran). The Bulletin of Bank Markazi Iran. Published Quarterly. 2. Bank Markazi Iran. Annual Repotr and Balance Sheet Published Annually (Hereafter Referred to as "Bank Markazi". 3. Plan Organization. Third Development Plan, Final Report. (Tehran: Plan Organization, Dec. 1970), (Hereafter Referred to as "3rd Plan". 4. Plan Organization. Fourth National Development Plan 1968-1972. (Tehran: Plan Organization, 1968), (Hereafter Referred to as "4th Plan". 5. Plan Organization. Summary of Fifth Development Plan 1973-1977. Persian Edition, (Tehran, Iran: Plan Organization, June 1973), (Hereafter Referred to as "5th Plan". 6. United Nations. Yearbook of National Account Statistics Vol. I, Indiviual Country Data, Published Annually by The United Nations. 7. INternational Monetary Funds. Government Finance Statistics. Published annually by IMF.

ures on national income in 1959; this is the most comprehensive source of data now available. The statistical information about Iran's development plans may also be obtained from the reports of Iran's Plan Organization. Although there can be no guarantee about the exactness of the data published by these sources, they are the most reliable and perhaps the only ones available.

Many factors are responsible for the scarcity and inaccuracy of data in LDCs in general, and in Iran in particular. First, the official statistical system is poorly organized because of insufficient government attention, especially inadequate financial support. The government statistics agency usually lacks a well-trained personnel to carry out the comprehensive surveys in an effective manner as often as needed. Second, the high illiteracy rate makes most people unable to keep records of their economic activities , transactions, income, etc. Third, the respondents are not cooperative with the surveyers. They are reluctant to reveal the true figures on their operations, fearing that their profit may be taxed away. Fourth, the government officials use the statistical figures for political or propaganda purposes. This makes these figures vulnerable to manipulation by the politicians to look as good as possible. Finally, the government is not willing to publish detail information on all of its own activities in an attempt to get away from public criticism.

Considering such difficulties the empirical studies on LDCs are tedious, if not impossible, and they may yield biased estimates due to the inaccuracy of the data and the low number of obsevations. Neverthless, they may be interpretable, may reveal the genereal direction of the economy, and may enhance our understanding of LDCs.

The data which are used in this study are confined to 19 years, 1959-77 period.[13] No data on national income accounts have been published prior to or after this period. These data are presented in Appendix B, along with the description of their sources and other related information.

It is hoped that the findings of this study will contribute effectively to our knowledge of the role of the Iranian government in Iran's recent economic growth. These results may also be of considerable value in long run national planning for Iran in terms of providing some guidelines for more efficient use of economic resources.

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[13] The Iranian calender year begins on March 21st, and ends on March 20th. Therefore, when we refer to year of 1970, it should be considered as the fiscal year of 1970-71 (March 21st of 1970 through March 20th of 1971) and so on. The Iranian current calender year is 1362 which can be corresponded to Gregorian calender by adding 621 to it.

The statistical figures which are used in this study are expressed in Iranian currency of Rial. Its par value for the period of our study can be approximated at one U.S. Dollar for 75.00 Rial.

1.4 THE OULINE OF THIS STUDY

The analysis of this study can be viewed as having two main parts. The first part, which consists of Chapters II, and III is an overall review of the literature on the economics of public enterprise. The second part, Chapters VI to VII, deals exclusively with the Iranian public enterprises and analyzes their performance. The chapter-by-chapter outline of this dissertation is as follows:

Chapter II reviews the pattern of growth of public enterprises in selected countries. The main purpose of this review is to determine the primary reasons behind the rapid growth of public enterprises in these countries. Chapter III examines the contribution of public enterprise to capital formation. It is a general approach to government investment in such enterprises which is of prime importance in this study, its evaluation, and its rationale. Chapter IV looks at industrialization and the national economic plans in Iran as the main events that led to formation and growth of the public enterprise sector. Chapter V examines the contribution of the Iranian public enterprises to economic growth of this country by evaluating their role in capital formation and their output performance. Chapter VI presents the methodology, the empirical study, and the analysis of findings. Finally, the last chapter summarizes the important results of this study in order to draw the final conclusions.

Chapter II

PUBLIC ENTERPRISE AS A MEANS OF ECONOMIC DEVELOPMENT

Chapter one provided an introduction and a framework for our study on government investment in public enterprises. As was indicated by this chapter, many developed and less devevloped coutries have experimented widely with public enterprises over the past few decades. The key objectives in creating and expanding the public enterprise sector have been to foster industrialization and to generate sufficient amounts of capital outlays required by industrialization. Therefore, such enterprises have originated from pragmatic needs of industrialization and must be considered as the backbone of the economic system of these countries. The study of public enterprises requires a rigorous explanation of various issues including the historical description of the roots and pattern of growth of such enterprises, the publicness of public enterprises, the control and accountability issue, pricing policy,etc. A thorough examination of all of these issues is out of the scope of this dissertation. The next two chapters, however, are designed to explore some of the most important issues of public enterprises which seem to be closely related to the purpose of our study. We begin our discussion in Chapter II by reviewing the pattern of

growth of public enterprise in selected countries to explore out the motives behind government intervention into the economy and the main reasons for public enterprises. Then, in the following chapter the contribution of public enterprises to capital formation will be analyzed as a criterion for judging their performance. The discussion in these chapters provides some background knowledge about the economics of public enterprise, and justifies their role in capital formation and employment generation.

2.1 PATTERN OF GROWTH OF PUBLIC ENTERPRISES

Reviewing the historical pattern of growth of the public enterprise sector in different countries helps us explain the primary reasons behind their creation as well as why they have been forced to grow in spite of enormous opportunity cost. We study the historical origins of public enterprises in both the developed and LDCs in the following section. Then some final thoughts will be presented on the basis of revealed evidence.

2.1.1 Developed Countries

The public enterprises in developed countiries grew intensively after the Second World War, namely for the following three reasons: (1) the post war period was a suitable time for nationalization and government control of the basic industries; (2) the increase in per capita income and the fact

that the services provided by public firms were highly income elastic; and (3) the repeated failure of private companies in major manufacturing areas. Although in some countries, such as the United States, public enterprises have a small share of GNP and aggregate investment, their contribution to GNP and investment is substantial in most European countries such as Great Britain. A large amount of resources flows to these enterprises every year in addition to great amounts of subsidy required to support them partially or totally. Great Britain has a large variety of public enterprises in many sectors.

In the basic areas such as postal services, telephone, telegraph, electricity, gas, ports, mass transit, coal production, forest and the hospital related to National Health Services, the public enterprises operate under full government ownership and control. W. G. Shepherd mentions two reasons for post war growth of public enterprises in Great Britain.[14] First the increasing demand for services provided by public firms, especially during the 1958-68 period, brought high profit and led to better performance of public enterprises. There was a hope that such good performance would persist into the future. Second, public awareness of the issues related to public enterprises led to better identification of the basis for public firms and a more sophisticated

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[14] William G. Shepherd, "British and the United States Experience" in Idem ed. W. G. Shepherd, on Public Enterprises: Economic Analysis of Theory and Practice (Lexington, Mass: D. C. Heath and Company, 1976), pp. 103-121.

choice of them. The bases were broadened to include many social as well as economic considerations. This resulted from the growth of related literature and research in the field, especially the work of Ralph Turvey on the economics of public enterprises.[15] British public enterprises, like those of many other countries, evolved gradually mostly after World War Two. In basic manufacturing industries British public firms operate in petroleum, steel, coal, and automobile (Rolls Roys and Layland). The major ones such as the National Coal Board and the Steel Corpopration, are designed to create a unified procedure capable of dealing with the structural problems in the industries. Most of the British public corporations are concentrated in infrastructures such as public utilities, railroads, airways, and transportation. The enterprises operating in the areas of broadcasting (British Broadcasting Corporation), health (National Health Servise), housing (Council of Housing Agencies), and art (Art Council) are examples of British public corporatiopns engaged in provision of social services.

In the United States the public enterprises are mostly limited to social services (schools, libraries, parks, museums, etc.), and public utilities. Most of them operate under partial control of the government. The development of public enterprises in the United States , as Shepherd believes, is mainly due to urbanization and the resulting spread of

---

[15] See particularly, Ralph Turvey, Economic Analysis and Public Enterprises, (London: Allen and Unwin, 1971).

social problems.[16] Contrary to the European countries, public enterprises in the United States did not originate from an intentionally integrated government policy, rather, they evolved from a variety of grass-root programs, such as those created during the period of 1933-45 in response to the Great Depression. The degree of state control of public enterprises in the United States varies from very high in the cases such as water, sewage, municipal parking facilities, and primary education, to partial control in the ares of land managemaent, aviation programs, and the census bureau, and finally to very low control in housing, ports, and public utilities. The extend of government subsidy also varies from no subsidy at all to full subsidization. The public enterprises that pursue economic objectives and exercise pricing and profit policies along the commercial lines do not usually receive government subsidy, while the enterprises involved in social services are partially or totally subsidized.

Italian public enterprises originated from accidental causes rather than deliberate use of them to promote economic growth. Since the early 1960s they have grown faster than any other sector in the Italian economy in terms of output, capital, and number of employees.[17] The Italian public en-

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[16] W. G. Shepherd, op cit, p. 111.

[17] Raymond Vernon, and Y. Aharoni, ed. State-Owned Enterprise in Western Economies, (New York:St. Martin's Press, 1981), p. 86.

terprises operate under the "holding company system" dominated by two giant national institutes: Instituto la Recostruzione Industriale (IRI), and Ente Nationale Idroccaburi (ENI). It is believed that this system has the advantage of preserving autonomy among its firms and stimulating efficiency by keeping competition in the market. The competition then enhances the sense of independence within management, thus making nationalization more tolerable. The first public enterprise in Italy dates back to 1884 when government investment founded a modern steel industry. Then, the state gradually moved to new areas. Presently, Italian public enterprises operate in public utilities, petroleum, natural gas, railroads, telecommunication, food processing, shipping, and ship building.

Unlike in other Eueropean countries, in Italy the joint-stock companies became an increasingly well-received form of government intervention into a wide variety of industries after World War Two. The IRI was established in 1933 to rescue those Italian banks and industries which were experiencing financial crisis caused by World War Two and the international economic depression of the early 1930s. It has a large number of companies operating in banking, electronics, engineerig, shipping, airlines, radio and television, andtelephone. In 1969, the IRI was involved with some 157 companies.[18] It is not really clear whether the creation

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[18] For full description of IRI operationalares see, United Nations, Organization, Management, and Supervision of

of IRI was the result of pressure from bankers and businessmen trying to avoid bankruptcy or the result of government strategy to take control of the basic industries and use them as developmental instrument. However, it is obvious that ENI resulted from conscious government policy to take control of oil, gas, and related industries and to achieve some planning goals. During the 1950s, IRI moved cautiously to expand its activities to modernization of telephone and transportation industries.[19] Public enterprises in Italy have accomplished a wide variety of objectives including channelling resources in the backward regions of southern Italy, thus bringing modernization and balanced growth.

Postwar expansion of public enterprise in France was due to extensive nationalization and to the government decision to use these firms as a device to assure economic progress and social changes. In the 1920s public enterprises in France were in the form of government monopoly operating in telephone, telegraph, radio broadcasting, communication, and tobacco. In 1928, the government created a public corporation to take control of oil industry. Later, in 1936, government purchased privately owned railroads to establish a national network. Many private firms were nationalized during the Popular Front Government of 1936-37 for the purpose

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Public Enterprises in Dveloping Countries, (New York: United Nations Publications, 1974), p. 71.

[19] Raymond Vernon, and Y. Aharoni, State-Owned Enterprise in Western Economies, (New York: St. Martin's Press, 1981), p. 90.

of social reforms; in particular the armament industries were nationalized to reduce the commercial interests in promoting the military costs. John Sheahan has noted three reasons for the postwar intensive nationalization in France: (1) to replace capitalism with a centrally planned economy; (2) to promote workers participation in operation and control of public enterprises; to foster industrialization and economic progress.[20] Nationalization later was extended to banking, insurance, electricity, gas, and coal industries. French public firms have been successful and more dynamic than private enterprises in several areas, especially in the sense of developing better investment policy and moving to new fields. Renault in the automobile industry and SNIAS in the aircraft industry are two examples of French public firms that have been successful in achieving substantial progress in technological leadership, in increasing market share, in operating overseas, and in producing cost efficient products.[21]

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[20] John Sheahan, "Experience With Public Enterprise in France and Italy" in idem ed. William G. Shepherd, Public Enterprise: Economic Analysis of Theory and Practice, (Lexington, Mass: D. C. Heath and Company, 1976), pp. 125-185.

[21] Idid., p. 136.

2.1.2 Less Developed Countries

In Turkey after the establishment of the new republic, the government had to take the initiative in dealing with the problem of the devastated economy. Public enterprises were created to play three important roles: (1) to promote infrastructures; (2) to establish modern industries in the absence of private entrepreneurship and needed capital; and (3) to create and mobilize the financial resources to assure enough saving and investment. The government industrial and commercial activities were extended to some important areas, including development banks, textile plants, cement factories, paper mills, iron and steel plants, and glass factories. Although the agricultural sector in Turkey is large and has a substantial influence on the economy, its share of national income relative to other sectors declined between 1938-63. On the other hand, the share of public enterprises which were operating in manufacturing grew at a rate about 7% in this period. This was caused by a large increase during World War Two in the demand for the commodities produced by these firms, and severe restrictions on imports of such commodities. After the war, however, the imports became available and public enterprises grew less rapidly. During the 1950s, public enterprises grew faster because the government created new firms and reorganized the old ones. Undoubtedly, public enterprises in Turkey were used as policy instruments by the government because the investment policy

of these firms was strongly related to the overall government development plan.

Public enterprises in Brazil have been used as a means of industrialization by the government in a continuous effort to transform the economy from agricultural to industrial. This was especilly evident during the period from 1939-73 when the agricultural share in net national product declined from 33% to 14% while at the same time government spending, which was more pronounced in infrastructures, increased rapidly.[22] The growth of public enterprises in Brazil is more visible in postwar period, when there has been a persistent shift of activities out of the agricultural sector into the industrial sector. The urbanization and consequent increase in the demand for social services also intensified the need for investment in public enterprises. Thomas J. Trebat mentions that "the infrastructure activities of the transportation and communication sectors dominated by public enterprises have approximately matched the eightfold increase in industrial output in the postwar era."[23] Brazilian public enterprises are distributed among various sectors, including mining, manufacturing, transportation, communication, electricity and finance.

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[22] Thomas J. Trebat, An Evaluation of Economic Performance of Public Enterprises in Brazil, (Doctoral Dissertation, Vanderbilt University, 1978), p. 54.

[23] Ibid., p. 54.

As in other countries, nationalization was a contributing factor to the growth of public enterprises in Brazil, especially the nationalization of railroads which had been under the control of foreign investors. The government realized that the nationalization was less costly than the guaranteed rate of return on foreign investment. In response to insufficient private capital and the government's intention to provide long term credits for basic industries, the Brazilian government followed the policy of import substitution in the early 1940s which led to the creation of public enterprises in two areas: petroleum and finance. the National Steel Company was also established because of the failure of the privately-owned steel industry, the undesirability of foreign ownership, and the strategic importance of the industry for defense.[24] In response to insufficient private capital and the government's intention to provide long term credit for basic industries, the Brazilian government followed the policy of import substitution which led to the creation of public enterprises in two areas: petroleum and finance. Public enterprises in Brazil compose almost 5% of the largest firms. They control more than 33% of total net assets of these firms and are concentrated mostly in public utilities, mining, and manufacturing.

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[24] For further information see Euforonio Carreno, on A Brazilian Model of Development (Doctoral Dissertation, Rutgers University, N. J., 1980), p. 220.

The South Korean public enterprise sector is relatively large compared to other LDCs. It has played a leading role in the promotion of infrastructures and the prevention of bottlenecks in the economy, and has contributed significantly to the growth of the manufacturing sector. The growth of public enterprise in this country, as Leroy Jones explains, can be traced back to colonial time and to the intensive use of government discretionary policy.

After the military revolution of 1960s, most of the enterprises owned by the Japanese colonial government or private entrepreneurs were confiscated by governmnet. By the end of 1973 the number of public enterprises in South Korea increased by 200%.[25] Jones argues that South Korea is one of the many less developed countries that has achieved a substantial growth rate during the 1960s which might be attributed to the sound government policy of effective utilization of public enterprises.[26]

The importance of public enterprises in South Korea may be realized by referrence to some measures of economic size. The information presented by Sheahan shows that about 14% of South Korean GDP from nonagricultural sectors is produced by public enterprises.[27] This share in terms of total value

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[25] Jones, opcit. p. 73-74.

[26] Ibid. p. 63.

[27] John B. Sheahan, "Public Enterprise in Developing Countries" in idem (ed) W. G. Shepherd, Public Enterprises: Economic Analysis of Theory and Practice, (Lexington, Mass: D. C. Heath and Company, 1976), p. 213.

of output (total value of output measured at factor cost; see Jones, Appendix B, p. 246) reduces to about 11.4%, and public enterprises account for more than 10% of employees' compensation. Real output of the public enterprise sector in South Korea grew at an average rate of 14.5% over a period when the overall economy grew at 9.5%. Korean public enterprises are more concentrated in the manufacturing sector. They account for 33% of the total value added in this sector with finance, communication, and transportation about 19% each, and electricity about 10%.[28]

Reviewing the sectoral composition of public enterprises in South Korea reveals significant changes during the period of 1969-75. The public enterprises' activities in manufacturing and construction remained stable during this period; their share in financial activities went up, and in mining and transportation decreased.[29] This indicates that in the post colonial period, public enterprises took over the strategic industries where the excessive concentration of private power was not desirable, or where private initiative was insufficient or lacking.

The public enterprises in India flourished after its independence in 1947. Before independence, the public enterprises were limited to elecricity and construction of irri-

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[28] Jones, op. cit. pp. 68-76.

[29] See V. Sundarajan, and Subhash Thakur, "Public Investment, Crowding Out, and Growth: A Dynamic Model Applied to India and Korea", International Monetary funds Staff Papers, Vol. XXVII, (Dec. 1980), pp. 814-855.

gation works, but after independence they were extended to many social services and industrial areas. Unlike other countries, the ideological considerations in the post independence period have been the most important factor in determining the role assigned to public firms. They have been used in accordance with the overall policy of promoting a socialist society. Direct public investment through public enterprises has also focused on the key industrial area. The government undertaking of the key industries in India was based on prior identification of them. As early as 1931, the socialist inclined government declared that the "State shall own or control the key industries and services, mineral resources, airways, waterways, shipping, and other means of public transport."[30] Later in 1965, the government listed 29 major industries in which the private sector was not allowed to enter or to lead the public sector. The private sector was prohibited from entering the shipping, aircraft, oil, coal, and telecommunication industries. The policy of dividing the industries between private and public sectors led to the channelling of government investment into the areas determined solely by political and not economic considerations. This approach is, according to John Sheahan, inferior to the use of public enterprises as a dynamic force in a mixed oligopoly structure.[31]

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[30] Quoted in Lloyd Musolf, Mixed Enterprises: A Development Perspective, Lexington, Mass: D. C. Heath and Company, 1972), p. 71.

The size of the public enterprise sector is relatively large in India. Its contribution to total fixed investment remained stable at about 33% from 1960 to 1975, its share of GNP was nearly 7%, and the real output of this sector increased at a rate of 9% overall for the same period.[32] Indian public enterprises are mainly concentrated in mining, banking and finance, transportation, communication, and manufacturing sectors.

2.2 CONCLUSION

From the preceding discussion it is evident that regardless of the dominant political philosophy, different countries have adopted public enterprises in various sectors. The scope of the activities of such enterprises has expanded or has remained stable, especially in LDCs, in recent years namely because no better way was available to deal with the problem of weak entrepreneurship. In most countries public enterprises have not been limited to building social overhead. They have also been extended to other fields such as manufacturing and agriculture, even though the government has not had a comprehensive economic plan.

The common goal of all countries with a large public enterprise sector has been to promote forces conducive to economic growth. It has been practically impossible for the

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[31] John B. Sheahan, op. cit. p. 217.

