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LONG-TERM PROSPECTS OF INDUSTRIAL DEVELOPMENT IN SAUDI ARABIA

prepared by
the Secretariat of UNIDO
in co-operation with ECWA

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Exchange rates Saudi Rials per US$

Year	Rate
1386/90 (1966/70)	4.5000
1390/91 (1970/71)	4.4868
1391/92 (1971/72)	4.1448
1392/93 (1972/73)	3.7014
1393/94 (1973/74)	3.5500
1394/95 (1974/75)	3.5176
1395/96 (1975/76)	3.5300

Chapter I

AN OVERVIEW OF THE SAUDI ECONOMY

Introduction

1. The Kingdom of Saudi Arabia was founded by King Abdulaziz Ibn Al Saud in 1932. It covers an area of 2.24 million square kilometers. The terrain is mainly desert, with mountain ranges in the western and south-western regions; there is little or no rainfall in most parts of the country.

2. Preliminary estimates of the population indicate that in 1976, the Kingdom had slightly over 7.4 million[1/] people including the expatriates residing in the country. Roughly 37 per cent of the population is urban and lives in 16 cities with a population over 30,000[2/]. The largest city is Riyadh, the capital of the Kingdom, with a population of 666,000, followed by Jeddah with about 516,000.

3. The single most important resource in the Kingdom is oil, which was discovered in commercial quantities in 1938. The Kingdom is the world's largest exporter of crude oil and possesses the largest reserves. In 1972, oil revenues totalled $ 2.8 billion and accounted for nearly 64 per cent of gross domestic product (GDP), 90 per cent of government revenue, and more than 90 per cent of total foreign exchange receipts. In 1975, following the sharp rise in the price of oil, it accounted for almost 83 per cent of GDP and over 90 per cent of government revenue and foreign exchange receipts. It is an understatement to remark that the Saudi Arabian economy is dominated by the oil sector, and that developments in this sector generally set the pace for overall economic and financial activity.

1/ This figure is derived from the estimates of ECWA's Population Division. It is considered by some to represent an overestimate.

2/ This figure is from the Population and Housing Census of 1974. The Population Division of ECWA estimates the urban population in Saudi Arabia to represent 21 per cent only. The census data with a detailed account of city dwellers appears to be more credible.

Gross domestic product and the level of economic activity

4. Economic activity in the Kingdom has increasingly been dominated by oil which constitutes, as was mentioned earlier, not only the major sector and contributor to GDP but through government spending of oil revenues, is also by far the single most important determinant of economic activity in other sectors as well.

5. In 1960, the share of oil in GDP at factor costs was almost 54 per cent. This share has risen to 83 per cent in 1975. In value terms, the increase is almost thirty-three-fold, rising from SR 3.316 billion in 1960 to SR 110.414 billion in 1975.

6. The growth rate of nominal GDP between 1960 and 1965 was around 12.3 per cent, which is slightly less than the 12.5 per cent growth rate of oil value added. Agriculture, in the same period, grew at an average annual rate of only 4.31 per cent, the lowest sectoral rate of growth for the period, whereas wholesale and retail trade grew at 16.16 per cent,the highest annual rate of growth.

7. The picture was slightly different between 1965 and 1970. Nominal value added in oil grew at an annual rate of 9.33 per cent and nominal GDP at 9.14 per cent. The rate of growth of value added in agriculture dipped to 2.39 per cent, whereas that of manufacturing and mining rose to 17.17 per cent. Wholesale and retail trade value added, which grew at the highest annual rate between 1960 and 1965, dropped to 7.01 per cent per year in the period extending between 1965 and 1970.

8. The sharp rise in the price of oil and the rapid increase in oil production and exportation in the Kingdom have resulted in marked changes in the magnitude and composition of the structure of production. Nominal

GDP (at factor costs) grew at an annual compound rate of growth of 50.6 per cent. The oil sector grew at an even higher rate of 64 per cent, reversing the decline in this growth rate over the period 1965-1970. Crude oil production, in fact, grew at an annual rate of 67 per cent, whereas oil refining experienced a lower rate of growth of 36 per cent. The rate of growth of agriculture value added in the same period also rose to 7.18 per cent. Construction and dwellings value added grew at an annual rate of 33.5 per cent, services value added at 25 per cent, and wholesale and retail trade value added at 27 per cent. These are phenomenal growth rates rarely duplicated even in the historical experience of highly industrialized societies. However, they represent growth rates in nominal values and do not reflect accurately physical growth, in that inflation was rampant in the seventies. To correct for price changes, we use the real domestic product growth rates to convert nominal magnitudes into constant SR values by deflating the various series using price indices with 1966/67 prices representing the base year.

9. The percentage increase in real GDP between 1966 and 1974 is almost 240 per cent. The rate of increase in real agriculture value added, over the same period, is significantly less (132 per cent), whereas crude petroleum increase is close to 281 per cent, other manufacturing increased by 188 per cent, construction increased by 259 per cent, and government by 1966 per cent.

10. Several adjustments must be made to reflect more accurately the structural changes and the growth of the Kingdom's productive capacity. Some of these adjustments include:

First, the standard methods of calculating real domestic product, i.e., deflating each component by its specific price index, generally underestimate the Saudi Arabian purchasing power, since the contributions of crude and

refined petroleum to the real growth of the economy are understated. Because a large portion of petroleum product is exported, a rise in their prices, other things being equal, increases the purchasing power of exports in terms of imports. This adjustment is illustrated in Table I.14. The terms-of-trade effect is defined as the difference between the value of exports deflated by an imports-price index and the value of exports deflated by an exports-price index. Thus, real national income shows an increase, in real terms, of 17.8 per cent, 19.9 per cent, 31.1 per cent, 150.5 per cent in 1971, 1972, 1973 and 1974 respectively. The corresponding figures for increases in real GDP for the same years are 14.4 per cent, 15.4 per cent, 19.7 per cent, 14.7 per cent.[1/]

Second, the dominance of oil masks important developments in other sectors of the economy. The non-oil sectors of the economy in 1974 show a GDP that is higher than the entire GDP in 1969, and their total in 1975 is almost three times their value in 1970. Furthermore, the percentage distribution of the non-oil GDP reflects some interesting features. Construction, for instance, has doubled its share between 1970 and 1975, manufacturing has maintained its share with some slight decrease. The share of services has risen, whereas that of agriculture has drastically fallen.

Third, the nature of the growth rates and percentage distribution of non-oil value added indicates that the private non-oil sector is dominated by the transportation and marketing of imported products.

Fourth, the relative shares of the private and government sectors in total non-oil GDP have remained virtually unchanged since 1969/1970, with the private sector accounting for slightly over 70 per cent in each year.[2/]

1/ Consult Table I.5

2/ See Tables I.7, I.8, I.9, I.10 and I.12.

Prices

11. There are two types of price indices available in Saudi Arabia: the cost of living index and the implicit non-oil GDP deflator. Both of these indicators have recently displayed an accelerating rate of inflation.

12. The cost of living index is prepared by the Central Department of Statistics (CDS) on a Gregorian year basis, with 1970 as the base year, and is weighted by the consumption basket purchased by a household with a monthly income of SR 600-899. The index is published quarterly and is heavily influenced by the import price index. The cost of living index is presented in Table I.15. The results in Table I.15 indicate that the cost of living has accelerated sharply from about 4 per cent in 1972 to 17 per cent in 1973, to 21 per cent in 1974 and to 33 per cent in 1975. A highly differentiated pattern of relative price changes has occurred. For example, in 1973 housing costs rose by only 12 per cent as compared with an almost 18 per cent increase in the index of commodities other than housing. However, this pattern has sharply been reversed during 1974 and 1975. The housing index rose at a rate of 39 per cent in 1974 and then at a rate of 72 per cent in 1975 as against a rate of change of 15 per cent and 16 per cent, respectively, for the other components.[1/]

13. The implicit non-oil GDP deflator has also displayed accelerated inflation, but at lower rates than that of the cost of living index. This is due to the fact that import prices have risen faster than domestic prices.

14. The basic causes of present inflation in Saudi Arabia are indeed the import prices, the rapid expansion of money supply (at rates that far outstripped the increases in the demand for real money balances), numerous bottlenecks (ports, skills, etc.), and the apparent supply inelasticities

---

1/ The cost of living index assigns a weight of 52 per cent to food and a weight of 25 per cent to housing. Since the government grants food subsidies, the index may systematically understate the actual rise in the cost of living.

for important commodities particularly housing. The government has taken a number of measures designed to reduce the rate of inflation and to cushion its impact on various groups. These policies have tended to reduce the side effects of inflation on certain groups within the economy, but have had no effect, so far, on the aggregate rate of inflation.

Employment

15. The Saudi Arabian economy suffers from a severe shortage of labour, especially skilled labour. There are as yet no systematic data available on employment, participation rates, regional labour markets, urbanization and the structure of employment by occupational group and by sector of economic activity. A demographic survey carried out by the Central Department of Statistics in 1966 estimated the labour force at about one million workers. The distribution over sectors included 46 per cent in agriculture, 7 per cent in mining and manufacturing, 10 per cent in construction, and the remaining 37 per cent in services.

16. Public service employment has increased from 69,000 in 1964/65 to 138,000 workers in 1969/70. Employment in the oil sector has remained stable throughout the decade 1960-1970. By the end of 1972, total oil employment was 14,694 workers, a figure virtually unchanged from the 1963 value. There was a slight decrease in employment by ARAMCO, but this was offset by an expansion in the work force of the government-established PETROMIN and the Arabian Oil Company.

17. More recent developments indicate that during the first plan period, Saudi Arabia's labour force has grown by an estimated 3.8 per cent per year, from 1.328 million workers in 1970 to 1.6 million workers in 1975. The growth rate for Saudi workers was 3.7 per cent, whereas the rate for non-Saudis was 4.2 per cent. Saudi workers, however, constituted 80 per cent of the labour force in 1975. The participation rate of Saudis has increased over the years 1970-1975 from 22.2 per cent to 23.3 per cent;

nevertheless, the overall rate is still significantly low compared to industrial countries. The basic reason for such a low participation rate is the exceptionally low female participation rate, which was less than one per cent in 1975. The participation rates of expatriates are 67.4 per cent for non-Saudi men and a low 3.8 per cent for non-Saudi women.

18. Foreign workers constitute a major component of the Saudi labour force; however, data on workers entering from other Arabian peninsula countries are unreliable since these migrants are not required to obtain work permits, and thus, their total number and their characteristics are very difficult to estimate. It is generally believed that most foreign workers entering the private sector are skilled operational and technical workers. Arab workers are predominantly of skilled operational, service, sales and agricultural types. Europeans are predominantly technical and scientific, and managerial. Asians account for the largest share of office workers.

Public Finances

19. The public sector in Saudi Arabia consists of the central government and more than 15 semiautonomous institutions. The central government budget is the dominant component in the finances of the public sector. Indeed, the bulk of expenditures of the semiautonomous bodies is financed by central governments grants and transfers. Furthermore, central government transfers to specialized banks and funds constitute the major source of medium and long-term financing for the private sector.

20. Recent budgetary developments have been characterized by ever increasing surpluses resulting from the sharp increases in revenues caused by the sharp rise in the price of oil, and a less rapid growth in expenditures. In Saudi Arabia, it is evident that the level of net domestic expenditures, or the difference between the government's domestic expenditures and revenues, determines in a direct and significant manner

the levels of aggregate demand and private income, and is the principle determinant of changes in domestic liquidity.

21. In the period 1969-1972, the budget recorded a cumulative surplus of SR 10 billion compared with a deficit of slighly over SR 1 billion in the three years preceding 1969/70. A dramatic change occurred in 1973/74 in the wake of the steep rise in oil prices in October 1973 and January 1974. Following an increase of 38 per cent in 1972/73, total revenues increased by 172 per cent to SR 41.7 billion in 1973/74. Although the growth in actual expenditures accelerated, the budget recorded a surplus of SR 23.7 billion. When the full impact of the increase in oil prices is accounted for, the actual revenues grew further by 140 per cent to SR 100.1 billion. Despite continuous and sustained growth in government expenditures, the surplus reached SR 68.1 billion.

22. The budget for 1975/76 provided for a record rise in total expenditures, from the 1974/75 level of SR 32 billion to SR 109 billion in 1975/76. Project expenditures and transfers to public funds were budgeted to increase by more than fourfold from the previous year, and current expenditures were budgeted to increase by 159 per cent.

23. Government revenues are primarily oil revenues. Non-oil revenues have risen in absolute terms; however, their share in total revenues has steadily declined from 12 per cent in 1971/72 to less than 6 per cent in 1974/75. Government expenditures, on the other hand, are primarily allocated to projects. Between 1971/72 and 1974/75 the share of outlays on projects in total expenditures has risen from 39 per cent to 53 per cent. Furthermore, a large part of the increase in current expenditures, particularly in 1973/74, 1974/75, and 1975/76, reflects the rise in personnel costs.

The balance of payments

24. The Saudi Arabian economy is still predominantly a single product economy and its balance of payments reflects this fact. There is a limited home production base, oil exports bring in almost all the export proceeds, and the net surplus is almost entirely directed to the coffers of the public sector. Given the limited domestic production base, a large part of private income and export proceeds is allocated to the purchase of foreign products and/or foreign assets. The openness of the Saudi economy and its limited tariffs facilities have enhanced this process. Although non-oil receipts are limited, proceeds from external investments are expected to yield a respectable future flow of foreign exchange.

25. The Saudi balance of payments has exhibited a growing current account surplus since 1970. From 1960 until 1975, the Kingdom experienced only two deficit years (1968, 1969) on the current account. The sharp rise in the price of oil in 1974 resulted in large current account surpluses in excess of SR 79 billion in 1974. Furthermore, despite increased capital outflows and foreign assistance, the balance of payments displayed net surpluses and increases in the official reserves and foreign commercial bank assets.

26. The structure of exports is such that oil exports, i.e. crude and refined, make up more than 90 per cent of total exports. The structure of imports shows a decline in the share of foodstuffs from 33 per cent in 1960 to 25.5 per cent in 1973. Even imports of building materials show some decline as a percentage of total imports over the years. In fact, imports of building materials increased in absolute and percentage terms from 1960 until 1966 when they accounted for 13.33 per cent, and declined from then on to 7.26 per cent in 1973. Textile and clothing imports have declined steadily as a percentage of total imports from 1960 until 1973. Machinery, electric appliances and transport equipment have experienced major increases in import shares. In 1960, they accounted for 23.27 per cent of total imports, whereas in 1973, they accounted for 34.32 per cent.

27. The magnitude of the increase in imports is phenomenal indeed, rising from SR 1,053 million in 1960 to SR 7,352 in 1973.[1/] The rise in oil exports has resulted in even more substantial changes. Imports totalled SR 26,974 million in 1975. There is every reason to believe that imports will increase further as the absorptive capacity of the economy increases.[2/]

28. The very sharp rise in imports since 1973 is explained by the considerable increase in total government spending which was strongly associated with large increases in direct government imports. Whereas increases in international prices in the past few years account for a large portion of the rise in import value, most of the increase is attributable to a more than threefold expansion in import volume.

29. The major trading partners have remained rather stable over the years. In 1975, the United States accounted for 31 per cent of total imports, Japan 28 per cent, the Federal Republic of Germany 12 per cent and the United Kingdom 9 per cent.

Gross capital formation

30. Real gross capital formation in Saudi Arabia has undergone a number of structural changes over the period 1966/67 - 1973/74.

1/ Official figures on the structure of imports cover the year 1973 only. For the other years estimates were based on trade partner figures.

2/ Despite a major expansion in the capacity of the major ports, the number of ships waiting at ports of the Kingdom has grown to 300 at the beginning of 1976 and the average waiting period for ships was over one month.

31. First, the annual rate of growth of real GCF over the period did not exceed 8 per cent. Since the real rate of growth of GDP exceeded 8 per cent the share of GCF in GDP fell from 18 per cent in the beginning of the period to 15 per cent at its end. Secondly, the share of government investment in total real GCF increased over this period. In 1966/67 the government share accounted for 38 per cent of the total real GCF whereas it accounted for 41 per cent of this total in 1973/74. This reflects the increased participation of the public sector in financing and undertaking of developmental projects. Thirdly, the share of the non-oil sectors in real capital formation has declined over the same period. In 1966/67, the non-oil sectors accounted for 79 per cent of total real GCF, whereas they accounted for only 73 per cent in 1973/74. Table I.24 displays the information used in making the above observations. Table I.25 presents information on nominal investment.

32. The information in Table I.25 indicate that investment in current prices increased at an annual rate of 27 per cent between 1966/67 and 1973/74. More important perhaps is the fact that investment in machinery and equipment did not increase as fast as the increase in total nominal investment. In fact, the share of investment in machinery and equipment in total investment fell from 16.2 per cent in 1966/67 to 11.8 per cent in 1973/74. Table I.24 shows that investment in building structures exceeded investment in machinery and transport equipment in every sector in the economy including the oil sector.

The development plans

33. Development planning was initiated in 1959, when an Economic Development Committee (EDC) was established to work closely with a mission from the World Bank. On February 4, 1961, a Royal Decree was issued dissolving the

EDC and setting up a Supreme Planning Council (SPC), to be presided over by the Prime Minister and to consist of the Ministers of Finance and National Economy, Transport and Communication, Trade, Agriculture, and Petroleum and Mineral Resources. The SPC staff, headed by a Secretary General, was assigned the responsibility for planning, supervising and executing the projects chosen by the SPC.

34. In 1965, a major government reorganization took place, and the SPC was replaced by a new planning organization called the Central Planning Organization (CPO), headed by a president with ministerial rank responsible directly to the King. The functions of the CPO included:

(i) preparation of periodic reports on the various aspects of the country's economy;
(ii) formulation of economic and social development plans for the consideration of the council of Ministers;
(iii) follow-up of planned projects;
(iv) preparation of estimates of costs of development projects to assist the Ministry of Finance in preparing the various budgets;
(v) the conduct of economic studies and the provision of necessary recommendations; and
(vi) the provision of technical advisory services to the King.

35. In 1969, the CPO prepared the first Five Year Development Plan for 1970/71-1974/75. In 1975, a Royal Decree was issued to elevate the CPO to the status of a full-fledged ministry which is still in operation as the Ministry of Planning and with the same functions as those of the CPO.

The First Development Plan 1970/71-1974/75

36. The First Development Plan had three basic objectives:

(1) the realization of an average annual rate of growth of 9.8 per cent in real terms; (2) the diversification of the structure of production in order to lessen the dependence of the economy on oil and (3) the development of human resources through manpower planning and investment in social infrastructure.

37. Total government expenditures over the Plan period were initially estimated against the background of declining oil prices and were set at SR 41.3 billion, of which SR 18.4 billion or 44.6 per cent were alloted to project expenditures, and the remainder to recurrent expenditures. In the first year of the plan, government revenues fell short of the budgeted expenditures. However, for the balance of the Plan period, the financial position of the government improved dramatically. As a result, budgetary allocations were extended far beyond initial targets, and in the final year of the Plan, allocations for project expenditures were raised to over six times the initial target. Interestingly enough, actual expenditures fell short of budgeted allocations in each year of the Plan period, but in total they exceeded the original plan target by 67 per cent.

38. Major increases in outlays were recorded for communications, education and health, municipalities, civil aviation and defense. Substantial progress was made in many fields. In communications, major progress was recorded in extending the road network, airports and harbours. There are now more than 11,000 kilometers of paved roads connecting all major commercial and administrative centres, and more than 20 airports have scheduled airline service. Furthermore, ten new berths have been constructed at the Port of Jeddah and seven berth have been added to the Port of Dammam. In the field of education, almost 800,000 students are enrolled in public schools and another 12,000 are attending colleges and universities.

Hospitals increased from 47 to 62 during the Plan period. In addition, a number of communities with municipality status increased from 54 at the beginning of the planning period to 85 at its end, thus ushering in a wide range of amenities to a much broader cross-section of the population.

39. The developments in the social overhead of the economy were also matched by significant developments in the productive sectors of the economy. During the first four years of the Plan, the Saudi economy grew at an annual rate of 16 per cent, as compared with the target rate of 9.8 per cent. Rates of growth higher than planned were achieved in oil production, construction, transport and communication, and in public administration and defense. On the other hand, industry and agriculture grew at lower rates than planned. The annual average rate of growth in non-oil GDP was about 10 per cent, a rate lower than the target set for its growth.

The Second Development Plan 1975/76-1979/80

40. The Second Development Plan was launched in May 1975 and it called for a continued high rate of economic growth, diversification of the economy's structure of production, accelerated development of human resources through education and training, expansion of social services, and the development of physical social overhead to support the achievement of related goals.

41. The quantitative targets of the Plan call for annual average rates of growth of 10.2 per cent for real GDP (at constant 1974/75 prices), and of 13.3 per cent for real non-oil GDP. The highest sectoral growth rates are planned for non-oil mining, manufacturing, construction, transportation, public utilities and services.

42. Total government expenditures are set at SR 498 billion, which is seven times the amount spent under the first Plan. The funds are to be derived almost entirely from oil revenues and earnings on investments abroad. Of this total, SR 332 billion (67 per cent) are allocated to project expenditures and SR 166 billion (33 per cent) to current outlays. Included in these total are defense expenditures of SR 116 billion and provisions for foreign assistance of SR 63.5 billion. Of the remaining project expenditures of SR 239 billion, physical infrastructure is alloted the largest share of 42 per cent, economic resources 37 per cent and human resources and social development the remaining 21 per cent.

43. The major infrastructure projects cover more than 13,000 kilometers of paved road and 10,000 kilometers of rural roads, 36 new berths in Jeddah and Damman in addition to other mechanical cargo devices that are expected to raise the handling capacity of ports to over 13 million tons of cargo in 1980 compared to 3 million tons in 1972/73. The public sector is scheduled to build 52,500 housing units for low-income families and to develop 44,300 fully serviced building lots to be allocated to low income households. Communities with municipality status are expected to double and the private sector is expected to construct a large number of housing units.

44. Expenditures for the development of economic resources under the Plan are primarily allocated towards financing major petrochemical and industrial projects and to the development of water and agricultural resources. Emphasis is also laid on the development of non-oil mining and the expansion of the electrification of the country. The major industrial projects will be discussed in chapters three and four. In agriculture, priority is given to raising productivity and to expanding farm land. All large desalination plants will be of the dual-purpose type capable of producing water as well as electricity.

45. The lack of sufficient human resources has long been recognized by the planners in Saudi Arabia as the major single constraint on the smooth and proper growth of the economy. The dearth of human resources is not only quantitative, but is also qualitative. Consequently, the Plan devotes substantial resources to educate and train Saudi workers. The Saudi work force is expected to rise from 1.3 million in 1975 to 1.5 million in 1980, the non-Saudi labour force from 0.314 million to 0.812 million. The private sector is expected to employ 1.978 million workers in 1980, a figure which respresents an increase of 46.2 per cent over 1975, whereas public administration employment is expected to grow by more than 90 per cent during the same period. The subtotal increase for the public sector is almost 109 per cent whereas it is only 53.1 per cent for the entire economy. The number of professional and technical workers needed to meet the Plan's requirement must grow from about 79,100 to more than 191,000 persons by 1980. All occupational groups except farmers and fishermen will grow by more than 7 per cent annually.

Plan of the study

46. The preceding sketch of the Saudi economy is intended to present the reader with a general overview of the economy within which the manufacturing sector, which constitutes the focal point of our study, operates. In chapter two, the aggregate manufacturing sector is studied in terms of its value added, employment, productivity, size, scale, etc. The non-oil manufacturing sub-sectors will be treated in chapter three. Chapter four is devoted to a consideration of general and specific problems of industrialization in the Kingdom. Chapter five deals with the institutional framework of the industrial sector, and chapter six with industrial policy and its impact. In chapter seven, the future prospects and outlook of the manufacturing sector are considered from different perspectives. Finally, chapter eight presents a summary of the results and some concluding remarks.

Table I.1 **GROSS DOMESTIC PRODUCT OF SAUDI ARABIA BY INDUSTRIAL ORIGIN, 1960-1965 (1380-1385) (At current factor costs; in millions of Saudi Arabian Riyals)**

	1960 1380	1961 1381	1962 1382	1963 1383	1964 1384	1965 1385
Agriculture	708.1	757.3	809.9	866.2	908.8	874.4
Manufacturing and mining	125.8	139.8	155.3	172.5	191.3	216.4
Wholesale and retail trade	339.5	393.4	445.3	516.0	599.7	718.0
Oil	3 316.5	3 888.5	4 231.0	4 631.7	5 597.2	5 934.4
Services	747.0	860.1	990.3	1 140.2	1 327.5	1 482.3
Construction and dwelling	535.1	583.5	636.3	692.8	773.3	931.7
Transport and communications	440.9	498.8	564.2	638.2	749.4	867.6
G D P	6 212.9	7 121.4	7 832.3	8 657.6	10 147.2	11 074.8

Source: Al-Bashir, F., A Structural Econometric Model of Saudi Arabia, 1960-1970.

Table I.2 **GROSS DOMESTIC PRODUCT OF SAUDI ARABIA BY INDUSTRIAL ORIGIN, 1960-1965 (1380-1385) (At current factor costs; Percentages)**

	1960 1380	1961 1381	1962 1382	1963 1383	1964 1384	1965 1385
Agriculture	11.40	10.63	10.34	10.01	8.96	7.90
Manufacturing and mining	2.02	1.96	1.98	1.99	1.89	1.96
Wholesale and retail trade	5.47	5.53	5.69	5.96	5.91	6.48
Oil	53.38	54.60	54.02	53.50	55.16	54.04
Services	12.02	12.08	12.64	13.17	13.08	13.38
Construction and dwelling	8.61	8.19	8.13	8.00	7.62	8.41
Transport and communications	7.10	7.01	7.20	7.37	7.38	7.83
G D P	100.00	100.00	100.00	100.00	100.00	100.00

Source: Al-Bashir, F., A Structural Econometric Model of Saudi Arabia, 1960-1970.

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Table I.3 GROSS DOMESTIC PRODUCT BY KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES AT CURRENT PRICES 1386-87 THROUGH 1395-96 (Million Saudi Riyals)

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 2/ 1973-74	1394-95 2/ 1974-75	1395-96 1/ 1975-76
	A. Industries and other producers except producers of government services									
1. Agriculture, forestry and fishing	846.3	881.0	957.4	984.1	1 015.5	1 058.7	1 138.7	1 242.4	1 392.1	1 586.3
2. Mining & quarrying										
a) Crude petroleum & natural gas	6 130.7	6 892.8	7 269.8	8 106.3	12 581.3	16 931.5	26 284.3	78 345.3	101 696.1	109 559.8
b) Other	36.4	43.5	48.9	46.7	50.3	58.7	90.4	146.4	247.5	576.1
3. Manufacturing										
a) Petroleum refining	759.8	901.6	984.7	1 240.9	1 474.2	1 441.6	1 310.3	4 346.5	5 765.8	5 962.4
b) Other	308.9	344.1	385.3	431.2	483.6	543.0	617.1	729.9	931.2	1 191.1
4. Electricity, gas & water	198.7	219.6	247.2	273.1	297.9	302.2	319.1	328.4	317.7	341.6
5. Construction	727.4	869.1	977.4	933.9	1 007.0	1 173.8	1 300.9	2 720.3	4 949.2	11 522.4
6. Wholesale and retail trade, restaurants and hotels	721.8	806.5	937.8	1 007.5	1 067.5	1 177.0	1 553.5	2 354.6	3 044.9	4 642.1
7. Transport, storage & communication	937.9	1 009.7	1 173.2	1 242.5	1 479.3	1 567.4	2 121.3	2 717.6	3 945.7	5 776.1
8. Finance, insurance, real estate and business services										
a) Ownership of dwellings	494.0	545.0	601.0	661.0	727.0	800.0	1 000.0	1 333.0	2 000.0	3 000.0
b) Other	266.7	314.7	334.9	354.7	376.6	411.4	522.5	746.3	1 107.4	1 654.6
9. Community, social and personal services	171.0	191.4	214.7	238.3	265.4	297.1	388.9	403.0	522.8	711.9
Less imputed bank service charge	-34.5	-39.1	-43.2	-46.6	-49.6	-50.0	-51.0	-63.8	-76.6	-95.8
Sub-total	11 565.1	12 979.9	14 089.1	15 474.2	20 776.0	25 712.4	37 554.5	95 339.9	128 843.8	146 423.6

/... "Continued"

Table I.3 "Continued"

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 2/ 1973-74	1394-95 2/ 1974-75	1395-96 1/ 1975-76
B. Producers of Government Services										
1. Public administration and defense	752.2	801.0	891.5	942.1	992.7	1 076.4	1 362.6	1 858.0	2 689.3	3 711.7
Other services	613.8	648.3	723.7	736.3	812.4	1 063.5	1 170.5	1 632.1	2 301.4	4 412.9
Sub-total	1 366.0	1 449.3	1 615.2	1 678.4	1 805.1	2 144.9	2 533.1	3 490.1	4 990.7	8 151.6
Total	12 931.1	14 429.2	15 704.3	17 152.6	22 531.1	27 857.3	40 087.6	98 840.0	133 834.5	154 583.2
Import duties	211.4	227.4	271.0	246.0	340.1	400.0	463.5	475.0	375.8	469.8
Gross Domestic Product	13 142.5	14 656.6	15 975.3	17 398.6	22 921.2	28 257.3	40 551.1	99 315.0	134 210.3	155 053.0

Source: National Accounts of Saudi Arabia 1386/87 through 1395/96, June 1977

1/ Preliminary

2/ Revised

Table I.4 GROSS DOMESTIC PRODUCT BY KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES AT CURRENT PRICES 1386/87 THROUGH 1395/96 (Percent)

	1386–87 1966–67	1387–88 1967–68	1388–89 1968–69	1389–90 1969–70	1390–91 1970–71	1391–92 1971–72	1392–93 1972–73	1393–94 1973–74	1394–95 1974–75	1395–96 1975–76
1. Agriculture, forestry & fishing	6.43	5.96	5.99	5.66	4.43	3.75	2.81	1.25	1.61	1.08
2. Mining and quarrying										
a) Crude petroleum & natural gas	46.64	46.67	45.51	46.59	54.89	59.92	64.82	78.89	78.81	79.66
b) Other	0.27	0.29	0.31	0.27	0.22	0.21	0.22	0.15	0.18	0.37
3. Manufacturing										
a) Petroleum refining	5.78	6.10	6.16	7.13	6.43	5.19	4.47	4.38	4.30	3.85
b) Other	2.35	2.33	2.41	2.48	2.11	1.92	1.52	0.73	0.69	0.77
4. Electricity, gas & water	1.51	1.48	1.55	1.57	1.30	1.07	0.79	0.33	0.24	0.22
5. Construction	5.53	5.88	6.12	5.37	4.39	4.15	4.46	2.74	3.69	7.43
6. Wholesale and retail trade, restaurants and hotels	5.49	5.46	5.87	5.79	4.66	4.17	3.83	2.37	2.27	2.99
7. Transport, storage & communication	7.13	6.83	7.34	7.14	6.45	5.55	5.23	2.74	2.94	3.73
8. Finance, insurance, real estate and business services										
a) Ownership of dwellings	3.75	3.69	3.76	3.80	3.17	2.83	2.47	1.34	1.49	1.93
b) Other	2.02	2.13	2.10	2.04	1.64	1.46	1.29	0.75	0.83	1.07
9. Community, Social and personal services	1.04	1.04	1.07	1.11	0.94	0.87	0.83	0.34	0.33	0.40
Less imputed bank service charge										
Public administration & defense	5.72	5.42	5.58	5.41	4.33	3.81	3.36	1.87	2.00	2.41
Other services	4.67	4.38	4.53	4.23	3.54	3.78	2.89	1.64	1.71	2.85
Import duties	1.60	1.53	1.70	1.41	1.48	1.42	1.14	0.48	0.28	0.30
G.D.P.	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Kingdom of Saudi Arabia, Ministry of Finance and National Economy, National Accounts of Saudi Arabia 1386–87 to 1395–96.

Table I.5 GROSS DOMESTIC PRODUCT BY KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES AT CONSTANT PRICES OF 1389-90 (1969 -70), 1386-87 (1966-67) THROUGH 1395-96 (1975-76) (Millions of Saudi Riyals)

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1973-74 1/	1394-95 1974-75 1/	1395-96 1975-76 2/
1. Agriculture, forestry & fishing	884.6	924.8	956.5	984.1	1 017.8	1 050.1	1 088.7	1 129.6	1 174.1	1 221.3
2. Mining and quarrying	6 216.7	6 741.9	7 135.3	8 153.0	9 970.9	12 482.3	15 633.4	18 254.5	17 460.9	17 687.6
a) Crude petroleum & natural gas	6 177.0	6 695.8	7 084.9	8 106.3	9 922.1	12 427.0	15 556.0	18 150.1	17 339.4	17 509.3
b) Other	39.7	46.1	50.4	46.7	48.8	55.3	77.4	96.4	121.5	158.0
3. Manufacturing	1 089.3	1 268.5	1 400.8	1 672.1	1 838.9	1 847.4	1 977.5	2 082.2	2 039.3	2 179.8
a) Petroleum refining	780.4	924.4	1 015.5	1 240.9	1 355.3	1 304.4	1 378.4	1 417.2	1 299.8	1 351.6
b) Other	308.9	344.1	385.3	431.2	483.6	543.0	599.1	665.0	739.5	828.2
4. Electricity, gas and water	198.0	219.2	247.0	273.1	297.9	328.6	381.0	416.6	458.5	525.9
5. Construction	846.8	961.4	1 027.8	933.9	957.2	1 052.7	1 395.8	1 737.3	2 189.0	2 845.7
6. Wholesale and retail trade, restaurants and hotels	755.0	840.9	960.7	1 007.5	1 051.3	1 145.9	1 375.1	1 622.6	1 934.5	2 326.5
7. Transport, storage & communication	918.9	1 012.7	1 139.5	1 242.5	1 467.7	1 544.4	1 818.5	2 284.2	2 728.8	3 370.4
8. Finance, insurance, real estate and business services (Less imputed bank service charges	771.1	855.5	893.8	969.7	1 005.6	1 063.5	1 165.3	1 291.9	1 435.3	1 652.1
a) Ownership of dwellings	520.5	564.8	602.2	661.0	693.0	731.9	787.4	864.4	950.8	1 093.4
b) Other	250.6	290.7	296.6	308.7	312.6	331.6	377.9	427.5	484.5	558.7
9. Community, social and personal services	180.2	198.3	215.1	238.3	253.0	271.8	287.2	310.5	335.6	371.6
10. Government services	1 475.3	1 515.6	1 646.5	1 678.4	1 722.0	1 834.4	1 980.5	2 176.6	2 437.8	2 730.3
11. Import duties	222.3	237.9	276.3	246.0	284.5	342.2	362.4	396.3	183.6	202.0
Gross domestic product	13 564.2	14 776.7	15 904.3	17 398.6	19 906.8	22 963.3	27 495.4	31 642.3	32 369.4	35 093.2

Source: Kingdom of Saudi Arabia, Ministry of Finance and National Economy, National Accounts of Saudi Arabia 1386/87 - 1395/96.

1/ Revised
2/ Preliminary

Table I.6 GROSS DOMESTIC PRODUCT BY KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES AT CONSTANT PRICES OF 1389-90 (1969-70), 1386-87 (1966-67), THROUGH 1395-96 (1975-76) (Percent)

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1973-74 1/	1394-95 1974-75 1/	1395-96 1975-76 2/
1. Agriculture, forestry & fishing	6.52	6.26	6.01	5.66	5.11	4.57	3.96	3.57	3.63	3.48
2. Mining and quarrying	45.83	44.87	46.86	50.09	54.36	56.86	56.86	57.69	53.94	50.34
(a)Crude petroleum & natural gas	45.54	45.31	44.55	46.59	49.84	54.12	56.58	57.39	53.57	49.89
(b)Other	0.29	0.31	0.32	0.27	0.25	0.24	0.28	0.30	0.37	0.45
3. Manufacturing	8.03	8.58	8.81	9.61	9.24	8.05	7.19	6.58	6.30	6.21
(a)Petroleum refining	5.75	6.26	6.39	7.13	6.81	5.68	5.01	4.48	4.02	3.85
(b)Other	2.28	2.33	2.42	2.48	2.43	2.37	2.18	2.10	2.28	2.36
4. Electricity, gas and water	1.46	1.48	1.55	1.57	1.50	1.43	1.39	1.32	1.42	1.50
5. Construction	6.24	6.51	6.46	5.37	4.81	4.58	5.08	5.49	6.76	8.11
6. Wholesale and retail trade, restaurants and hotels	5.57	5.69	6.04	5.79	5.28	4.99	5.00	5.13	5.98	6.63
7. Transport, storage & communication	6.77	6.85	7.16	7.14	7.37	6.73	6.72	7.03	8.40	9.60
8. Finance, insurance, real estate, and business services. (Less imputed bank service charges)	5.69	5.79	5.65	5.57	5.05	4.63	4.24	4.08	4.43	4.71
(a) Ownership of dwellings	3.84	3.82	3.79	3.80	3.48	3.19	2.86	2.73	2.94	3.16
(b) Other	1.85	1.97	1.86	1.77	1.57	1.44	1.38	1.35	1.49	1.59
9. Community, social & personal services	1.33	1.34	1.35	1.37	1.27	1.18	1.04	0.98	1.04	1.06
10. Government services	10.88	10.26	10.35	9.65	8.65	7.99	7.20	6.88	7.53	7.78
11. Import duties	1.68	1.61	1.74	1.41	1.63	1.49	1.32	1.25	0.37	0.58
Gross domestic product	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Kingdom of Saudi Arabia, Ministry of Finance and National Economy, National accounts of S.Arabia 1386/87-1395/96.

1/ Revised.

2/ Preliminary.

Table I.7 **GROSS DOMESTIC PRODUCT (EXCLUDING OIL) OF SAUDI ARABIA BY INDUSTRIAL ORIGIN, 1960-1965 (1380-1385) (At current factor costs; in millions of Saudi Arabian Riyals)**

	1960 1380	1961 1381	1962 1382	1963 1383	1964 1384	1965 1385
Agriculture	708.1	757.3	809.9	866.2	908.8	874.4
Manufacturing and mining	125.8	139.8	155.3	172.5	191.3	216.4
Wholesale and retail trade	339.5	393.4	445.3	516.0	599.7	718.0
Services	747.0	860.1	990.3	1 140.2	1 327.5	1 482.3
Construction and dwelling	535.1	583.5	636.3	692.8	773.3	931.7
Transport and communications	440.9	498.8	564.2	638.2	749.4	867.6
GDP (excluding oil)	2 896.4	3 232.9	3 601.3	4 025.9	4 550.0	5 090.4

Source: Al-Bashir, F., A Structural Econometric Model of Saudi Arabia, 1960-1970.

Table I.8 **GROSS DOMESTIC PRODUCT (EXCLUDING OIL) OF SAUDI ARABIA BY INDUSTRIAL ORIGIN, 1960-1965 (1380-1385). (At current factor costs; Percent)**

	1960 1380	1961 1381	1962 1382	1963 1383	1964 1384	1965 1385
Agriculture	24.45	23.43	22.49	21.52	19.97	17.18
Manufacturing and mining	4.34	4.32	4.31	4.28	4.20	4.25
Wholesale and retail trade	11.72	12.17	12.36	12.82	13.18	14.11
Services	25.79	26.60	27.50	28.32	29.18	29.12
Construction and dwelling	18.48	18.05	17.67	17.21	17.00	18.30
Transport and communications	15.22	15.43	15.67	15.85	16.47	17.04
GDP (excluding oil)	100.00	100.00	100.00	100.00	100.00	100.00

Source: Al-Bashir, F., A Structural Econometric Model of Saudi Arabia, 1960-1970.

Table I.9 GROSS DOMESTIC PRODUCT (EXCLUDING OIL) BY KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES AT CURRENT PRICES, 1386-87 - 1395-96 (in millions of Saudi Arabian Riyals)

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1973-74	1394-95 1974-75	1395-96 1975-76
1. Agriculture	846.3	881.0	957.4	984.1	1 015.1	1 058.7	1 138.7	1 242.7	1 392.1	1 586.3
2. Mining and quarrying	36.4	43.5	48.9	46.7	50.3	58.7	90.4	146.4	247.5	576.1
3. Manufacturing	308.9	344.1	385.3	431.2	483.6	543.0	617.1	729.9	931.2	1 191.1
4. Electricity, gas and water	198.7	219.6	247.2	273.1	297.9	302.2	319.1	320.4	317.7	341.6
5. Construction	727.4	869.1	977.4	933.9	1 007.0	1 173.0	1 800.9	2 720.3	4 949.2	11 522.4
6. Wholesale & retail trade	721.8	806.5	937.8	1 007.5	1 067.5	1 177.0	1 553.5	2 354.6	3 044.9	4 642.1
7. Transport, storage and communications	937.9	1 009.7	1 173.2	1 242.5	1 479.3	1 567.4	2 121.3	2 717.6	3 945.7	5 776.1
8. Finance, insurance, real estate and business services										
(a) Ownership of dwellings	494.0	545.0	601.0	661.0	727.0	800.0	1 000.0	1 333.0	2 000.0	3 000.0
(b) Other	266.7	314.7	334.9	354.7	376.6	411.4	520.5	746.3	1 107.4	1 654.6
9. Community, social and personal services	171.0	191.4	214.7	238.3	265.4	297.1	330.9	403.0	522.8	711.9
Less imputed bank service charges	- 34.5	- 39.1	- 43.2	- 46.0	- 49.6	- 50.0	- 51.0	- 63.8	- 76.6	- 95.8
Public administration and defence	752.2	801.0	891.5	942.1	992.7	1 076.4	1 362.6	1 858.0	2 689.0	3 741.7
Other services	613.8	648.3	723.7	736.3	812.4	1 068.5	1 170.5	1 632.1	2 301.4	4 412.9
Import duties	211.4	227.4	271.0	246.0	340.1	400.0	463.5	475.0	375.8	469.8
G.D.P. (excluding oil)	6 252.0	6 862.5	7 720.0	8 051.4	8 865.3	9 884.3	12 506.0	16 625.0	23 748.0	39 530.6

Source: Kingdom of Saudi Arabia, Ministry of Finance and National Economy, National accounts of Saudi Arabia, 1386/87 - 1395/96, June 1977.

Table I.10 GROSS DOMESTIC PRODUCT (EXCLUDING OIL) BY KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES AT CURRENT PRICES, 1386-87 - 1395-96 (Percent)

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1973-74	1394-95 1974-75	1395-96 1975-76
1. Agriculture	13.53	12.83	12.40	12.22	11.45	10.71	9.14	7.47	5.86	4.01
2. Mining and quarrying	0.58	0.63	0.63	0.58	0.56	0.59	0.72	0.83	1.04	1.45
3. Manufacturing	4.94	5.01	4.99	5.35	5.45	5.49	4.95	4.39	3.92	3.01
4. Electricity, gas and water	3.17	3.20	3.20	3.39	3.36	3.05	2.56	1.97	1.33	0.86
5. Construction	11.63	12.66	12.65	11.59	11.35	11.97	14.52	16.36	20.84	29.14
6. Whole sale and retail trade	11.54	11.75	12.14	12.51	12.04	11.90	12.47	14.16	12.82	11.74
7. Transport, storage and communication	15.0	14.71	15.19	15.43	16.63	15.85	17.03	16.34	16.61	14.61
8. Finance, insurance, real estate and business services										
(a) Ownership of dwellings	7.90	7.94	7.78	8.20	8.20	8.09	8.02	8.01	8.42	7.58
(b) Other	4.26	4.50	4.33	4.40	4.24	4.16	4.19	4.40	4.66	4.10
9. Community, social and personal services	2.18	2.21	2.22	2.38	2.43	2.49	2.71	2.04	1.87	1.55
Less: imputed bank service charges										
Public administration and defence	12.03	11.67	11.54	11.70	11.19	10.89	10.93	11.17	11.32	9.46
Other services	9.81	9.44	9.37	9.14	9.16	10.81	9.39	9.81	9.69	11.16
Import duties	3.38	3.31	3.50	3.05	3.83	4.04	3.72	2.85	1.58	1.13
GDP (excluding oil)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Kingdom of Saudi Arabia, Ministry of Finance and National Economy, National accounts of Saudi Arabia, 1386/87 - 1395-96, June, 1977.

Table I.11 GROSS DOMESTIC PRODUCT (EXCLUDING OIL) BY KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES AT CONSTANT PRICES OF 1389-90 (1969-70), 1386-87 (1966-67) THROUGH 1395-96 (1975-76) (in millions of Saudi Arabian Riyals)

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1973-74 1/	1394-95 1974-75 1/	1395-96 1975-76 2/
1. Agriculture, forestry & fishing	804.6	924.8	956.5	984.1	1 017.8	1 050.1	1 088.7	1 129.6	1 174.1	1 221.3
2. Mining and quarrying	39.7	46.1	50.4	46.7	48.8	55.3	77.4	96.4	121.5	153.0
3. Manufacturing	308.9	344.1	385.3	431.2	483.6	543.0	599.1	665.0	739.5	828.2
4. Electricity, gas and water	198.0	219.2	247.0	273.1	297.9	328.6	381.0	416.6	458.5	525.9
5. Construction	846.8	961.4	1 027.8	933.9	957.2	1 052.7	1 395.3	1 737.3	2 100.0	2 845.7
6. Wholesale and retail trade, restaurants and hotels	755.0	840.9	960.7	1 007.5	1 051.3	1 145.9	1 375.1	1 622.6	1 934.5	2 326.5
7. Transport, storage & communication	918.9	1 012.7	1 139.5	1 242.5	1 467.7	1 544.4	1 848.5	2 224.2	2 720.8	3 370.2
8. Finance, insurance, real estate and business services (Less imputed bank charges)	771.1	855.5	898.8	969.7	1 005.6	1 063.5	1 165.3	1 291.9	1 435.3	1 652.1
a) Ownership of dwellings	520.5	564.8	602.2	661.0	693.0	731.9	787.4	864.4	950.8	1 093.4
b) Other	250.6	290.7	296.6	308.7	312.6	331.6	377.9	427.5	484.5	558.7
9. Community, social and personal services	180.2	198.3	215.1	238.3	253.0	271.8	287.2	310.5	335.6	371.6
10. Government services	1 475.3	1 515.6	1 646.5	1 678.4	1 722.0	1 834.4	1 980.5	2 176.6	2 437.8	2 730.3
11. Import duties	228.3	237.9	276.3	246.0	324.5	342.2	362.4	396.3	183.6	202.0
Gross domestic product (excluding oil)	6 606.8	7 156.5	7 803.9	8 051.4	8 629.4	9 231.9	10 561.0	12 067.0	13 730.2	16 232.0

Source: Kingdom of Saudi Arabia, Ministry of Finance and National Economy, National Accounts of Saudi Arabia, 1386/87 - 1395/96.