[32] V. Sundarajan and Tkakur. op. cit., p. 817.

private sector to create such forces. When the entrepreneurial talents are insufficient, when the technology comes from outside the countries, when the well-organized financial market is lacking, when the political and economic power is in the hands of the few, then the capability of the private sector to initiate economic development is limited. The public enterprises then can be an effective complement to private enterprises in the development process. They put a constructive pressure on the private sector to enhance its capability. Building such a favorable environment for the growth of the private sector may be costly, but social and economic benefit may exceed the cost.

In summary, the overall pattern of growth of public enterprises in the countries reviewed suggests that public enterprises came out of the situation common to most of these countries: (1) the popularity of socialist ideology which was the driving force behind large scale nationalization in most European and developing countries (the political opinion seeking public ownership never become a promonant political force in the United States); (2) the inability of the private sector to finance the projects which require huge amounts of initial investment with low return; (3) the apparent failure of private enterprises in the postwar period, which were then bailed out by the government; (4) the desire to meet international competition (oil industry) or preserve national prestige (national airline); (5) the need to elimi-

nate the commercial interests in military and national defense.

Chapter III

PUIBLIC ENTERPRISE AND CAPITAL FORMATION

The post war economic development of many less developed countries that have achieved outstanding growth rate has been marked by an increasing public investment share of GDP. For example, in Brazil the public investment share of GDP increased from 14% in 1949 to about 25% in 1975.[33] In South Korea the real rate of growth of investment in public enterprises more than tripled between 1963-73. It increased from 70.8 billion Won in 1963 to 230.1 in 1973.[34] Similar data for Pakistan indicate that public investment jumped from 20334.2 Rials in 1977 to 29694 in 1981, an annual rate of increase of more than 11.5%.[35] Because the low rate of capital formation is a serious obstacle, economic development is not possible without increasing the investment income ratio. Rostow indicates a rate of investment over 10% of national income is essential for the take off process.[36]

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[33] Thomas J. Trebat, An Evaluation of Economic Performance of Public Enterprises in Brazil, Ph. D. Dissertation (Vanderbilt University, 1978), p. 144.

[34] Leroy Jones, opc it. Table 6-2, p. 84

[35] The Government of Pakistan, Pakistan Economic Survey, (Islamabad, Goverment of Pakistan, Finanmce Division, Economic Advisors Wing), Various issues.

[36] W. W. Rostow on The Stages of Economic Growth: A Non-Communist Manifesto, (London: Cambridge University Press,

Arthur Lewis states that economic development is nothing more than the increase in saving from 4-5% of national income to 12-15% or more, because to him the central fact of economic development is rapid capital formation.[37] It is argued that the rate of capital accumulation in LDCs is not high enough to absorb all the labor forces, even in the advanced sector, because of dependency on foreign investment. The rate of capital accumulation is low while the population growth is considerably in excess of the growth of capital. Failure to attain adequate capital stock means the excess supply of labor will remain either unemployed or seek employment in low productivity rural areas. Thus, a huge amount of capital outlay is needed to absorb the unemployed or underemployed labor and to prevent the per capita income from decreasing in the face of growing poulation.

Athough there is not a general consensus about the most crucial element of economic development, in the dominant models the capital stock is regarded as the sole determinant of the economy's output, hence growth.[38] Therefore the at-

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1961), p. 41

[37] A. Lewis, "Economic Development With Unlimited Supply of Labor" on Manchester School of Economic and Social Studies (May 1954), Vol. XXII, No. 2, P. 139-91. See especially p. 155

[38] See for example the following studies: Irma Adelman, and F. T. Sparrow, "Experience With Linear and Piece-Wise Linear Dymanic Programming Models" in Idem (ed), Adelman, and Thorbecke, The Theory and Design of Economic Development, (Baltimore: 1966), pp. 291-316. United Nations Conference on Trade and Development, Trade Prospect and Capital Needs of Developing Countries (New York: United

tention of macroanalysis is on capital formation in spite of recent skepticism among some leading economists[39] about the sufficiency of capital accumulation as the only condition for economic progress. Although they suggest that other factors are also important, this writer believes that capital formation is still the heart of economic development. The high rate of capital formation can concurrently create the other conditions as well. It can lead to technological progress because it is the bearer of the already existing technology of developed countries. It can improve the quality of human resources by introducing the workers to modern production processes and advanced equipment that help them to acquire skill and experience. The resulting increase in productivity leads to higher income and expansion of the market which, in turn, stimulates further production.[40]

Nations Publicatoions, 1968)

[39] They include: Gerald M. Meier, Leading Issues in Economic Development Third Edition, (New York: Oxfor University Press, 1976), Chapter 3. C. P Kindleberger Economic Development Revised Edition, (New York: McGraw-Hill Book Co., 1977), Chapter 5. Ranger Nurkse, Problem of Capital Formation in Underdeveloped Countries and Patterns of Trade and Development, (New York: Oxfor University Press, 1970), p. 1.

[40] For further discussion of the effects of capital accumulation on various aspects of economic devlopment see S. P. Schatz, "The Role of Capital Accumulation", Journal of Development Studies, (Oct. 1968), pp. 39-43.

3.1 INVESTMNET AND THE PRIVATE SECTOR

In chapter II we mentioned that socioeconomic and political conditions in the LDCs are not conducive to the rise of private entrepreneurs. Thr historical conditions favorable to the economic development of capitalistic countries in the 19th century no longer exist in the LDCs of the present time. Their economy is not characterized by labor exploitation, supportive attitude for private wealth accumulation, and lack of government commitment. Indeed, the chronic dilemma of stagflation, which is still in LDCs, has necessitated the government commitment to redistribution of income and increasing general access to social services, and to improving unemployment rate, national output and productivity. It seems that the governments in the LDCs have already recognized their role in economic development. They do not consider themselves as the neutral observers of laissez-faire; rather they are active in investing in a wide variety of developmental projects. The state undertakings serve the necessary capital that the private sector may not be able to provide in a sufficient amount. Table 1, which compares the government expenditures on development programs for industrial and developing countries supports this point.

The task of controlling the investment flow by the government is as critical as the investment itself. The state needs to regulate the scarce capital resources in order to ensure that they flow into the right undertakings, i.e. de-

TABLE 1

EXPENDITURE ON ECONOMIC DEVELOPMENT

(as percentage of total)

Industrial Countries:		Less Developed Countries:	
United States	9.58	Turkey	43.10
W. Germany	8.15	Iran	26.88
United Kingdom	11.57	Brazil	22.35
Switzerland	14.90	Mexico	33.78
France	9.06	India	36.76
Netherland	6.99	S. Korea	22.18
Sewden	10.74	Venzuela	36.75

Source: International Monetary Fund.
Government Finance Statictics Yearbook.
different years.

velopmental projects. An attempt should be made to pull the resources out of speculation and real estates- the so called "land game"- which is an epidemic disease in LDCs and channel them toward industrial and agricultural activities, either directly or indirectly, by making such activities more interesting for the private sector. Usually the LDCs try to achieve this through various motivational policies such as protective tariffs, tax exemption, import duties concesion or exemption, and subsidy. Neverthless, the response of private entrepreneurs may not be adequate because the level of profit on the activities considered as favorable by the government is not high enough to enable such activities to compete with more profitable alternative projects. Consequently the government efforts to stimulate the

investment indirectly are not likely to produce adequate resources for developmental needs.

Labra explains that under the condition of stagflation which is prevailing in LDCs, the private investors are not likely to be interested in investment because the inflationary pressure undermines the real rate of return on private investment. Discouraged by the low rate of return, they avoid reinvesting their surplus to make up the losses.[41] This reduces the level of employment and results in exploitation of labor and worsening the already stagnant economy. The government policy to stimulate the rate of return on private investment may be effective in a very short run, but in the long run the government policy will eventually fail. The developmental observers[42] offer four reasons for such a failure: (1) there is no straight forward way of attracting the private capital into the desired activities; (2) the level of economic growth in LDCs is not high enough, so the potential profit is low; (3) there is insufficient entrepreneurial ability to extract the profit even though the government is able to increase it; (4) there is a lack of experience and complementary investment in the private sector due to prolong overprotection of this sector which results in a strong inefficiency and loss of its self regeneration.

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[41] Armando Labra, "Public Enterprise in an Underdeveloped and Dependent Economy" in Idem Ed. W. J. Baumol. Public and Private Enterprise in Mixed Economy. (New York: St. Martin's Press, 1980), pp. 36-40.

[42] See especially Albert H. Hanson, opcit. pp. 66-71.

Under these circumstances the only way to accumulate adequate capital is through public enterprises which require a low rate of return and can be used to mobilize the economic resources. In addition, they can improve income distribution, thus increasing aggregate demand, and market size, and providing hopeful prospect for the private sector. As Labra concludes, "public enterprise serves as the backbone of the system as it deals with the most critical of economic issues: employment, production of foodstuffs, and foreign exchange."[43]

John Sheahan argues that the private investment initiative may not be efficient in LDCs because the private investors do not have full knowledge of market opportunities.[44] Even if they have such a knowledge they are not able to finance their projects. The private investment decisions are not based on sophisticated schedules or accurate cost-benefit analysis; rather they are based on poor information. He believes that improving the conditions in capital market, even without any change in aggregate ability of the economy, would raise the productivity and growth rate.[45] This is why one of the basic areas in the public enterprise sector is "investment finance corporations" which are engaged in mobilizing the internal as well as external resources and pro-

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[43] Labra, op cit. p. 39.

[44] J. B. Sheahan. op cit. p. 205-235.

[45] Ibid., p. 210.

vide low cost and accessable credits for investors.[46]

Sheahan describes economic development as the response to investment opportunities. The response of the private sector is so weak that it can not be taken as the measure of potential opportunities open to the economy. He mentions two factors as the main determinants of private response: risk and return. If the investment opportunity is not exploited by the private sector, it must have low return, given the risk. Therefore, the private sector may not be willing to expand its operation to the point where all the potential opportunities are exhausted. Geometrically, this point is illustrated in Figure 1, The very inelastic response of the private investors may lead to the choice of investment level A, which means no ivestment at all. In other words, the level of investment chosen by the private sector is too low to yield a return greater than the cost of capital. The implication of this on our analysis of public enterprise depends on the structure of motivations and the people who make decisions about government investment.

The managers of public enterprises are less likely to be influenced by profit, risk, or the desire to control the enterprise. Since they have less personal interests in their decision making, they have more freedom to carry on investment up to point C which is the optimum size of investment.

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[46] For a detailed discussin on the financial public enterprises see W. G. Shepherd, "Public Enterprise in Financial Sector" in Idem Ed. Shepherd, op cit. pp. 185-204.

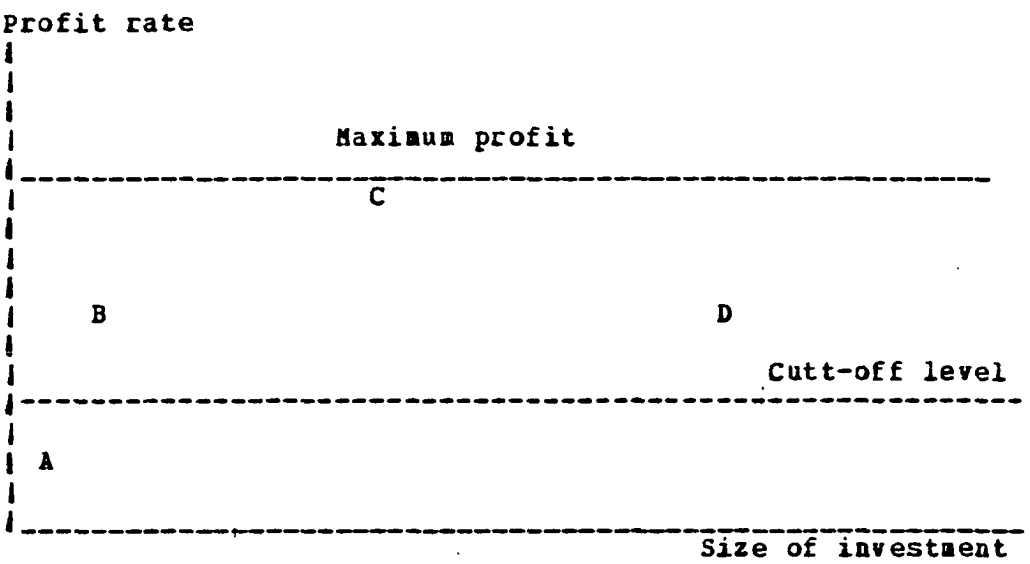

Figure 1: ALTERNATIVE CHOICES OF INVESTMENT SIZE AND THE RATE OF PROFIT

Sheahan raises the possibility of excess government investment, that is, the overexpansion of public enterprises, at point D, if the reward structure is mainly based on the size.[47] This is, of course, least likely in LDCs where the inadequate government investment has caused a noticable shortage of commodities produced by these enterprises. For example, in Iran you have to wait two or three years to receive your telephone or electricity services, or you have to stay in a long line to purchase the publicly provided products. This can be blamed partially on insufficient government investment on complementary projects, or inadequate infrastructures, especially transportation, in the LDCs.[48]

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[47] Ibid., p. 210.

Having described the importance of capital formation coupled with insufficiency of private response to investment opportunities, we may ask how the public enterprise sector can contribute to capital formation and how significant such a contribution is. As it was noted earlier the government can contribute to capital formation either directly by investing in public enterprises or indirectly by encouraging the private investors.[49] We do not not intend to concentrate on the government policies designed to stimulate the private investment in this study; rather we are interested in the direct government investment in public enterprises. That is:

> the way in which within a given structure of ownership of means of production the surplus of output over the basic consumption needs of workforce is extracted, mobilized through financial institutions and invested in the form of productive capacity."[50]

The government investment, then, is that part of surplus expropriated by the state. The states use a variety of policies to extract the surplus for the purpose of accumulation, mainly in an institutional manner. Hanson points out[51] that

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[48] This opinion is particularly expressed by the following authors: A. J. Youngson, Overhead Capital: A Study in Development Economics, (United States: Edinburg University Press, 1967); and R. Nurkse, op. cit.

[49] For a description of suc policies and their application to Brazilian economy see the following references: Werner Baer, Industrialization and Economic Development in Brazil, (Homwood, ILL: Irwin Inc., 1965), and Joel Bergsman, Brazil: Industrialization and Trade Policies, (New Yoork: Oxford University Press, 1971).

[50] E. V. Fitzgerald, Public Investment Criterion and Role of State, (London: McMillan Press Ltd., 1978), p. 100.

the best policy to generate a sizable amount of surplus is through public enterprises whose effect is either to increase the total investment in the economy or to direct the surplus from one sector to another. The extent of the state involvement in the accumulation process then determines the effects and scale of government investment. The state may limit its role to just supporting the private sector and to concentrating on activities such as financial aids or infrastructures.

3.2 THE RATIONALE OF GOVERNMENT INVESTMENT

The economy of most LDCs is characterized by what is referred to as "dualism" which implies that there exists a modern sector in the economy that uses the imported advanced techniques and depends on foreign capital. While a tiny portion of population is engaged in this sector, it accounts for the major part of national income. The majority of people work in the traditional agricultural sector but receive a small share of national income because of low productivity. The dualism is the direct result of uneven development of capitalism in LCDs. Within this type of economy, the role of the government becomes important. Because the state has political support for its operations, it can act to lessen the dualism by its distribution strategy. The data presented in Table 2, show the labor share of GDP in the manufacturing

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[51] A. H. Hanson. op. cit. pp. 66-71.

sector for both LDCs and advanced countries.The limited income distribution through wages has grave consequences for resource allocation. It implies increasing imports of capital goods and decreasing employment for LDCs. Thus, aggravating the problem of using capital intensive technique in the labor surplus economies.

TABLE 2

THE LABOR SHARE OF GDP IN MANUFACTURING SECTOR

(as percentage of GDP, 1970-75)

Less developed countries:		Industrial countries:	
Iran	8.71	United States	19.90
Brazil	8.08	W. Germany	24.17
Egypt	14.05	United Kingdom	23.50
India	12.14	Japan	13.84
Pakistan	8.45		
Turkey	10.31		

Source: United Nations.
Yearbook of National Accounts Statistics,
(New York: United Nations Publications, 1977), Vol. 1,
Individual Country Data.

The widespread disguised unemployment or underemployment in the traditional sector means substantial portion of population is apparently engaged in agricultural activities and consumes the agricultural goods but actually contributes very little or nothing to the output. Shifting this portion of labor force to the industrial sector is one of the major developmental policies advocated by many economists. In this

sector, the labor can be utilized more efficiently and can have a positive contribution to the economy's output. Arthur Lewis[52] suggests that in a dualistic economy the expansion of the industrial sector would create quite enough employment for the surplus labor of the agricultural sector because it draws labor from this sector where the marginal product of labor is zero.[53] The capacity of the industrial sector to absorb the surplus labor depends on two factors: the rate of capital accumulation and the progress in innovative activities which, in turn, depend on capital accumulation. Therefore, the capital accumulation appears to be the driving force in providing employment opportunities, increasing the magnitude of the economy's surplus, and assuring further expansion of the industrial sector.[54] This is

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[52] A. Lweis, op cit, p. 142.

[53] The assumption of zero marginal productivity of labor is controversial. It may not be true for many LDCs where the labor is still scarce. The agricultural works are really labor intensive and the removal of a worker may damage the output unless he is replaced by a better technique. Zero, or even negative productivity of labor is a possibility if the employment of labor becomes redundant. As soon as the redundant portion of labor is taken up then the marginal product of labor becomes positive. Geometrically, there is a turning point in the horizontal supply of labor beyond which the labor supply becomes positively sloped. For elaboration of this point see J. C. Fei, and G. Ranis, The Development of the Labor Surplus Economy, (Homewood, ILL: Irwin Co. 1964), p. 18, and G. Meier, op cit. p. 157.

[54] The effect of capital accumulation on agricultural surplus depends on its effects on relative price, the elasticity of demand for agricultural goods, and the conditions of labor productivity in agricultural sector. See Yashio Niho, "The Role of Capital Accumulation in Industrialization of A Labor Surplus Economy: A Formulation of

considered as one of the main conditions for economic development by many development economists.[55]

The less developed countries with the limited absorptive capacity can not generate many profitable projects without the assistance of the government. Schatz points out that:

> a general precondition for accelerated growth is the government that is dedicated to development, ready to invest on the basis of a comrehensive conception of social desirability of capital, and willing and able to take the steps necessary to mobilize the required financial and real resources. Given such a government, a substantial increase in the rate of capital formation is necessary and (nearly) sufficient for a substantial acceleration of economic development and is economically and potentially feasible.[56]

The implication of natural resources must not be ignored. Almost all the LDCs suffer from poor natural resources, what the economists call "positive natural disadvantages".[57] Yet the existing resources are not being fully utilized unless a huge amount of investment is being made by the public sector. The full exploitation of agricultural or mineral resources is not possible because of insufficient energy, unavailability of fertilizers at economical prices,

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the Fei-Ranis Model", in Journal of Development Economics, Vol. 3, No. 2, (July 1976), pp. 161-70.

55 Including: D. E. Argenson, "The Development of A Dual Economy", Economic Journal, (1961), pp. 309-334; and R. Sato and Y. Niho, "Population Growth and Development of A Dual Economy", Oxford Economic Papers, Vol. 23, (Nov. 1971), pp. 418-37.

56 Schatz, op cit. p. 41.

57 Youngson, op cit. p. 141.

and insufficient transport facilities. To make possible the full exploitation of resources, large scale government investment is needed. For these countries there is a threshhold to pass; as Youngson notes it, it is a matter of all or nothing.[58] The LDCs fortunately have access to the huge inventory of already existing advanced knowledge. Therefore, their ability to make radical changes in their environmental conditions is not constrained by inadequate technology.

3.3 GOVERNMENT INVESTMENT AND LINKAGE EFFECTS

Government investment results in further investment because the output of public firms is often input for the other firms. This is a useful aspect of government investment because it creates new opportunities and generates additional business and enlarges the country's capital base. Government investment generates primary and secondary effects, creating not only new investment but also leading to more efficient combination of productive factors. Youngson distinguishes two sets of impacts: first, there is the physical impact which means the improvement in utilization of new opportunities created by the original investment. He calls these "technological linkages" which usually result from government investment unless the output is consumed on the spot - a highly unlikely possibility for most government projects. Second, there is monetary impact in the form of

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[58] Ibid, p. 113.

the familiar Keynesian spending multiplier.[59] This effect seems to be weakened by high propensity to import, which is usually the case in LDCs, because the full operation of the multiplier requires that the newly generated income creates additional demand for domestic labor and capital.[60] The new activities attract inputs from other uses by biding up their prices. Because these factors are better utilized in new activities, they have a higher productivity. Therefore, part of the income generated will be net gain. This is very valuable for LDCs because these resources have zero or low productivity in their previous employment. The social gain is then equal to the value of production produced by these inputs.