1/ Revised

2/ Preliminary

Table I.12 GROSS DOMESTIC PRODUCT (EXCLUDING OIL) BY KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES AT CONSTANT PRICES OF 1389-90 (1969-70), 1386-87 (1966-67) THROUGH 1395-96 (1975-76)

(Percent)

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1/ 1973-74	1394-95 1/ 1974-75	1395-96 2/ 1975-76
1. Agriculture, forestry & fishing	13.39	12.92	12.26	12.22	11.80	11.38	10.31	9.36	8.55	7.53
2. Mining and quarrying	0.60	0.65	0.65	0.58	0.56	0.60	0.73	0.80	0.88	0.97
3. Manufacturing	4.67	4.81	4.94	5.36	5.61	5.88	5.67	5.51	5.39	5.10
4. Electricity, gas and water	3.00	3.06	3.16	3.39	3.45	3.56	3.61	3.45	3.34	3.24
5. Construction	12.82	13.43	13.17	11.60	11.09	11.40	13.22	14.40	15.94	17.53
6. Wholesale and retail trade, restaurants and hotels	11.43	11.75	12.31	12.51	12.18	12.41	13.02	13.45	14.09	14.33
7. Transport, storage and communication	13.91	14.15	14.60	15.43	17.01	16.73	17.50	18.43	19.82	20.76
8. Finance, insurance, real estate and business services (Less imputed bank service charges)	11.67	11.95	11.52	12.04	11.65	11.52	11.04	10.71	10.45	10.18
a) Ownership of dwellings	7.88	7.89	7.72	8.21	8.03	7.93	7.46	7.16	6.92	6.74
b) Other	3.79	4.06	3.80	3.83	3.62	3.59	3.58	3.54	3.53	3.44
9. Community, social and personal services	2.73	2.77	2.75	2.96	2.93	2.94	2.72	2.57	2.44	2.29
10. Government services	22.33	21.18	21.10	20.85	19.96	19.87	18.75	18.04	17.76	16.82
11. Import duties	3.45	3.33	3.54	3.06	3.76	3.71	3.43	3.28	1.34	1.25
Gross Domestic Product (excluding oil)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Kingdom of Saudi Arabia, Ministry of Finance and National Economy, National Accounts of Saudi Arabia, 1386/87 - 1395/96

1/ Revised

2/ Preliminary

Table I.13 **RATE OF GROWTH OF GROSS DOMESTIC PRODUCT OF SAUDI ARABIA BY INDUSTRIAL ORIGIN, 1960-1975 (Current factor costs)**

	1960-65 1380-85	1965-70 1385-90	1970-75 1390-95	1960-70 1380-90	1965-75 1385-95	1960-75 1380-95
Agriculture	4.31	2.39	7.18	3.35	4.76	4.61
Manufacturing and mining	11.46	17.17	19.79	14.28	18.47	16.09
Wholesale and retail trade	16.16	7.01	24.76	11.49	15.54	15.75
Oil	12.53	9.33	63.87	10.91	33.85	26.33
Services	14.69	13.11	21.40	13.90	17.18	16.35
Construction and dwelling	11.73	11.35	34.23	11.54	22.25	18.64
Transport and communication	14.50	7.45	26.00	10.92	16.35	15.73
G D P	12.26	9.45	50.47	10.85	28.33	22.73
GDP (excluding oil)	11.94	9.60	23.74	10.76	16.65	15.06

Source: Al-Bashir, F., A Structural Econometric Model of Saudi Arabia, 1960-1970.
National Accounts of Saudi Arabia 1386/87 through 1395/96, June 1977

Table I.14 **REAL NATIONAL INCOME (1389-90, 1394-95)**
(SR millions in 1389-90 equivalent prices)

	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1973-74	1394-95 1974-75
Constant 1389-90 prices	13 573.7	14 794.4	16 732.0	20 405.8	29 004.2	33 086.6
Terms of trade effect	-	1 198.1	2 441.2	4 732.5	33 956.2	53 348.6
Real national income	13 573.7	15 992.5	19 173.2	25 138.3	62 960.4	86 435.2
Annual rate of increase (percentage)	-	17.8	19.9	31.1	150.5	37.3
Average annual rate of increase (percentage)			44.8			

Source: **Saudi Arabia, Central Department of Statistics, Preliminary Estimates and Projections**

Table I.15 COST OF LIVING INDEX FOR URBAN HOUSEHOLDS IN THE INCOME GROUP SR 600-899 PER MONTH, 1971-1975 (1970 = 100)

	Food	Housing	Clothing and Footwear	Miscellaneous	General index	Index of all commodities except housing[1]
Weights[2]	52.19	2[illegible].88	6.58	16.35	100.0	
1971 (1391)	102.32	111.46	107.[illegible]3	100.6[illegible]	10[illegible].49	10[illegible].[illegible]1
Percentage change over 1970	(2.3)	(11.5)	(7.[illegible])	(0.6)	([illegible].5)	([illegible].[illegible])
1972 (1392)	10[illegible].02	121.58	118.21	102.52	109.01	10[illegible].95
Percentage change over 1971	(1.7)	(9.1)	(10.0)	(1.9)	(4.3)	(2.5)
1973 (1393): Quarter I	115.3[illegible]	136.09	132.99	125.52	123.99	
II	113.86	136.23	135.10	128.[illegible]9	123.21	
III	121.95	136.11	135.85	128.5[illegible]	127.[illegible]7	
IV	133.08	136.30	135.91	128.56	133.32	
Annual	121.06	136.18	13[illegible].96	127.78	127.00	123.75
Percentage change over 1972	(16.4)	(12.0)	(1[illegible].2)	(2[illegible].6)	(16.5)	(17.9)
1974 (1394): Quarter I	131.23	171.55	15[illegible].55	1[illegible]7.01	1[illegible]5.38	
II	1[illegible]1.07	17[illegible].31	151.38	13[illegible].05	1[illegible]8.87	
III	1[illegible]9.1[illegible]	199.02	1[illegible]3.76	13[illegible].69	159.16	
IV	1[illegible]9.46	211.98	156.2[illegible]	136.58	163.36	
Annual	1[illegible]2.73	189.22	152.7[illegible]	138.08	15[illegible].19	1[illegible]2.61
Percentage change over 1973	(17.9)	(38.9)	(13.2)	(8.1)	(21.[illegible])	(15.2)
1975 (1395): Quarter I	159.86	290.33	1[illegible].47	160.25	191.37	
II	171.02	33[illegible].7[illegible]	152.67	15[illegible].0[illegible]	207.79	
III	171.3[illegible]	33[illegible].75	157.[illegible]1	152.01	207.92	
IV	181.55	339.20	165.83	153.06	215.08	
Annual	170.9[illegible]	32[illegible].76	155.11	15[illegible].8[illegible]	205.5[illegible]	166.07
Percentage change over 197[illegible]	(19.8)	(71.6)	(1.6)	(12.1)	(33.3)	(16.5)

Source: Ministry of Finance and National Economy, Central Department of Statistics, Cost of Living Index, 1974 and 1975.

1/ The implicit weights in the index of all commodities except housing are: Food = 69.48; Clothing and Footwear = 8.76; Miscellaneous = 21.77

2/ Weights were calculated by the Central Department of Statistics from the results of a budget survey of households in Riyadh, Dammam and Jeddah which earned from SRls 600 to SRls 899 in 1390 (1970). Raw price data for the index are currently gathered only in Riyadh

Table I.16 **DISTRIBUTION OF LABOUR FORCE BY ECONOMIC ACTIVITY AND REGION, 1966**
(In thousands of workers)

Type of activity	Region					Total	Percentage of total
	Central	East	West	North	South		
Agriculture, fishing, livestock and Bedouin	83.3	33.8	78.2	55.5	213.9	464.7	46.2
Mining and quarrying	0.3	23.9	0.2	0.3	0.5	25.2	2.5
Manufacturing	7.2	7.3	18.7	1.0	6.8	41.0	4.1
Construction	32.1	11.2	46.5	3.5	10.8	104.1	10.3
Electricity, gas, and water	0.9	1.4	3.4	0.2	2.6	8.5	0.8
Commerce	18.3	10.7	41.4	5.5	19.9	95.8	9.5
Transportation, communication and storage	10.5	7.8	18.4	1.6	5.6	43.9	4.4
Services	60.7	21.9	87.9	18.4	27.0	218.9	21.8
Activities not adequately defined	2.2	0.8	1.0	-	0.5	4.5	0.4
Total	215.5	121.8	295.7	86.0	287.6	1 006.6	100.00

Source: Central Department of Statistics, Demographic Survey 1385/86 AH, 1965/66)

Table I.17 **EMPLOYMENT IN THE OIL SECTOR, 1963-72**
(Number of workers)

Employer	1963 1383	1964 1384	1965 1385	1966 1386	1967 1387	1968 1388	1969 1389	1970 1390	1971 1391	1972 1392
Aramco	12 988	12 880	12 783	12 664	12 073	11 531	10 865	9 782	10 139	10 362
Petromin	65	101	144	424	746	1 285	1 608	1 660	2 049	2 158
Arabian Oil Co.	745	903	928	1 027	1 092	1 165	1 244	1 241	1 326	1 345
Getty Oil Co.	894	988	963	953	945	935	924	920	859	829
Total	14 692	14 872	14 818	15 068	14 856	14 916	14 641	13 603	14 373	14 694

Source: Ministry of Petroleum and Mineral Resources.

Table I.18 CENTRAL GOVERNMENT REVENUE
(In millions of Saudi Riyals)

	Actuals				Budget		Budget
					Estimate	Actual	Estimate
	1390/91 1970/71	1391/92 1971/72	1392/93 1972/73	1393/94 1973/74	1394/95 1974/75		1395/96 1975/76
Oil revenues	6 827	9 795	13 455	39 267	91 216	91 190	86 970
Royalties	1 840	2 208	3 008	10 645	37 561	33 134	21 458
Income tax	4 987	7 587	10 447	28 622	56 655	61 056	65 512
Other revenue	1 127	1 321	1 870	2 438	4 031	5 913	8 877
Income tax	116	150	214	333	216	428	190
Other taxes and fees 1/	402	415	576	602	536	473	379
Customs duties	305	332	446	435	400	376	375
Return on government investments	-	252	440	857	2 800	4 207	7 771
Miscellaneous 2/	304	172	194	211	79	429	162
Total	7 954	11 116	15 325	41 705	98 247	100 103	95 847

Source: Ministry of Finance and National Economy, various budget documents and fiscal accounts.

1/ Including excise taxes on petroleum products, transportation tax, Zakat, fees and licences.

2/ Including sales and rentals of government property.

Table I.19 ACTUAL PROJECT EXPENDITURES UNDER THE FIRST DEVELOPMENT PLAN, 1970-1975[1] (in millions of Saudi Riyals)

Saudi Arabian Fiscal Years	1390/91 1970/71	1391/92 1971/72	1392/93 1972/73	1393/94 1973/74	1394/95 1974/75
Ministry of Communications	500	673	906	1 [illegible]	[illegible]
Ministry of Education and educational institutions	16	41	81	173	527
Ministry of Health	6	6	26	53	153
Ministry of Labour and Social Affairs	6	8	9	23	17
Ministry of Interior, of which: Municipalities	170 (139)	25[illegible] (210)	311 (271)	822 (690)	2 [illegible] (2 437)
Ministry of Agriculture	196	286	272	325	[illegible]83
Ministry of Finance and National Economy	23	75	50	101	209
Ministry of Finance (public projects)	64	140	190	290	962
Ministry of Petroleum	28	58	49	7[illegible]	81
Ministry of Commerce & Industry	6	13	2	4	9
Ministry of Defense	1 106	1 320	2 160	4 073	6 822
Civil Aviation and meteorology	67	100	13[illegible]	256	627
National Guard	5	8	8	127	341
Ministry of Information	16	19	6	33	29
Ministry of Foreign Affairs	2	-	11	15	30
Other	13	18	38	1 868	656
Total	2 30[illegible]	3 02[illegible]	4 253	9 512	16 831

Source: Ministry of Finance and National Economy.

1/ Excludes transfers to Public Investment Fund and includes participation in the equity capital of oil companies amounting to SRls 1.8 billion in 1973/7[illegible].

Table I.20 **SUMMARY OF CENTRAL GOVERNMENT BUDGETARY OPERATIONS, 1970-1976**
(in millions of Saudi Riyals)

	Actuals					Budget Estimate
	1390/91 1970/71	1391/92 1971/72	1392/93 1972/73	1393/94 1973/74	1394/95 1974/75	1395/96 1975/76
Revenues	7 954	11 116	15 325	41 705	100 103	95 847
Oil Revenues	6 827	9 795	13 455	39 267	94 190	86 970
Other	1 127	1 321	1 870	2 438	5 913	8 877
Expenditures	6 293	7 780	9 909	17 995	32 038	109 335
Current 1/	3 359	4 096	4 976	7 976	12 368	31 993
Foreign aid	630	660	680	494	2 839	2 527
Transfer to Saudi Development Fund	-	-	-	-	-	2 031
Project 2/	2 304	3 024	4 253	9 525	16 831	72 779
Surplus or deficit (-)	1 661	3 336	5 416	23 710	68 065	-13 488
Changes in net government deposits (decline -) 3/	1 555	2 359	3 776	22 231	66 455	...
SAMA	1 599	3 341	3 810	22 185	66 233	...
Commercial banks	-44	18	-34	46	222	...

Sources: Ministry of Finance and National Economy, Final Budgetary Accounts, Budget Estimates, 1395/96 and Appendix tables 42-44.

1/ Excluding foreign aid and transfers to Saudi Arabian Development Fund.

2/ Excluding transfers to Public Investment Fund.

3/ The discrepencies between changes in government deposits and the overall surplus are due mainly to the fact that the fiscal accounts are not kept on a strictly cash basis and that government deposits with SAMA include deposits of public entities.

Table I.21 BALANCE OF PAYMENTS

(In millions of Saudi Riyals)

	1960* 1380	1961* 1381	1962* 1382	1963 1383	1964 1384	1965 1385	1966 1386	1967 1387	1968 1388	1969 1389	1970 1390	1971 1391	1972 1392	1973[d] 1393	1974 1394	1975 1395
Current Account																
A. Receipts	4 054	4 423	4 783	5 198	5 229	6 030	7 632	7 880	8 960	9 284	10 271	17 610	23 583	34 952	130 052	115 229
1. Exports F.O.B.[a]	2 631	3 991	4 396	4 761	4 675	5 373	6 930	7 038	8 028	8 303	9 810	16 284	21 795	32 472	123 000	100 800
2. Other oil revenues	121	112	126	162	189	203	202	225	248	243	297	353	420	448	597	2 938
3. Pilgrimage	238	256	198	180	239	256	266	284	324	423	459	485	653	909	1 000	1 709
4. Miscellaneous	63	67	63	95	126	198	234	333	360	315	405	478	655	1 123	4 790	9 701
B. Payments	3 199	3 456	3 973	4 460	4 608	5 589	7 038	7 475	2 592	2 819	10 688	13 605	17 671	27 054	50 997	57 725
1. Imports C.I.F.	1 057	1 174	1 386	1 440	1 773	2 259	2 830	2 912	3 338	4 018	4 010	4 226	5 769	8 506	14 575	26 974
2. Non-monetary gold	n.a.	45	63	50	54	63	72	67	50	58	31	42	40	50	60	70
3. Investment income payments	1 548	1 660	1 815	2 056	1 773	1 985	2 727	2 709	3 118	3 245	4 018	6 446	8 496	12 350	24 760	12 635
4. Government expenditure abroad n.i.e.[b]	67	63	189	243	315	342	365	621	1 215	1 251	1 206	1 232	1 240	2 986	7 465	11 195
5. Travel & personal transportation n.i.e.	90	135	148	176	198	243	302	374	428	468	554	649	793	1 050	1 317	2 169
6. Tapline expenditure abroad	n.a.	85	108	117	99	99	99	103	108	104	72	212	195	180	134	94
7. Other services	436	292	234	378	436	598	643	689	752	675	747	796	1 138	1 932	2 606	3 508
A-B Current account surplus or deficit (-)	+855	+972	+810	+738	+632	+441	+594	+405	-549	-535	-283	+4 005	+5 852	+7 898	+79 055	+57 504
Capital and Reserve asset account																
1. Direct investment (- indicates inflow)	+117	+ 54	+135	-50	-63	-243	-342	-167	-81	-22	-14	-490	-1 487	-220[c]	-2 797	-4 330
2. Other capital including errors and omissions (+outflows)	+616	+315	+180	-514	+117	+175	+496	+59	-108	+14	-199	+819	+1 118	+1 919	+18 064	+3 625

/... "Continued"

Table I.21 "continued"

	1960* 1380	1961* 1381	1962* 1382	1963 1383	1964 1384	1965 1385	1966 1386	1967 1387	1968 1388	1969 1389	1970 1390	1971 1391	1972 1392	1973 d/ 1393	1974 1394	1975 1395
3. SAMA foregin assets (+ increase)	-40	+265	+99	+1 086	+401	+630	+508	+293	-306	-572	+392	+3 573	+5 [illegible]30	+6 044	+63 471	+57 742
4. Commercial bank net foreign assets (+increase)	-27	+112	-40	+149	+27	-121	-68	+220	-54	+15	+104	+103	+741	+125	+371	+167
5. Repayment of debt (official)	+189	+225	+436	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: Saudi Arabia, Saudi Arabian Monetary Agency, Annual Reports, 1382/83 - 1396

Notes: a/ On the basis of posted realized prices

b/ Including aid granted by Saudi Arabia

c/ Net of participation payment to Aramco

d/ Data conversions have been made at Riyal/Dollar parities except for 1973 which required different conversion factors for trade and for capital account transactions. The latter, made at the year end parity of Rls 3.55 per Dollar, resulted in adjustments to foreign assets of the Monetary Agency and commercial banks. Trade data, on the other hand, were converted at Rls 3.70 per Dollar, representing the daily average of the prevailing parity which changed on February 12 from Rls 4.145 to Rls. 3.738 on August 11 to Rls 3.55. The latter rate was used for 1974 and the weighed rate of Rls 3.52 per Dollar in 1975.

* Data conversions have been made at Rls 4.5 per Dollar (Only 1960, 61, 62 were reported by SAMA in U.S.Dollars).

Table I.22 DECOMPOSITION OF IMPORTS BY MAJOR TYPES OF COMMODITIES, 1960-1973
(Values in million Saudi Riyals)

	1960 1380	1961 1381	1962 1382	1963 1383	1964 1384	1965 1385	1966 1386	1967 1387	1968 1388	1969 1389	1970 1390	1971 1391	1972 1392	1973 1393
Food stuffs etc.	344	357	396	432	496	600	693	666	796	926	1 011	1 097	1 202	1 875
Building materials	89	111	152	154	183	248	305	199	303	429	324	463	480	531
Textiles and clothing	115	127	103	131	167	154	148	147	153	172	142	203	344	657
Machinery, electri appliances, and transport equipment	245	267	320	353	452	656	691	709	846	1 084	1 018	1 099	1 606	2 583
Chemical products	71	71	73	68	85	101	118	111	137	259	180	240	244	397
Miscellaneous	189	212	222	220	310	299	330	330	343	507	462	565	732	1 366
Total	1 053	1 148	1 266	1 358	1 693	2 058	2 288	2 212	2 578	3 377	3 197	3 667	4 708	7 359

Source: Kingdom of Saudi Arabia, Saudi Arabian Monetary Agency, Annual Reports, 1963-1976.

Table I.23 DECOMPOSITION OF IMPORTS BY MAJOR TYPES OF COMMODITIES, 1960-1973 (Percent)

	1960 1380	1961 1381	1962 1382	1963 1383	1964 1384	1965 1385	1966 1386	1967 1387	1968 1388	1969 1389	1970 1390	1971 1391	1972 1392	1973 1393
Food stuffs, etc.	32.67	31.10	31.28	31.81	29.30	29.15	30.29	30.11	30.88	27.42	31.62	29.92	25.96	25.50
Building materials	8.45	9.93	12.01	11.34	10.81	12.05	13.33	9.00	11.75	12.70	12.01	12.63	10.20	7.26
Textiles and clothing	10.92	11.06	8.13	9.65	9.86	7.48	6.47	6.65	5.93	5.09	4.44	5.51	7.31	8.93
Machinery, electric appliances and transport equipment	23.27	23.26	25.28	25.99	26.70	31.88	30.33	32.05	32.82	32.10	31.81	29.97	35.01	34.32
Chemical products	6.74	6.18	5.77	5.01	5.02	4.91	5.16	5.02	5.31	7.67	5.63	6.54	5.16	5.40
Miscellaneous	17.95	18.47	17.54	16.20	18.31	14.53	14.42	17.18	13.30	15.01	14.45	15.41	15.55	18.58
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Kingdom of Saudi Arabia, Saudi Arabian Monetary Agency, Annual Reports, 1963-1976.

Table I.24 GROSS FIXED CAPITAL FORMATION, SAUDI ARABIA 1386/87 - 1393/94 (1966/67 - 1973/74)
Constant 1389/90 (1969/70) Prices

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1973-74
A. The Price Deflator								
Building and structures	85.9	90.4	95.1	100.0	105.2	111.5	129.5	162.3
Machinery and transport equipment	94.7	96.5	96.5	100.0	106.3	124.6	146.5	184.1
B. Gross Fixed Capital Formation, Constant Prices 1969/70 (SR million)								
Oil	514.5	420.1	358.4	327.4	543.4	584.0	1 525.1	1 247.3
- Buildings and structures	411.6	334.8	256.9	212.8	383.0	434.7	1 149.1	939.9
- Machinery and transport equipment	102.9	85.3	101.5	114.6	160.4	149.3	376.0	307.4
Non-oil Private	1 007.8	954.5	984.3	1 055.7	1 080.4	1 114.2	1 231.4	1 467.0
- Buildings and structures	572.1	603.9	627.0	657.9	693.0	753.4	799.5	951.4
- Machinery and transport equipment	435.7	350.6	357.3	397.8	382.4	360.8	432.9	515.6
Government	921.2	1 232.2	1 416.3	1 213.9	1 139.8	1 277.5	1 510.4	1 923.8
- Buildings and structures	784.2	1 080.8	1 289.3	1 098.0	1 005.9	1 137.8	1 347.8	1 716.8
- Machinery and transport equipment	137.0	151.4	127.0	115.9	133.9	139.6	162.6	207.0
Total non-oil	1 929.0	2 186.7	2 400.6	2 269.6	2 220.2	2 391.7	2 741.8	3 390.8
Grand total	2 443.5	2 606.8	2 759.0	2 597.0	2 763.6	2 975.7	4 266.9	4 638.1

Sources and notes:

1. Price deflator for buildings and structures is GDP price deflator for construction, from SAMA 1393,95 annual reports.
2. Price deflators for machinery and transport equipment is unit price index of machinery exports from developed market economies (OECD) to LDC's, calculated on a 1970 basis from UN, Yearbook of International Trade Statistics, 1974 vol. 1 table B, p. 62.
3. Gross fixed capital formation in constant prices is obtained by deflating current price estimates of the components of GFCF by appropriate price deflator. Components of GFCF in current market prices were calculated from Central Department of Statistics, National Accounts of Saudi Arabia (1386/87 - 1391/92) table 6, and Saudi Arabia Monetary Agency (SAMA), Annual Report 1395, table 30.

Table I.25 **INVESTMENT IN MACHINERY AND EQUIPMENT AND TOTAL GROSS CAPITAL FORMATION IN SAUDI ARABIA, 1966-1974 AT CURRENT PRICES**
(Values in SR millions, percent)

	1386/87 1966/67	1387/88 1967/68	1388/89 1968/69	1389/90 1969/70	1390/91 1970/71	1391/92 1971/72	1392/93 1972/73	1393/94 1973/74	1394/95* 1974/75
Machinery and equipment	350.1	319.4	295.1	319.5	423.2	477.3	519.8	1 219.5	1 715.0
Total of all capital goods	2 158.3	2 392.3	2 632.0	2 597.0	2 931.7	3 402.9	5 695.8	8 924.3	14 493.3
Machinery and equipment as percent of total GFCF	16.2	13.3	11.2	12.3	14.4	14.0	9.1	13.6	11.8

Source: Ministry of Finance and National Economy, National Accounts of Saudi Arabia 1386-1394/95, CDS, January, 1977.