The concept of linkage effects, first introduced by Hirschman, indicates that investment in a particular project may stimulate additional investment in earlier stages (backward linkages) or later stages (forward linkages) of the production process. This implies that the social benefits of a project may outweigh its private benefits. The magnitiude of linkage effects vary from industry to industry. Economists suggest that the project with highest total linkages is the best source of economic development. With regard to public enterprises, the question is, what is their merits in terms of linkage effects? Can they play the role of leading

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[59] Youngson, op cit. p. 123.

[60] For further discussion see Younson, op cit. p. 123.

sector in the sense of generating maximum linkages? Theoretically, because the government invests in key industries where the output is not consumed directly, there is a large probability of high forward linkages. This means that a high portion of the public enterprises output will be consumed by the industries as intermediate input. According to Table 3, presented by Hirschman, industries such as iron and steel, Petroleum products, chemicals, metal mining, petroleum and natural gas, and electric power generate very high total linkages. These industries are usually operated by the government in LDCs. They are characterized by long range economies of scale which are valuable because the expansion of output means lower cost and price. Similarly, Leroy Jones found that Korean public enterprise had a high position in a linkage matrix; strong forward linkages and moderate backward linkages comparable to nonagricultural sector in South Korea.[61] Thus, the expansion of government investment in public enterprises leads to the growth of other industries, especially such as the users industries.

The linkage effects may also be examined in the context of employment generation. Public enterprises may serve as a source of employment either directly or indirectly. In a study conducted by Meller and Marfin, direct employment is defined as the amount of labor required to produce a certain level of output; indirect labor is defined as the labor

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[61] Jones, op cit. p. 104.

TABLE 3

FL AND BL OF SELECTED INDUSTRIAL SECTORS

IN ITALY, JAPAN, AND THE UNITED STATES

Industrial sector	BL(a)	FL(b)
Intermediate manufacture:		
Iron and steel	66	78
Paper and products	57	78
Petroleum Products	65	68
Coal Products	63	67
Chemicals	60	69
Rubber Products	51	48
Final Manufacture:		
Leather and Products	66	37
Transport Equipment	60	20
Machinery	51	28
Shipbuilding	58	14
Intermediate Primary Production:		
Metal Mining	21	93
Petroleum and Natural Gas	15	97
Coal Mining	23	87
Electric Power	27	59
Agricultural and Forestry	31	72
Final Primary Production:		
Fishing	24	36
Transport	31	26

a. Backward linkage is equal to percentage ratio of industry purchases to total production.

b. Forward linkage is the percentage ratio of industry sales to total demand.

Source: A. Hirschman,
Strategy of Economic Development
(New Haven: Yale University Press, 1958), pp. 106-107.

needed by the industries that supply the intermediate inputs to public enterprises.[62] The ability of public enterprises

[62] Patricio Melle, and Manuel Marfin, "Small and Large Industry: Employment Generation, Linkages, and Key Sectors" Economic Development and Cultural Change, Vol. 29, (Jan. 1981), pp. 264-74.

to generate employment depends on total direct and indirect linkages which are considered as backward linkages by Meller and Marfin, in the Hirschmanian sense. Then, the forward linkages are computed as the difference between total linkages ans backward linkages. The total employment linkage of sector X is the fall in aggregate employment for the whole economy if sector X is completely removed. The removal of this sector will reduce the forward and backward linkages of the other sectors, hence their employment. Table 4, shows the total employment linkages (backward linkages plus forward linkages) for different industries in the Chilean economy.

As is indicated by this table, the key sectors for employment generation are food, wood, beverages, and metal products. Since these industries are not usually operated by public enterprises in LDCs, it may be concluded that public firms are not highly successful in employment generation. Meller and Marfin's study also indicates that small industries have a greater labor requirement compared with large industries, 90% higher within 20 manufacturing sectors.[63] Thus, government investment in public enterprises may not generate sufficient employment because it usually concentrate on large scale and capital intensive industries.

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[63] Ibid., p. 272.

TABLE 4

TOTAL EMPLOYMENT LINKAGES FOR CHILEAN INDUSTRIES

Industry	Total linkages
Food	97.65
Beverages	51.62
Tobacco	16.47
Textile	46.30
Clothing and Footwear	41.81
Wood	80.71
Furniture	41.60
Paper	46.72
Printing	35.60
Leather	40.51
rubber	22.48
Chemicals	29.04
Oil and Coal Products	13.86
Nonmetalic Mineral	34.55
Basic Metal	35.83
Metal Products	50.23
Machinery Except Electrical	38.94
Electrical Machinery and Appliances	32.88
Transportation Equipment	49.58
Divers Manufactures	36.65

Source: Computed on the basis of data given by Meller and Marfin. See Meller and Marfin, op cit. P. 269.

3.4 AN ASSESSMENT OF THE ROLE OF GOVERNMENT INVESTMENT

In the private sector the value of the project depends on the flow of future returns generated by the investment. The rule for acceptability of the project is that the value of its future returns must exceed its cost. The scope of the application in this type of methodology is limited to tangible effects. For the public projects, however, there are much wider standards. The simple cost-benefit analysis may not be sufficient - although applicable - basis for the ass-

essment of government investment simply because it does not reflect the social effects whose merit can not be judged in materialistic terms. This does not mean that they must be excluded from our analysis; rather, the attempt should be made to incorporate both economic and noneconomic effects into the evaluation process and balance them in a logical manner.

Economic development is not just materialistic growth; its scope is broader, since it includes social changes as well. Government investment should be assessed within this broad definition of economic development, that is, its contribution to the economy as a whole. It should not be considered in isolation, using strict microeconomic efficiency standards, because its importance as a part of the overall system and its contribution to national or sectoral plans may be ignored. This approach is, of course, based mainly on value judgement and, as Fitzgerald points out, is "as much an art as a science."[64]

It is often contended that the public enterprises are less efficient than their private counterparts in terms of their contribution to capital formation. However, there is no objective reason to confirm such an allegation; the theoretical evidence may indicate the opposite. The public enterprises undoubtedly have more undistributed profit for the purpose of reinvestment and the enlargement of their ca-

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[64] Fitzgerald, op cit. p. xxii.

pital stock. The private firms, on the other hand may have more distributed profit whose major portion will be devoted to the consumption expenditures because the greater the proportion of distributed margin, the larger the marginal propensity to consume out of profit.[65] The public enterprises are created as a source of surplus, not profit. The distribution of earning is limited to that portion of profit which is not reserved for future needs. Consequently, public corporations contribute more to capital formation. Their contribution is also consistent and steady ensuring a more stable growth for the economy.

The foregoing discussion is, of course, based on the assumption that the main objective of private companies is to maximize the profit and the wealth of the owners. This seems a plausible assumption consistent with rational economic behavior which implies that the individuals invest in private projects where the expected return is highest. But the question revolves around whether the public firms strive to maximize the wealth of the stockholders. Apparently, they do not. The owner of these enterprises is the government that represents the public. The expected return here may not necessarily be monetary. The government may ask the public firms to invest in the areas not particularly profitable, but desirable in terms of implementing its own planning ob-

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[65] This point is fully discussed in: Emilio Sacristan Roy, "Some Consideration of the Role of Public Enterprises" in Idem Ed. William J. Baumol, op. cit. pp. 44-52.

jectives. The public enterprises can not pursue the profit objective in Turkey, for example; a wide variety of public enterprises were created under the government of Kamal Attaturk which were operating at a loss, not because they were inefficient, but because they were required by the government to sell their products to the private sector at prices below costs. The objective was to transfer their profit to private enterprises. In Italy a law was passed in 1971 requiring public enterprises to allocate 60% of their existing investment and 80% of their new investment to Southern Italy. This policy served to develop southern Italy and, at the same time, to generate new investment. The public enterprise located in Northern Italy had to increase their investment in order to replace plants and machinery. The increase in investment then was translated to additional investment in southern Italy, as was specified by law, as long as they are obligated to abide by such government requirements.

Renato Mazzolini believes that public enterprises have two types of existential goals defined as "a company's purpose in the most basic sense":[66] profit goals and tool goals. The first set relates to enterprises ofa commercial nature which are left to their own operation and are not expected to participate in implementing the national plan. The

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[66] Renato Mazzolini, Government Controlled Enterprises International Strategic and Policy Decisions (New York: John Wiley and Sons, 1979), p. 23.

second set is applicable to those which may be called social enterprises becase they have to pursue socioeconomic goals in response to government policies, and to fulfill certain expectations. Therefore, some economists are convinced that profit maximization should be abandoned for such enterprises. Henry Tulkens argues that the main reason behind profit maximization is that the profit would influence the utility of the owners. Such effect is negligible for public enterprises because as he points out:

> the profit (or losses) of each of them, taken separately, affects only marginally the budget of each citizen, and therefore the latter can not be expected to put high pressure on public managers toward profit maximization. At least, there is some striving to avoid losses.[67]

Compared to private enterprise managers, the managers in public firms may be less efficient because they are not chosen on the basis of competency, but through the political ties and pressure of interest groups. They may not feel fully responsible because they do not bear the consequences of their actions. Since they know that they are not going to stay on the job permanently, they are not likely to be interested in the long run future of the enterprise. Therefore, they try to maximize their short run gain by undertaking short term, ambitious, although unproductive projects, with a highly visible outcome, showing the public that they are accomplishing something.

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[67] Henry Tulken, "The Publicness of Public Enterprises" in Idem ed. W. G. Shepherd, op cit. p. 29.

The upshot of the discussion is that although the public enterprises make a significant contribution to capital accumulation, their productivity may be reduced by the restrictions imposed by the government. Such restriction, as policies designed to control the price and the level of employment, or the continuation of unprofitable operations for the sake of their social benefits, inhibit the capital formation even though these enterprises may operate efficiently.

As is the case in Italy, the political influence can be used to secure new investment in a quick manner. Consequently, some authors believe that public enterprise's managers are more capable of taking the risk of their operations. Franco A. Grassini summarizes this point in the following passage:

> managers of state-owned enterprises are able to take higher risks in their investment than managers of private enterprises as a result of state laws and political and financial incentives. The higher managers of enterprises who are appointed or confirmed often receive their appointment through political patronage. As a result, they are freer to take the risks requested by government. The economic performance of the company does not reflect substantially on its capabilities; losses are seen as the consequences of poor political choices or imposed social objectives. The only indicator of successful management is in employment which, inevitably, requires an increase in investment.[68]

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[68] Franco Grassini, "The Italian Public Enterprises" in Idem ed. Y. Aharoni, Chapter 5, p. 80.

Most of the issues discussed above are abstractive and may not conform to empirical evidence. Waste and conspicuous consumption may also be seen in public firms. The association between the ability of enterprises to generate surplus and their expansion may be far less than perfect, because the surplus of these firms often goes to the treasury where they are allocated by the government authorities. While some corporations generate sufficient surplus, they are not able to use it to finance their own needed expansion. This is an indication of a weak chance of overcapitalization in public firms.

The effectiveness of public enterprises depends also on the degree of autonomy they have in managing their own internal matters. The independent managers feel responsible for the failure of the corporation, so there is a larger probability of success. A good example is provided by the Electric de France which is dealt with as a public enterprise but works efficiently as an independent unit, as opposed to the French Telephone Company which is run entirely by the government.[69]

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[69] See William J. Baunol, Public and Private Enterprise in A Mixed Economy, off Proceeding of a conference held by International Economic Association in Mexico City, (New York: St. Martin's Press, 1980), p. 55.

Chapter IV

THE GROWTH OF THE PUBLIC ENTERPRISE SECTOR IN IRAN

This chapter is designed to review the pattern of growth of public enterprises in Iran. First, we will examine the expanding role of the government in Iranian economy. Then, we will look at Iran's development plans as the main events that led to expansion of public enterprise. And finally, we will present some concluding remarks.

4.1 THE PATTERN OF GROWTH OF PUBLIC ENTERPRISE IN IRAN

Iran has a mixed economic system in which both the private and public sectors are actively involved in economic affairs. Prior to 1900, the role of government was limited to selling concessions or granting monopoly rights to foreign entrepreneurs.[70] The selling of concessions was not based on

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[70] The first such concession was given in 1872 to Julius de Reuter. It allowed for the exploration and production of coal, iron, copper, oil, and other mineral resources for sixty years in exchange for 15% of the net profit. Also in 1900, William D'Arcy was granted the right to explore for oil, natural gas, and oil-related minerals in all Iranian land except five northern province (which were under Russian influence) for L200,000 and 16% of the net profit. This was really a new factor in Iranian history because it opened the door to foreign domination for the coming decades. Near the close of the eighteenth century the Belgian and Russian entrepreneurs also obtained permission from the Iranian government to invest in modern manufacturing plants including: match, glass, and sugar beet factories. The nature of such deals is discussed in

a well organized program nor incorporated into an overall economic plan. Its purpose was to utilize the economy's natural resources while securing a sizable source of revenue for the central government. The benefits of such deals were usually directed to the country of concessionaires rather then Iran. It was not until 1925 that the government made an effort to further control the economy by expanding its role through a series of laws enacted to increase the government influence on economic activities.[71] The state monopoly was created to control the exports and imports. This was considered an essential move to curtail the demand for foreign exchange, to stimulate the demand for domestically produced products, and to protect the infant Iranian industries. The government attempted to create state factories in capital intensive areas while encouraging private enterprise in small scale industries through protective policies and other incentives that were made available to this sector. No serious attention was paid to the agricultural sector; instead,

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the following sources: Julian Bharier. Economic Development in Iran 1900-1970. (Great Britain: Oxford University Press, 1971), Chap. 9, and Manouchehr Farhang. The Economic Life of Iran. (Tehran: The College of Communication Science Press, 1973), Chap. 3.

[71] These laws were generally aimed at creating state monopolies in certain areas, or encouraging industrial investment of the private sector. For instance, a law of 1925 created a state monopoly of sugar, sugar goods, and tea. It also exempted imported machineries from import duties for ten years. A law of 1931 established a state monopoly in foreign trades. More information about these laws may be found in Bharier. op. cit., pp. 174-76, and Jamshid Amuzegar. Iran: An Economic Profile. (Washington, D.C.: The Middle East Institute, 1977), p. 99.

the emphasis was on promoting infrasctructures by investing in roads and communication facilities to reduce the bottlenecks.

As in most of the other LDCs, in Iran the major step toward government intervention was taken after World War Two. Between the two wars the country had been occupied by allied forces and the government influence in the economy was undermined. The improvements in roads, railways, and communication facilities were not to stimulate economic growth, but rather to serve the allied forces since most of the key industries were under the control of British, American, or Russian enterprises. By the end of World War Two, the circumstances were changed in favor of government involvement in the economy. The idea of long run planning was developed, and the need was felt for promoting adequate infrastructures and basic industries capable of generating self sustained growth. Many goverment agencies like The Industrial and Mining Bank, and Planning Board (which later on was changed to Plan Organization) were established to formulate and coordinate a comprehensive national economic plan. As a result the government's economic activities were expanded and its priorities were translated into the operational objectives of national plans. A number of public enterprises were created to accomplish these objectives.

Before 1925, large scale manufacturing industries did not exist in Iran. The manufacturing sector was limited to a

few small local workshops operating in such basic areas as carpets, shawls, textile, sugar, leather, matches, etc. Most of the products of this sector were demanded for the domestic market, leaving a very low chance for export. Earlier attempts by foreign entrepreneurs to establish modern factories in this country failed because of scarcity of labor, the high cost of acquiring raw materials, the foreign competition, and such noneconomic factors as the unreadiness of the public to consume the products produced by machine. The absence of a national economic plan and the restrictive custom duties on imports were also among the causes of the slow growth of the manufacturing sector during this period. Very little statistical information is available on such aspects as the number, output , employment of those workshops. In 1947, the Ministry of Labor made a survey of Iranian idustrial plants.[72] The information provided by this survey, although of poor reliability, can give us some clue to the development of the manufacturing sector in Iran. During 1926-1947, the main characteristics of industrial development in Iran were the following: (a) most of the factories were owned and operated by the private sector; (b) they were concentrated in the areas of basic needs such as food materials; (c) the needed machinery and capital equipment had to be imported.

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[72] Ministry of Labor. Survey of Major Industrial Plants of Iran. (Tehran: Ministry of Labor, 1943).

The role of the government during that period was limited to making laws and regulations in order to encourage private industries. Numerous government agencies were involved in dealing with the manufacturing sector. The government hoped that by assisting the private sector it would be able to modernize the industries and to free the country from imports. However, because of inadequacies in the private enterprises the government had to act directly to establish the new factories in certain areas. For instance, the price of sugar was (and still is) controlled by the government in Iran. This, coupled with high custom duties on imported sugar, caused a heavy loss for private sugar factoties. The government subsidization of private sugar producers was costly and did not solve the problem. Therefore, government action was taken to open the sugar beet plants between 1932-38. In other manufacturing areas the government intervened for quite different reasons. For example, in the cement industry, the establishment of state owned factories was due to the availablility of raw materials, the simplicity and profitability of operation, and the high capital labor ratio.

In summary, during this period the major pressure for industrialization came from the government. Its direct contribution was substantial. In 1946,for example, 64 out of 175 large Iranian factories were owned the government, and about 50% of industrial workers were engaged in state facto-

ries.[73] Sugar, cement, and tobacco were under almost complete government ownership and control. In textiles, tea processing, and flour and rice milling, the control was distributed between government and private enterprises, but other manufacturing industries were under almost complete control of the private sector.

The period of 1947 to 1955 was marked by the occurence of important events in the Iranian economy which affected especially the manufacturing sector. The first economic plan was introduced, the oil industry was nationalized, and the political events of the early 1950s led to the coup d'etat in 1953. The government decided to reorganize its own factories and at the same time to protect the private industries. Most of these factories were operating at a loss because of mismanagement, overemployment, undue centralization, and competition from aboard. The initial effect of the nationalization of oil was a cutback in industrial spending of the First Plan from 5.3 billion to 1.6 billion Rials which was allocated entirely to the completion of two state sugar factories. The private investors also suffered from shortage of foreign exchange because of the decline in all exports. Therefore, little progress took place in the manufacturing sector over these years.

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[73] Plan Organization. Report on Second Economic Plan. p. 56.

4.2 ECONOMIC PLANNING AND INDUSTRIALIZATION

For the Iranian planners, economic development was synonymous with industrialization and the shift from an agricultural to an industrial state. Iran's post-war economic achievement was nothing more than a continuous attempt to transfer resources out of the agricultural and into the industrial sector. The government believed that the average productivity in this sector was much less than that of the advanced countries due to the following reasons.[74] (1) incompetent management in private enterprises; (2) the shortage of enrepreneurial skills and capital goods; (3) low scale operation; and (4) lack of adequate infrastructures. Faced with these problems, society pressured the government to expand its economic role and accept the new and complicated responsibilities which necessitated the formation of huge and specialized productive entities. Accordingly, the government expenditure for the industrial sector rose persistently after 1949, at the expense of falling agricultural outlays. As it is indicated by data in Table 5, The government capital spending on infrastructurs and industries grew during the last three decades while it diminished for the agricultural sector. During 1968-72 alone the growth rate of the industrial sector was reported as 13.8%, almost 1% above the projected rate and 2% more than overall growth of GNP. The growth rate of the agricultural sector during the same

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[74] "4th Plan", p. 34

period amounted to only 4%, 1% below the estimated rate. The period of 1968-78 was marked by an increasing investment in infrastructures. Perhaps this was due to the planners' realization that the economic growth was not possible without adequate infrustructures.

TABLE 5

GOVERNMENT EXPENDITURES ON SELECTED SECTORS

(Billion Rials)

Sector	1949-55 A	%	1965-62 A	%	1963-67 A	%	1968-72 A	%	1973-78 A	%
Agriculture	5	25	18	22	47	23	65	13	80	28
Infrast. & Basic Ind.	8	38	37	43	102	50	312	65	533	52

A= amount
Source: "Bank Markazi", Various years.

The industrialization gradually led to urbanization and further government involvement in social and economic activities. The total expenditure of the public sector was rising continuously to meet the increasing demand for social or economic services. Meanwhile, at that critical stage of Iran's economic development, a substancial outlay was needed for capital formation. Fortunately, the rich oil sector that enabled the government to earmark a huge amount of its revenue for direct public fixed capital formation in certain fields, and at the same time to increase its current expen-

ditures. The figures in Table 6, show the relationship between total government spending, GNP, and current and capital expenditures for the decade from 1967 to 1976. Except for 1973, the ratio of government expenditures to GNP shows a smooth and steady growth. The sharp decline of this ratio in 1973 was due to the increase in the price of oil, hence GNP, which was not matched by an equal rise in government spending. The main reason for this growth was the increasing expenditure on infrastructures, basic industries, armed forces, and government administration.

TABLE 6

THE GROWTH OF PUBLIC SECTOR EXPENDITURE

Year	(1)	(2)	(3)
1967	27.7	60.1	39.9
1968	30.3	59.0	41.0
1969	33.0	56.0	44.0
1970	32.7	58.5	41.5
9171	34.2	60.5	39.5
1972	33.9	63.8	36.2
1973	18.3	61.6	38.4
1974	30.6	65.2	34.4
1975	41.8	59.8	40.2
1976	40.3	65.9	34.1

(1) = (total/GNP) 100
(2) = (current/total) 100
(3) = (capital/total) 100

Source: "Bank Markazi", Various issues.

One of the features of economic planning in Iran was the emphasis on industrial diversification which led to further expansion of public enterprises in this country. For this purpose a vast number of new industries was launched and the old ones were expanded, hoping to provide a reliable foundation for a self sustained economy without strict reliance on a single industry, i.e., oil. The data on government expenditure on development projects which are given by Table 7, show that during the period of 1962-78 more than 38% of total government expenditures on the average was devoted to development projects each year. This includes the government outlays for industries, mining, elctricity, gas, steam and water, roads, transportation, and communication.

The emergence of most public enterprises in Iran was the direct result of this expanding government role. The public enterprises in Iran have been created in numerous forms and structures in both financial and nonfinancial sectors. Particular attention will be paid to the large nonfinancial public enterprises in this and forthcoming chapters. These enterprises are engaged in oil exploration, petrochemicals, iron and steel, mining public utilities, agricultural development, airlines, railroads, and communication. The sectoral distribution of Iranian nonfinancial public enteprises will be presented in Chapter V, and a complete list of them will appear in Appendix B.

TABLE 7

DEVELOPMENT EXPENDITURES IN IRAN

(Billion Rials)

Year	Amount	As % of total
1963	18.8	28.0
1964	27.2	33.4
1965	42.0	48.0
1966	44.4	49.0
1967	63.1	52.0
1968	83.0	59.0
1969	83.0	53.0
1970	92.2	39.8
1971	103.6	36.5
1972	116.6	32.5
1973	132.6	28.0
1974	303.4	24.2
1975	426.6	27.2
1976	558.1	31.1
1977	844.5	34.0
1978	672.3	33.8

Source: "Bank Markazi", Various years.

4.3 DEVELOPMENT PLANS

The purpose of economic planning in Iran was to formulate the long term policies of the public sector while at the same time provide guidelines for the private sector by informing it of government priorities. The state attempted to promote both sectors by direct participation in capital formation, and by channelling private funds into the areas known to be of vital interest. The government undertook a series of complex industrial projects which for various reasons such as capital requirement, size, risk, technological

knowhow, etc., were unattractive to the private sector. Whereas, its traditional role in promoting infrastructures was undermined, emphasis was on rapid growth of industrial output with minor attention to employment and social welfare. The government hoped that by accelerating the rate of growth of output, it could generate sufficient employment opportunities to absorb the expanding labor force. However, adopted welfare measures were not sufficient to improve the income distribution.

The government hoped to overcome the structural constraints through development planning. It was aware that the private sector had neither the financial nor the technological capabilities to remove these obstacles. The first and second development plans (1949-55, 1956-62) were really nothing more than lists of projects that the government intended to invest in. The emphasis in the First Plan was on infrastructures with secondary attention to industrial activities, irrigation, and mechanization of agricultural sector. More than three- fourths of the resources under this plan were allocated to promotion of infrastructures, agriculture, and improvement of social welfare. the main sources of receipts were the oil revenue, more than 70% of total, and foreign loans.

The projected total expenditure of the Second Plan (1956-62) was 40% more than that of the First Plan with main reliance, again, on the oil revenue. The allocation of funds

under this plan was as follows: communication 33%, agriculture 26%, social services and utilities 26%, and industry and mining 15%. During the life of the first two plans the Iranian economy was faced with some uncontrollable fluctuations which resulted from lack of experience in planning, the uncertainties surrounding these plans, and the political events that led to nationalization of the oil industry in 1950. Although the planners were pessimistic about the prospect of Iran's industries, they made some progress in expanding government activities into irrigation projects, fertilizers, railway system, ports, public utilities, and modernization of textile industry.

At the beginning of the third plan the state offered some of its own factories to the private sector for sale because of general inefficiency and high opportunity cost in their operation. In 1963, a comprehesive study was made by the International Bank for Reconstruction and Development of the state's enterprises to find the cause, or causes, of unprofitability. No evidence of overstaffing or excessive capital-output ratio was found in comparison with private enterprises. Instead, the reason for inefficiency was reported as high administrative cost and strict centralization, which tended to destroy creative and innovative ideas.[75] In spite of this report, which implied that the private sector would

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[75] International Bank for Reconstruction and Development. The Development Program of Iran - An Appraisal. (International Bank for Reconstruction and Development, 1963), part 2. pp. 30.

have found the state factories profitable, the government was not successful in selling these units, or correcting the inefficiencies. In the 1960's the government took a passive role in the area of production of consumer goods. During this period, all the new establishments in this area were privately owned and operated. The role of the government was centered on financial assistance, or protective subsidies; the so-called policy of import substitution via promoting the private industry.

The comprehensive approach to development planning began with the Third Plan (1962-67) whose overall goal was to achieve a target growth rate of 6% for GNP through industries. This was translated into a series of gove rnment investment in the core industries such as steel mills, machine tools, petrochemical plants etc. Nearly 70% of total government spending was devoted to the industrial sector in this plan. Part of this amount went to the existing government firms to increase their capacity. These enterprises were mostly operating in sugar factories, wearing mills, carpet industries, foodprocessing, and tobacco factories. The government started the foundation of heavy industries like iron and steel, petrochemical, metallurgical, machine tools, etc. In addition to direct investment, the government assisted the private sector by extending credit to private investors in the form of loans (1518 million Rials), or equity

participation (1381 million Rials).[76]

The actual figure of industrial spending under the Third Plan was about 8% above the projected amounts. The reasons were reported as: (1) the policy of government in protection and encouragement of the private sector resulted in an increasing confidence of the private investors; (2) government commitment to promote infrastructures spurred the private sector to increase its investment during the entire life of the Third Plan; (3) expanding credits and long term loans to the private sector through The Industrial and Mining Development Bank of Iran, Industrial Credits Bank, and The Industrial Guarantee Fund facilitated private investment.[77] In addition, the government helped the private sector by pursuing policies which led to the establishment of vocational school and on-the-job training.

During this plan period, the contribution of the agricultural sector to GNP dropped from 34.3% to 24.3%, while the industrial share grew rapidly to 14.2% in 1967, up from 8.7% in 1959. The agricultural sector, as a matter of fact, was reported to have the smallest growth rate among all sectors resulting in a strong dependency on foreign sources for food and agricultural products. In terms of employment, this sector also declined from 65% of all employment in 1956 to about 46% in 1967. The same figure for the industrial sector

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[76] "3rd Plan", pp. 52-57.

[77] Ibid., pp. 49-50.

jumped up to 27% in 1967 from 20% in 1956. The government's share of total fixed investment grew at an average rate of 5% during the life of this plan when the government was able to establish giant industrial corporations.[78]

The policy of industrialization was also followed in the Fourth Plan (1968-72). The government declared that:

> The Fourth Plan is the first stage of a long term programme to industrialize the country, the objective of which is to make the country independent of consumer goods and to manufacture the capital and intermediate goods inside the country so as to minimize the volume of imports, and to diversify the exports of locally manufactured goods to foreign countries. This will reduce the dependency of the country on oil revenue.[79]

The primary goal of the public enterprise sector under this plan was to complete the industrial projects which were started in the latter part of the Third Plan as well as to create new public firms in aluminum smelting plants, tractor factories, fisheries and related industries, and the defense industries.

An overall economic growth rate of 9% was envisaged for the Fourth Plan. To provide support for such a high growth rate, the fixed capital formation of 810 billion Rials was appropriated. The Fourth Plan indicated that the public consumption expenditure must not go up faster than 10% per year. Instead, the emphasis was on public industrial investment because: (1) it had a larger rate of return in compari-

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[78] All the figures referred to in this paragraph were derived from "3rd Plan", pp. 1-13, and pp. 49-58.

[79] "4th Plan", p. 120.

son with the other sectors; (2) the growth of this sector was helpful in improving the production techniques and management in other economic fields; (3) unlike the agricultural activities, it was less affected by natural and climatic conditions; and (4) industry was better able to adopt the nature of its products to ecnomic requirements. On the basis of such reasoning, more than 25% of fixed investment of the public sector was allocated to the industrial activities while the share of agricultural sector was only 8%.[80] The distribution of the fixed investment among various sectors during the Fourth Plan is presented in Table 8.

During the Fifth Plan no major public firms were created. With regard to the manufacturing sector the following objectives were set up:[81] (1) to complete the unfinished projects of the Fourth Plan, and to merge similar industries in order to decrease the unit cost. (2) to expand the industries closely related to the existing industries especially the capital goods industries to reduce the dependency on foreign sources and to increase the probability of exports. and (3) to use labor intensive methods to prevent the importing of foreign techniques or capital. The Fifth Plan was originally approved by Majlis - Iran's house of representatives - as early as 1973, but the increase in the oil price later in that year caused a drastic change in the financial

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[80] All the stated figures in this paragraph are based on the "4th Plan", p. 41, and pp. 52-53.

[81] "5th Plan", p. 45.

TABLE 8

FIXED INVESTMENT DURING FOURTH PLAN

(billion Rials)

Sector	Public	Private	Total	As % of Total
Agriculture	25.0	41.5	66.1	8.2
Industry and Mining	86.7	120.3	207.0	25.5
Oil and Gas(a)	42.3	52.3	94.6	11.7
Water and Power	98.4	1.2	99.6	12.3
Other Sectors	191.1	158.6	342.7	42.3
Total	443.5	366.5	810.0	100
As % of Total	54.7	44.3	100	

a. Fixed investment by the oil consortium and other foreign companies.

Source: Plan Organization,
4th National Development Plan,
(Tehran: Plan Organization, 1968), p. 52.

projections of the plan. The revised version of this plan which was approved by the parliament in 1974, allowed the government to spend more on developmental projects. It called for total fixed investment of 4699 billion Rials for the period of 1973-77, a 100% increase over what was estimated in the original plan. The primary goal of the Fifth Plan was to attain the highest possible growth rate with emphasis on industries and infrastructures. The fixed investment of the public sector was projected as 1548.7 billion Rials, of which 6.6% was to be spent on the agricultural sector, 14.4% went to the industrial and mining sector, and the remainder to other government activities. In the fifth

plan alone the industrial sector enjoyed a growth rate of 16% compared to 4.6% for the agricultural sector.[82]

4.4 AN APPRAISAL OF IRAN'S DEVELOPMENT PLANS

Having reviewed the development plans of Iran, we gained some insight into this country's economic conditions. The facts provided by the official statistics - although controversial - indicate the reasons for the expanding role of the government , and enable us to draw some overall conclusions.

Iran's development plans provide a useful context in which the creation and growth of the public enterprise sector can be examined. They describe the political and historical circumstances - which are similar to those of the other LDCs - from which the Iranian public enterprises have evolved. They were not a complete success in all aspects because of insufficient preconditions. The planners were aware of the institutional framework and the socioeconomic constraints, but they failed to incorporate them into their development strategy. Consequently, the Iranian public enterprises were not potentially successful. Most of them were, and still are, operating below their full capacity due to shortages of raw materials, parts, skilled labor, and all other kinds of physical bottlenecks. The government was not able to rectify these apparent shortages through its econom-

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[82] The stated statistical numbers in this paragraph are based on the "5th Plan", pp. 52-3.

ic planning. Also, because of its narrow approach to economic development, the benefits of these plans were not spread out throughout the economy evenly. Although it is difficult to judge the performance of the public enterprise sector in Iran at this stage, some general observations can be made based on the analyses of this chapter.

The central goal of almost all the development plans was to promote modern industries as fast as possible through massive government investment. The attempt to diversify the industries was based on the belief that strict reliance on a single sector of oil would jeopardize the countries economic prospect because sooner or later the oil resources would be depleted. The highest priority was given to the oil related industries since the needed resources were relatively abundant within the country. Furthermore, the capital intensive nature of them prevented the private enterprises from entering these areas. The strategy of establishing public enterprises in basic fields intended to serve a dual purpose: generating the needed capital, and moving the country away from a single crude oil production. For this reason, the iron and steel, machine tools, mining activities, etc., gained particular attention. The success of industrial diversification was not forthcoming without adequate infrastructures, but failure to respond promptly caused the emergence of persistent shortages of all kinds, and binding constraints which impaired the productive capacity of the economy.

If the economic development is viewed just as a materialistic growth, Iran has experienced a remarkable rate of growth during its last three development plans at least as far as the official statistics are concerned. According to government figures all sectors other than agricultural enjoyed an outstanding growth rate during the last three plans. The average annual growth rate of GDP was reported as 11% which was far above the same figure for most of the other LDCs for the same period.[83]

This high quantitative growth of the Iranian economy was not without cost, namely the destruction of the agricultural and other traditional activities. Furthermore, the qualitative side of economic development was assumed away. Although there is no wide spread agreement as to whether sole reliance on materialistic growth is good or bad, and no acceptable standard exists against which such evaluation could be made, the crude data must not be taken at their face value. The huge amount of oil revenue, especially after 1973, makes it almost impossible to attach any significance to the reported growth rates. The oil revenue was the major source of funds to finance the government projects. On the average, more than 57% of total receipts of each plan was contributed by the oil sector[84] By providing the major

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[83] United Nations. Year Book of National Accounts statistics. (New York: United Nations Publications, 1980), Individual Country Data.

[84] Computed based on the data provided by "bank Markazi", Various years.

part of the capital needed for the growth of the economy, the oil sector obviated the most severe constraints on growth faced by this country. It seemed that most of the public enterprises were not able to secure their own capital requirements without the help of the oil revenue. The availability of easy oil money perhaps led to two detrimental effects on public enterprises. First, it resulted in their wasteful operation and sluggishness in providing their own funds. Second, Because the price of oil was highly sensitive to international political events, the uncontrollable fluctuations in the price of oil were dangerous enough to destroy the successful operation of public enterprises.

One of the significant changes that took place during the entire planning period in Iran was the rapid decline in the agricultural sector. Its rate of growth was always the lowest among all sectors, and usually below the projected target rate. The contribution of this sector to GNP declined sharply relative to those of the other sectors. Data in Table 9, present the sectoral distribution of GNP for the last four plan periods. Over this time nearly one third of GNP was accounted for by the services sector, while the share of agricultural sector was only 17% on the average each year. The reason was that this sector included the "state services" item which contained the budget of security forces -even though it was deliberately underestimated- and the lavish expenditures on sophisticated army equipments.

TABLE 9

SECTORAL DISTRIBUTION OF GNP 1962-78

(billion Rials, constant price)

Sector	1962-63 A	%	1967-68 A	%	1972-73 A	%	1977-78 A	%
Ariculture	88.8	27.4	111.1	21.6	71.0	10.3	339.0	9.2
Industry(a)	57.8	17.8	106.3	20.7	333.0	12.6	684.0	18.5
Services(b)	119.8	40.0	187.0	36.4	629.0	23.7	1281.0	34.6
Oil	40.0	12.3	92.4	18.0	1333.0	50.6	1285.0	34.7
GNP(c)	324.2		513.8		2635.7		3702.4	

a. This sector includes: manufacturing and mines, water and power and construction.

b. It contains also the share of state services.

c. This may not be the exact sum of the columns 1-4, because it includes indirect taxes, and non-oil net factor income from abroad.

A = amount

Source: Homa Katouzian.
The Political Economy of Modern Iran: Despotism and Pseudo-Modernism, 1926-1979.
(New York: New York University Press, 1981), p. 257.

The data in Table 10, compare total government expenditure on development with that on defense which is mostly purchases of arms from the United States. Although the data on military expenditures are rarely available, the information provided by Table 4-10 points to their rising trend in Iran. Strangely enough, the government spent almost an equal amount on defense and development for the entire period. For the years of 1975 and 1976 the defense expenditure

was even larger. The chief objection to such high military spending is that it depleted the total resources available for economic development in this country where radical structural improvements were needed. While the defense sector was consuming the lion's share of the economy's resources it easly escaped publuic scrutiny since the details were not publicized.

TABLE 10

GOVERNMENT EXPENDITURES ON DEVELOPMENT AND DEFENSE

(billion Rials)

Year	Development Expenditure(a,b)	Defense Expenditure(c)
1970	92.2	66.0
1971	103.6	79.2
1972	116.6	103.8
1973	132.8	114.2
1974	303.4	276.0
1975	426.5	474.4
1976	558.1	669.4
1977	844.5	705.0

a. Source: "Bank Markazi", Different years

b. Development expenditures include government investment in industries, mining, electricity, gas, steam and water, roads, transportation, ans communication.

c. Source: Computed on the basis of, U. S. Military Sales to Iran, Staff report to Subcommittee on Foreign Assistance of the Senate Foreign ralation Committee, (Washington D.C.: 1976), p. 13.

The high import content of this sector was another problem. The imported arms were usually sophisticated military hardware and weapons with no civilian applications. They were being exchanged for oil the most valuable resource that could have otherwise been used for export earning or other productive purposes. Although the implication of defense spending on the Iranian economy is a subject urgently demanding investigation, no major study has been made so far about the extent and nature of such an impact.[85] Briefly, the scenario of Iran's past development planning was really nothing more than using the oil revenue to alter the structure of the Iranian economy and the fabric of its society. The resulting changes of careless development strategy were detrimental to some sectors. The rural society which was the producer of agricultural commodities was seriously damaged. The inequitable distribution of income led to social and economic imbalance which further separated the already dualistic economy, the local small scale industries were ruined in competition with large and inflated industries, the Iranian culture and value system were undermined, and a hostile

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[85] There has been some general debate on this issue in recent years. The interested readers may be referred to the following sources: Emile Benoit. Defense and Economic Growth in Developing Countries. (Lexington, Mass: Lexington Books, 1973); Mary Kaldor. "The Military in Development," World Development. Vol. 4, No. 6, 1976; U.S. Arm Control and Disarmament Agency. World Military Expenditures and Arms Transfer 1970-79. (Washington, D.C.: March 1982); and David K. Whnes. The Economics of the Third World Military Expenditures. (Austin: University of Texas Press, 1979).

atmosphere was created between the state and the people who disapproved of what it was doing. These were some of the consequences of the government's naive goal of industrialization and the Shah's dream of creating "the fifth industrial state in the world".

Chapter V

ECONOMIC GROWTH AND THE IRANIAN PUBLIC ENTERPRISES

The Iranian public enteprises, especially those in the industrial fields, originated not from social preferences or historical necessities, but rather from the government's precipitateness into industrialization and its unwillingness to rely on the private sector or await its initiative. They were used as a shortcut to industrialization and economic growth. Judging the performance of the Iranian public firms, therefore, means examining their contribution to economic growth; that is, their effect on national output, capital formation, employment, etc. Similar observations can be made for the private sector to find out what effect the growth of public enterprise has had on this sector. The main concern of this chapter is to investigate the output and investment pattern of public enterprises and their impact on the Iranian economy. The theoretical argument that follows immediately is intended to serve as a basis for the subsequent discussion. It describes the alternative strategies that can be used to speed the pace of economic growth. In the next section some evidence will be presented on the importance of the Iranian public enterprise sector. Then its contribution to economic development will be studied in the

remainder of this chapter by looking at their output, capital formation, linkage effects, and employment generation.

5.1 THEORETICAL SETTING

The concern of the development economists today is to find out the most advantageous style of economic growth, that is, how the growth proceeds with lowest cost, and how it can be sustained. The modern-day approaches to economic growth began after World War II, with the pioneering works of several leading scholars[86] and the international organizations such as the United Nations and the World Bank.