* Preliminary estimates.

Table I.26 GOVERNMENT EXPENDITURES UNDER THE FIRST DEVELOPMENT PLAN, 1970-1975
(In millions of Saudi Riyals)

Saudi Arabian Fiscal Years	1390/91 1970/71	1391/92 1971/72	1392/93 1972/73	1393/94 1973/74	1394/95 1974/75	Total
Project expenditures						
Planned	3.5	3.3	3.7	4.0	3.8	18.4
Budgeted 1/	2.6	4.7	6.5	13.5	23.4	50.7
Actual 1/	2.3	3.0	4.3	9.5	16.8	35.9
Recurrent expenditures						
Planned	3.5	4.2	4.6	5.1	5.5	22.9
Budgeted 2/	3.5	5.7	6.3	7.9	14.7	38.1
Actual 2/	3.4	4.1	5.0	8.0	12.4	32.9
Total expenditures						
Planned	7.0	7.5	8.3	9.1	9.3	41.3
Budgeted	6.1	10.4	12.8	21.4	38.1	88.8
Actual	5.7	7.1	9.3	17.5	29.2	68.8

Sources: Central Planning Organization, Development Plan, 1390(1970) and Ministry of Finance and National Economy.

1/ Excluding transfers to the Public Investment Fund.

2/ Excluding foreign aid and transfers to the Saudi Fund for Development.

Table I.27 ANNUAL COMPOUND REAL GROWTH RATES OF VALUE ADDED BY SECTOR[1/]

(Percent)

	Planned 1390/91 - 1394/95 1970/71 - 1974/75	Actual 1390/91 - 1393/94 1970/71 - 1973/74
Agriculture	4.6	3.5
Crude Oil Production	9.1	22.5
Other Mining and Quarrying	23.3	20.0
Petroleum Refining	9.1	3.5
Manufacturing	14.0	11.2
Construction	10.4	15.6
Electricity, gas and water	13.2	12.9
Transport and communication	12.9	14.6
Wholesale trade	12.8	12.0
Banking, insurance and real estate	11.0	7.3
Ownership of dwellings	8.6	6.5
Public administration and defense	5.0	6.4
Other services	15.0	6.8
Total GDP	9.8	16.1

Sources: Central Planning Organization, Development Plan, 1390(1970) and SAMA, Annual Report 1395 (1975)

1/ The plan figures are expressed in 1966/67 prices while the actual figures are based on revised national accounts data at constant 1969/70 prices.

Table I.28 PROJECTED GROWTH OF GDP UNDER THE SECOND DEVELOPMENT PLAN AT CONSTANT 1394/95 PRICES (In millions of S.R.)

	Estimated[1/] 1394/95 1974/75	Projected 1399/1400 1979/80	Average Annual Growth Rate
I. Private	145 244	235 579	10.2
Agriculture	1 409	1 714	4.0
Crude Petroleum and natural gas	121 232	195 200	10.0
Other mining & quarrying	175	353	15.0
Petroloum refining	7 495	9 566	5.0
Other manufacturing	902	1 736	14.0
Electricity, gas & water	333	670	15.0
Construction	4 362	8 774	15.0
Wholesale and retail trade	2 580	5 189	15.0
Transport, communications and storage	3 638	7 317	15.0
Ownership of dwellings	1 638	2 190	6.0
Finance, insurance, real estate & other business services	895	1 801	15.0
Community, social & personal services	585	1 069	15.0
II. Government	3 600	6 619	12.9
Public administration	1 291	2 080	10.0
Education	1 027	1 960	13.8
Health	256	516	15.0
Defense	1 026	2 063	15.0
III. Gross domestic product(I+II) of which:	148 844	242 198	10.2
1. Oil sector	128 727	204 766	9.7
2. Non-oil GDP	20 117	37 432	13.3
Private	(16 517)	(30 813)	(13.3)
Government	(3 600)	(6 619)	(12.9)

Source: Ministry of Planning, The Second Five-Year Development Plan, 1395-1400 (1975-80).

1/ These estimates (shown in the Plan Document) differ from those presented in Table 9 and Appendix Table 39 which represent more recent estimates by the Central Department of Statistics.

Chapter II

THE MANUFACTURING SECTOR: MACRO INDICATORS AND TRENDS

Introduction

47. Manufacturing activity in Saudi Arabia is for the most part a recent development. Prior to 1950, the prevailing production pattern catered to the needs of city dwellers, and was characterized by large numbers of independent shopkeepers, metalsmiths, carpenters and peddlers catering to small numbers of regular customers. There was little interest in large-scale manufacturing, and the limited available capital was generally allocated to real estate and/or foreign trade.

48. As late as 1955, almost 17 years after the discovery of oil, Saudi Arabia had fewer than 36 factories. In 1976, the number of licensed establishments exceeded 898. The era between 1955 and 1976 has witnessed rapid industrialization. Not only has the number of industrial establishments increased, but the average size of these establishments has also grown. Several factors have contributed to these developments, most notable of which have been the massive increase in oil prices and the deliberate and persistent government involvement in this process.

49. The economy of Saudi Arabia is markedly different from that of any other major economy. Mining and quarrying industries of which the most important is crude oil, accounted for about 78 per cent of total GDP in 1974/75. Petroleum refining added another 4.2 per cent. This heavy dependence on oil implies serious disadvantages, such as the vulnerability of the economy to changes in foreign demand and lack of linkages among the producing sectors. Diversification of economic activity in the context of Saudi Arabia, implies primarily industrialization of the economy. This aspect appears to be fully recognized by the government and explains much of its planning efforts.

50. The purpose of this section is to present the major macro-economic indicators of the aggregate manufacturing sector which, because of the special characteristics of Saudi Arabia, must be studied in terms of oil-related manufacturing and non-oil manufacturing. However, the aggregate sector will be considered first.

Total manufacturing activity

General indicators

51. Between 1966 and 1976, value added in manufacturing increased from SR 1,068 billion to SR 7,153 billion. The implicit annual rate of growth exceeded 23 per cent. This high rate of growth is reduced to 7.94 per cent per year, however, when manufacturing GDP is expressed in terms of constant 1970 prices. Nevertheless, it should be noted here that the current prices measure is, perhaps, a more accurate index of the growth of the sector, since the largest share of total manufacturing GDP is petroleum refining, the price of which has more than quadrupled between 1973 and 1976.

52. Regardless of whether the real or the nominal rate of growth is taken to represent the index of growth of the manufacturing sector, the Saudi rate is higher than that of most other developing or developed economies. The annual real rate of growth of world manufacturing output for the period 1965-1970 averaged around 6.4 per cent, whereas developed market economies experienced an average rate of 5.3 per cent, and developing market economies around 6.2 per cent. Only the centrally planned economies achieved a higher rate of 8.8 per cent. Africa, excluding South Africa, achieved a low rate of growth of 4.5 per cent; the comparable Saudi rate for the period 1966-1970 is 16.34 per cent in current prices, and 14 per cent in constant 1970 prices.

53. The rapid growth of Saudi manufacturing output is more pronounced in the period 1970-1973. The average annual growth rate for this period exceeded that of all other countries, reaching a high rate of 37 per cent per year in current prices.

Table II.1 AVERAGE ANNUAL GROWTH RATES OF WORLD MANUFACTURING OUTPUT BY DEVELOPING REGION AND ECONOMIC GROUPING 1/

	1965-1970	1970-1973
World	6.4	6.7
Saudi Arabia	16.3 a/	37.0
Developed market economies	5.3	6.3
Centrally planned economies	8.8	7.2
Africa (excluding South Africa)	4.5	4.7
Developing market economies	6.2	8.5

Source: For 1965-1970, Industrial Development Survey, Special Issue for the Second General Conference of UNIDO. For the period 1970-1975, Yearbook of National Income Accounts, 1974.

1/ The manufacturing output is not strictly comparable across regions.
a/ For 1966-1970

54. The remarkable rates of growth, important as they are, reflect ultimately the influence of an initial small value of manufacturing GDP. To illustrate further this point, it is sufficient to consider the rate of growth of GDP, the percentage share of manufacturing value added in total GDP, and per capita manufacturing output. Between 1965-1970, the average annual rate of growth of nominal GDP was around 9.45 per cent; however, between 1970-1975, the rate exceeded 50 per cent. Thus, the rate of growth of manufacturing output exceeded that of GDP between 1965-1970, but fell below it between 1970-1975.

55. On the other hand, the share of manufacturing output in total GDP is rather small, having averaged about 8 per cent between 1965-1970 and having declined to less than 5 per cent in 1975. In comparison with the rest of the world, it represents a very small percentage indeed. As a matter of fact, it was lower than African's 11.5 per cent in 1970, and significantly lower than developing market economies' rate of 17.4 per cent in the same year. The corresponding rate for developed market economies was as high as 31 per cent.

56. The picture is clearer when per capita manufacturing output in U.S. dollars is considered on a comparative basis. Saudi per capita manufacturing output was as low as $ 60 in 1970 compared to $ 640 in developed market economies and $ 790 in centrally planned economies. The corresponding African (excluding South Africa) figure is as low as $ 16. If we were to exclude petroleum refining from total manufacturing, however, the corresponding African (excluding South Africa) figure is as low as $ 16. If we were to exclude petroleum refining from total manufacturing, however, the corresponding Saudi figure would drop to the African low value of $ 16.

57. Although the above indices are not complete or fully comparable, they indicate that the Saudi manufacturing sector, despite its record high growth rate, is still in its early stages of development. Further insights into the nature and structure of this sector are gathered by considering the technical nature of the production relationship of this activity.

The Manufacturing Production Function

58. Empirical studies of the production process in manufacturing have generally been based on estimating the underlying production function relating inputs to output. The two basic inputs used are labour measured in man-years and capital generally measured in value terms. The estimates

of the production function may point out the scale nature of production, i.e. whether increasing, constant or decreasing, the elasticity of substitution among inputs, and factor shares when coupled with some assumptions about the nature of the product and factor markets.

59. A recent study of the Saudi economy presents estimates of the manufacturing production function as follows.[1/]

$$\ln Y_{MN} = \underset{(.08)}{.203 + 1.276 \ln L_{MN}} + \underset{(.022)}{.164 \ln K_{MN}}$$

$$R^2 = .99$$

where

Y_{MN} = manufacturing GDP in million SR

L_{MN} = number of manufacturing workers in 1000

K_{MN} = capital stock in million SR

60. The equation appears to be acceptable statistically: the R^2 is high, the coefficients have the right signs, the (t) statistics of the capital coefficient is significant at the 1 per cent level, but that of labour is just above one.[2/] The scale of production implied by the equation is greater than one, signifying increasing returns to scale, the elasticity of output with respect to labour is suspiciously high, however and that of capital is low.[3/] Bashir gives two reasons for the high elasticity of labour. First, the labour force has a high percentage of foreign skilled workers (more than 50 per cent of the total in some establishments), which fact is supposed to explain the high productivity

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1/ Al-Bashir, Faisal, A Structural Econometric Model of the Saudi Arabian Economy, 1960-1970 (London: John Wiley and Sons, 1977), pp. 49-53.

2/ A not uncommon time series finding given high collinearity between labour and capital in many data series.

3/ This follows from the footnote above

of labour in this sector. Second, the capital stock series employed in the estimation of the relationship is based on book value of capital rather than on capital used, and since the former is larger than the latter, the capital coefficient is underestimated. Furthermore, the apparent overwhelming effect of L_{MN} on K_{MN} whenever the two factors of production are included in the same equation may be explained by multi-collinearity; thus it is possible to claim that both coefficient estimates are biased; elasticity with respect to labour upward and that with respect to capital, downward.

61. Another feature of the estimated relationship is the high elasticity of substitution between labour and capital. This implies that capital deepening can ease the labour shortage of the economy and, the labour's share in GDP will rise with increases in the wage rate.

62. The evidence presented on the production function is rather mixed and inconclusive. Cross section estimates are different from the time series estimates. Restricted estimation results in insignificant coefficients, whereas indirect estimation of the elasticity of substitution using the wage bill results in an estimate that supports the Cobb-Douglas specification.

Some Further Technical Indices of the Manufacturing Sector

63. The inconclusive results concerning the nature of the production relationship in the Saudi manufacturing sector may be remedied by considering some alternative indices of production such as the capital-output ratio, the incremental capital-output ratio, output per worker, and capital per worker.

64. The capital stock in manufacturing was calculated according to the following identity:

$$K_{MNt} = K_{MNo} + \sum_{i=1}^{t} (1 - \gamma)^{t-i} I_{MNi}$$

where

K_{MNo} = initial capital stock in manufacturing

K_{MNt} = capital stock in manufacturing at time t

γ = depreciation rate

I_{MN} = gross investment in manufacturing

65. There is no capital stock series for the economy and there is not even a complete investment series. The capital stock in manufacturing was assumed to be zero in 1958. There was no choice since there were no investment data before 1959.[1/] The depreciation rate used by Al-Bashir for manufacturing was 10 per cent per year, which is consistent with government tax policy.

66. A number of tentative conclusions can be made on the basis of the information in Table II.3. First, the capital-output ratio is strikingly low. The low value of the capital-output ratio is indicative of either low capitalization and/or high average capital productivity. Low capital values may be either due to a low estimate of the capital stock in manufacturing or to the fact that non-oil manufacturing is primarily of the small scale variety requiring little capital. The high productivity explanation could be attributed to the highly productive petroleum industry which constitutes the major part of the manufacturing activity in the country. Secondly, the capital-labour ratio has nearly tripled between 1966 and 1973, whereas the capital-output ratio and ICOR have fluctuated. This is indicative of capital bias and also of technical problems in translating capital deepening consistently into higher output. In other words productivity of capital has not increased in a consistent manner.

1/ Al Bashir, Ibid p. 21

Table II.2 GENERAL CHARACTERISTICS OF THE SAUDI ARABIAN MANUFACTURING SECTOR, 1966-67 - 1975-76

	1386-87 1966-67	1387-88 1967-68	1388-89 1968-69	1389-90 1969-70	1390-91 1970-71	1391-92 1971-72	1392-93 1972-73	1393-94 1973-74	1394-95 1974-75	1395-96 1975-76
Manufacturing (million SR)	1 068.7	1 245.7	1 370.0	1 672.1	1 957.8	1 984.6	2 427.9	5 076.4	6 697.0	7 153.5
a) Petroleum refining	759.8	901.6	984.7	1 240.9	1 474.2	1 441.6	1 810.8	4 346.5	5 765.8	5 962.4
b) Other	308.9	344.1	385.3	431.2	483.6	543.0	617.1	729.9	931.2	1 191.1
Manufacturing (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
a) Petroleum refining	71.10	72.38	71.88	74.21	75.30	72.64	74.58	85.62	86.10	83.35
b) Other	28.90	27.62	28.12	25.79	24.70	27.36	25.42	14.38	13.90	16.65
Exchange rate (Rial/Dollar)	4.5000	4.5000	4.5000	4.5000	4.4868	4.1448	3.7014	3.5500	3.5176	3.5300
Manufacturing (Million U.S. Dollars)	237.49	276.82	304.44	371.58	436.35	478.82	655.94	1 429.97	1 903.85	2 026.49
a) Petroleum refining	168.85	200.35	218.82	275.76	328.56	347.81	489.22	1 224.37	1 639.13	1 689.07
b) Other	68.64	76.47	85.62	95.82	107.79	131.01	166.72	205.60	264.72	337.42
GDP (million SR)	13 142.5	14 656.6	15 975.3	17 398.6	22 921.2	28 257.3	40 551.1	99 315.0	134 210.3	155 053.0
GDP (million dollars)	2 920.5	3 257.0	3 550.1	3 866.4	5 108.6	6 817.5	10 955.6	27 976.1	38 153.9	43 924.4
Population (Millions)	5.722	5.893	6.069	6.245	6.429	6.618	6.813	7.013	7.219	7.432
Per capita manufacturing (US$)	41.50	46.98	50.16	59.50	67.87	72.35	96.28	203.90	263.73	272.67
a) Petroleum refining	29.51	34.00	36.05	44.16	51.10	52.55	71.81	174.58	227.06	227.27
b) Other	11.99	12.98	14.11	15.34	16.77	19.80	24.47	29.32	36.67	45.40
Per Capita GDP (US dollars)	510.40	552.69	584.96	619.12	794.62	1 030.14	1 608.04	3 989.18	5 285.21	5 910.17
Manufacturing (% of GDP)	8.13	8.50	8.57	9.61	8.54	7.02	5.99	5.11	4.99	4.61
a) Petroleum refining	5.78	6.15	6.16	7.13	6.43	5.10	4.47	4.38	4.30	3.84
b) Other	2.35	2.35	2.41	2.48	2.11	1.92	1.52	0.73	0.69	0.77
Non-oil manufacturing (% of non-oil GDP)	4.94	5.01	4.99	5.36	5.45	5.49	4.95	4.39	3.92	3.01

Source: Based on information presented in Chapter I.

Table II.3 MANUFACTURING TECHNICAL COEFFICIENTS IN SAUDI ARABIA, 1966-1973

	1966	1967	1968	1969	1970	1971	1972	1973
Capital Stock (million SR)	447.2	509.5	561.4	630.5	773.2	930.4	1 127.7	1 414.4
Manufacturing Value added (million SR)	068.7	1 245.7	1 370.0	1 672.1	1 957.8	1 984.6	2 427.9	5 076.4
Incremental Capital Output ratio	n.a.	0.352	0.417	0.229	0.500	5.86	0.445	0.108
Investment-output ratio	n.a.	0.050	0.038	0.041	0.073	0.080	0.081	0.056
Capital-output ratio	0.418	0.409	0.409	0.377	0.395	0.469	0.464	0.279
Capital per worker (SR)	10 835.6	-	-	-	21 418.2	-	-	30 417.2
Manufacturing value added per worker (SR)	25 894.6	-	-	-	54 213.3	-	-	109 169.8
Oil-manufacturing value added per worker (SR)	-	-	-	-	1,053 000.0	-	-	2 069 761.9
Non-oil manufacturing value added per worker (SR)	-	-	-	-	13 936.6	-	-	16 439.1
GDP per worker	13 056.3	-	-	-	20 765.7	-	-	70 576.3

Source: Based on information presented in Chapter I.

Productivity Indices

67. Whereas the capital-labour ratio has tripled between 1966 and 1973, manufacturing value added per worker has grown by 400 per cent. However, the productivity of the manufacturing sector has not kept pace with the general productivity of the economy. In 1966, manufacturing value added per worker was almost double the average productivity of the economy. In 1974/74, it was only a third higher. Nonetheless, it is important to observe that productivity in manufacturing has exceeded the national average in every year for which there are data on employment.

68. Although data on the distribution of employment among sectors are not available for many years, it is evident from the 1973/74 data that manufacturing productivity is primarily the result of a very highly productive petroleum refining sub-sector. Whereas the average national productivity (GDP/worker) was around SR 70,576 in 1973, productivity in petroleum refining per worker was around SR 2,069,761. On the other hand, productivity in the non-oil manufacturing sector was as low as SR 16,439 per worker in the same year.

69. Capital productivity may be calculated by using the inverse of the capital-output ratio. Since the capital-output ratio was seen to be slightly increasing, it follows that capital productivity in the manufacturing sector is decreasing. This is, perhaps, to be expected, given an excess supply of financial capital in the economy and the many technical and logistical bottlenecks that will be discussed in Chapter IV.

Linkages and Dependency

70. The Saudi manufacturing sector is typical of an economy experiencing unbalanced growth. The oil sector is export-oriented. It utilizes the most advanced technology, it has limited technical linkages with the other sectors, it is operated and maintained by foreign workers, and only a small percentage of its output is directed towards local consumption.

71. Consequently, the manufacturing sector of Saudi Arabia exhibits weak and deficient backward and forward linkages among its components, and between it and other sectors of the economy. Although it is difficult to quantify the extent of linkage deficiency without an input-output table and Rasmussen's analysis,it is possible to use the structure of trade as an indicator of the pattern of domestic production.[1/]

72. The Saudi economy is more heavily dependent on exports and imports than most other economies of the world. The import structure is such that the percentage of imports to domestic production is high for many products. It is extremely high, however, for machinery, equipment and food items. This dependency on imports to satisfy local demand indicates clearly the limited capacity of the domestic manufacturing sector to satisfy local demand, and exposes several gaps in the structure of production.

73. In quantitative terms, the foreign trade percentage, i.e. the sum of exports and imports divided by gross domestic product, has risen from a high percentage of 85 per cent in 1966/67 to more than one hundred per cent in 1974/75.

[1/] Norrghard P. Rasmussen, Studies in inter-sectoral relations (Amsterdam, North-Holland Publishing Co., 1962), p. 133.

74. The percentages of imports to GDP for some selected sectors in 1973/74 were as follows:[1/]

Agriculture, forestry and fishing	60 per cent
Non-oil manufacturing	515 per cent
Transport, storage and communication	25 per cent

75. The excessively high multiple of imports to local production for non-oil manufacturing is sufficient to support the remarks made above.

Refined Petroleum Products

76. This sector is primarily export-oriented and its output, given limited domestic consumption, reflects export demand conditions. Presently, less than 8 per cent of Saudi Arabia's crude oil output is refined domestically and refined oil output has not changed much since 1970. As a matter of fact, output declined in 1975. Significant increases did occur between 1962 and 1970 as is shown in Table II.4. Most of the refined products are produced in Aramco's 584,000 b/d refinery at Ras Tanura. Getty Oil Co. and the Arabian Oil Co. also operate export-oriented refineries with a combined capacity of 80,000 b/d. The bulk of domestic consumption of refined petroleum is met by two refineries at Jeddah and Riyadh (operated by the state oil company PETROMIN) with a combined capacity of 60,000 b/d.

77. Domestic consumption has increased rather sharply in recent years, reflecting a rising level of economic activity. The rate of growth has increased from 10.8 per cent in 1970/71 to 28.6 per cent in 1974/75. However, domestic consumption of refined product does not account for more than one per cent of total production.

[1/] Kingdom of Saudi Arabia, CDS, National accounts of Saudi Arabia, 1386/87 - 1394/95, table 8(2).

Table II.4 REFINED PETROLEUM PRODUCTS BY COMPANY, 1962 THROUGH 1975

(Thousand US Barrels)

Year	Jeddah Oil Refinery	Arabian Oil Company	Getty Oil Company	Arabian American Oil Company	Total
1962	-	-	11 657	82 762	94 419
1963	-	-	9 418	90 587	100 005
1964	-	-	9 424	97 766	107 190
1965	-	-	10 384	109 722	120 106
1966	-	423	9 766	112 870	123 059
1967	-	3 598	8 770	121 253	133 621
1968	999	6 306	8 404	147 420	163 129
1969	2 561	5 834	8 278	155 808	172 481
1970	1 801	7 166	8 899	207 464	225 330
1971	1 826	8 267	10 679	198 295	219 067
1972	2 247	8 989	11 911	199 415	222 562
1973	2 161	6 704	8 928	217 379	235 172
1974	1 108	6 405	11 787	217 279	236 579
1975	-	6 989	13 363	-	207 638

Source: Annual Reports of Oil Companies and Ministry of Petroleum and Mineral Resources.