On the one hand, strong support has been given to the Rosenstein-Rodan argument that the "big Push" policy is the most efficient way to move the LDCs out of the vicious cir-

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[86] Some of the earlier related works may be found in the following sources: Paul N. Rosenstein-Rodan. "Industrialization of Eastern and Southeastern Europe," Economic Journal. (June-Sept. 1943), pp. 205-216; Paul A. Rosenstein-Rodan. Capital Formation and Economic Development. (Cambridge, Mass: MIT Press, 1964); Paul A. Rosenstein-Rodan. Note on the Theory of 'big push," in Idem ed. Theodor Morgan. Reading in Economic Development. (Belmont, Calif.: Wadworth Co., 1963), pp. 143-150; Hans Singer. "The Concept of Balanced Growth and Economic Development: Theory and Fact," University of Texas Conference on economic development (April 1958), pp. 4-6; Hans Singer. International Development: Growth and Change. (New York: McGraw-Hill, 1964); Marcus Fleming. "External Economies and the Doctrine of Balanced Growth," The Economic Journal. Vol. 65, (June 1955), pp. 241-256; Paul Streeton, "Unbalanced Growth," Oxford Economic Papers. Vol. 11, (June 1959), pp. 167-191; Pual Streeton. "Unbalanced Growth: a Reply," Oxford Economic Papers. Vol. 15, (March 1963), pp. 66-73; Tibor Sitovsky. "Growth: Balanced or Unbalanced," in Idem ed. Moses Abramovitz. Allocation of Economic Resources. (Stanford: Stanford University Press, 1059); Albert O. Hirschman. The Strategy of Economic Development. (New Haven: Yale Universi-

cle of backwardness in the sense that it requires the minimum amount of resources. This necessitates the creation of certain developmental poles capable of setting up stimuli and pressure needed for further investment. On the other hand, the advocates of balanced growth emphasize that the development projects complement and reinforce each other. Therefore, their recommendation is investment in a wide variety of sectors simultaneously.

5.1.1 Unbalanced Growth

The doctrine of unbalanced growth, based on the concept of external economies gained popularity after the publication of an early work of Rosenstein-Rodan, "Industrialization of Eastern and Southeastern Europe" in 1943. He states that the basic industrial projects are characterized by high indivisibility in investment, low return, and high extrenal economies. This implies that the individual project is not able to find sufficient demand and generate enough return; thus, it becomes too risky, unless there is a guarantee that complementary investments will take place. According to Rosenstein-Roden the big push is the solution to economic development problem of LDCs where the growth is not possible without external economies of infrastructures and strategic industries. Benjamin Higgins argues that "gradualism" will

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ty Press, 1070); and Ranger Nurkse. Problems of Capital Formation in Underdeveloped Countries and Pattern of Trade and Development. (New York: Oxford University Press, 1970).

fail in LDCs but there is no evidence to suggest that "big push" is painful or doomed to failure.[87] It takes a big push to overcome the obstacles and move the stagnant economy toward a high level of income and prosperity. Higgins stresses that "The development economists should fight tooth and nail any line of argument that might result in ... gradualism as the basis for development policy."[88]

Hirschamn's answer to the economic development problem of LDCs is strongly in favor of the "big push". He is convinced that the market mechanism will not assure economic growth. The growth should flow from one sector, or sectors (leading sector, or sectors) to the others (followers). He refers to the projects with high backward and forward linkage effects as the best candidates for "leading sectors". An industry with high backward linkage has a large amount of purchases from the other industries relative to its total cost of production; high forward linkage means that the sales of an industry to other industries is substantial relative to its total sales. Tables 3 of Chapter III provided us with rankings of the industries in terms of their linkage effects. Such ranking has also been constructed for the Iranian industries and will be presented in the following chapter. Hirschman points out that the growth need not to be ba-

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[87] Benjamin Higgins. Economic Development Problems, Principles, and Policies. Revised edition (New York: W. W. Norton & Company, Inc., 1968), p. 265.

[88] Ibid., p. 266.

lanced from the beginning: "The isolated progress in one area is possible, but only for a limited period; if it is not to be choked off, it must be followed by progress elsewhere."[89] Therefore, the important task is to identify the key sectors, the one with maximum linkage effects, and apply the "big push " to them.

5.1.2 Balanced Growth

Balanced growth is based on the Nurkse's idea presented in his major book Problems of Capital Formation in Underdeveloped Countries. He believes that the capacity to produce is limited in LDCs because of the small size of the market and weak purchasing power which have a strong disincentive effect on the application of capital to any individual project. In this sense, as he points out, the smallness of the market is the number one obstacle to economic development in LDCs. The market is small since the low level of production is not capable of generating sufficient income. The real problem is low productivity and the size of the market is directly related to it. Nurkse's prescription is a general increase in productivity - "capacity to buy means capacity to produce."[90] by applying the capital to a wide variety of industries. The diversified industries are conplementary in most cases in the sense that they provide a market for each

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[89] Hirschman. op. cit., p. 41.

[90] Nurkse. op. cit., p. 11.

other and thus support themselves. This is, as he believes, based on the desire of the consumers to diversify their consumption: "The case for 'balanced growth' rests on the need for balanced diet."[91] The proponents of balanced growth suggest a balanced pattern of investment in several industries simultaneously which increases the general level of income and deamnd.

The next question is whether the economic growth should be left to the private enterprises or be planned by tne government. Owing to its subjective nature, this is a matter of value judgment, but it is of particular interest in this study. Although there is no precise answer to this question, the following theoretical argument helps us to clarify the issues.

In the Western economies the rapid economic progress was the result of the initiatives of the private entrepreneurs of the Schumpeterian type who play the central role in industrialization process. This is still true for the advanced countries where using Nurkse's words:

> there has been a tendency to take economic develpment for granted, as something like a natural process that takes care of itself and to concentrate on the short-run osciliations of the economy.[92]

But what about the LDCs where the market conditions discourage the application of capital by private entrepreneurs and make the success of individual projects impracticable?

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[91] Nurkse, op cit., p. 11.

[92] Ibid., p. 12.

Although the choice between public or private enterprises, as Higgins expresses, is a matter of administrative expediency,[93] there is good ground to argue that those who favor the "big push" strategy leave the task to the government, because it has the capability of providing the required resources and leadership. Once the government invests in the leading sector, or sectors, there will be a transmission of pecuniary and technological externalities into other sectors. Higgins argues that:

> The basic reason for the government action to promote development is that each of a set of individual private investment decisions may seem unattractive in itself, whereas a large-scale investment program undertaken as a unit may yield a substantial increase in national income."[94]

The government may support the private enterprise to provide the bulk of investment needed, or provide it directly through public enterprises. This is a matter of political choice but is unlikely to take place without government involvement in decision process.

The preceding survey describes the alternative strategies available to the government for planning economic development. There exists so many issues about the government intervention, many of which are still hotly debated. For example, should the investment in social overhead and heavy industries take place prior to direct productive investment, or follow it? In other words, should the government build

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[93] Higgins. op. cit., p. 332.

[94] Ibid., p. 329.

the productive capacity ahead of time, or wait for the bottlenecks to emerge? Alternatively, should the government coordinate widespread investment over several related areas? These and similar questions are difficult to deal with. As a matter of fact, each development strategy answers them differently with its own advantages and shortcomings. Their comprehensive examination is out of the scope of the present study and may not yield conclusive results.[95] Neverthless this brief review assists us in analyzing more efectively the role and contribution of the public enterprise sector in Iran, and in evaluating better the outcome of a particular policy adopted in the process of this country's industrialization.

5.2 STATISTICAL DIMENSION OF IRANIAN PUBLIC ENTERPRISES

Although there is no comprehensive survey on the different aspects of large public enterprises in Iran, from the list whch appears in Appendix A, their number can be estimated as 142 units in both financial and nonfinancial sectors. The sectoral distribution of nonfinancial Iranian public corporations is given in Table 11 which indicates that they are mainly concentrated in manufacturing, public utilities, agriculture, and services sector. A closer examination of their sectoral distribution shows that they are mostly engaged in the areas where a great deal of capital investment

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[95] The interested readers are referred to Hirschman, op cit. Chapter 5.

is required, and the technology is of prime importance to their successful operation. In other words, they have to keep up with rapidly progressing technology.

TABLE 11

SECTORAL DISTRIBUTION OF PUBLIC ENTERPRISES IN IRAN

Sector	Number
Mining	3
Manufacturing	39
Transportation & Communication	4
Construction	7
Oil & Gas	2
Services	12
Commerce	2
Agriculture	18
Chemical & Petrochemical	5
Public Utilities	24
Others	14

Source: From the list in Appendix A.

This author was not able to find information on other aspects of these enterprises - such as number of employees, value of their assets, labor compensation - which are good indicators of size. The growth of the public enterprise sector in Iran has followed the same pattern as in other developing countries. They grew under similar political and historical circumstances. For example, when it comes to direct public ownership, they are concentrated in pubic utilities, transportation, basic industries, etc., with the objective of helping the private sector.

The composition of government investment in public enterprises has changed significantly since the 1950s. Typically the government firms have monopoly power in many areas such as public utilities, communication, tobacco, etc., but this is not the only pattern of control and ownership. Two other patterns can be recognized. First, during the last decade the government formed several joint-ventures with multinational companies in the petrochemical,[96] steel, and automobile industries hoping to obtain foreign investment and technology that otherwise might be impossible to extract. Second, the newly formed government enterprises in the capital intensive areas such as nuclear energy, aircraft, and basic metals was a direct response to the insufficiency of aggregate supply and the government commitment to minimize the dependency on foreign products via an import substitution policy. Overall, the story of public enterprise in Iran in recent years is one of rapid expansion, reorganization and entry of government into the new fields with the primary goal of supporting the industrialization.

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[96] For example, The National Petrochemical Company (NPC), which was established in 1963, holds three major companies with partnerships of foreign corporations. They are: Shahpour Chemical Co. Ltd. with 50-50% ownership with Allied Chemical Co. Abadan Petrochemical Co. Ltd. with 74% of the share belonging to NPC and 26% to B. F. Goodrich. Karg Chemical Co. with 50% of ownership belongs to NPC and the other half to Amoco. For further information see "3rd Plan", p. 56, and J. Amuzegar. op. cit., Chapter VI.

The contribution of public enterprises to government revenue may also be an indicator of size. Table 12 shows the composition of government revenue including the share of commercial public enterprises which is insignificant compared to oil and tax revenue. The only objection to these figures is that the commercial public enterprises are subject to price control and there is a large chance that these data underestimate the true size of the public entrprise sector.

TABLE 12

THE COMPOSITION OF GOVERNMENT REVENUE (as % of total)

Year	Oil & Gas	Taxes	Comm. Pub Enterprises	Other	Total
1959	47.9	40.3	9.0	2.8	100
1966	50.6	37.0	7.0	4.5	100
1068	48.6	40.0	7.2	7.2	100
1071	48.4	25.2	3.5	23.0	100
1072	42.6	23.8	2.6	31.0	100
1973	54.0	22.8	1.9	21.3	100
1974	79.4	10.4	1.0	9.2	100
1975	78.8	17.1	2.0	2.1	100
1976	76.2	19.2	1.3	2.9	100
1977	73.6	21.8	1.7	2.9	100
1978	63.4	29.0	3.3	4.3	100
Average	60.4	26.1	3.7	10.0	

Source: Computed from "Bank Markazi", Various years.

How large is the the Iranian public entrprise sector in absolute terms? There is perhaps no definite answer to this question. International comparison enables us to observe the

relative size, but even that leads to vague results because of the varitey of indicators being used which are hardly comparable, or the lack of a unique method for sectoral identification. The information in Table 13 describes several indicators of size which are used by William Shepherd.

TABLE 13

INDICATORS OF THE SIZE OF PUBLIC ENTERPRISE

IN SELECTED COUNTRIES

Algeria	15%of employment in industry, construction and trade in 1965, 51% of such employment in 1972.
Bangladesh	85% of the assets of "modern industrial enterprises in 1972.
Brazil	44% of total new investment by enterprise in 1969.
India	13% of total employment in the factories, 23% of reproducible capital in 1958.
Korea	14% of GDP from nonagricultural activities in 1972.
Malaysia	1% of nonagricultural corporate equity in 1972.
Mexico	15% of gross investment in 1952, 22% of gross investment in 1962
Tanzania	5% of GDP in the monetary sector of the economy in 1966, 11% of such product in 1970.
Turkey	4% of value added in industry in 1964.

Source: W. G. Shepherd, "Public Enterprise in Developing Countries," in Idem Ed. Shepherd, op cit., p. 214.

Jones presented the data to compare the value added of the public enterprise sector for various countries of diverse political philosophy. In very rare cases their share

exceeds 15% of nonagricultural GDP.[97] On the basis of this observation he described the role of the public enterprises in the mixed economies in the following passage:

> There is little or no correlation between the rhetoric of socialism and its practice as manifested in public ownership and control of the means of production. Korea which approximates zero on the rhetoric scale, has a public enterprise sector which (on the basis of value added outside agriculture, forestry, and fishing) is quite similar to India's, and probably larger than that of Italy and the United Kingdom, despite substantial social advocacy in all three countries.[98]

5.3 PUBLIC ENTERPRISE AND CAPITAL FORMATION

As it was mentioned earlier, development economists suggest that the ratio of capital formation to national income of at least 10% is the essential precondition for the take-off stage. For the Iranian economy, this ratio has been consistently over 15% (see Table 15-5), despite the fact that the economy is still at the primitive stages of economic development. It was unusually high after 1974 when the abrupt acceleration of oil revenue led to a tremendous increase in both private and public investment. Data in Table 14 compare the average share of gross fixed capital formation (GFCF) in GNP of Iran with some other developing countries who have accomplished a similar growth rate during the same period. With the exception of Saudi Arabia, this ratio is well above 20% for all of these countries. According to

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[97] Jones. op. cit., p. 70, and Table 5-5, p. 71.

[98] Ibid., p. 73.

comparable observations, Chenery and Syrguin found an investment/GDP ratio of 10.3% to 23.1% for a selected group of industrial countries.[99] It is clear from such evidence that no matter what stage of economic development the country is at, an investment/GDP ratio of larger than 10% is needed to sustain its growth rate.

TABLE 14

INVESTMENT SHARE OF GDP FOR SELECTED COUNTRIES

Country	(GFCF/GDP) 100
Iran	21.7
Saudi Arabia	16.9
Hong Kong	22.9
South Korea	21.7
Greece	23.3
Libya	24.5
Singapore	30.2
Spain	20.9
Brazil	24.8

Source: United Nations.
Yearbook of National Income Accounts Statistics 1979.
(New York: United Nations Publications, 1980), Vol. 1,
Individual Country Data.

The capital output ratio along with some other related measures are computed for the Iranian economy and are shown in Table 15. The ratio of GFCF to change in GDP (column 2) is a measure which shows how much capital expenditure is

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[99] Hollis Chenery, and Moises Syrguin. Pattern of Development, 1950-1970. (London: Oxford University Press, 1975), p. 20.

needed to produce one unit worth of output. This ratio came out to be 2.00, on the average, which implies that on the average 2.00 Rials worth of investment was required to produce one Rial worth of additional output. This is not, of course, an accurate measure of capital efficiency for the Iranian economy. The value of this ratio is likely to be underestimated because the countribution of the oil sector to GNP was substantial for all of these years but its share in capital formation is insignificant. Consequently, the ratio of GFCF to non-oil GDP is a better approximation. Column (3) shows this ratio with the average value of 2.95, which is significantly larger than the mean value of the previous ratio in the second column. The value of this ratio deviates widely around its mean which must be due to the large fluctuations in the value of output of the oil sector.

Since most of the public investment has been in industries and services, especially in later years, the ratio of fixed capital formation to non-oil non-agricultural GDP has also been computed in column (4). The mean value of this ratio is 3.3 with low deviations from the average. Its value is larger than the conventional capital output ratio of 3% due to the lack of complementary facilities, particularly skilled labor, and the inability to utilize the industrial plants to their potential capacity. The last column of this table gives us the ratio of net domestic investment to change in working population. The net investment was used

TABLE 15

FIXED CAPITAL FORMATION, GDP, AND EMPLOYMENT

Year	(1)	(2)	(3)	(4)	(5)
1960	18.3	1.8	3.4	3.9	na
1961	16.0	4.6	6.8	6.1	na
1962	14.4	2.7	3.9	4.6	na
1963	14.4	3.5	5.2	5.8	na
1964	16.7	2.0	2.6	3.0	91.0
1965	19.8	1.6	2.2	2.5	209.7
1966	18.4	2.0	3.0	3.8	299.0
1967	21.8	2.2	3.0	3.5	174.0
1968	21.8	2.0	2.8	3.3	348.0
1969	23.3	2.3	3.6	4.7	372.5
1970	24.0	2.4	3.7	3.6	357.0
1971	22.7	1.1	1.9	2.5	334.0
1972	32.5	1.2	1.6	1.9	823.0
1973	21.4	0.7	1.7	2.0	1935.0
1974	17.1	0.4	1.1	1.2	2003.8
1975	28.0	2.4	2.1	2.2	3034.4
1976	33.8	1.3	2.0	2.1	5044.4
1977	32.0	2.0	2.4	2.7	8836.6
Mean	21.7	2.0	3.0	3.4	1711.0

(1) = (GFCF/GDP) 100
(2) = (GFCF/change in GDP) 100
(3) = (GFCF/non-oil GDP) 100
(4) = (GFCF/non-oil non-agriculture GDP) 100
(5) = net domestic investment/total working population (net domestic investment was used because only this portion of totsl investment contributes to national employment)

Source: "Bank Markazi", various years.

because this portion of total investment contributes to domestic employment. The average value of this figure is 1,711,000 Rials, which simply indicates that during the entire period a relatively large amount of money was spent to create one additional job. For the later years, this figure is even much larger. Such a low rate of labor absorption is

an indication of capital intensiveness of large government projects, the main absorbers of the conomy's resources, and underutilization of capacity which is still an unresolved problem.

In the preceeding chapters we analyzed the direct role of government in the process of capital formation by investing in public enterprises and its indirect role by facilitating private investment. To investigate the direct role of government in capital accumulation, we can observe the behavior of private investment in response to public investment. A comparison is made in Table 16 which gives us the breakdown of public versus private investment. The share of the private sector has been about 48% of total, and the remaining 52% has been supplied by the public sector. In general, one can say during this period a nearly balanced contribution of both sectors occured. The absolute amount of investment went up remarkably after 1974 for both sectors although there has not been a major change in their relative shares. This indicates that the government used the oil revenue not only to increase its own capital spending, but also to pass on a considerable portion of it to the private sector in the form of financial assistance or industrial credits.

At the earlier stages of development, where most of the industries were operating in consumer goods or construction activities, the private sector was the major source of

TABLE 16

PUBLIC AND PRIVATE INVESTMENT IN IRAN

(billion Rials, current price)

Year	Private Investment A	Private Investment %	Public Investment A	Public Investment %	Ratio of Public to Private	Ratio of Private to GDP	Ratio of Public to GDP
1959	30.9	59.8	20.8	42.2	0.67	10.3	6.9
1060	39.5	66.9	19.0	33.1	0.48	12.3	5.8
1961	33.4	64.0	20.0	36.0	0.56	10.6	6.0
1962	34.1	66.4	17.2	33.6	0.50	9.7	4.9
1963	32.5	54.2	20.4	45.8	0.63	8.8	5.5
1964	44.2	66.2	26.2	33.8	0.50	11.0	5.6
1965	47.1	53.8	40.4	40.2	0.86	10.3	8.9
1966	53.2	56.5	39.5	43.5	0.76	10.4	7.9
1967	63.3	52.3	57.6	47.7	0.90	11.4	10.4
1968	60.2	44.0	76.1	56.0	1.30	9.4	12.2
1069	67.7	41.7	94.8	58.3	1.40	9.7	13.6
1970	84.2	45.7	100.6	54.3	1.20	10.9	13.0
1971	98.3	43.7	125.5	53.3	1.30	10.1	12.9
1972	150.1	51.4	142.2	48.6	0.95	12.4	11.8
1973	181.0	46.7	206.5	53.3	1.14	10.3	11.7
1974	206.5	39.0	323.0	61.0	1.56	6.7	10.4
1975	513.6	51.5	485.3	48.5	0.94	14.6	13.8
1976	702.3	44.2	886.5	55.8	1.26	14.9	18.9
1977	777.3	43.6	1007.3	56.4	1.30	13.9	18.0
Mean		51.7		48.3		10.9	10.4
SD						1.9	1.4

A=amount

Source: "Bank Markazi", various years.

domestic investment. However, toward the later stages of economic development, the government decided to establish heavy industries which required immense capital outlay and highly advanced techniques that had to be imported. The private sector was not capable of securing the required funds or the technique. Consequently, the large scale industries

were emphasized by the government; the small scale industries were left to the private sector. The government promised to assist this sector by expanding the opportunities for profitable activities through its promotional policies.

The data in Table 17 show the amount of public and private investment in the key sectors of the Iranian economy. A close inspection of this table reveals some interesting facts. First, most of these sectors are dominated by the government, especially oil and gas, water and power, transportation and communication, and petrochemicals in which the share of the private sector in total investment is zero or negligible. Second, the share of the public sector in capital formation has decreased from 76.43% during the Fourth Plan to 62% during the Fifth Plan. Third, a subset of large industrial enterprises which are totally state-owned accounted for 68% of total government investment in the Fourth Plan which declined to 53% for the next Plan. This reflects the fact that most of these industrial projects - basic metals, oil exploration, petrochemicals - which were laid out at the beginning of the Fourth Plan were near completion during the Fifth Plan. Finally, the overall rate of growth of investment in the manufacturing sector was much lower than that of the other sectors, i.e., infrastructure activities during the Fifth Plan. This was an indication of the government's shift of attention from basic industries in the Fourth Plan to social overhead in the Fifth Plan.

TABLE 17

PUBLIC AND PRIVATE INVESTMENT IN SELECTED SECTORS

(1968 - 1977, billion Rials)

Sector	Fourth Plan Pub.	Fourth Plan Pri.	Fifth Plan Pub.	Fifth Plan Pri.	Growth rate Pub.	Growth rate Pri.
Manufacturing & mining:						
Food Proces. & Tobacco	7.7	8.0	15.3	35.3	9.7	34.0
Metal & Metal smelting	40.1	5.0	57.0	55.5	4.2	100c
Electrical & Vehicles	12.1	50.0	37.9	41.5	21.7	-1.7
Chem. & Petrochem.	25.3	32.2	45.5	68.2	8.0	11.3
Nonmetal minerals	0.4	3.5	16.5	5.9		
Other Industries	1.3	11.9	18.8	58.5	142	39.2
Tech. assistance	2.6		4.0		5.4	39.2
Exploration of Mines	3.2	1.4				
Assist. to Pri. Sector	8.3	a	20.0		14.1	a
Oil and Gas	42.3	52.3	275	187	55.0	22.3
Water	52.0	1.2	109	4.0	11.0	23.3
Power	46.4		119		15.8	
Trans. & Communication	78.0		184	4.0	3.6	
Telecommunication	19.1		57.0		20.0	
Total	339	166	959	505		
As % of total b	76.4	45.2	62.0	55.3	-1.4	1.0

Source: "4th Plan", p. 129, and "5th Plan", p. 53.

a= Fixed investment by oil consertium and other foreign companies.

b= As percentage of total public or private fixed investment in the Fourth or Fifth Plan.

c= The unusually high growth rate in this sector is due to the low starting base value.

On the contrary, the same figure for the private sevtor shows a considerable increase from 45.2 % in the Fourth Plan to 55.4% in the Fifth Plan. This is in fact due to the government effort to encourage private investment by various means including: (a) huge outlays in heavy industries; (b)

tranference of some public enterprises to the private sector; (c) the policy of easy credits which facilitated the private access to public funds through specialized banks; and (d) support and encouragement of foreign investment through the Center for Attracting and Protecting Foreign Investment of Iran. In spite of the government's effort, the foreign investors did not show much interest in the basic industries. For example, in 1968, they were mostly engaged in tires, pharmaceuticals, electrical machinery, motor oil, transportation equipment, construction, and food processing industries in the order of preference. As the last column of Table 17 shows, the sectoral share of the private investment grew at a considerable rate during the entire period. This may raise the speculation that the government policy of encouraging private investment was, in fact, working.

The effect of government investment on private investment can be measured by analysing the ratio of public to private investment as appeared in Table 16 This ratio went up from 0.67 in 1967 to 1.3 in 1977 almost a twofold increase. The important point is to find out whether such an increase has inhibited the growth of private investment. A simple way to observe this is to calculate the simple coefficient correlation between the public investment to GDP and private investment to GDP ratios. The data in Table 18 present the results of such computation. The coefficient coorelation for the entire period came out 0.55, which implies a

weak but positive relationship. Accordingly, it can be stated that the overall growth of public investment did not affect the private investment adversly over the period of concern. When the coefficient coorelation was computed for different Plan periods, there was no change in the sign, but each individual coefficient came out much larger than the overall coefficient. This suggests that the government investment in each development plan has stimulated the private investment strongly for the same plan period. This is true because the government policy for each development plan also contains guidelines which the private sector is expected to follow. The government played the role of leading sector to some extend in the sense of channelling private resources into desired goals. The ratio of private investment to GDP averages about 11% with the standard deviation of 1.9; the same figures for public investment are 10.4 and 4.3 respectively. The lower value of standard deviation for the private sector signifies that this sector has followed a more stable pattern in its investment trend in relation with GDP. This is, in fact, true because private investment is considered as indogeneous and highly sensitive to GDP fluctuations and economic conditions. The government investment , on the other hand, is automonous and is mostly determined by the external factors most importantly oil revenue. It should be regarded as a determinant of GDP while the private investment lags behind national output.

TABLE 18

THE CORRELATION BETWEEN PUBLIC AND PRIVATE INVESTMENT

Variable	Time	Coefficient
Private investment/GDP	1959-77	0.55
Private investment/GDP	1959-67	0.94
Private investment/GDP	1968-73	0.96
Private investment/GDP	1974-77	0.90

Source: Computed from the data presented in Table.

The sectoral distribution of government investment is presented in Table 19, which shows a changing pattern of government investment from the Fourth to the Fifth Plan. In the earlier years the manufacturing sector claimed the major part of government investment, about 30%, which was then decreased to 22.4%. The main reason for this decrease was the government's intensive effort to promote basic industries during the Fourth Plan in order to increase the productive capacity of tne economy by providing sufficient inputs for manufacturing industries. In the Fifth Plan a lower priority was given to the infrastructure sector because its share declined noticably during this plan period. It seems that the policy makers did not realize of building ahead of demand to remove the threat of bottlenecks. The grave consequence of this was the occursece of general shortages in the late 1970's when the inadequacy of electricity, water, and communication services was evident everywhere in the country and

forced the government to ration most of the commodities. The manufacturers and businessmen were damaged the most because they had to operate only during certain hours. The rate of capacity utilization drastically declined causing a widespread shortage of consumer goods.

TABLE 19

SECTORAL ALLOCATION OF GOVERNMENT INVESTMENT

Sector	1962-72	1973-77
Manufacturing and Mining	29.8	22.4
Oil ang Gas	12.5	28.7
Water	15.4	11.4
Power	13.7	12.3
Transportation and Communication	23.0	19.2
Telecammunication	5.6	5.9
Total	100	100

Source: As in Table 5-17.

The sharpest increase in the sectoral share of investment took place in the oil and gas sector, from 12.5% in the Fourth Plan to 28.7% in the Fifth Plan. This was the direct result of the government's heavy investment in oilactivities outside the country in an attempt to produce and export natural gas during 1973-77 period.

Further inquiry into the financial matters of the public enterprises shows that the large commercial ones were the big demanders of public funds. Only a tiny portion of their invested funds were provided by internal sources. For exam-

ple, of 92,700 million Rials total government investment in these enterprises during the Fourth Plan, only 2,000 million Rials, about 2%, were contributed by their surplus funds and the remainder came from the credits of the Plan Organization.[100] This contribution was raised to 20% during the Fifth Plan owing to the fact that the industrial public enterprises were at the primary stage of operation during the Fourth Plan, but they were closer to completion and expansion of their productive capacity during the Fifth Plan.

5.4 OUTPUT PERFORMANCE

Since most of the Iranian public enterprises are engaged in the areas exhibiting high external economies and linkage effects, it is plausible to assume *a priori* that their contribution to national output is outstanding. Table 20 presents the average annual growth rate of GDP for Iran in comparison with some other countries for more than one and a half decades. All of these countries have a population larger than one million, and diverse political systems. Of the 119 countries which have achieved a growth rate of more than 5% during 1960-76 period listed by the World Bank, Iran with a growth rate of 8.2% is in third place after Libya and Romania. A closer consideration of this table provide us with some interesting facts. Firstly, in those countries which are relatively poor in terms of natural resources, such as

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[100] "4th Plan", pp. 128-29.

South Korea and the Republic of China, the high growth rate is most likely attributable to the discretionary policy of using public enterprises. Secondly, the political institution has little effect on economic performance as far as the government adopts an appropriate development strategy. Despite the major political differences among these countries, they all have an extensive public enterprise sector which, in most cases, has been used successfully to promote economic development. And finally, it is not really clear whether the high growth rate in the oil-rich countries during this period was due to the oil and other natural resources, to the government efforts, or to a combination of both. However, since the majority of such countries have enjoyed the higher growth rate relative to other countries, it may by concluded that the oil has contributed the main part of the growth. Therefore, even if the government could not do it, oil could.

The contribution of public enterprises to economic growth may also be evaluated by using some measures such as their value added and other financial aspects. Unfortunately the related information is scarce, incomplete, or unaccessable. The figures of Table 21 show the sectoral size of the sectors dominated by the government. Because the complete separation of output for public and private enterprises was not possible in manufacturing and mining sectors, there was no accurate way to detect the effects of the output of publ-

TABLE 20

RATE OF GROWTH OF GDP FOR SELECTED COUNTRIES

(1960-1976)

Country	Per Capita GNP ($)	Average Growth Rate (%)
Libya	6310	10.2
Japan	4010	7.9
Saudi Arabia	4480	7.0
Spain	2920	5.1
Singapore	2700	7.5
Greece	2590	6.1
Hong Kong	2110	6.5
Iran	1930	8.2
Portugal	1690	6.5
Yugoslavia	1880	5.6
Romania	1450	8.4
Rep. of China	1070	6.3
S. Korea	670	7.3
People's Rep. of China	410	5.2

Source: Wold Bank,
World Development Indicators,
(Washington D. C.: World Bank, 1978), p. 6-7.

Note: The growth rate of the market economies is based on the estimate of GDP at constant prices and its components. For the centrally planned economies, it is based on the system of Material Product Balances (MPS). Net material product in this system is comparable to GDP, by kind of economic activities in the System of National Accounts (SNA). See, United Nations.
Yearbook of National Accounts Statistics,
Vol. 1, Part 2, Individual Country Data, (New York: United Nations tions, 1982), p. xix.

ic enterprises on the rest of the economy. However, some inferences on their role can be made using the information provided by this and subsequent table.

It can be claimed that the public sector accounted for an average of 58% of national output over the period of

TABLE 21

SHARE IN GDP OF THE SELECTED SECTORS (%)

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1959	11.7	0.6	6.8	0.4	8.3	1.5	8.1	37.4
1963	14.3	0.5	9.2	1.1	6.9	1.6	8.6	42.2
1967	16.7	0.9	10.6	1.9	5.4	2.3	10.8	48.6
1970	19.8	1.0	11.8	1.7	5.5	3.8	12.6	56.2
1971	23.5	0.8	11.2	1.8	5.0	3.3	12.0	57.6
1972	23.3	0.9	11.0	1.8	5.6	3.8	10.8	57.0
1973	35.0	0.8	10.0	1.5	5.4	4.1	7.7	64.5
1974	47.4	0.6	7.4	1.0	4.4	4.8	8.3	73.9
1975	40.0	0.9	8.1	1.1	5.3	5.7	8.5	69.6
1976	37.0	1.2	7.3	0.9	5.2	5.6	9.2	66.4
1977	32.0	1.4	7.7	1.0	6.0	7.0	9.3	64.4
Mean	27.4	0.8	9.2	1.3	7.5	4.0	9.6	58.5

Source: "Bank Markazi", various years.
(1) Oil
(2) Manufacturing
(3) Electricity, Gas, and Water
(4) Transportation and Communication
(5) Financial services
(6) State services
(7) Total
(8) Annual average

1959-77, with the major part, 27.4% contributed by the oil. Excluding the value added of the "state services" and financial sector, this average declines to 46.5 % which shows that portion of GDP produced by the industrial public firms. Yet, subtracting the value added of oil, this figure boils down to 19% which may be the best approximation of the size of the industrial public enterprises in Iran. All the output of the public enterprise sector is provided nationally with the exception of electricity and water which are produced

regionally or locally. In terms of relative size, the oil sector accounts for 47% of the total value added in of the public sector, with the state services and manufacturing 16% each, transportation and communication 13%, and the remaining 8% being the share of the other sectors.

As the data in Table 22 show, the overall growth rate of output in the public enterprise sector is substantial; it increased from 37.4% of GDP in 1959 to more than 64% in 1977, 6.6% annual increase. As can be seen in this table, all the sectors dominated by the government have enjoyed a higher than usual growth rate especially after 1973 and the boom in oil revenue.

The highest overall growth rate belongs to the financial sector, reflecting the fact that the major portion of oil revenue was used for speculation or real estate activities, especially after the historical escalation in the oil price of 1973 when the growth rate of this sector was about 34%. The mining sector has the largest growth rate during the Fifth Plan partly because of the government huge outlay in oil exploration, and mainly because of explosion in private construction and quarrying activities. Transportation and communication have the lowest growth rate particularly during the earlier years of 1959-67, which caused in severe bottlenecks and congestion problem at later years when the government had to pay more attention to this sector. Overall, the growth rate of the public enterprise sector is

TABLE 22

GROWTH RATE OF VALUE ADDED IN SELECTED SECTORS

(1959-77, current prices)

Sector	1959-67	1968-72	1973-77	Average
Oil	9.3	19.4	22.0	17.2
Mining	9.6	12.2	34.2	19.0
Manufacturing	10.0	13.3	18.2	14.2
Electricity, Gas, Water	18.3	14.8	16.3	17.3
Trans. & Communication	2.1	14.4	25.5	14.1
Financial Services	10.0	19.0	33.8	21.3
State Services	10.6	10.6	27.0	16.7
GNP	6.6	13.7	23.0	14.3

Source: Computed from "Bank Markazi", various issues.

Note: The growth rate is computed using the following formula:

$$R = \frac{\log Vt1 - Vt0}{t1 - t0} 100$$ in which

R=growth rate
Vt0=value added at initial year
Vt1=value added ar final year

larger than that of GNP implying that the lower growth rate of GNP must be due to the sluggishness of other sectors namely agriculture, commerce, and private services.

To examine the behavior of prices in the public enterprise sector, the rate of growth of its real value added was calculated and presented in Table 23. Comparing this table with the preceding one some interesting observations can be made. First, the real rate of growth for infrastructure activities is larger than its nominal value for the 1959-72 period. This may be interpreted as a sign of underpricing the services of the public enterprises because it is cont-

rolled directly by the government. In other words, the primary purpose of these enterprises is to provide essential services at low cost. Their financial performance is of secondary importance since they depend on government subsidy either totally (education, health), or partially (electricity, transportation). Second, for the period of 1973-77, the real growth rate of all sectors is significantly smaller than the monetary growth rate and is even negative for the oil sector. It is difficult to interpret such a result because the hyper-inflation during this period and the inaccuracy of official price indicators makes the comparison between real and nominal growth rates meaningless.

TABLE 23

THE GROWTH RATE OF REAL VALUE ADDED

(1959-1977, constant price)

Sector	1959-67	1968-72	1973-77	Aveage
Oil	9.7	11.0	-1.0	6.7
Mining	11.6	10.2	13.9	11.9
Manufacturing	9.8	10.9	10.7	10.5
Electricity, Gas, Water	21.6	15.2	13.5	16.8
Trans.& Comm.	5.4	15.5	17.8	12.8
Financial services	10.0	16.6	27.5	16.0
State services	14.0	11.0	15.8	13.6
GNP	6.5	11.1	10.0	9.2

Source: As in previous table.

5.5 OUTPUT INTERDEPENDENCE

The following discussion is designed to examine inter-industry relationships by utilizing the input-output table of Iran. An attempt will be made to estimate the productive linkages of the public enterprise sector by decomposing this table and identifying some measure of forward and backward linkages. The extent to which the Iranian public enterprises generate linkage effects, in the Hirschmanian sense, depends on their relation with other industries. Such relationship was taken as the basis for measuring the linkage effects. The sales of industry X to others relative to the value of its total output[101] is considered as the forward linkages of industry X; the total purchase of industry X from other industries relative to its total factor cost is regarded as the backward linkages of industry X[102] Then, the areas of high linkages are indentified, by inter-industry comparison

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[101] This ratio may be a considerable underestimation of linkage effects for the sector with high export because it fails to distinguish the domestic from external effects. Accordingly, for the sectors with high exports, such as crude petroleum, and gas production the total value of output was adjusted to eliminate the problem.

[102] Computing linkage effects in this manner poses a problem of double counting. The sales of industry X to industry Y is considered as X's forward linkages and Y's backward linkages. But, only one of these two is effective and should be counted. In other words, if we assume that industry X causes Y to expand, it is equally true that y causes x to grow. For example the Iranian communication sector has a high forward linkage, but this does not mean that it caused the users industries to expand. On the contrary, the causality may be from the other direction. The growth of this sector may be seen as the result of increasing demands of users industries and development of bottlenecks.

of this ratio, as the candidate for playing the role of leading sector.

The linkage effects for the Iranian industries are summarized by Table 24 under four categories. Except for a few cases, the majority of Iranian public enterprises fall in the second category with high forward and low backward linkages.

The location of each sector in forward linkage-backward linkage space is shown by Government enterprises in basic industries have forward linkages similar to those of the infrastructure sector, but much higher backward linkages. However, this is not a good representation of their performance for the entire period of our study because this table was constructed for the year of 1974 when the skyrocketing of the price of oil caused an overestimation of the real value of output of the oil and other sectors. Figure 2. The public enterprises in oil, gas, and mining have forward linkages similar to those of the agricultural sector but slightly different backward linkages.

The private industrial firms exhibit lower backward and forward linkages relative to all the other sectors. This might be due to the fact that these enterprises usually produce consumer goods which do not have high linkage effects. The construction activities have high backward linkages with very low forward linkages. There is no unusual pattern of linkages for different sectors except the finan-

TABLE 24

FORWARD AND BACKWARD LINKAGES FOR IRANIAN INDUSTRIES

Industry	FL (a)	BL (b)
High Forward, High Backward Linkages:		
Iron and Steel	99.0	72.0
Chemicals	61.5	70.5
Non-metalic Manufactured Products	95.7	55.3
Nonferrous Metals	71.8	71.0
Leather and Products	85.3	75.8
Textile	72.8	71.0
Livestocks	90.0	50.0
Water	64.3	50.0
High Forward, Low Packward Linkages:		
Crude Petroleum and Gas Production	99.0	1.3
Grain	99.0	28.0
Other Mining	96.4	9.6
Financial Services	78.2	64.2
Coal and Products	76.3	30.0
Wood Products	77.4	39.0
Rubber Products	70.0	30.0
Communication	71.2	15.2
Industrial Crops	67.0	24.0
Coal Mining	66.0	31.6
Electricity	57.0	16.0
Hunting, Fishing, Forestry	52.0	4.3
Metal Ore Mining	51.0	21.0
Low Forward, High Backward Linkages:		
Oil Refinering	37.0	58.0
Petrochemicals	25.2	66.0
Paper and Products	27.0	76.4
Transport Equipment	22.0	64.5
Food Manufacturing	6.3	50.0
Private Construction	6.4	52.0
Public Construction	0.0	59.0
Transportation	36.0	53.0
Machinery	13.0	56.1
Low Forward, Low Backward Linkages:		
Other Agricultural Activities	31.0	23.0
Tobacco	12.3	18.0

a=(Sales of the industry to other industries/total value of output) 100

b=(Purchase from other industries/total cost of production) 100

Source: Computed from the input-output model of Iran published by the Statistical Center of Iran, Department of Financial and Statistics and National Accounts, in cooperation with Yekom Consultants, 1979.