Table II.5 OUTPUT OF REFINED PETROLEUM PRODUCTS IN SAUDI ARABIA, 1970-75.
(In millions of barrels)

	1970	1971	1972	1973	1974	January-September 1/ 1974	1975
Gasoline and Naphta	37.6	34.4	38.2	48.1	47.3	36.3	30.8
Diesel Oil	21.6	22.9	23.6	27.2	27.8	21.5	18.0
Fuel Oil	126.8	124.4	122.6	114.0	106.3	83.6	64.9
Jet fuel	13.8	13.2	16.3	13.2	7.8	7.2	2.9
Kerosene	6.9	5.3	5.0	5.5	7.4	4.9	6.1
Other	18.6	19.0	16.9	27.2	39.9	28.5	31.2
Total	225.3	219.2	222.6	235.2	236.5	182.0	153.9

Source: Ministry of Petroleum and Mineral Resources.

1/ Provisional

Table II.6 DOMESTIC CONSUMPTION OF REFINED PRODUCTS IN SAUDI ARABIA, 1970-1975
(In millions of barrels)

	1970	1971	1972	1973	1974	January-July 1974	1975
Motor gasoline	4.2	4.4	5.1	5.9	7.3	3.9	5.2
Aviation fuels	1.4	1.6	2.1	2.5	3.6	1.8	2.1
Kerosene	1.0	1.0	1.1	1.2	1.2	0.7 1/	0.7
Industrial fuels 2/	7.4	8.4	10.0	12.8	16.9	9.1	12.4
Other 3/	1.5	1.7	1.8	2.5	3.1	1.6 1/	2.3
Total	15.5	17.1	20.1	24.9	32.1	17.1	22.7
Percentage change from previous period		10.8	16.6	24.3	28.6		33.1

Source: Ministry of Petroleum and Mineral Resources.

1/ Estimated.
2/ Includes diesel oil, fuel oil and natural gas.
3/ Includes asphalt, LPG, solvents and lubricants.

78. The largest share of refined petroleum products is that of fuel oil, followed by gasoline and naphta. Interestingly enough, the largest share of domestic consumption of refined products is that of industrial fuels.

79. Although exports of refined products remained unchanged between 1970 and 1974, their share in total oil exports has declined from 15 per cent in 1970 to less than 7 per cent in 1975.

80. Value added in petroleum refining has risen sharply between 1966-67 and 1975/76 because of the dramatic rise in the price of oil. In value terms it increased from SR 759 million in 1966/67 to SR 5,962 million in 1975/76. Its percentage share of total manufacturing value added has consequently increased from 71 per cent in 1966/67 to 86 per cent in 1974/75. As was mentioned earlier, labour requirements in this sector are rather small and, given the high value added generated by this sector, labour productivity is exceptionally high (SR 2,069,761.9 in 1973/74).

81. Given the importance of non-oil manufacturing in the future development of the economy, a special chapter is devoted to it.

Conclusion

82. Manufacturing activity in Saudi Arabia is still in its infancy. It is, however, undergoing rapid development and transformation that is bound to change the industrial structure of the economy.

83. Oil refining not only dominates other manufacturing activity, its dominance has increased because of the recent sharp rise in oil prices.

84. The Saudi manufacturing sector exhibits many of the characteristics of single product developing economies. The sector is dualistic. Oil

employs the most efficient technology and is export oriented. It has little or no links with the rest of the economy; it is capital intensive and has high labour productivity. The rest of the manufacturing sector has low productivity, little capital and limited export potential.

Chapter III

THE STRUCTURE OF NON-OIL MANUFACTURING

General Characteristics

85. Non-oil manufacturing activity is defined to comprise all economic activities classified in the international standard industrial classification (ISIC) under the indices 200 through 399. Oil-based industries have already been discussed in Chapter II.

86. Saudi manufacturing statistics are scanty and are collected at different points of time under survey conditions that do not provide either appropriate coverage or sufficient continuity to be adequate for analytical purposes. There are, however, some common grounds among the various surveys that might be exploited in order to arrive at some tentative observations and remarks about the structure of production and its performance efficiency.

87. Five periods have been selected. For two of these (1968 and 1972) the data on non-oil manufacturing is rather complete and basically comparable. Table III.1 defines the nature of coverage for each year.

88. Although the contribution of aggregate non-oil manufacturing to nominal GDP has increased between 1960 and 1976, its rate of increase has been generally lower than that of GDP or that of petroleum refining. As a consequence, the share of non-oil manufacturing in GDP has declined

from a low percentage of 2.4 per cent in 1966/67 to as low as 0.8 per cent in 1975/76. Moreover, non-oil manufacturing's share in total manufacturing dropped from 28.9 per cent in 1966/67 to as low as 13.9 per cent in 1974/75. Of course, the high growth of the oil sector is responsible for these developments and does indeed mask some of the improved potential of non-oil manufacturing. Yet, it is still possible to conclude that non-oil manufacturing in Saudi Arabia is still at an early stage of development and still exhibits most of the characteristics of a non-industrial economy.

89. It has already been pointed out that non-oil manufacturing GDP in U.S. dollars per person in 1970 places Saudi Arabia in the same position as Africa excluding South Africa.

90. Generally, the non-oil manufacturing activity accounts for a significant portion of total employment in industrial or even semi-industrial economies. In Saudi Arabia, non-oil manufacturing accounted for as little as 3.1 per cent of total employment in 1970 and its share had declined to 2.9 per cent in 1975.

91. Thus, as a source of domestic value added and as a generator of employment, Saudi non-oil manufacturing has been of limited consequence. On the other hand, performance indices of the various industrial sub-sectors sometimes reveal a different picture. For instance, light manufacturing defined here to include (ISIC 31, 32, 33 and 39) show a share of almost 45 per cent of total manufacturing output. This is indeed lower than comparable shares in other developing economies at similar stages of industrial maturity; a fact which may lead to incorrect conclusions about the extent of development of the Saudi industrial sector. In fact the Saudi industrial structure is still in its early stages of

development and the factors that explain the nature of its industrial composition are specific to the Saudi economy and more reflective of its special circumstances rather than of its stage of development. Some of these factors include the oil-related industries that are usually classified as medium-type manufacturing and the substantial growth in the cement industry in response to the construction boom stimulated by the massive influx of foreign workers.

92. The industrial potential of the Kingdom, however, far exceeds its current realized capability. Massive government investment in petrochemical industries and infra-structural services are bound to have a catalytic impact on the emergence of manufacturing activity of various types and forms.

93 . In what follows a detailed account of the nature, potential and performance of the various non-oil manufacturing subsectors is undertaken. The analysis is restricted to nine sectors on account of the paucity of Saudi industrial data.[1/]

The Food, Beverage and Tobacco Industries

94 . This sector has a characteristic dual structure possessing a multitude of small establishments and a number of large establishments. The various censuses and surveys of manufacturing indicate that this sector has preserved its share of establishments almost independently of the size definitions. In 1966, it accounted for 28 per cent of the total number and in 1972 it accounted for 27 per cent. Even when only "large" establishments are counted as in 1974/75, its share was 16.5 per cent.

1/ Tables III.2 - III.16 present information on industrial performance and characteristics. They are placed at the end of the chapter.

95 . The output share is also stable at around 27 per cent of the total non-oil manufacturing gross output and it explains close to 30 per cent of total employment. Its percentage share of capital falls below its output and employment shares. In 1966 it amounted to 16 per cent, whereas in the full coverage years 1968 and 1972 it averaged 18.5 per cent and 13 per cent, respectively.

96 . The performance of this sector is mixed. Output per worker roughly equalled the national average in 1972, and was slightly above it in 1968. When only "large" establishments are considered, labour productivity in this sector is below that of most other industries. This mixed performance is evident in a number of indices. First, the capital-labour ratio in this sector is low. In 1968, it was about SR 6.4 thousand, whereas the non-oil manufacturing average was around SR 7.5 thousand. In 1966, 1970 and 1974, when account is taken of relatively "large" establishments, the capital-labour ratio is below that of most other industries. In 1974/75 its capital per worker was the lowest among all sectors.

97. The average size of establishment also contributes to the explanation of low labour productivity. Although the capital per establishment is not as low as that of capital per worker on a comparative basis, it is still slightly above the national average. Given that the overall average is itself rather low in comparison with the average size of establishments in industrial countries, it is possible to conclude that size of the establishments in the food, beverages and tobacco sector is still conducive to increasing returns to scale.

98 . It is worth noting, however, that whereas output per worker in this sector is rather low, output per establishment is comparatively higher than the national average. This points to the possibility of increased

efficiency and productivity through increased capitalization and rationalization of the scale of production.

Textiles, Wearing Apparel and Leather Products

99. This sector accounts for a large share of establishments employing fewer than five workers. Only few establishments in this sector appear to employ large number of workers. This observation is deduced from the fact that, in the full coverage years 1968 and 1972, this sector accounted for a large percentage of total establishments (38 per cent in 1972). If one considers only establishments employing five or more workers, the share of this sector drops to as low as 3.6 per cent, as in 1968. In 1974, when establishments employing ten or more workers are considered, the share drops further to 3.4 per cent.

100. The share of this sector in total output reached a high of 8 per cent in 1972. Also it accounted for almost 17 per cent of the total employment in non-oil manufacturing in the same period.

101. The indices of performance vary as small establishments are included or excluded. When small establishments are included, output per worker, capital per worker, output per establishment and capital per establishment are rather low and drop below the Saudi non-oil manufacturing averages.

102. However, the situation changes when only"large" establishments are counted. Output per worker, capital per worker and all other indices per establishment are significantly higher for this sector than under full coverage conditions.

103. Given the dependence of textiles on synthetic fibres, it is possible to conceive of some significant developments in this sector in the near future in Saudi Arabia, whose comparative advantage in oil-dependent products cannot be exaggerated.

Wood and Wood Products Including Furniture

104. This is another sector in the light manufacturing category. It accounts for between 12 and 16 per cent of total establishments. This percentage drops to 6 per cent when only establishments employing 10 or more workers are included. Its percentage share of output is much lower than its percentage share in total establishments. Its employment share exceeds its output share however, indicating some productivity problems. Indeed, output per worker is below the national average for "small" and "large" establishments. In 1970 output per worker in this sector was the lowest among all other manufacturing sectors in the Kingdom.

105. Capital per worker is very low and so is capital per establishment. Output per establishment is also low, again indicating some size problems. The ratio of imported raw materials to total raw materials is extremely high in this sector. Typically employment is lower than three workers per establishment for small units, and is below twenty workers per "large" establishments.

106. Comparing the three sub-sectors discussed above, only textiles appear to have some growth potential. The efficiency of the food industry may be increased through size rationalization. Wood products are very dependent on imports, and these are of limited consequence to the economy as a whole in terms of value added and employment.

Paper and Paper Products; Printing and Publishing

107. This sector is generally comprised of "medium" and "large" establishments. In full coverage years, the percentage share of the sector is less than

one per cent. If five or more workers defines the cut-off point, the percentage is between 11.76 per cent and 13.57 per cent. However, if coverage is restricted to establishments employing 10 or more workers, the percentage share rises to 15.03 per cent.

108. The percentage shares of this sector in output and employment exceed its percentage share of establishments in most years, a feature which indicates high establishment productivity and larger size than average. Furthermore, output per worker in 1968 exceeded that of almost all other industries except chemicals. In 1972, output per worker exceeded the national average.

109. Given the above information, it might be expected that capital per worker would be relatively high in this sector. In fact, this is not the case, although capital per establishment appears to be high. This could indicate the presence of some redundant workers. The fact that worker productivity is comparatively lower than establishment productivity implies that the overall performance of this sector might be improved by adjusting the capital-labour ratio upward. This fact is all the more clear when the percentage share of capital in this sector is considered. In 1966 and again in 1974, the ratio of the share of capital to the share of establishments is less than half. In 1968 and 1972 this ratio is between 12.5 and 6.6 respectively. This signifies that small establishments have a more adequate capital structure than large ones. Capital per unit data further substantiate the above remark.

Chemicals and Chemical, Coal, Rubber and Plastic Products

110. If Saudi Arabia has any comparative advantages to be exploited and developed, they should lie in this sector. Output per worker and output per establishment are the highest here and are compatible with industrial economy norms. The industry is comprised of highly capital-intensive units which produce a large volume of output and pay the highest salaries per worker.

111. To appreciate the magnitude of quantitative differences between this sector and the remaining non-oil manufacturing sectors, it is sufficient to observe that its percentage share of establishments in 1968 and 1972 did not exceed one half of one percent, while, at the same time, it accounted for 6.24 per cent and 15.41 per cent of output, 2.02 per cent and 5.67 per cent of employment, and,more importantly, 4.28 per cent and 14.43 per cent of capital.

112. Indeed when account is taken of establishments employing ten or more workers, this sector's share of total establishments rises to 8.27 per cent, its output to 34.23 per cent and its capital share to 32.16 per cent.

113. It is interesting to note here that the large establishments in this industry group are basically public sector institutions. The private sector share in this activity is primarily restricted to small establishment producing primarily consumer-type goods.

114. A wide range of chemical product industries could be developed in the Kingdom. At present several complexes are planned in Yanbu and Jubail, but these will not start production until the 1980's. However industrial gases are currently produced by five companies:

- Industrial Gases Co. in Al Khoubar;
- Abdallah Hachem in Dammam;
- Riyadh Oxygen Plan in Riyadh
- Industrial Gas Co. in Jeddah;
- Abdallah Hachem in Jeddah.

115. All these establishments are presently considering expansion, as they are and have been for some time operating at full capacity. Their output in 1974, included oxygen which amounted to 921 tons. Liquid oxygen

production at Al Khobar and Jeddah amounted to 125,000 litres. These firms also produce nitrogen gas, with a total production in 1974 of about 41 tons. Liquid nitrogen production in the same year totalled 1.4 million litres. Acetylene production reached 400 tons, argon 2.5 tons, and carbon dioxide 225 tons in 1974.

116. The production of fertilizers is limited at present to the output of the Saudi Arabian Fertilizer Co. (SAFCO) ammonia/urea complex at Dammam. Due to recurring technical problems, production has on occasion fallen short of the designed capacity of 163,000 TPAN of ammonia, which quantity is necessary to sustain an output of 152,000 TPAN of urea.

117. Ironically, there is at present no production of pesticides or paints and varnishes. A small plant with a capacity of 223 tons per year, is being built to meet household consumption. A new license has been granted for production of the pesticide requirements of the National Health Services. The estimated annual production capacity includes 1,575 tons of pesticides and 3,240 tons of phelolic desinfectants. Two plants are being constructed to produce paints. They will be in operation by 1980. The first is scheduled to have an annual capacity of 1,500 tons, whereas the second will have an annual capacity of 3,000 tons. There exists only one plant in Saudi Arabia for the production of pharmaceuticals. The plant started production late in 1976. It is a joint venture of the Saudi Government and a Swiss firm. The Hilal Establishment is also licensed to build a pharmaceutical plant in Al Khobar. Rubber products are not yet produced in the Kingdom, although the Second Development Plan includes a project for tyre manufacturing with an annual capacity of 3 million tyres.

118. At present, production of plastic products in Saudi Arabia is limited to plastic bags, pipes, hoses, household articles and kitchen wares, containers, plastic foam, insulating materials, plastic shoes, polyester reinforced glass, and so on. Twenty eight Saudi firms were active in plastic product manufacturing in 1975. Table III.18 summarizes the basic features of this activity.

119. Detergent production in the Kingdom is limited to one plant in Jeddah, which produces well-known brand name. The yearly production capacity on a one shift basis is nearly 3,000 tons of finished products. The actual production is still short of supplying local demand. A new oil and soap plant has been licenced. It will have a production capacity of 200,000 tons.

120. It is clear from such an over-view of the chemical-related products sector in Saudi Arabia, that the capacity of the economy to produce a wide range of chemical products is still in its infancy, and falls short in most instances of satisfying local demand. There are substantial comparative advantages associated with the broadening of this industry in Saudi Arabia, the most important of which is the availability of abundant oil at relatively cheap prices. The high capital requirements of this industry together with large Saudi foreign exchange surpluses are an excellent combination that places the Kingdom in the fortunate position of being able to finance entry into this restricted industry. Perhaps the most difficult problem is the reluctance of major multinationals to admit Saudi Arabia to their club. The Kingdom is aware of this consideration and is operating on the principle of joint ventures which could also solve its chronic skill-shortages.

Non-Metallic Mineral Products

121. This sector comprises mainly "medium" and "large" establishments, each producing a large volume of output and employing the largest complement of workers per establishment. The capital-output ratio is rather high and together with the capital-labour ratio signifies a relatively capital-intensive sector. The share of this sector in total capital in 1974 accounts for 50 per cent of total capital in non-oil manufacturing establishments employing 10 or more workers.

122. Two striking observations regarding productivity in this sector can be made. Output per establishment is relatively high and output per worker, despite the fact that it is above the non-oil manufacturing average, varies from one sample year to another. Given the high capital-labour ratio and the high level of capital per establishment, it is no wonder that output per establishment is high. It is also true that the nature of this industry is such that higher productivity is associated with size. The lack of strict correspondence between output per establishment and output per worker signifies that some gains in labour efficiency could still be realized in this sector.

123. The two most important industries within this sector are cement and gypsum. Table III.19 presents time-series data on the output of cement, and on the share of local cement production in the total supply of cement in Saudi Arabia.

124. Cement production in the Kingdom increased at annual average compound rate of 22.3 per cent. This output is expected to increase up to 12 million tons in the 1980's. Local production satisfies a varying portion of the market. In 1973, it supplied about 78.2 per cent of the domestic market. The construction boom that ensued in 1974, 1975 and 1976 saw the decline of this ratio to 29 per cent in 1976.

125. Gypsum production data for the years 1966 and 1972 show an increase in production from 27.8 thousand tons in 1966 to 47.1 thousand in 1969 and a subsequent decline to 35.9 thousand tons in 1972.[1/]

126. The prospects of this sector are promising in that raw materials are abundant within the Kingdom and because local demand is expected to remain high in the 1980's and beyond.

1/ Data obtained from Petromin.

Basic Metals Industries

127. There is only one large establishment and many small ones in this sector. In 1968, they accounted for 6.53 per cent of total output of non-oil manufacturing. In 1974, the large establishments accounted for more than 1.3 per cent of total value added. Its share, in the same year, of total capital exceeded 3.62 per cent. Alternatively its value added per worker averaged SR 23.8 thousand in 1974, a figure that does not compare very favourably with the remaining sectors in the same year. However, value added on an establishment basis was very high, but this reflects more the establishment size than its productivity. Capital per worker was very high and exceeded that of any other sector. The same is true for employment per establishment.

128. Production of iron bars was far below capacity, and plans for a large complex in Jubail have been scheduled. There are indications of the existence of iron ore deposits in Saudi Arabia, which could be exploited in the future. Presently, cheap ore from India and other sources is envisaged to provide some scope for development of such an industry.

Fabricated metal products, machinery and equipment

129. The heavy industry category in Saudi Arabia is concentrated in non-metallic mineral products with little or no basic and fabricated metals. However, neglect of the latter industries, classified by many development theorists as the backbone of industrialization, may place severe constraints on the nature and pace of Saudi industrial development.

130. At present this sector comprises a large percentage of "large" establishments. In 1974, it shows a share of almost 30 per cent. In 1972, when all establishments were counted, the share dropped to 9.23 per cent. This is characteristic of a sector with few large establishments.

131. The performance indices of the sector reveal acceptable productivity levels, be they of labour or of capital. Surprisingly, however, the capital labour ratio is low in a sector that is generally characterized by capital-intensive techniques and high capital intensity. Output per establishment is somewhat low, perhaps indicating that size of the market of a given establishment may not be adequate.

Conclusions

132. Saudi-Arabia's comparative advantage demonstrates itself in the chemical and chemical product industries. Very high returns to labour and capital are reaped in these industries and the abundant supply of relatively cheap oil places the Saudi chemical industry in a very special and privileged position. Export potential is high, but is dependent on the Kingdom's ability to penetrate markets dominated by multi-national corporations. Other industries appear more limited in growth potential, because they are domestically oriented, inefficient in size, and low in labour productivity.

133. The non-metallic mineral products industry assumes a significant position in terms of its contribution to GDP and to absorption of labour, although more could be expected of it in terms of import substitution.

134. Light industry is expanding at a rapid rate. It appears, however. that the motivation of most of these industries is not so much commercial viability as the reaping of certain subsidies which may be manipulated to cover initial costs plus profits.

135. The Government is undertaking the establishment of a large number of industries on a massive scale. Should these industries prove viable, the industrial outlook of the Kingdom will immeasurably be improved.

Table III.1 NATURE AND SOURCES OF DATA

Year	Coverage	Source
1966	Establishments employing five workers or more, excluding the oil industry	ISDC,[1] survey of industrial establishments of Saudi Arabia 1386/87
1968	Full coverage excluding oil	CDS,[2] sample survey of manufacturing establishments 1389
1970	Five workers or more, excluding oil	ISDC, techno-economic study, 1971
1972	Full coverage excluding oil	CDS, survey of manufacturing establishments, 1973
1974	Ten workers or more, excluding oil in the central, western and eastern regions	ISDC, survey of manufacturing establishments, 1396 (1976)

1/ Industrial Studies and Development Centre, Saudi Arabia
2/ Central Department of Statistics, Saudi Arabia

Table III.2 GENERAL ECONOMIC CHARACTERISTICS OF NON-OIL MANUFACTURING IN SAUDI ARABIA, 1966 (Values in SR million)

ISIC	Industrial Division	No.of establishments	Employment	Capital	Raw material	Gross output
31	Food, beverages and tobacco	39	2 049	26.2	7.2	20.7
32	Textiles, wearing apparel and leather industries	5	130	1.2	0.8	3.1
33	Wood, wood products including furniture	17	439	1.8	2.4	5.0
34	Paper and paper products; printing and publishing	19	631	10.3	4.1	6.8
35	Chemicals and chemical, petroleum, coal, rubber, and plastic products	4	266	33.2	10.7	18.1
36	Non-metallic mineral products	17	1 742	72.0	0.3	17.8
37	Basic metal industries	4	270	17.2	n.a.	0.2
38	Fabricated metal products, machinery and equipment	30	464	3.0	2.3	4.9
39	Other manufacturing industries	5	62	1.5	0.3	0.5
	T o t a l	140	6 053	167.0	28.2	77.9

Source: Kingdom of Saudi Arabia, Industrial Studies and Development Centre, Survey of Industrial Establishments in Saudi Arabia, 1389, Vol.I, II and III.

Table III.3 GENERAL ECONOMIC CHARACTERISTICS OF NON-OIL MANUFACTURING IN SAUDI ARABIA, 1968 (Values in SR million)

ISIC	Industrial Division	No. of establish-ments	Employ-ment	Capital*	Raw material	Output	Value added	Wages
31	Food, beverages, and tobacco	1 600	6 705	43.2	54.8	127.3	54.5	20.7
32	Textiles, wearing apparel and leather industries	1 406	2 653	5.0	12.7	31.3	17.2	4.8
33	Wood and wood products including furniture	1 074	3 938	10.8	17.4	45.2	24.9	12.7
34	Paper and paper products printing and publishing	58	1 038	18.4	8.3	21.7	11.4	7.6
35	Chemicals and chemical petroleum, coal, rubber and plastic products	8	281	10.0	20.6	30.4	8.7	2.3
36	Non-metallic mineral products except petroleum products	675	5 160	87.0	36.6	118.9	57.6	23.6
37	Basic metal industries	415	1 517	26.7	10.3	31.8	14.7	6.9
38	Fabricated metal products machinery and equipment	3 062	5 979	30.8	11.9	71.0	46.9	21.5
39	Other manufacturing industries	865	1 514	1.9	2.9	9.6	5.8	0.8
	T o t a l	9 163	28 785	233.9	175.5	487.3	242.3	101.0

Source: Kingdom of Saudi Arabia, Industrial Studies and Development Centre, Report on Projections for the Manufacturing sector for the First Five Year Plan, 1390-1395.