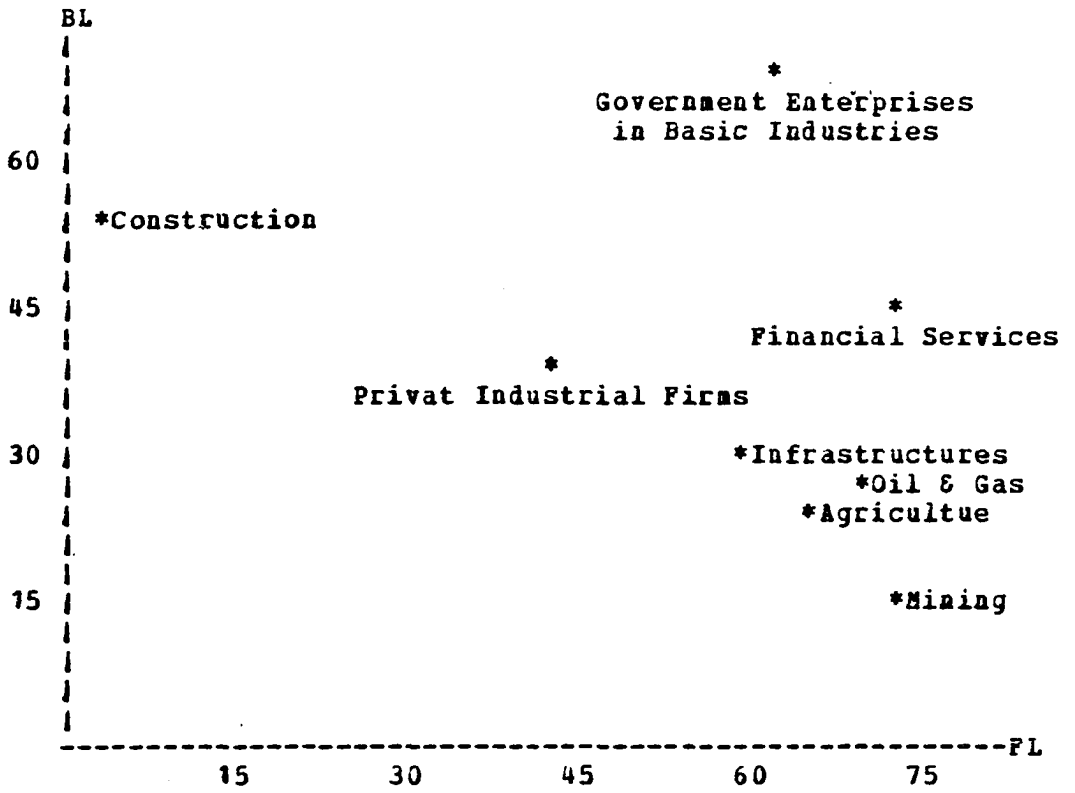

Figure 2: AGGREGATE LINKAGES FOR SELECTED SECTORS

cial services which show relatively high backward and forward linkages. This may be the result of the drastic increase in oil revenue after 1973 which made this sector important. This figure shows the relative importance of public enterprises over the other sectors, which may lead to the speculation that these enterprises can function as the leading sectors.

Chapter VI

THE EMPIRICAL FINDINGS

Many economists believe that an increase in government spending causes capital formatiuon in the private sector to decline in response to government expenditure. This so-called "crowding out" effect is a serious problem, especially if the economy is operating at full employment and the conditions of constant return to scale.[103] When crowding out has occured under such conditions, the resources available for the private uses will be squeezed down by exactly the same amount as the additional government spending. Consequently, the intended expansionary effect of such a policy will be partially offset by its negative impact on provate spending. The crowding out will most likely occur if the government spending is financed by tax collection or borrowing from the public. This would force the interest rate to go up and the private investment and output to go down. However, if the government could borrow from the private sector without pushing the interest rate up, then the private investment and output may not be affected adversely. This may happen only if the additional borrowing comes from private

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[103] This subject is discussed in macroeconomics textbooks. See Laurence H. Meyer. Macroeconomics A Model Building Approach. (Cincinnati, Ohio: South-Western Publishing Co., 1980), Chapters 9 and 21.

consumption - and not savings - which is less likely to be the case. The intensity of the crowding out effect depends on the impact of government spending on private savings and the interest elasticity of private investment.

Financing additional government spending by money creation leads to a higher equilibrium level of income which pushes both private savings and consumption up in nominal terms, but real consumption and savings may stay the same or even decline. The long run effects of such a policy are not really clear. It depends on its effect on the interest rate and the way the additional government spending is allocated between current and capital expenditures. If the government devotes the major portion of its spending to investment, which would not probably be the case in Iran, then there is a likelihood of the economy's investment and capital stock going up. Government spending may affect the capital formation positively in the sense that it absorbs a portion of the private output. This stimulates aggregate demand by creating income that can be used to purchase the private output, thus encouraging the private investment.

Theoretically speaking, in the advanced economies the interest rate plays a leading role as the determinant of the private investment. Keynes suggests that:

> The actual rate of investment will be pushed to the point where there is no longer any class of capital asset of which the marginal efficiency exceeds the current rate of interest. In other words, the rate of investment will be pushed to the point in the investment demand schedule where the marginal efficiency of capital in general is

equal to the market rate of interest.[104]

This implies an inverse relationship between the interest rate and the level of investment. The interest rate, however, may not be such a strong determinant of the private investment in LDC's. There are numerous factors such as lack of a well-organized network of financial intermediaries, imperfect capital and money market, and governmentally supported projects that make investment behavior in LDC's different from that in developed countries. Government investment is treated as one such variable in this study. The important feature of present research is the effort to relate private investment and output to government investment, and to discover the channel through which this relationship is carried out. It is presumed that the government investment in LDC's has strong but offsetting effects on the private investment and output. Some negative effects are due to: (1) the competition of the government with the private sector over the same resources (the crowding out effect), and (2) promotion of infrastructures that facilitates production and decreases the per unit investment in the private sector because such facilities, otherwise, have to be provided and paid for by this sector. Positive effects stem from: (1) the increase in aggregate demand resultant from government spending which, in turn, stimulates ouput and fu-

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[104] John M. Keynesm The General Theory of Employment, interest, and Money. (New York: Harcourt Brace, 1936), pp. 136-37.

ture investment in the private sector, and (2) the increase in total supply and income owing to government spending which enhances the financial resources of the whole economy that are available for private investment. All of these effects are summarized in Figure 3.

Sources of negative effects	Sources of positive effects
Crowding out	Increase in aggregate demand
Infrastructures (reduction in private investment per unit of output)	Increase in aggregate supply

Figure 3: SUMMARY OF THE EFFECTS OF GOVERNMENT INVESTMENT ON THE PRIVATE SECTOR

It is believed that the effect of government investment on the private sector is of a long run nature. Therefore, this study intends to test the relationship between private investment and lagged value of government investment to determine if there are significant results. It is hoped on the basis of the present study we will be able to discover which effect is stronger for the Iranian economy by examining the estimated statistics.

6.1 THE MODEL

The model of this study is based on the neoclassical investment theory[105] which suggests that private investment is positively related to the level of output and negatively related to the cost of capital relative to the wage rate.[106] It is assumed that the private sector chooses that level of capital stock which minimizes its total cost. The total cost of the private sector can be expressed as the cost of producing a desired level of output plus the cost of acquiring capital. The cost of production for this sector depends not only on the available capital stock, YPt, and desired level of output, YP, but also on the public sector's capital stock, KGt, which represent infrastructures. Economic efficiency requires that the application of capital should be continued up to the point where the reduction in total cost, as a result of employment of an additional unit of capital, equals the current cost of capital. From this condition the desired level of capital stock, hence investment, for the private sector can be derived. Using the Cobb-Douglas production function of the following form as a specific case,

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[105] This model was adopted with some modification from the following study, V. Sundarajan, and Subhash Thakur. "Public Investment, Crowding Out, and Growth: A Dynamic Model Applied to India and Korea," I.M.F Staff Papers. Vol. 27, No. 4, (Dec. 1980), pp. 414-445.

[106] For a comprehensive review of recent literature on the neoclassical investment theory see Dale W. Jargenson, "Economic Studies of Investment Behavior: A Survey," Journal of Economic Literature. Vol. 9, (Dec. 1971), pp. 1111-1147.

the equation for the desired level of capital stock can be formulated:

$$(1)\quad YP_t = T\,(KG_t)^{a}\,(KP_t)^{b}\,(L_t)^{c}\ ;\ T, a, b, c>0, \text{ in which:}$$

YP = Private output.

T = Technical changes that cause a shift in our production function.

KG = Government capital stock.

KP = Private capital stock.

L = Labor input.

The variable cost can be expressed as:

$$(2)\quad C_t = W_t + L_t\ ;\ \text{in which:}$$

W = Wage rate.

Computing Lt from equation (1) and substituting its value in equation (2) we have:

$$(3)\quad C_t = W_t \cdot (YP_t)^{1/a} \cdot (T_t)^{-1/a} \cdot (KG_t)^{-a/c} \cdot (KP_t)^{-b/c}$$

Differentiating (3) with respect to KPt:

$$(4)\quad dC_t/dKP_t = -b/c\,(KP_t)^{-(1+b/c)} \cdot (W) \cdot (YP_t)^{1/a} \cdot (A_t)^{-1/c} \cdot (KG_t)^{-a/c}$$

This is equal to the user's cost of capital (CK). Then, the desired level of capital stock can be obtained by solving equation (4) for the value of KPt:

$$-b/c\,(KP_t)^{-(b-c)/c} = CK/W\,(YP_t)^{-1/c} \cdot (A_t)^{1/c} \cdot (KG_t)^{a/c}$$

$$(KP_t)^{-(b-a)/c} = -c/b\,(A_t)^{1/c} \cdot CK/W\,(YP_t)^{1/c} \cdot (KG_t)^{a/c}$$

$$(KP_t) = -c/b(T_t)^{-1/b+c} \cdot (CK/W)^{-c/b+c} \cdot (YP_t)^{1/b+c} \cdot (KG_t)^{-a/b+c} \quad ; \text{ in which}$$

$c/b(T_t)^{-1/b+c}$ is constant. Therefore, the desired level of capital stock at time t is:

$$(5)\quad KP_t = -c/b(A_t)^{-1/b+c} \cdot (CK/W)^{-a/b+c} \cdot (KP_t)^{1/b+c} \cdot (KG_t)^{-a/b+c}$$

Since a>0, then an increase in government capital stock, KG, leads to a change in the desired capital stock for the private sector, KP, which reduces the private investment and the cost of private output. Equation (5) indicates that an increase in Ck/W has the same effect on private investment. The reduction in the level of capital stock in this case is due to substitution of labor for capital.

A linear approximation of equation (5) in the following form can be used for the purpose of estimation:

$$(6)\quad KP_t = a_0 - a_1(CK/W) + a_2(YP_t) - a_3(KG_t)$$

It is evident from equation (6) that the increase in KG has a negative impact on KP and a positive effect on YP which, in turn, stimulates private investment. The combination of these two effects determines the net impact on private investment.

As the flexible accelarator model suggests, it is assumed that the adjustment of private capital stock to its desired level is partial. In other words, only a portion of the gap between actual and desired capital stock will be

closed at any given period, depending on availability of resources to finance private investment. This would determine the speed of adjustment of private capital stock.

On the basis of foregoing discussion, the following investment equation may be specified for the private sector:

$$(7)\quad IP_t = a_0 + a_1 (CK/W)_t + a_2 (YP)_t + a_3 (KG)_t + a_4 (GI)_t + a_5 (KP)_{t-1}$$

The planned private output is assumed to be a function of its past level plus the level of capital stock in both private and public sectors which expected to have a positive effect on private output:

$$YP_t = b_0 + b_1 (YP)_{t-1} + b_2 (KP)_t + b_3 (KP)_t$$

The basic statistical technique for this study is multiple regression. The objective is to discover the relationship between private investment and output as the dependent variables and some independent variables, including government investment, using time series data for Iran. The complete list of equations and variables is as follows:

$$PIM = a_0 + a_1 (dYP) + a_2 (CR) + a_3 (GI)$$

$$PIC = b_0 + b_1 (GI) + b_2 (dYP) + b_3 (CR)$$

$$YP = c_0 + c_1 (KG) + c_2 (YP) + c_3 (KP) + c_4 (PIM+PIC)/YP$$

in which:

PIM=Private investment in machinery and equipment.

PIC=Private investment in construction.

YP=GDP for the private secrtor.

dYP=Change in private eoutput.

GI=Government investment.

KG=Capital stock of the public sector.

KP=Capitl stock of the private sector.

CR=Credit of the specialized banks to the private sector.

The inclusion of these variables in our model is based on the feasibility of acquiring data, the objective of this study, and the peculiarities of the Iranian national accounts system.

The private investment is broken down into two categories: investment in machinery, and investment in construction. Such categorization which is consistent with the United Natons tradition, seems necessary because the factors that influence the private investment in machinery may not have exactly the same effect on private investment in construction. Furthermore, the response time of these two types of investment to those factors may have different durations. It is assumed that private investment in machinery is a function of change in private output. This variable is included to reflect some aspect of the accelerator principle which suggests that change in current sales and output will generate a larger change in the future level of investment. The reason for the one year lag is unavailability of quarterly data for private output.

As it was mentioned earlier, the interest rate may not have a significant effect on private investment in the Iranian economy where most of the private investment is fi-

nanced by family funds or government credit which are less sensitive to market conditions. Although the ratio of interest rate to wage rate could have been used to account for substitution of capital for labor, the unavailability of such data made this ratio unaccessible. The credit conditions were believed to be the major determinant of private investment in both machinery and construction in Iran because the increasing participation of the private sector in economic activities brings about the need for utilization of bank loans and credit. Specialized banks such as the Industrial Credit Bank of Iran, the Mineral and Industrial Development Bank of Iran, and the Agricultural Developmnet Bank of Iran play an active role in private capital formation in Iran by distributing credit to this sector and participating in investment or equity sharing of private companies.

The inclusion of government investment in our model is of special merit and is based on the idea developed throughout the earlier chapters of this dissertation. It is hypothesized that the effect of government investment on the private sector is of both a short run and a long run nature. Accordingly, the lagged value of GI is included in our investment equation. Since the computer allows us to test different lag structures, the author intends to test the relationship between private investment and one to five years lagged values of the government investment to see if there are any significant results. The government investment in

this model is considered as an exogenous variable because: (1) the ability of the government to invest depends on factors which are out of our control, especially the oil revenue, and (2) our intention is to examine the effect of autonomous changes in government investment on the private investment and output.

The private output is assumed to be correlated with the capital stock of both public and the private sector. The former is used as a measure of infrastructures which supposedly increases the total demand and the production of the private sector. The variable (PIM+PIC)/YP=YI has been introduced to our model to take care of the second negative effect which suggests that total private investment is lower than it might be because government investment provides some of the needed facilities.

There are, of course, some other determinants of private investment such as change in profit, change in inventory, rate of capacity utilization, and wage and interest rate. However, the complete data for these variables are not available.

6.2 EMPIRICAL RESULTS

Tables 6.1 through 6.7 show the estimated results for various equations in our model. In all cases, the coefficient of determination, R2, is close to one indicating that the major portion of deviations in dependent variables is explained by

selected explanatory variables. The adjusted R2 is not significantly different from unadjusted R2, implying that its large value is not due to the inclusion of any additional variables which would be likely to increase the explained sum square of residuals for the same total sum square.

The overall significance of the model can also be tested by analyzing the F-ratio. The large value of this ratio in all cases suggests a statistically significant correlation between the dependent and independent variables leading to rejection of the null hypothesis that all the estimated parameters are jointly equal to zero. However, in spite of the large value of this ratio, in some cases the estimated parameters are not statistically significant. This may be due to the small number of observations relative to the number of parameters which reduces the degree of freedom in computation of F-ratio, or to a multicollinearity problem which suggests that the explanatory variables may be correlated with each other. This problem is diagnosed and dealt with in each specific case in the next section. The Durban-Watson statistics show no sign of autocorrelation except in two instances where it yields inconclusive results.

6.2.1 Private Investment

Table 25 shows the estimated results for total private investment, PI. The value of R2 is high, 0.9861, indicating that the investment equation has been specified correctly.

The estimated coefficients for the independent variables have the expected sign and some of them are statistically significant. Except for the credit condition, CR, the estimated parameters are small in spite of the large value of R2. So, we may suspect that there is a multicollinearity problem. To detect the problem the correlation matrix was formed and examined. A reltively strong association was discovered between GI and CR which may be the source of the multicollinearity. Dropping one of these variables may improve the problem but it would lead to a specification error because our theory which was developed earlier in this chapter tells us that both of these variables are crucial and must be included in our model.

TABLE 25

ESTIMATED RESULTS FOR TOTAL PRIVATE INVESTMENT

Independent Variables	Estimated Coefficients	Expected Sign	t-Statistics
Intercept	30.588	+	1.218
dYP	0.310	+	1.370
GI	-0.144	-	-0.364
KPLG	-0.008	-	-0.141
KG	-0.123	?	-0.942
CR	1.823	+	2.423

R2=0.9861, Adj. R2=0.9803
F-Ratio=170.076
DW=2.584

The credit condition appears to be the most powerful factor in determining the level of private investment. The estimated parameters for this variable is the largest and is statistically significant at 95% level of confidence implying that a substantial portion of government credit will find its way into capital accumulation in Iran. For each Rial additional credit the total private investment increased by approximately two Rials. This strong association between private investment and credit condition is perhaps an indication of the inability of the private sector to provide sufficient funds for investment projects without support of the government. THis variable must be regarded as the measure of resources available to the private sector via the government credit allocation policy.

The weak association between dYP and PI suggests that the output expectations of the private sector will not bring about much further investment; the value of the estimated coefficient for dYP confirms our earlier statement that the adjustment of capital stock to its desired level is partial. One unit increase in private output results in a change in private investment equal to 0.30 Rial. This change would take place within the same year. Further inquiry revealed that the lagged value of YP has a negative and insignificant effect on total private investment, see Table 26. This may be, indeed, the case in Iran where the current output expectation causes a strong optimism about the future and over-

reaction by the businessmen in the form of excessive current investment. Consequently, there will be less need for additional investment in the next period.

The initial capital of the private sector, KPLG, has a positive but weak impact on the level of private investment. This is in accordance with the flexible accelerator principle that the level of private investment depends on the gap between the actual and the desired level of capital stock. The capital stock of the public sector has a negligible negative effect on private investment. This means after all long run adjustments, the net effect of government investment on the private sector is, in fact, negative and insignificant. In other words, the crowding out effect of GI is more than offset by its possible demand induced impact.

TABLE 26

ESTIMATED EQUATION FOR PI AND LAGGED VALUE OF GI

Independent Variable	Estimated Parameters	Expected Sign	t-Statistics
Intercept	5.997	+	0.285
dYP	-0.246	+	-0.996
GI	-0.036	?	-0.118
KPLG	-0.035	-	-0.771
KG	0.170	?	1.219
CR	3.258	+	4.332
GI1	-10.580	-	-3.011

R2=0.992, Adj. R2=0.988
F-Ratio=238.50
DW=2.139

Adding the lagged value of government investment,GI1, to this equation does not cause a noticable change in the pattern of effects, Table 26. No major changes occur in the sign of parameters. However, the effect of CR is strengthened because of the positive correlation between GI and CR. According to the estimated results of this table, the GI1 causes a drastic reduction in the level of private investment. Its corresponding coefficient is statistically significant at 99% reliability, implying that a serious crowding out effect would take place after one period. Deeper investigation showed that this negative impact persist, but it becomes weaker beyond two lag periods.

For more detailed examination, the private investment is broken down into two components: investment in machinery, pim, and investment in construction, PIC. The estimated equations for both of them which are quite different from that of total private investment are presented in the following two tables. As Table 27, and 28 show, there are some important changes in our findings.

The relationship between output expectation, dYP, and PIM is now direct, but it is inverse with respect to PIC. In both cases the corresponding t-statistics is significant especially for PIC. It appears that an increase in output stimulates only that type of investment which contributes to production directly. That is, investment in machinery and plants which draws funds from construction investment be-

TABLE 27

THE ESTIMATED EQUATION FOR PIC

Independent Variables	Estimated Parameters	Expected Sign	t-Statistics
Intercept	-1.169	+	-0.331
YP	-0.084	?	-2.647
GI	0.296	+	5.313
KPLG	0.009	-	1.067
KG	0.500	+	2.740
CR	0.196	+	1.861

R2=0.999, Adj. R2=0.998
F-Ratio=2480.077
DW=1.765

cause there must be a certain amount of investable funds available in any given period of time. In other words, the optimistic output expectations widens the gap between actual and desired level of output, hence more direct productive investment is needed to close the gap. Some of the resources must be released from the use in construction activities and be transferred to the productive operations. As it is indicated by Table 28, the government investment affects the PIM adversely. This implies that a weak crowding out occurs in the current period which tends to sustain into the future because KG also exhibits a similar effect on PIM.

These two negative effects may reinforce each other. On the contrary, both GI and KG have a strong positive influence on PIC with the t-statistics significant at 99% level of confidence. This is an interesting result of our study

TABLE 28

ESTIMATED EQUATION FOR PIM

Independent Variables	Estimated Parameters	Expected Sign	t-Statistics
Intercept	31.757	+	1.343
dYP	0.394	+	1.851
GI	-0.439	?	-1.179
KPLG	-0.016	-	-0.309
KG	-0.173	?	-1.417
CR	1.262	+	2.295

R2=0.947, Adj. R2=0.925
F-Ratio=42.841
DW=2.495

because it raises the speculation that the government investment, overall, has not stimulated direct productive investment in Iran during the period of concern. It has, rather, led to the build up of capital stock which facilitated channelling of resources toward the construction activities for which there was no indication of positive contribution to the economy's output. The credit condition, again, appeared to be the major source of variations in both types of private investment. Its effect on PIM is stronger and statistically significant at 99% reliability. This must be so because the government credit policy was aimed at establishing or extending the productive facilities. The positive correlation between CR and PIC suggests that, in spite of the government intention, a sizable portion of credits extended to the private sector has been transferred to construction activites.

As shown in Table 29, the lagged value of government investment, GI1, exerts a powerful negative impact on PIM implying that the crowding out remains effective after the current period. Such effect is not very serious with respect to PIC, as is indicated by Table 30 because both the estimated coefficient and related t-statistics have small values.

TABLE 29

ESTIMATED EQUATIOD FOR PIM USING GI1

Independent Variables	Estimated Parameters	Expected Sign	t-Statistics
Intercept	8.323	+	0.424
dYP	-0.135	+	-0.572
GI	-0.337	?	-0.173
KPLG	-0.043	?	-1.001
KG	0.107	+	0.819
CR	2.990	+	4.270
GI1	-1.195	+	-3.078

R2=0.971, Adj. R2=0.956
F-Ratio=62.496
DW=2.036

Further research showed that the crowding out effect becomes trivial beyond one period lag for both type of investments. This suggests that the adjustment of private investment in response to government credit policy in Iran is of a short term nature and the long run impact is negligible.

TABLE 30

ESTIMATED RESULTS FOR PIC USING GI1

Independent Variables	Estimated Parameters	Expected Sign	t-Statistics
Intercept	-2.325	+	-0.597
dYP	-0.110	+	-2.334
GI	0.300	?	5.274
KPLG	0.007	-	0.877
KG	0.063	+	2.464
CR	0.264	+	1.91
GI1	-0.059	?	0.765

R2=0.999, Adj. R2=0.998
F-Ratio=1955.00
DW=1.606

6.2.2 Private Output

The regression results for the private output are given in Table 31. Except for the intercept, all the estimated parameters have the expected sign and are statistically significant. The main determinant of private output seems to be its past level and the capital stock of both public and private sectors. In the preceeding section we examined the relationship between private output and investment which was negative for PIM, and positive for PIC. The evidence of a direct and strong correlation between YPLG and YP may suggest that the positive effect of output on PIM, which was regarded as productive investment, is larger and not offset by its negative impact on PIC and the consequent decline in private output. Therefore, we may expect that the net effect of lagged value of private output on its current level will be positive.

TABLE 31

THE REGRESSION RESULTS FOR PRIVATE OUTPUT

Independent Variables	Estimated Parameters	Expected Sign	t-Statistics
Intecept	-302.540	+	-4.131
KG	-1.253	?	-2.807
KP	0.453	+	2.170
YPLG	2.014	+	6.984
YI	841.300	+	1.970

R2=0.995, Adj. R2=0.993
F-Ratio=648.12
DW=1.620

The estimated parameter for KG is fairly large implying that the public sector's capital stock has a powerful negative influence on private output expectations. A comparison between the absolute value of the coefficients of KG and KP indicates that KG put forth much stronger influence on YP than on KP. This negative impact reinforces the immediate effect of GI which is squeezing out the private investment, especially in machinery. Thus, the crowding out effect is likely to be much more severe than is implied by the coefficient of GI in Table 6-1. This may be partially explained by the fact that most public projects have large capital output ratios and do not produce output directly. Especially in the earlier years of such projects, the private output will severely decline by the initial crowding out effect. Neverthless, there might be some increase in later years when these

projects mature and the private sector recovers from the earlier crowding out impact. The association between private output and YI shows that a reduction in this ratio -owing to government investment (the second source of negative effects in Figure 3 below)- may, in fact, reduce the private output drastically.

Chapter VII

SUMMARY AND CONCLUSIONS

This study has assessed the role of the Iranian public enterprise sector in changing the structure of that country's economy during its modern history. An earnest attempt was made to pursue this goal throughout this dissertation to a successful completion. The framework of this study was laid down in Chapter I along with the description of its purpose and the definition of public enterprise.

A genuine research about public enterprises would not be complete without the background information provided by Chapters II and III. These two chapters explored some of the issues of vital importance to our study, particularly the role of public enterprises in capital formation. In Chapter II it was demonstrated how the public enterprises arose from the historical situations common to all the countries considered, and how these enterprises served to accomplish a wide variety of economic or noneconomic objectives. As Jones concluded from his observations, different countries with diverse political systems have used public enterprises. Therefore, the governing political philosophy has little effect on the size of the public enterprise sector. If his assertion is correct, then the growth of public enterprises in

different countries may be chiefly due to economic or social necessities rather than discretionary government policy.

Chapter III concentrated on capital formation as the main requirement for economic development in LDC's. As referred to at the beginning of this chapter, a number of development economists believe that low income-investment ratio is the most severe obstacle to economic development in LDC's. Since the level of capital formation is low the economy is not capable of absorbing the ever increasing labor force, improving the quality of resources, or utilizing progressive techniques. The critical question that Chapter III tried to deal with was: who possesses the capacity to provide sufficient amounts of capital resources to support rapid economic growth in LDC's? It was argued that the private sector has neither the ability nor interest to do so. Consequently, the LDC's have no choice except to turn to the government as the next best alternative. The direct government intervention through public enterprises was analyzed in this chapter. The government projects were compared to their private counterparts to evaluate and justify the role of the government.

The historical pattern of growth of public enterprises in Iran was reviewed in Chapter IV. It was mentioned that the history of modern Iranian public firms began with the formulation of the First Plan in 1955. Before this date, a coordinated approach to public enterprises was lacking. The

government priorities declared in development plans were translated into action through public enterprises. Without them such plans had to remain on paper. It was concluded in this chapter that development planning in Iran was not a complete success because institutional factors were not incorporated into development strategy. The modernization was pushed too far in two or three sectors, and the major resources were allocated to arm purchases.

Chapter V concentrated exclusively on the Iranian public enterprises especially their role in capital accumulation. In the first section of this chapter, the alternative strategies offered by different schools were outlined as the theoretical basis for subsequent analyses. The idea of "balanced" versus "unbalanced" growth was analyzed in order to determine what strategy would be more appropriate for an underdeveloped country like Iran, and what role should be assigned to the government in the development process. It was pointed out that although the debated issue is of a subjective nature, there are some reasonable grounds to argue that under each strategy the central task should be left to the government. As Higgins reminded us no strategy is fully successful without government participation.

Although no comprehensive data were available on different aspects of Iranian public enterprises, a serious effort was made to obtain the necessary information and make it as accurate as possible. Several criteria which may signify the

size of the public enterprise sector in Iran, such as their number, their sectoral distribution, etc. were presented in this chapter. Their contribution to capital formation was examined by analyzing the long run pattern of changes for both public and private investment, and by computing various useful ratios such as the ratio of fixed capital formation to different measures of national output. A crude test of the correlation coefficient between public investment to GDP and private investment to GDP showed a weak positive relationship between these two for the period of 1959-77. But, for each plan period, taken separately, a stronger association was found. This led to the conclusion that once the government declared its priorities for each planning period, the private sector would follow suit.

The sectoral allocation of government investment showed a changing pattern from one plan period to the other perhaps in response to the economy's most urgent needs manifested by shortages and bottlenecks, to change in oil revenue, or to government preferences. In other words, there was no provision of adequate productive capacity; rather, the government waited for the bottlenecks to emerge, then responded. The performance of the Iranian public enterprise sector was also judged by examining their output and linkage effects. The nominal growth rate of output in this sector appeared to be significant during the entire period of concern, 6.6% annual average. The growth rate of real value ad-

ded showed signs of underpricing the services of public firms. The input-output table of Iran for 1974 indicated that the government enterprises in basic industries as a whole had the highest forward and backward linkages among other sectors. Other public enterprises showed a moderate level of linkage effects. Since the data were not available, the contribution of public firms to employment could not be investigated.

In Chapter VI, we developed our econometric model and applied it to a time series data of Iran to test the effect of government investment on private investment and output. Overall, our empirical results did not produce sufficient evidence to accept the null hypothesis that the positive effect of government investment on the private sector is stronger than its negative effect. On the contrary, the impact of government investment on the total private investment was found to be negative although trivial. Such a contractionary effect was also confirmed by our findings for private output. This suggested that the rate of growth of the private sector was adversely affected by government investment during the 1959-77 period. In all cases the credit conditions appeared to be the main source of variations of private investment in Iran where the long run government policy outlined in the national plan, provided directives for types and levels of private activities. The investment decisions of the private sector were usually of short term na-

ture in response to government declared policies and priorities.

Our findings in Chapter VI revealed that the overall economic performance of the Iranian public enterprise sector was not satisfactory because government investment in this sector only served to channel the resources into the unproductive construction activities. As a result, it affected the productive investment adversely. Also its detrimental effects on some sectors caused unharmonious economic growth in the country which led to rapid expansion of some paticular industries, mostly assembly lines, in the major cities. The resulting massive migration into these cities put severe upward pressure on demand for housing and other type of construction. In spite of numerous constraints, this sector grew at a high rate and absorbed the unskilled and semiskilled workers from other sectors. The boom in demand for housing, coupled with a lack of a sound pricing system, pushed up the rate of return in this sector and resulted in further transmission of resources into the construction activities. Many businessmen left their productive jobs and shifted their resources away from productive activities toward construction projects, mostly urban development. Even a substantial portion of government credits found its way into this sector. The upshot was a decrease in the efficiency of capital by creating an atmosphere conducive to a shift of resources away from the industrial sector which caused a heavy loss of output for the economy.

The expansion of construction activities seemed inevitable in a time of rapid economic restructuring because industrialization brought about the need for administrative, sanitary, health, educational and similar facilities. But these were not the kinds of construction activities emphasized by the government or the private sector. The high construction investment in the public sector was mainly in the form of massive outlays for luxury government buildings, resorts, and hotels, which proved to be nothing more than unproductive showy projects. Although no detailed information about these projects is available, the aggregate official figures show an immense expenditure on royal palaces, luxury constructions for security and armed forces, and ministry headquarters. For example, in the Fourth Plan alone 16 billion Rials was spent on government buildings of which 13 billion rials was allocated to those mentioned above.[107] For the private sector the motives for high construction investment were the feasibility of investment because the needed raw materials were available domestically, the high return on investment, the simplicity of production process, and the supportive attitude of the public.

Although this dissertation is among the first studies concentrating on economic implications of the Iranian public sector, it also provides some interesting facts that may be used to redirect the future planning for the country. More

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[107] "4rh Plan", pp. 252-53.

future research is needed to investigate the impact of public enterprises on the Iranian economic growth. A number of improvements must take place to make such studies more reliable:

- More detailed data on different aspects of the Iranian public enterprises, particularly their financial matters.
- Longer time series data for all variables used in this study
- Availability of consistent data on interest rate, wage rate, employment, labor force, etc.

Appendix A

PRESENTATION OF DATA

The purpose of this appendix is to present the time series data which are used in this study and to describe the way these date were derived. As was pointed out in Chapter I, the data situation in LDCs is the major impediment to any empirical studies about these countries. All the difficulties related to the data situation in Iran seem insurmountable. The author tried to get over some of them by consulting as many sources as possible, specifying the variables and extracting their values in a way that is most consistent with the purpose of this study, and using the latest official publications in the case of any inconsistency between the figures to reduce the chance of quantification error.

The output of the private sector is derived in the following manner: First, the output of the public sector was computed as the summation of output in oil, mining, electricity and gas, water, transportation and communication, financial and monetary services, and state services which are operated almost entirely by the public sector. Then, this summation was subtracted from the GNP to obtain the value of private output. In sectors such as manufacturing, where the government contribution to total output is consid-

erable, the output should have been devided between public and private sector, but the unavailability of data made such categorization impractical.

The Iranian national accounts system reports the investment figures under two distinct categories: machinery and construction for both public and private sector. Those figures are used in this study in the same manner. The change in inventory is not included in the investment data because it was not feasible to decompose these figures to determine the share of public and private sectors. The capital stock is derived by utilizing the following formula:

$K_t = K_{t-1}(1-d) + I_t$ in which:

K_t = Capital stock at time t.

d = depreciation rate.

The depreciation rate was assumed to be constant and equal to 0.24, the value of capital stock in the benchmark year (1959) was computed by using the capital output ratio of 3.3.[108]

Table A _ 1 contains the time series data for all the original variables used in this dissertation. All the values are expressed in billion Rials.

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[108] The applied rate of depreciation and capital output ratio are based on the computation made in the following study: Andrew H. Gantt, and Guiseppe Ditto. "Financial Performance of Government-Owned Cotporations," I M F Staff Papaers. (March 1968), pp. 102-143, see especially p. 110.

Table A-1

TIME SERIS DATA USED IN THE TEXT

Year	PIM	PIC	GIM	GIC	CR
1959	16.20	14.70	5.20	15.60	7.30
1960	19.20	20.30	4.10	14.90	8.00
1961	13.90	21.50	5.90	14.10	8.20
1962	14.00	20.10	3.60	13.60	11.80
1963	12.50	20.00	2.50	17.90	15.40
1964	19.70	24.50	4.10	18.50	20.00
1965	20.90	27.20	9.70	30.70	24.30
1966	24.00	28.30	12.00	37.50	28.50
1967	32.50	30.60	17.10	40.50	33.00
1968	28.00	32.20	25.00	51.10	37.70
1969	27.50	40.20	32.70	52.10	42.90
1970	32.50	51.70	32.80	67.80	50.30
1971	47.20	51.30	35.90	85.60	58.00
1972	81.20	69.90	34.20	108.00	74.10
1973	85.40	95.60	56.60	149.50	99.60
1974	81.80	124.70	111.00	212.00	159.80
1975	305.20	208.40	150.20	335.50	270.50
1876	350.00	352.30	205.40	681.80	403.50
1977	316.00	461.30	285.60	721.70	545.50

TABLE A-1 (cont.)

Year	YG	YP	KG	KP
1959	89.10	195.60		
1960	90.60	210.00	284.13	645.84
1961	96.00	218.00	234.94	530.34
1962	103.60	228.40	198.55	438.46
1963	114.30	230.70	168.10	367.33
1964	134.10	243.90	148.16	311.67
1965	158.00	271.30	135.20	281.10
1966	172.70	293.00	143.15	261.71
1967	196.60	319.80	158.30	251.20
1968	231.30	347.70	177.90	254.21
1969	270.30	373.00	211.31	253.40
1970	314.60	389.90	355.40	260.28
1971	420.20	483.60	294.70	282.00
1972	520.80	609.20	345.47	312.83
1973	914.40	746.60	404.76	388.85
1974	2015.20	1010.80	513.72	476.53
1975	2106.00	1326.00	713.42	568.66
1976	2680.00	1890.60	1027.90	945.78
1977	3092.80	2303.20	1668.41	1421.01

Appendix B

THE IRANIAN PUBLIC ENTERPRISES

1. Non Financial Enterprises:

Abadan Petrochemical Co.

Agricultural Chemical Co.

Agricultural Co. (consulting services)

Agricultural Machinery and Services of Dasht Ghazvin

3 Agro-Industry Companies

Ahvaz Pipe Manufacturing Co.

Amin-Abad Refractory Material Co.

Arak Machine Producing Co.

Bafkar Textile Co.

Central Store of Handicraft Co.

Construction Instalation Co.

Dam Construction & Irrigation Instalation Co.

Electronic Calculator Services Co.

Electronic Industry of Iran

Farim Wood Industry and Exploitation Co.

Fars Meat Industrial Complex

Financial Organization of Production Units Expansion

Housing Expansion

Housing Organization Co.

Industrial Innovation Center Co.

Institute for Preparation and Improvement of Sugar Beet Seeds

Instructional Industries Co.

Iova Co. (consulting services)

Iran Airline Industries Co.

Iran Aluminium Co.

Iran Central Organization of Rural Cooperatives

Iran Diary Industries Co.

Iran Distribution of Chemical Fertilizer Co.

Iran Ease Co. (electronic machinery)

Iran Electric Appliance Co.

Iran Fisheries Co.

Iran Helicopter Industries Co.

Iran Mine & Metal Smelting Co.

Iran National Airline Co.

Iran National Copper Industries Co.

Iran Pharmacutical Co.

Iran Power Generation & Transmission Co.

Iran Press Industries Co.

Iran Pump Co.

Iran South Fisheries Co.

Iran State Railways Organization

Iran State Trade Co.

Iran Telecommunication Co.

Iran Term Co.

Iran Tobacco Co.

Iran Tours Co.

Iran Tractor Manufacturing Co.

Iran Wood & Paper Industries Co.

Iranian Carpet Co.

Iranian International Exhibition Co.

Jouneed Co. (crane services)

Kanaf-Kar Co. (jute bag and cloth production)

Khouzestan City Planning Organization

Kampidro (industrial compressors)

Lorestan Meat Industrial Complex Co.

Ministry of Economic Affairs & Finance Auditing Co.

Ministry of Islamic Guidance Printing Co.

Motogen Co. (electric motors)

Narmak Hatching Institute (poultry)

Natioal Iranian Gas Co.

National Iranian Smelting Co.

National Iranian Oil Co.

National Organization of Radio & Television Co.

National Organization of Wheat, Lump Sugar, Sugar, and Tea

National Petrochemical Industries Co.

National Steel Industries Co.

Neka Chub Co. (forestry)

Niroo Battery Manufacturing Co.

Organization for Development & Reconstruction of Iranian Industries

Organization for Expanding Non-Agricultural Activities (handicrafts)

Organization of Industrial Management Co.

Organization of National Defense Industries

Organization of Parts and Navigation

Organization for Protecting Consumers and Producers

Organization of Rural and Urban Cooperative Co.

Pars Machine Producing Co.

Pars News Agency

Pastoral and Forestry Services Co.

Pasture Development Fund

Post Office Department

Production and Marketing Co. for agricultural commodities of Dasht Ghazvin

8 Regional Power Co.

6 Regional Water Co.

7 Regional Water and Power Co.

Rey Cement Co.

Road Safety Equipment Producing Co.

Sahand Lift Truck Producing Co.

Sefidroud Agricultural and Animal Husbandry Co.

Sepahan Cement Co.

Shahpour Chemical Co.

Shiraz Petrochemical Co.

Silk Co.

Simansaz Cement Co.

Siol Technical and Mechanical Laboratory

State Gazette Co.

State Meat Organization

State Printing Co.

5 Sugar Companies

Tabriz Machinery Co.

Technologue Co. (engineering services)

Technology and Industrial Production Co. of Iran (engineering services)

Trade Services Expansion Co.

Turkey Meat Industrial Complex Co.

Vanak Factories Co. (industrial Complex)

Warehouse Construction and Services Co.

Water and Power Engineering Services Co.

West Regional Development Co.

2. Public Financial Institutions

Bank Markazi (central bank)

Agricultural Cooperative Bank of Iran

Agricultural Development Bank of Iran

Central Insurance of Iran

Common Funds of Municipalities

Industrial Credit Bank

Insurance Bank of Iran

Iran Exports Guarantee Fund Corp.

Iran Insurance Co.

Mortgage Bank of Iran

National Bank of Iran (commercial bank)

Workers Welfare Bank

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