* Capital is the value of fixed assets.

Table III.4 GENERAL ECONOMIC CHARACTERISTICS OF NON-OIL MANUFACTURING IN SAUDI ARABIA, 1970 (Values in SR million)

ISIC	Industrial Division	No. of establish-ments	Employ-ment	Capital	Raw material	Value of output	Net value added
31	Food, beverages and tobacco	77	3 221	121.8	38.7	82.9	38.6
32	Textiles, wearing apparel, and leather industries	7	227	10.4	2.0	6.5	4.5
33	Wood and products including furniture	29	487	4.1	3.9	7.9	3.8
34	Paper, paper products, printing and publishing	33	1 144	38.2	19.3	40.3	19.4
35	Chemicals, chemical, petro-leum, coal, rubber, and plastic products	16	2 617	999.1	1 039.5	2 134.9	1 058.1
36	Non-metallic mineral products	66	2 979	231.5	27.1	110.5	64.6
37,38	Basic metal industries, fabricated metal products machinery and equipment	63	160	65.4	20.5	33.6	12.0
39	Other manufacturing industries	2	29	0.4	21.6	22.4	0.7
	T o t a l	293	10 864	1 470.9	1 172.6	2 439.0	1 201.9

Source: Kingdom of Saudi Arabia, Industrial Studies and Development Centre, Techno-Economic Survey, 1971.

Table III.5 GENERAL ECONOMIC CHARACTERISTICS OF NON-OIL MANUFACTURING IN SAUDI ARABIA, 1972 (Values in SR million)

ISIC	Industrial Division	No. of establish-ments	Employ-ment	Capital	Gross output	Net value added
31	Food, beverages, and tobacco	2 526	10 601	91.0	320.3	119.1
32	Textile, wearing apparel and leather industries	3 563	5 959	14.3	88.6	41.6
33	Wood and wood products, including furniture	1 474	4 429	18.8	76.2	35.7
34	Paper and paper products, printing and publishing	67	1 594	34.0	59.3	26.9
35	Chemicals and chemical, petroleum, coal, rubber and plastic products	38	2 042	103.3	170.8	47.8
36	Non-metallic mineral products	793	6 065	364.7	253.0	155.5
37	Basic metal industries	33	1 022	62.9	35.8	19.2
38	Fabricated metal products, machinery and equipment	864	4 260	26.5	99.5	51.9
39	Other manufacturing industries	2	40	0.5	5.1	1.0
	T o t a l	9 360	36 012	716.0	1 108.6	498.7

Source: Central Department of Statistics, Survey of Manufacturing Establishments, 1973

Table III.6 GENERAL ECONOMIC CHARACTERISTICS OF NON-OIL MANUFACTURING IN SAUDI ARABIA 1974/1975 (values in SR millions)

ISIC	Industrial Division	No. of establishments	Employ-ment	Capital	Net value added
31	Food, beverages and tobacco	49	2 998	100.8	52.9
32	Textiles, wearing apparel, leather ind.	9	443	17.9	5.4
33	Wood and wood products, including furniture	16	325	10.7	10.4
34	Paper and paper products, printing and publishing	40	1 697	80.3	42.1
35	Chemicals and chemical, petroleum, coal, rubber, and plastic products	22	1 799	479.0	189.2
36	Non-metallic mineral products except petroleum products	44	4 577	607.9	150.3
37	Basic metal industries	1	301	54.0	7.2
38	Fabricated metal products, machinery and equipment	79	2 770	109.3	72.5
39	Other manufacturing industries	6	323	29.1	22.6
	T o t a l	266	15 233	1 409.0	552.6

Source: Kingdom of Saudi Arabia, the Industrial Studies and Development Centre, A Guide to Industrial Investment in Saudi Arabia, 5th edition.

Table III.7 SAUDI ARABIA. PERCENTAGE SHARE OF NUMBER OF ESTABLISHMENTS

ISIC	Industrial Division	1966	1968	1970	1972	1974
31	Food, beverages, and tobacco	27.86	17.46	26.28	26.99	16.42
32	Textiles, wearing apparel and leather industries	3.57	15.34	2.39	30.07	3.38
33	Wood and wood products including furniture	12.14	11.72	9.90	15.75	6.01
34	Paper and paper products, printing and publishing	13.57	0.63	11.26	0.72	15.03
35	Chemicals and chemical, petroleum coal, rubber, and plastic products	2.86	0.09	5.46	0.41	8.27
36	Non-metallic mineral products	12.14	7.37	22.53	8.47	16.54
37	Basic metal industries	2.86	4.53		0.35	0.37
38	Fabricated metal products, machinery and equipment	21.43	33.42	21.50	9.23	29.69
39	Other manufacturing industries	3.57	9.44	0.68	0.02	2.25
	Total	100.00	100.00	100.00	100.00	100.00

Source: Based on information presented in Tables III.2 - III.6

Table III.8 SAUDI ARABIA. PERCENTAGE SHARE OF GROSS OUTPUT BY SECTOR

ISIC	Industrial Division	1966	1968	1970	1972
31	Food, beverages, and tobacco	26.85	26.12	3.40	28.89
32	Textiles, wearing apparel and leather industries	4.02	6.42	0.27	7.99
33	Wood and wood products including furniture	6.49	9.28	0.32	6.87
34	Paper and paper products, printing and publishing	8.82	4.45	1.65	5.35
35	Chemicals and chemical, petroleum, coal, rubber, and plastic products	23.48	6.24	87.53	15.41
36	Non-metallic mineral products	23.09	24.40	4.53	22.82
37	Basic metal industries	0.26	6.53		3.23
38	Fabricated metal products, machinery and equipment	6.36	14.57	1.38	8.98
39	Other manufacturing industries	0.65	1.97	0.92	0.46
	T o t a l	100.00	100.00	100.00	100.00

Source: Based on information presented in Tables III.2 and III.5

Table III.9 SAUDI ARABIA. PERCENTAGE SHARE OF EMPLOYMENT BY SECTOR

ISIC	Industrial Division	1966	1968	1970	1972	1974
31	Food, beverages, and tobacco	33.85	43.29	39.65	29.44	19.68
32	Textiles, wearing apparel and leather industries	2.15	9.22	2.09	16.55	2.90
33	Wood and wood products, including furniture	7.25	13.68	4.48	12.30	2.13
34	Paper and paper products, printing and publishing	10.42	3.61	10.53	4.43	11.13
35	Chemicals and chemical, petroleum, coal, rubber and plastic products	4.39	2.09	24.09	5.67	11.89
36	Non-metallic mineral products	28.78	17.93	27.42	16.84	30.84
37	Basic metal industries	4.46	5.27		2.84	1.97
38	Fabricated metal products, machinery and equipment	7.67	20.77	1.47	11.83	18.13
39	Other manufacturing industries	1.02	5.26	0.27	0.11	2.12
	Total	100.00	100.00	100.00	100.00	100.00

Source: Based on information presented in Tables III.2 - III.6

Table III.10 SAUDI ARABIA. PERCENTAGE SHARE OF CAPITAL BY SECTOR

ISIC	Industrial Division	1966	1968	1970	1972	1974
31	Food, beverages, and tobacco	15.69	18.47	8.23	12.71	6.76
32	Textiles, wearing apparel and leather industries	0.72	2.14	0.71	2.00	1.20
33	Wood and wood products including furniture	1.08	4.62	0.28	2.65	0.71
34	Paper and paper products, printing and publishing	6.17	7.87	2.60	4.75	5.39
35	Chemicals and chemical, petroleum, coal, rubber and plastic products	19.80	4.28	67.92	14.43	32.16
36	Non-metallic mineral products	43.11	37.20	15.74	50.94	40.82
37	Basic metal industries	10.30	11.42		8.78	3.62
38	Fabricated metal products, machinery and equipment	1.80	13.17	4.45	3.70	7.34
39	Other manufacturing industries	0.90	0.81	0.03	0.07	1.95
	T o t a l	100.00	100.00	100.00	100.00	100.00

Source: Based on information presented in Tables III.2 - III.6

Table III.11 SAUDI ARABIA. PERCENTAGE SHARE OF VALUE ADDED BY SECTOR

ISIC	Industrial Division	1968	1970	1972	1974
31	Food, beverages, and tobacco	22.65	3.81	[illegible]	9.57
32	Textiles, wearing apparel and leather industries	7.09	0.37	7.09	0.07
33	Wood and wood products including furniture	10.27	0.31	[illegible]	1.[illegible]
34	Paper and paper products, printing and publishing	4.70	1.61	5.3[illegible]	7.01
35	Chemicals and chemical, petroleum, coal, rubber, and plastic products	3.59	88.0[illegible]	15.40	34.23
36	Non-metallic mineral products	23.77	5.37	22.02	27.10
37	Basic metal industries	6.06	0.09	3.22	1.39
38	Fabricated metal products, machinery and equipment	19.35		8.97	13.11
39	Other manufacturing industries	2.39	0.05	0.45	4.00
	T o t a l	100.00	100.00	100.00	100.00

Source: Based on information presented in Table III.3 - III.6

Table III.12 PERFORMANCE INDICES OF NON-OIL MANUFACTURING IN SAUDI ARABIA, 1966
(Values in SR thousand)

ISIC	Industrial Division	Output per person	Capital per person	Output per unit	Capital per unit	Employment per unit
31	Food, beverages and tobacco	14.6	12.0	820.5	749.8	56
32	Textiles, wearing apparel and leather products	24.7	9.2	621.8	239.6	26
33	Wood and wood products including furniture	21.6	4.0	507.5	107.2	26
34	Paper and paper products, printing and publishing	14.2	16.[illegible]	61[illegible].0	54[illegible].[illegible]	33
35	Chemicals and chemical, petroleum, coal, rubber and plastic products	157.3	124.7	9 0[illegible].0	8 2[illegible].5	66
36	Non-metallic mineral products	17.7	[illegible]1.3	2 5[illegible].5	5 53[illegible].3	134
37	Basic metal industries	6.4	63.0	180.0	5 743.0	90
38	Fabricated metal products, machinery and equipment	16.[illegible]	6.[illegible]	30[illegible].3	102.1	16
39	Other manufacturing industries	13.3	2[illegible].6	177.3	30[illegible].0	12
	Averages	12.9	27.8	556.4	1 192.9	43

Source: Based on information presented in Table III.[illegible]

Table III.13 PERFORMANCE INDICES OF NON-OIL MANUFACTURING IN SAUDI ARABIA, 1968
(Values in SR thousand)

ISIC	Industrial Division	Output per person	Value added per person	Capital per person	Raw material per person	Wages per person	Output per unit	Value added per unit	Capital per unit	Wages per unit	Employment per unit
31	Food, beverages and tobacco	19.0	8.2	6.4	8.2	3.1	79.6	34.3	27.0	12.9	4.2
32	Textiles, wearing apparel and and leather industries	11.8	6.5	1.9	4.8	1.8	22.2	12.3	3.6	3.4	1.9
33	Wood and wood products, including furniture	11.5	8.5	3.7	4.4	4.3	42.1	23.2	10.1	11.9	3.7
34	Paper and paper products, printing and publishing	20.9	11.0	17.7	8.0	7.3	374.4	196.9	316.6	131.1	17.9
35	Chemicals and chemical, petroleum coal, rubber and plastic products	108.4	31.0	35.6	73.3	8.4	3 806.6	1 087.6	1 251.8	294.1	35.1
36	Non-metallic mineral products except petroleum products	11.2	23.0	16.9	7.1	4.6	176.1	85.3	123.9	35.0	7.6
37	Basic metal industries	21.0	9.7	17.6	6.8	4.6	76.7	35.5	64.4	16.7	3.7
38	Fabricated metal products, machinery and equipment	11.9	7.8	5.2	2.0	3.6	23.2	15.3	10.1	7.0	2.0
39	Other manufacturing industries	6.3	3.8	1.3	1.9	0.6	11.1	6.7	2.2	1.0	1.8
	Average	16.0	8.4	7.5	6.1	3.5	50.1	26.4	23.5	11.0	3.1

Source: Based on table III.3

Table III.14 PERFORMANCE INDICES OF NON-OIL MANUFACTURING IN SAUDI ARABIA, 1970

(Values in SR thousand)

ISIC Code	Industrial Division	Output per person	Value added per person	Capital per person	Raw material per person	Output per unit	Net value added per unit	Capital per unit	Employment per unit
31	Food, beverages and tobacco	25.7	12.0	37.8	12.0	1 077.0	502.0	1 582.2	42
32	Textiles, wearing apparel and leather industries	28.8	19.8	46.0	8.8	934.4	641.8	1 493.2	32
33	Wood and products including furniture	16.2	7.8	8.3	8.0	272.8	131.0	140.1	17
34	Paper and paper products, printing and publishing	35.2	17.0	35.4	16.9	1 157.2	559.5	1 157.8	35
35	Chemicals, and chemical, petroleum, coal, rubber and plastic products	815.8	404.3	381.8	397.2	133 431.6	66 133.7	62 446.7	164
36	Non-metallic mineral products	37.1	21.7	77.7	9.1	1 674.3	979.6	3 507.0	45
37,38	Basic metal industries, fabricated metal products, machinery and equipment	209.8	74.8	408.8	127.9	532.9	190.0	1 038.2	3
39	Other manufacturing industries	771.9	24.5	13.4	746.9	11 193.0	355.0	195.0	15
	Average	224.5	110.6	135.3	107.9	8 324.2	4 102.0	5 020.1	37.1

Source: Based on Table III.4

Table III.15 PERFORMANCE INDICES OF NON-OIL MANUFACTURING IN SAUDI ARABIA
(Values of SR thousands)

ISIC Code	Industrial Division	Output per person	Value added per person	Capital per person	Gross output per unit	Net value added per unit	Capital per unit	Employment per unit
31	Food, beverages and tobacco	30.2	11.2	1.7	126.8	47.1	7.2	4
32	Textiles, wearing apparel and leather industries	14.9	7.0	0.5	24.9	11.7	0.8	2
33	Wood and wood products, including furniture	17.2	8.1	0.9	51.7	24.2	2.6	3
34	Paper and paper products, printing and publishing	37.2	16.9	4.3	885.1	401.5	101.5	24
35	Chemicals and chemical, petroleum, coal, rubber and plastic products	83.6	23.4	10.1	4 494.7	1 257.9	544.7	54
36	Non-metallic mineral products except petroleum products	41.7	25.6	12.0	319.0	196.1	91.9	3
37	Basic metal industries	35.0	18.8	12.3	1 084.8	581.8	381.8	31
38	Fabricated metal products, machinery and equipment	23.4	12.2	1.2	115.2	60.1	6.1	5
39	Other manufacturing industries	127.5	25.0	2.5	2 550.0	500.0	50.0	20
	Average	30.8	13.8	4.0	118.4	53.3	15.3	4

Source: Based on table III.5

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Table III.16 PERFORMANCE INDICES OF NON-OIL MANUFACTURING IN SAUDI ARABIA, 1974/75

(Values in SR thousands)

ISIC Code	Industrial Division	Value added per person	Capital per person	Value added per unit	Capital per unit	Employment per unit
31	Food, beverages and tobacco	17.6	33	1 080	2 057	61
32	Textiles, wearing apparel and leather industries	12.3	40	604	1 993	49
33	Wood and wood products including furniture	32.0	33	649	671	20
34	Paper and paper products, printing and publishing	24.8	47	1 052	2 008	42
35	Chemicals, and chemical, petroleum, coal, rubber and plastic products	105.2	266	8 604	21 818	82
36	Non-metallic mineral products	32.9	132	3 415	13 816	104
37	Basic metal industries	23.8	180	7 171	54 095	301
38	Fabricated metal products, machinery and equipment	26.2	39	918	1 364	35
39	Other manufacturing industries	70.0	90	3 768	4 854	54
	Average	36.3	97	2 074	5 598	57

Source: Based on Table III.6

Table III.17 UREA PRODUCTION 1970-1974
(Quantity in tons)

	1970	1971	1972	1973	1974
Urea	11 200	41 300	34 600	65 700	80 600

Source: George Roueiheb, The Chemical Industry in Saudi Arabia, ECWA, 1978

Table III.18 PLASTIC PRODUCTS PLANTS EXISTING AND UNDER CONSTRUCTION, SAUDI ARABIA

	Western region	Central region	Eastern region	Total
Existing plants	21	4	3	28
Plants under construction	8	7	5	20
Total plants (existing and under construction)	29	11	8	48
Production capacity (tons)1/				
Existing plants	12 500	22 000	1 400	35 900
Plants under construction	1 800	4 000	5 300	11 100
Total plants (existing and under construction)	14 300	26 000	6 700	47 000
Investments in SR. thousands				
Existing plants	20 210	24 500	2 100	46 810
Plants under construction	9 000	11 000	22 000	42 000
Total	29 210	35 500	24 100	88 810
Labour force.				
Existing plant	444	388	25	857
Plants under construction	166	187	227	580
Total	610	575	252	1 437

Source. Ministry of Industry.

1/ One shift per day basis and 270 working days per year.

Table III.19 CEMENT CONSUMPTION IN THE KINGDOM
(thousand tons)

Year	Local production	Imports	Total	Production as percent of total
1378 (1958)	30.3	346.5	376.8	8.0
1379	78.8	229.5	308.3	25.6
1380 (1960)	89.6	270.8	360.4	24.9
1381	120.2	234.0	354.2	33.9
1382	196.2	275.7	471.9	41.6
1383	217.0	201.5	418.5	51.8
1384	258.5	339.7	598.2	43.2
1385	250.2	491.3	742.0	33.7
1386	323.2	456.0	779.2	41.5
1387	417.6	291.6	709.2	58.9
1388	510.8	490.3	1 001.1	51.0
1389	574.1	685.7	1 259.8	45.6
1390 (1970)	666.9	463.7	1 130.6	59.0
1391	703.4	549.9	1 253.3	56.1
1392	911.1	299.5	1 210.6	75.3
1393 (1973)	1 000.3	288.5	1 288.8	78.2
1394	1 056.6	636.0	1 692.6	62.4
1395	1 125.4	1 300.0	2 425.4	46.4
1396 (1976)	1 [illegible]	2 [illegible]	3 [illegible]	[illegible]

Source: Ministry of Commerce.

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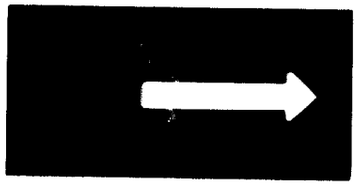

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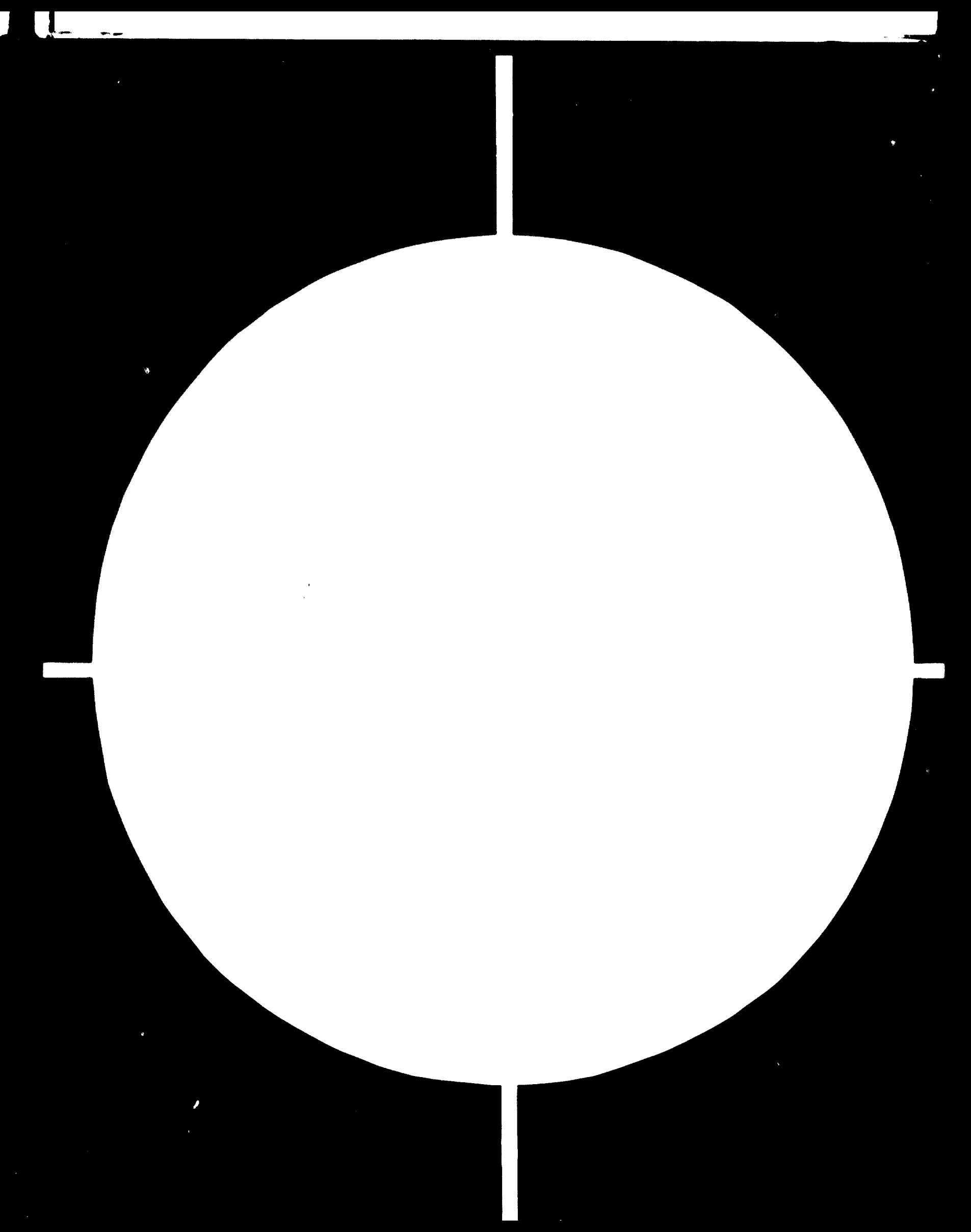

Chapter IV

PROBLEMS OF INDUSTRIALIZATION

Introduction

136. It is clear from the preceding chapters that the developments in the oil sector, however impressive they may have been in terms of contribution to GDP, have failed to provide sufficient stimulus to induce the growth of other non-oil industries. Several rigidities, inelasticities of supply and other obstacles collectively provide a formidable barrier that has in the past impeded, and may continue to impede the effort of the Kingdom to industrialize.

137. The limited availability of both capital and foreign exchange has long been considered the major obstacle to economic growth and industrialization. This premise has, however, been seriously challenged by recent events in Saudi Arabia and other OPEC countries. It is now believed that the technical absorptive capacity of an economy is initially dependent on its ability to transform financial capital into human and physical capital. The conditions underlying and defining such a transformation are themselves the limiting factors. In Saudi Arabia, it is clear that shortages of labour and infra-structural services place the most stringent constraints on the performance and ability of the economy to develop and industrialize.

138. In this chapter a detailed account of those obstacles organized in terms of inputs and arrangements of production is presented. The micro aspects, i.e., problems related to specific industries, are only discussed if they pertain to one of the more general problems.

Labour shortage

139. There is a serious gap between the supply and demand for labour. This gap exists not only in terms of quantity of labour, but also and more critically, in terms of labour quality. In the short term, foreign labour has been recruited to offset deficiencies in local supplies. Since man-power development is a time consuming process, dependence on foreign labour is likely to remain a basic feature of the Saudi labour market for some time to come.

140. It has been estimated that the labour force will rise from 1.6 million in 1975 to 2.33 million in 1980. Total non-Saudi workers in 1975 averaged 314 thousand or about 20 per cent of the total work force.[1/] In 1980 the number of foreign workers is expected to rise to 812.600 persons. The foreign workers will then represent 35 per cent of the total labour force.

141. The absorption of such large numbers of foreign workers is not likely to be an easy task and may put serious pressures on the society, economy and government. The substitution of security for efficiency may result in serious losses in productivity to the economy. Attempts to control politically the numbers of certain groups may introduce considerations that may not be consistent with productivity. Also, the substitution of foreign workers for local workers has serious long-run implications. Labour shortages are undoubtedly a serious Saudi problem, but the use of foreign workers should be seen as a temporary stop-gap measure rather than as a long-term policy. Otherwise, the Saudis face the danger of developing into a rentier society rather than a production-oriented society. Thirdly, the costs involved in servicing foreign workers are enormous, and the problems they are brought in to solve may be complicated by their presence. Severe bottlenecks have already developed in the housing market, the consumer goods' market and other markets as a result of the massive influx of foreign workers. Fourth, the costs

1/ These figures are from the Second Development Plan. It is believed, however, that the number of foreign workers is significantly higher, especially when account is taken of Yemeni workers.

Table IV.1 ESTIMATED MANPOWER DISTRIBUTION OF VARIOUS OCCUPATIONAL GROUPS
(Thousand)

Occupational Groups	1975		1980	
	Saudi	Non-Saudi	Saudi	Non-Saudi
Managers and officials	7.4	6.3	8.7	12.4
Professionals	40.4	15.7	52.9	23.5
Technicians and sub-professionals	25.0	31.4	33.4	61.3
Clerical	67.5	31.4	99.6	121.8
Sales	82.3	47.1	97.2	112.6
Services	105.2	47.1	134.5	145.2
Operatives	40.0	25.1	57.1	51.4
Skilled workers	70.1	47.1	93.5	101.9
Semi-skilled	170.0	82.8	265.0	168.5
Sub-total	615.9	314.0	841.9	812.6
Unskilled	244.0		296.4	
Farmers	311.2		281.0	
Bedouin	114.9		98.7	
Total	1 286.0	314.0	2 359.9	812.6

Source: Second Development Plan 1975 - 1980.

Table IV.2 **STATISTICAL SUMMARY OF EDUCTION, 1974 - 1979**
(present conditions and projections)

Education Programme	Student enrollment		Graduates		Teachers		Schools	
	1394 (1974)	1399 (1979)	1394	1399	1394	1399	1394	1399
School Education								
Elementary	620 000	1 041 000	49 800	97 500	30 800	50 500	2 899	4 467
Intermediate	120 400	230 000	25 200	53 200	7 300	15 500	557	991
Secondary	35 400	72 500	7 000	17 000	2 155	4 861	141	231
Sub total	775 800	1 343 500	82 000	167 700	40 255	70 861	3 597	5 689
Teacher training	15 690	27 500	4 547	7 914	1 056	1 954	46	60
Technical and vocational	3 685	14 405	857	3 469	365	1 365	16	37
Teacher Training (post secondary level)	271	10 325	102	3 233	61	819	2	20
Adult literacy programme	84 400	520 000	-	54 200	6 300	31 000	1 114	3 327
University	10 872	24 757	1 167	3 842	1 758	4 497	-	-
Women's Teacher Training	1 009	7 200	74	1 351	101	693	-	-
Islamic University (Graduate level)	3 446	11 024	1 703	7 158	2 088	6 102	-	-

Source: Second Development Plan.

Note: Some large figures have been rounded to nearest hundred.

Table IV.3 GRADUATES FROM VOCATIONAL TRAINING CENTRES IN THE KINGDOM UP TO JANUARY 1976

Trades	Total	Percentage
Automotive mechanics	730	16.7
Electrical	672	15.4
Building	488	11.2
Carpentry	594	13.6
Mechanics (general)	424	9.7
Sanitary engineering	338	7.7
Welding	389	8.9
Sheet metal	174	4.0
Painting	78	1.8
printing	135	3.1
Office machines	58	1.3
Radio and T.V.	41	0.9
Refrigeration and air-conditioning	132	3.0
Tailoring	46	1.1
Hair-dressing	38	0.9
Upholstery	20	0.5
Bookbinding	14	0.3
Total	4 371	100.0

Source: Vocational Training Administration.

Table IV.4 **ESTIMATED DAILY WAGE RATES FOR VARIOUS WORKERS IN MAJOR CITIES OF THE KINGDOM (Average for 1975/1976)**

Types	Daily wages (SR)
Unskilled	40
Carpenter	80
Equipment operator	65
Plasterer	80
Painter	60
Tile layer	50
Plumber	60
Electrician	60
Mason	50

Source: ISDC "A Guide to Industrial Investment in Saudi Arabia".

Table IV.4 **AVERAGE SALARY AND WAGE LEVELS IN VARIOUS CATEGORIES** (Private sector)

Occupation	SR / month
Manager	10 000 - 15 000
Assistant Manager	8 000 - 10 000
Professional/Technical	7 000 - 10 000
Technical/Engineer	6 000 - 10 000
Sub-professional	4 000 - 2 000
Skilled	2 000 - 3 500
Semi-skilled	1 500 - 2 000
Unskilled	1 200 - 1 500

Source: ISDC, " A Guide to Industrial Investment in Saudi Arabia".

Note: The cost of housing and transportation is in addition to this for expatriates.

/...

of foreign workers are usually high, raising thereby the costs of production. Of course, if the productivity of these workers is higher than their remuneration, this may not be true. However, their remuneration appears to be significantly higher than their international transfer price in order to compensate them for the hardships of living in a severe climate. Assuming that their transfer price measures their marginal productivity, their remuneration in Saudi Arabia is certainly higher than their productivity, thus leading to a rise in their comparative cost of production.[1/]

142. The growth of labour demand between 1975 and 1980 is expected to be highest for the category of professional and technical workers, whose numbers are expected to rise from 79,100 in 1975 to more than 191,100 by 1980 (an annual growth rate of 19.3 per cent). The academic and technical institutions of the Kingdom cannot at present supply even a fraction of this anticipated demand. All other occupational groups with the exception of farmers and fishermen are expected to grow at annual average rates exceeding 7 per cent. The number of production workers is expected to increase at an annual rate of 10.1 per cent, service workers at 12.9 per cent, and administrative and managerial workers at 9 per cent. These rates of growth will require massive inflows of expatriate labour with the required skills. Tables IV.1 and IV.2 display the required vectors of workers. Their availability is essential for the implementation of the plan; their social cost, however, is rather high.

Vocational training

143. Technical education in Saudi Arabia is still in its early stages. Fewer than 5 per cent of total students enrol in these schools. Thus, serious shortages are expected to persist if this trend is permitted to continue. Up to January 1976, fewer than 4,371 students graduated from vocational centres and a large part of this total is trained for commercial or services jobs.

1/ A detailed account of housing costs and wages will be provided in the latter sections of this chapter.

144. The comparable figures for developed countries exceed 50 per cent of total students. Shortages of skills in the indigenous population is expected to persist for a long time. Given that vocational education does not require long gestation, it may be possible to remedy this problem in a short period of time.

Wages

145. It has already been suggested that wage costs are relatively high in the Kingdom, reflecting adjustments to a harsh living more than compensation for productivity. To illustrate the pay scale, two tables are presented. Both represent data that is not up to date. However, the structure of wages is still relevant and is generally expected to be maintained even when inflationary adjustments are made.

146. Table IV.4 reveals a tight bank on wages. Unskilled workers are paid wages that are close to those of the skilled category. This reflects the all-pervasive shortages of labour, and Saudi disinclination to assume menial jobs at low wages. In table IV.5 the band widens considerably. Managers receive more than ten times the relatively high unskilled monthly payment. More important, perhaps, is the fact that managers receive between 5 and 6 times the remuneration of skilled workers. Thus two remarks can be made. The pay scale when housing and other amenities are provided are extremely high by developing economies' standards. Secondly, the range of payments show a limited variation between skilled and unskilled remuneration and a wide variation between skilled and professional salaries.

147. The implications of these features are clear. Costs of production in Saudi Arabia will necessarily be higher than those of competitors. Furthermore, professionals are in greater demand than skilled workers. This is a direct result of the ambitious development effort of the Kingdom and its limited industrial capability. With the advent of industrialization, the pay scale is likely to adjust in favour of skilled workers.

Infrastructural deficiencies

148. The discovery of oil along the coast had its advantages in terms of cheap delivery but resulted in a poor infrastructural development of the economy. Multinational corporations have always developed the sector that caters to their interest and neglected the rest. Saudi Arabia's economy is no exception. Oil export facilities are well-developed but the interior or non-oil regions have been left without facilities.

149. Insufficient capital has led economic planners to devote only limited amounts to infrastructure, allocating instead the major portion of scarce capital to productive users. Ironically, this allocation did not bring about the intended improvement. Bottlenecks developed and the lack of infrastructure precluded the operation of the production sectors.

150. Saudi Arabia facing little or no scarcity of financial capital, has opted to develop its infrastructure first. This, however, given limited use, may raise the cost per unit of the infrastructural services. Below is a detailed account of housing problems, shortages of port facilities, communication difficulties, transportation bottlenecks, etc.

Housing and land

151. Serviced lands are in short supply. Given the rapid and massive increase in demand occasioned by the boost in oil revenues and planned expenditures, land prices have soared to unprecedented levels.

152. Housing in major cities is either unavailable, or only available at exorbitant prices. Land prices in residential areas currently range between SR 2,000 and SR 3,000 per square meter, say, in Riyadh.

153. Rental prices for living accommodation are on average SR 30,000 to SR 40,000 per year for a two bed-room appartment with a kitchenette and a bathroom. A three-room independent house rents for SR 90,000 - 150,000 per year.

154. The government is setting up a crash building programme to house the increased influx of foreign workers and personnel. This, however, will not have its full impact for several years.

Transportation and communication

155. The spatial and temporal delivery of inputs and outputs is critical to the efficient performance of industry. Spatial frictions and time delays can increase costs and result in inefficiencies and spoilage.

156. The Saudi economy is characterized by the existence of numerous small and fragmented markets. Delivery of inputs and outputs between these centres is both time-consuming and excessively costly. The small size of plants, alluded to in the preceding chapter, is a natural response to this phenomenon. Furthermore, the limited capacity of the economy to produce its requirements results in heavy dependence on imports. These have to be transported from different origins. The inadequate network of ports, roads, and railroads and the great distances among different centers have resulted in yet another source of additional comparative cost that reduces the industrial efficiency and viability of the economy. For example, to transport a ton of product from Jeddah to Riyadh would cost SR 95 according to a government fixed rate. The actual cost however, is multiples of this figure. The government fixes a charge of SR .09 per kilometer per ton. However, the market rate is usually much higher.

Table IV.6 **ROAD TRANSPORTATION RATES BETWEEN THE DIFFERENT TOWNS IN SAUDI ARABIA (SR per ton)**

From / To:	Riyadh	Jeddah	Medinah	Mecca	Taif	Dammam	Dhahran	Hofuf	Tabuk	Turaif	Buraidah	Al-Kharj	Sulail
Riyadh	-	95	89	89	81	42	41	30	149	156	44	8	50
Jeddah	95	-	38	6	14	138	136	125	100	251	87	103	46
Medinah	89	38	-	40	48	131	130	119	62	245	49	97	39
Mecca	89	6	40	-	8	131	130	119	102	245	82	97	39
Taif	81	14	48	8	-	123	122	111	110	237	74	89	31
Dammam	42	138	131	131	123	-	1	14	191	114	86	50	92
Dhahran	41	136	130	130	122	1	-	13	190	115	85	48	91
Hofuf	30	125	119	119	111	14	13	-	178	128	73	37	80
Tabuk	149	100	62	102	110	191	190	178	-	305	108	156	9
Turaif	156	251	245	245	237	114	115	128	305	-	200	164	6
Buraidah	44	87	49	82	74	86	85	73	108	200	-	51	4
Al-Kharj	8	103	97	97	89	50	48	37	156	164	51	-	3
Sulail	50	146	139	139	131	92	91	80	199	206	94	43	-

Source: Ministry of Interior.

Note: Rate calculated at SR 0.09 per kilometer per ton.

157. Ports are limited in capacity and ill-equipped. During the period of the massive increase in imports, ships had to wait an average 90-180 days before unloading. Exorbitant surcharges were paid to ship owners to deliver products to the Kingdom.

158. The Government has recently undertaken a substantial development project to improve the port facilities. A special Port Authority has been created. By 1977/78 the waiting period for ships at Damman and Jeddah was reduced. New and more efficient methods of unloading were used, especially the RO-RO (roll on - roll off) method. For the long run, as has been pointed out in chapter one, the Second Development Plan envisages the construction of 54 berths at major ports. Other plans include improvements in the entry-exit channels, installation of marine guidance system, and the construction of dry-dock facilities. It also planned to install self-propelled floating crane and container handling equipment. Commercial and industrial ports are being constructed in Jubail. These measures and developments are bound to improve the delivery system within the Kingdom.

159. The air transportation network is adequate by any standards and has, therefore, presented little or no obstacle to the performance of the economy.

160. Railways, on the other hand, provide a very limited capacity. There is only a 582 kilometer line connecting Riyadh with Dammam. There is much more scope for this line of transportation than has been actually realized. Few developments are planned for this mode of transportation that is generally cheaper for long distances than road transportation.

161. The communication network is rather limited and service is inadequate. However, plans are underway and contracts have been signed with Bell Co. and others to modernize the communication network of the Kingdom. It is expected that every fifth Saudi will have a phone and the number of telexes will increase by an enormous magnitude. The post office was poor in the past; however, it is believed to have made significant progress lately. In 1974, there were 228 post offices, handling about

31.6 million internal and 59.5 million international letters. The SDP envisages a massive network, highly mechanized, and capable of servicing the entire Kingdom.

Power and water

162. Industrial usage of water is extensive and water in the Kingdom is in short supply and consequently is costly (if not in real terms, it is expensive in an opportunity cost sense). To cope with water scarcity, projects designed to increase the water supply of the Kingdom have received a high priority. The principal source of water is wells. Several desalination plants are in operation and seve . others are planned. A major recycling programme should be considered in line with the development of industry. Furthermore, the Kingdom urgently needs a national water use plan.

163. Electric power in the Kingdom has increased in supply and kept pace with demand in a smooth and an efficient manner. In addition, the utility rates are highly subsidized for industrial users. The recently established Electricity Corporation has embarked on an ambitious electrification project that is likely to result in sufficient electric power for years to come.

Dependence on foreign raw materials

164. Most industries in Saudi Arabia are dependent on imports of raw materials. This dependence varies from industry to industry; however, the percentage of imported raw materials to locate raw materials is extremely high. The government has lifted its duty on most raw materials imported by licensed industries. This adds to the protection (effective) of the final products produced, but does perhaps preclude the production of these raw materials or their substitutes at home. The need to import the bulk of the raw materials used reduces domestic value added and increases the cost of domestic production.

165. There are to be sure several industries in Saudi Arabia that depend on locally produced materials, such as petroleum refining, cement, gypsum, marble, glass, bricks and others. It is not imagined that Saudi Arabia could become or even should strive to become self-sufficient in raw materials. However, a more realistic policy of industrial encouragement would necessitate a thorough minerals policy, protection policy of domestic industry and a detailed strategy to develop along the lines of comparative advantage at least in the early stages of industrialization.

166. The Kingdom does not appear to be poor in mineral resources. Table IV.7 reveals quite a number of domestic mineral products that could perhaps be commercially exploited.

The Foreign Exchange Rate

167. It is rather difficult to assess the impact of the value of the exchange rate on industrialization in Saudi Arabia. However, it is clear that oil exports set its rate. This rate could very well be affected in the future by the accumulation of surplus funds. Thus, it is very possible that the rate will move out-of-line with the industrial efforts of the Kingdom. Should it reflect the capital account, it is very likely that it would be over-valued in terms of the export-potential of non-oil products.

168. Generally, economic planners speak of a shadow exchange rate which ultimately equates costs of production among trading partners. This role could not be expected of an over-valued capital-account-linked exchange rate. It is, therefore, useful to consider this question as part and parcel of industrial policy.

Lack of Regional Co-operation

169. It is a fact that not one of the Arab economies is industrially capable of sustaining itself. However, it is ironic that little has been achieved in terms of Arab economic co-operation.

170. The Kingdom's efforts in developing its heavy industries and oil-downstream operation, are of limited consequence if markets are not developed to absorb the minimum economically efficient output of those industries. Regional co-ordination of investment is more important than free trade. What is needed is a general framework of co-operation and prevention of harmful and wasteful duplication. Saudi Arabia has initiated several joint ventures with other Arab countries, knowing in advance that capital participation is a key to the partners market. Yet, this has happened without a proper framework.

171. Regional disparities in the ECWA region have increased on account of OPEC's performance. Regional co-operation is an effective means of redressing the new inequities and ensuring joint and mutual benefits. Such benefits are critical to effective regional planning of industrial development.

Policy and Institutions

172. There appears to be adequate institutions in support of industrialization in Saudi Arabia. This aspect will be the subject matter of chapter 5. However, as will be pointed out later, there is inadequate correspondence between the policies formulated and the practices of institutions. For example, the Saudi Industrial Development Fund appears to be extending more funds for electrification than for industry.

173. Furthermore, there does not appear to be a coherent system of protection for domestic industry. Tariffs are limited in coverage and scope, quantitative restrictions are not used and protection is administered on a case by case basis. These are retrospective rather than anticipatory measures.

174. The government is wedded to the principles of free enterprise, yet it realizes with full clarity, that the role of the public sector in industrializing the economy is indispensable. A clearer view of this seeming contradiction is needed. For years to come, there will be no substitute for concerted government action.

Table IV.7 **KNOWN MINERAL DEPOSITS IN THE KINGDOM OF SAUDI ARABIA**

Name of Locality	Minerals and percentage	Estimated Tonnage	Location	Remarks
Wadi Fatima	46.2 Fe (hematite)	48.5 MT	40–50 km east of Jeddah	Contains about 0.[illegible]% P
Wadi Swawin	42.0 Fe (hematite & Magnetite)	390 MT	40–60 km east of Red Sea just south of Gulf of Aqaba	13–16% SiO_2, with 0.2–0.5% P. Reserves could go over one billion tons
Jabal Idsas	25.0 Fe	80 MT	Near Dawadmi about 300 km SW of Riyadh	Some 6–8 MT is high grade (about 65% Fe)
Wadi Jassat	Pyrite (80%)(Fe & S)	300 MT	200–210 km E. of Jizan	Reserves could go as high as 800 MT
Al-Amar	9.2g/t,Au,0.75% Cu 5% Zn and some lead	6 MT	650 km E-NE of Jeddah	
Samrah	466 g/t Ag,5% Zn, and 1% lead	300 T	Near Dawadmi	
Nuqrah	Silver, Gold, Copper and Zinc	Unknown	On Medina Qassim Road	North & South Nuqrah. Study is going on to evaluate the prospect.
Jabal Sayid	2.2% Cu,1.4% Zn,40g/t Ag,0.5 g/t Au	8 MT	320 km NW of Jeddah	
Wadi Bidah Rabathan	2.6% Cu, with some Au, Ag, Zn	1 MT	260 km SW of Jeddah	More drilling is planned.
Gehab	1.56 % Cu.	1.5 MT		
As Safra	2.13 Cu 1.29 Cu	2.75MT 4.5 MT	400 km SE Medina	Very rough estimate; small separate ore bodies.
Jabal Dhaylan	Lead, Zinc with varying percentages	-	500 km NW of Jeddah near the Coast	
Wadi Tulayl	Chromite (39.7 Cr_2O_3)	small	440 km E-NE of Jeddah	
Zarhat	Magnesite (45% MgO)	1 MT	600 km E-NE of Jeddah	
Jabal Al Rokham	Magnesite varies upto 45% MgO	812 MT	330 km NE of Jeddah	Further drilling is under consideration

Table IV.7 "Continued"

Name of Locality	Minerals and percentage	Estimated Tonnage	Location	Remarks
Rabig	Barite 90% $BaSO_4$	100 M	150 km N of Jeddah	
Jizan-Farasan	Rock Salt 96% NaCl	Over 30 MT	Jizan	
Um-alHammam	Salt (96% NaCl)	160 MT	Near Dammam	
Khashain Rida	Clay 20-30% Al_2O_3	56 MT	125 km East of Riyadh	
Thaniyat-Tarayf	Phosphate 23% P_2O_5 16% P_2O_5	over 200 MT + 1 000 MT	Close to Jordan and Iraq borders	The deposits are located on both sides of Wadi Serhan which could be a source for underground water
Al-Hith	Gypsum	Undetermined	NE coast of Red Sea	Many deposits are recorded.
Al-Kharj	Gypsum	3 MT	Near Riyadh	
Al-Doghm	Glass sand	large	Near Riyadh	
Mahd-Dahab	Gold	Unknown	300 km N.J of Jeddah	Old mine for gold being re-evaludated.
Wadi Qatan	Nickel	-	200-240 km E of Jizan	Exploration for nickel is underway with promising results.
Wadi Hizmah	Cu, Ag, Au, and Zn	-	160 E of Jizan	Exploration is underway, promising sulfide mineralized bodies

Source: ISDC, A Guide to Industrial Investment in Saudi Arabia, 5th Edition, Riyadh - 1977.

Chapter V

THE INSTITUTIONAL FRAMEWORK AND INDUSTRIAL ORGANIZATION

Introduction

175. There are a number of institutions, primarily public, that promote directly or indirectly, industrialization in the Kingdom. These institutions are responsible for setting, co-ordinating, and controlling the nature, pace and pattern of industrial development policy. The Kingdom adheres to the concept of a free enterprise economy. It intervenes in the workings of the economy primarily to encourage, promote, and direct the efforts of the private sector. It has, however, participated directly in establishing and running certain basic industries where it was felt that private initiative was incapable of raising sufficient funds to establish these industries. The pattern and growth of institutions reflect a serious determination to construct an industrial environment conducive to effective industrialization. A brief description of some of the institutions is given below.

Government Ministries

The Ministry of Planning

176. The old Central Planning Organization (CPO) was elevated to the status of a full-fledged ministry by a Royal Decree in 1975. It was charged with the following responsibilities:

(i) preparation of periodic reports on the various aspects of the country's economy;

(ii) formulation of economic and social development plan, in accordance with the needs and requirements of the various ministries;

(iii) follow-up of planned projects and reporting to the Council of Ministers concerning the stage of the plan's execution;

(iv) estimation of financial outlays for projects approved by the Council of Ministers;

(v) the conduct of economic studies and the making of necessary recommendations.

177. The (CPO) completed the First Five Year Plan (1970-1975) and the Ministry of Planning launched the Second Development Plan in 1975. Both Plans embody the sectoral and sub-sectoral programmes submitted by the respective Ministries and departments. Given the size and the nature of the Plan, it is possible to assert that the Ministry of Planning plays an important role in the financial allocation, the physical size and the general characteristics of industrial development in the Kingdom.

178. The details presented in Chapter I on Plan allocations to the industrial sector are sufficient indicators of the role which this Ministry plays and is likely to play in the industrial development of the Kingdom.

The Ministry of Industry and Electricity

179. This is an offshoot of the old Ministry of Commerce and Industry which was reconstituted as two separate ministries; the Ministry of Industry and Electricity, and the Ministry of Commerce. While other ministries and agencies are also concerned with industry, the ultimate responsibility for co-ordinating industrial endeavours within the framework of the Development Plan rests with the Ministry of Industry and Electricity. The overall functions of the Ministry are:

(i) Co-ordination of industrial development with other ministries and agencies;

(ii) Realisation of a steady and balanced industrial development in the Kingdom;

(iii) Creation of a suitable atmosphere for protection and encouragement of domestic industries in such a manner that the plan's stipulated industrial targets are achieved;

(iv) Design of policies and adoption of suitable actions so that the less developed regions of the Kingdom can attain sufficient industrial growth;

(v) Design of and implementation of periodic and systematic surveys of the industrial sector;

(vi) The identification and evaluation of promising industrial opportunities;

(vii) The promotion of private investor interests, both Saudi and foreign.

(viii) The licensing of industrial projects and the administration of tariffs and exemptions to ensure that the exempted items are used for the purposes for which they were exempted.

(ix) Screening of requests for the acquisition of land plots in the industrial estates.

180. In addition to these functions, the Minister of Industry and Electricity is the Chairman of a number of autonomous organizations such as the Industrial Studies and Development Centre (ISDC), the recently established Electricity Corporation and Saudi Basic Industries Corporation (SABIC).

181. The Ministry is organized into a number of specialized Departments that include the following:

(i) Industrial Affairs
- (a) Foreign Capital Investment Committee
- (b) Industrial Protection and Encouragement Department
- (c) Industrial Estates Department
- (d) Industrial Licenses Department
- (e) Projects and Engineering Department
- (f) Industrial Technical Bureau
- (g) General Department

(ii) Electrical Affairs

(a) Companies Financial Control Department

(b) Companies Technical Control Department

182. Previously, there was a Power Development Department. It has been cancelled and an autonomous organization has been found under the title of "Electricity Corporation" headed by a governor.

Autonomous Bodies

183. Several autonomous institutions have been established for special purposes. These include:

Industrial Studies and Development Centre (ISDC)

184. The Cente was established by a Royal Decree issued in 1386 (1967) as an autonomous body governed by a board of directors with the Minister of Industry and Electricity as the Chairman and its Director General as the Principal Executive. The Headquarters of the Centre are located in Riyadh with branches in Jeddah and Dammam. The main functions of the Centre include:

(i) The conouct of industrial research, opportunity and feasibility studies;

(ii) the giving of advice and consultation on formulation of industrial policies, plans and programmes and on the implementation of industrial projects;

(iii) provision of technical assistance to existing industrial enterprises;

(iv) supervision of planning; construction and management of industrial estates in various parts of the Kingdom.

185. In addition, the Centre provides a variety of technical and managerial services to existing industries. The scope of the ISDC's extension services includes methods of production, product design and development, quality control, production scheduling, cost control and marketing. Furthermore, the Centre has recently built up an industrial laboratory for the benefit of private industry and a common facility workshop in Riyadh with the capacity to design, manufacture and repair press tools, moulds, jigs and fixtures, and various other spare parts. Similar workshops are expected to be in operation in 1978 in Jeddah and Dammam Industrial Estates.

186. Functionally, the centre is comprised of the following departments:

(i) an Industrial Research Department;
(ii) a Technical Services Department;
(iii) an Information and Documentation Department;
(iv) an Evaluation and Follow-up Department, and
(v) an Administration Department.

187. Although the Centre is an autonomous body, by the very nature of its functions, it is closely associated with the Ministry of Industry and Electricity.

General Petroleum and Minerals Organization (PETROMIN)

188. This organization was established by the Government in 1382 (1962) to develop the Kingdom's important natural resources and promote their industrial exploitation. The specific functions of PETROMIN include:

(i) implementation and administration of petroleum and mineral projects;
(ii) importation of mineral needs of the Kingdom;
(iii) preparation of studies and carrying out of tasks entrusted to it by the Government, with regard to searching for, producing, refining, purchasing, selling, transporting, distributing and marketing petroleum and minerals at home and abroad;
(iv) cooperation with private enterprises for undertaking petroleum or mineral activities, and
(v) establishment of companies and participation in their capital, at home or abroad.

189. PETROMIN is currently wholly owned by government; however, it is expected to be partly privately owned in the future. At the end of 1975, the responsibility for development of the basic industries, with the exception of petroleum refining, has been shifted to the Ministry of Industry and Electricity, which in its turn has created the Saudi Basic Industries Corporation (SABIC).

Saudi Basic Industries Corporation (SABIC)

190. SABIC was established in 1976 as an offshoot of the Ministry of Industry and Electricity to handle the non-oil mineral activities of PETROMIN. The major responsibilities of SABIC include:

(i) implementation of petrochemical, fertilizer and other hydrocarbon based industries;
(ii) implementation of iron, steel and aluminium industries;
(iii) implementation of other basic industries which the private sector does not or cannot undertake;
(iv) execution of projects that supply the corporation with its raw material requirements;
(v) the marketing of industrial products inside and outside the Kingdom.

191. The Corporation is permitted to undertake industrial, commercial and financial activities in any sector that it deems necessary to realize its objectives. The companies that it establishes and/or participate in enjoy exemptions and privileges granted to national industries.

192. The Corporation is to last for fifty years and this period may be extended by a decision taken by the Extraordinary General Meeting. It is currently wholly owned by the Government; however, it is expected to see 75 per cent of the shares to the public within a period of six years from the data of incorporation. The Government plans to retain 25 per cent of the Corporation's shares.

193. The Capital is SABIC is SR 10 billion divided into 10 million shares. The head office of the Corporation is Riyadh. It is managed by a Board of Directors of seven members, of which at least two must be government representatives. The Minister of Industry and Electricity is the Chairman of the Board.

The Electricity Corporation

194. The Electricity Corporation replaces the Power Development Department of the Ministry of Industry and Commerce. It was established in Riyadh by Royal Decree No. M 155 dated 1396 (1976). Its main functions include:

(i) the development of a phased programme for the electrification of the Kingdom;
(ii) the establishment of electricity projects;
(iii) the buying of shares in electricity projects;
(iv) the take-over, management and operation of all projects previously owned by the government,
(v) the co-ordination and supervision of the activities of foreign and Saudi consultants, establishments, factories or importers in the field of electricity.

Other Institutions: Private and Public

195. There is a host of other small institutions that contribute directly or indirectly to the industrial development of the Kingdom. Below is a list and a short discussion of the main functions of each of these institutions.

Saudi Arabian Standards Organization (SASO)

196 . This organization was established in 1972 to lay down the rules for granting certificates of compliance with national standards. It is also entrusted with setting the national standards for the various industrial products.

The Directorate General of Mineral Resources (DGMR)

197. The Directorate was established under the Ministry of Petroleum and Mineral Resources to conduct geological surveys, mapping, exploration and studies regarding mineral resources in the Kingdom.

Chambers of Commerce and Industry

198. At present, there are five chambers of Commerce and Industry in the Kingdom, located at Riyadh, Jeddah, Mecca, Medina and Dammam. Establishment and operation of the chambers is regulated under a statute authorized by Royal Decree.

199. The Chambers are run by administrative committees. Two-thirds of the members of such committees are elected whereas one-third are nominated by the Ministry of Commerce.

200. The chambers extend a number of services to their members, including the establishment of contacts with foreign counterparts, the securing of government bids and the settlement of industrial disputes. They publish bulletins and journals, and disseminate other commercial and industrial information. The chambers generally serve as agencies of mutual co-operation among industrialists and businessmen, and help to draw the attention of government and other agencies to the problems faced by industry and to the avenues of resolutions of difficult situations. They are also solicited to make recommendations regarding policy modifications

needed to promote industrialization. They also authenticate documents for which they charge fees ranging from SR 10 to SR 50 per piece.

The Royal Commission for Jubail and Yanbu

201. The Royal Commission was created in 1977 by Royal Decree to establish industrial complexes in Jubail and Yanbu. Several large hydrocarbon and basic industries are envisaged for development on these complexes in an effort to develop the two important regions of the Kingdom.

Financial Institutions

202. Since commercial banks are more likely to finance short term projects and needs, the Government has set up financial institutions with substantial capital to finance medium and long-term scale projects. The funds are extended to both private and public projects.

The Saudi Industrial Development Fund (SIDF)

203. The Saudi Industrial Development Fund was established by Royal Decree No. M13 in March 1974 with its head office in Riyadh. It is administered by a Board of Directors with a General Manager and a Deputy General Manager. Its main function is the provision of medium or long-term interest free loans to new or existing industrial establishments for the purpose of expanding their activities or for replacing and modernizing their equipment. The loans extended cover up to 50 per cent of the total funds required for financing the project or its development. Loans are to be redeemed within a maximum period of 15 years. A fee of 2 per cent of an outstanding loan is charged as a service fee. The loan conditions stipulate that the funds shall not be used as a working capital, and that a feasibility study should be attached to the application form. The Fund controls the implementation of projects and acts as a consultant to the borrowers for the duration of the loan.

204. The Fund's capital was initially set at SR 500 million. It was subsequently raised to SR 3,000 million.

Saudi Investment Bank

205. The Bank was established in June 1976 with the aim of providing medium or long-term loans to business and individuals, particularly for financing new projects in industry and other economic fields.

206. The capital of the Bank is SR 30 million, one half of which has been paid. Thirty six percent of the capital was privately subscribed and the remaining sixty four was raised from Saudi and foreign institutions. The Bank will be managed for the first five years by the Chase Manhattan Banking Corporation which holds 20 per cent of the capital.

207. The Bank is administered by a Board of Directors comprised of ten members, including seven representing Saudi share-holders, two representing Chase and one representing other foreign institutions.

The Contractors' Financing Programme

208. The Programme was established in 1974 by a Decision of the Council of Ministers. It is administered by a special committee and has a capital of SR 50 million. Its main objective is to grant interest free loans to Saudi contractors for financing direct purchases of the basic materials needed. These loans are primarily for short or medium terms only.

209. The terms of the loans stipulate that they are extended only to Saudi nationals, or establishments wholly owned by them, and who conduct their main activities within the Kingdom and are classified according to the Contractors' classification regulations. The loans are to be paid back within a maximum period of five years.

The General Investment Fund

210. This Fund was established in 1391 (1971) with its head office in Riyadh and with an initial capital of SR 1,000 million (subsequently raised to SR 7,400 million in 1976). Its primary function is to extend funds or guarantees to Saudi citizens of low income bracket to purchase shares in Saudi Companies and industries.

211. The General Investment Fund is administered by a Board of Directors with the Minister of Finance and National Economy as Chairman.

Conclusions

212. The Saudi authorities are aware of the fact that the massive developmental effort of the Kingdom necessitates the establishment of a number of specialized institutions to co-ordinate, plan and complement the activities of government and the private sector. This is particularly true in the industrial sector. Furthermore, although the government adheres to the principles of a free enterprise economy, it has realized that the creation of a favourable environment within which free enterprise is most able to exercise its role, should precede delegating industrial development responsibilities to this sector. The newly established institutions have generally responded rather well to the tasks entrusted to them. Several changes have been made which reflect a continuous process of adjustment, adaptation and review.

Chapter VI

INDUSTRIAL POLICY, OBJECTIVES AND INCENTIVES

Introduction

213. Industrialization is not a random process, rather, it is the outcome of a number of favourable conditions, least of which is a deliberate and systematic policy. In view of the many barriers to industrial development in Saudi Arabia, it is unrealistic to imagine that industrial expansion will occur spontaneously. The many domestic and international obstacles cannot be overcome without a deliberate and systematic ordering of priorities, and the allocation of scarce resources in accordance with such an ordering.

214. The industrial policies of the Kingdom enunciated in the two plans and in separate statements of policy indicate an awareness of the need to lay down the ground rules for an orderly development of the industrial sector in conformity with the general values, principles and needs of the society and the economy.

215. The Saudi government, however, faces two important conflicting historical trends that its policies have always attempted to reconcile. First, the massive inflow of oil revenues has given the government enormous economic power. This power is all the more important given the fact that oil is the single most important product of the economy. Second, the government is unreservedly in favour of a private enterprise system in which private initiative and market forces are to remain the main determinants of resource allocation. What has emerged from this conflict is the realization that the willingness of Saudi private enterprise to participate effectively in the development of Saudi industry remains very much dependent on the appropriate design and the effective implementation of a conscious and systematic industrial policy.

216. The purpose of this chapter is to examine the government industrial policy and evaluate its role in industrial development.

Objectives

217. There are a number of sources which may be used to arrive at the industrial objectives of the government, the most important of which are the two plans and the Statement of National Industrial Policy which was formulated by the Ministry of Commerce and Industry and approved by the Council of Ministers in 1394 (1974).

218. The single most important industrial objective is to lessen the dependence of the Saudi Economy on oil and to transform the Saudi economy into a balanced and diversified industrial economy. This overall objective is served by a host of sub-objectives including the following:

(i) The promotion of the development of an industrial base capable of producing at competitive costs a wide range of products for domestic and export use;

(ii) the encouragement of the full utilization of existing industrial capacity and facilitation of the expansion of industries to their optimal economic size;

(iii) the encouragement of the full exploitation of the Kingdom's comparative advantage arising from oil related products;

(iv) the encouragement of the full exploitation of the Kingdom's natural resources other than oil;

(v) the spreading and dispersion of economic activity in order to secure a regionally balanced structure of production;

(vi) reduction of the Kingdom's dependency on foreign workers by developing national skills through education and training;

(vii) facilitation of the linking of industry in order to secure a mature and balanced structure of production with complete forward and backward linkages;

(viii) promotion and facilitation of the acquisition of the appropriate and modern technologies; and

(ix) promotion and protection of developing domestic industries, capable of producing import substitutes.

Instruments and Incentives: The Policy Framework

219. Objectives without incentives and instruments to implement them remain vacuous. In the statement of Industrial Policy, the Saudi government provided a detailed account of the general principles, incentives, and instruments of its industrial strategy. Below is a brief summary of the essential points;

(i) The government intends to encourage the establishment and expansion of manufacturing industries, which can effectively contribute to the increase of national income, to raising the standard of living and employment, to increasing the technical capability of the economy and to diversifying its structure of production.

(ii) The Kingdom's economy has traditionally been based on competition between the private commercial and industrial enterprises. The government realizes that the objectives of industrial development will be most effectively achieved, if over the long run, private enterprise bears the major responsibility for implementing industrial projects. Accordingly, entrepreneurs who are ready to assume the risks of success and failure, motivated by the

prospects for profit, shall enjoy the full support of government as they conceive, establish and operate industrial enterprises which are beneficial to the Kingdom. The government shall also be ready to supplement the efforts of entrepreneurs in the private sector by establishing, financing and participating in the management of those large industrial projects which are in need of technical expertise and which the private sector is incapable of handling alone.

(iii) The government regards competition as the most effective system for serving the interest of consumers and for directing entrepreneurial activity towards socially beneficial industries. The government believes competition to be more effective than governmental edicts in prompting the selection of investment schemes which suit best the market requirements, for encouraging low cost production and for fixing "fair" prices for both producers and consumers. However, the government will not permit harmful foreign competition such as dumping.

(iv) The government stands ready to ensure that entrepreneurs who are prepared to participate in the industrial development of the Kingdom shall have access to the information needed for the identification, implementation and successful operation of feasible projects. The government provides them with industrial and feasibility studies and other pertinent information that may be available, as well as technical and managerial services.

(v) To ensure the profitability of projects of prospective benefit to the national economy, the government is prepared to offer financial and trade incentives to all industrial activities to make them more attractive to domestic investors. The government will grant the same incentives to all projects within the sector without delay. The incentives may include the following:

(1) provision of loans and participation in equity capital;
(2) provision of operating subsidies and assistance;
(3) exemption of imported machinery and equipment and raw materials from customs duties;
(4) tax exemptions of foreign company profits;
(5) preferential treatment of local products in government purchases;
(6) provision of industrial sites in industrial estates at nominal rates;
(7) the granting of subsidies for training Saudi employees;
(8) protective tariffs on competing imports and quantitative restrictions on some imported commodities;
(9) the granting of subsidies to exporters;
(10) assistance to entrepreneurs in the selection, formation and operation of new industries.

(vi) To organize the establishment and operation of industrial enterprises as well as to simplify the effective administration of the assistance programmes granted to those enterprises, the government has set into effect a system of licensing industrial projects which exceed a specified size in terms of invested capital or employment. The government extends licenses to applicants in all cases except those involving practical considerations relating to the supreme national interest or to the national economy.

(vii) The government will avoid the use of quantitative restrictions against imports or the fixing of prices as means of controlling economic activity; unless it is proven that such measures are the only measures capable of securing the national interest by eradicating monopoly practices.

(viii) When the private sector is unwilling or incapable of investing in certain enterprises and the government steps in to establish such enterprises, participation in them is open to the private sector. It is the declared policy of the government to sell to the public the shares it owns in industries other than those relating to national security. In all cases the government conducts its policies in a manner that establishes its position as a partner rather than a competitor to producers in the private sector.

(ix) The government recognizes the right of the business community to utilize all resources including labour in the manner it sees fit provided that its practices do not contravene statutes in force.

(x) Foreign capital and expertise are welcomed in Saudi Arabia and government policy encourages such participation in industrial development projects in cooperation with the Saudi Business community. Foreign investors are assured that the government will always avoid imposing any restrictions on the entry and exit of capital from the Kingdom.

(xi) The government is committed to the provision of the necessary infrastructural and institutional services required for setting up economically feasible industries while taking into account the dependence of industry on the general development of the Kingdom, it is also committed to encouraging and promoting the balanced growth of all sectors and regions with a view to ensuring a sufficient and steady supply of local resources for domestic producers and an adequate effective demand for their products.

Instruments and Incentives: the Practical Aspects

220 . The implementation of the statements of objectives and policies has taken a number of forms and has proceeded differentially to encompass several aspects of industrial development. Below is a detailed account of the procedural and practical aspects of these instruments and incentives.

Duty Exemptions and Protective Tariffs

221. The Ordinance for the Protection and Encouragement of National Industries in Saudi Arabia (Royal Decree No. 50, 23/12/1381H) introduces protective tariffs as an encouragement to Saudi infant industries. It also admits the possibility of imposing quantitative restrictions on imports where necessary. Furthermore, a joint committee (formed by Royal Decree M5, dated 28/2/1388H) composed of representatives from the Ministry of Finance and National Economy, and the Ministry of Commerce and Industry (now two separate ministries), was entrusted with the responsibility of evaluating all applications for protection. This joint committee submits its findings and recommendations to the Ministers of Finance and National Economy and of Commerce and Industry, who in turn pass on their final recommendations to the Council of Ministers. The outcome has been a piecemeal approach wherein applications are considered on individual basis. The structure has never been rationalized, and the practices are often arbitrary and based on ex-post considerations rather than on anticipatory bases. Furthermore, the tariffs are not "protective" in the current meaning of the term. They tend to over-protect final consumer products at the expense of intermediate and capital goods.

222. Originally, custom duties were imposed on a number of commodities for revenue considerations only. This aspect has and will have drastic consequences for the nature and use of tariffs as an instrument of protection of national products. Furthermore, due to the substantial increase in oil revenues, the original purpose for imposing custom duties has lost much of its significance. At present, tariffs are viewed as instruments of industrial and macro-policy.

223. Recent inflationary pressures and considerations of stabilization policies have resulted in a watering down of the impact of this instrument. On August 14, 1974 (26th of Rajab 1394H) the government revised downward customs duties. The following features are currently in effect:

Table VI.1 VALUE OF CUSTOM-DUTY EXEMPTIONS MADE FOR INDUSTRIAL MACHINERY AND RAW MATERIALS FOR THE YEARS 1393-1395 (1973-1975)

(SR thousands)

ISIC	Category	1393 (1973)	per cent	1394 (1974)	per cent	1395 (1975)	per cent
31	Food industries	25 429	6.88	8 789	5.46	25 826	15.78
32	Textiles	4 742	1.28	2 825	1.75	89	0.05
32	Leather products	373	0.10	385	0.23	197	0.12
33	Wood products	2 256	0.61	7 197	4.47	8 233	5.03
34	Paper products	11 342	3.07	2 085	1.29	4 849	2.96
35	Chemical industries (including petrochemicals, coal, rubber, and plastics)	297 003	80.43	69 815	43.44	62 264	38.05
36	Building materials	6 681	1.80	42 767	26.61	32 832	20.09
36	Glass and products	351	0.09	108	0.06	48	0.02
38	Metallic products	21 072	5.70	26 720	16.62	29 208	17.85
39	Optics	-		-		32	0.01
	TOTAL	369 249	100.00	160 691	100.00	163 628	100.00

Source: ISDC, A Guide to Industrial Investment in Saudi Arabia, 5th Edition, Riyadh-1977.

Table VI.2 VALUE OF IMPORTED INDUSTRIAL MACHINERY EXEMPTED FROM CUSTOMS DUTIES 1975 BY REGION (in SR thousands)

ISIC	Category	Central Region	Per cent	Western Region	Per cent	Eastern Region	Per cent	Total
31	Food products	12 756	40.66	3 271	9.32	1 806	4.1[illegible]	17 933
32	Textile products	-		12	0.03	-		12
32	Leather products	-		63	0.17	-		63
33	Wood products	515	1.64	486	1.38	-		1 001
34	Paper products	-		3 258	9.28	-		3 258
35	Chemical products	14 092	44.94	6 075	17.31	25 937	59.52	46 104
36	Glass products	-		-		-		-
36	Building materials	1 712	5.46	30 687	58.95	40	0.09	32 439
38	Metal products	2 276	7.25	1 238	3.52	15 791	36.23	19 305
39	Optics	-		-		-		-
	TOTAL	31 351	100.00	45 090	100.00	43 574	100.00	120 015

Source: ISDC, A Guide to Industrial Investment in Saudi Arabia, 5th Edition, Riyadh-1977.

Table VI.3 VALUE OF IMPORTED INDUSTRIAL RAW MATERIALS EXEMPTED FROM CUSTOMS DUTIES IN 1975 (in SR thousands)

ISIC	Category	Central Region	Per cent	Western Region	Per cent	Eastern Region	Per cent	Total
31	Food products	1 829	13.54	5 864	26.02	300	3.95	7 993
32	Textiles products	-		78	0.34	-		78
32	Leather products	135	0.99	-		-		135
33	Wood products	919	6.80	6 314	28.01	-		7 233
34	Paper products	53	0.39	1 385	6.14	156	2.05	1 594
35	Chemical products	5 627	41.67	5 615	24.91	4 919	64.86	16 161
36	Glass products	48	0.35	-		-		48
36	Building materials	260	1.92	183	0.81	-		443
38	Metal products	4 631	34.29	3 063	13.59	2 209	29.12	9 903
39	Optics			32	0.14			32
	TOTAL	13 502	100.00	22 534	100.00	7 584	100.00	43 620

Source: ISDC, A Guide to Industrial Investment in Saudi Arabia, 5th Edition, Riyadh-1977.

Table VI.4 LIST OF DOMESTIC MANUFACTURES GRANTED IMPORT PROTECTION - 1975
SAUDI ARABIA

1.	Candy, sweets, and chocolate	
2.	Tahini	
3.	Ice cream	
4.	Macaroni	
5.	Marble and decorative stones, dolomite and quartz	
6.	Gypsum - SR 150 per ton	
7.	Gasolene and kerosene - SR 0.16 per litre	
8.	Oxygene and acetylene	
9.	Soap powder	
10.	Plastic foam	
11.	Plastic bags	
12.	Plastic bottles and other products	
13.	Wooden boxes and other products	
14.	Paper towels and handerchieves	
15.	Paper bags and boxes	
16.	Prayer carpets	
17.	Red ghotras (men's head dress)	
18.	Cotton towels	
19.	Shoes and sandals	
20.	Tiles (floor and gypsum tiles)	
21.	Glass bottles	
22.	Tanks and barrels (metal) with less than 300 liters capacity	
23.	Metal shelves	
24.	Aluminium utensils	
25.	Water heaters	
26.	Wood furniture	
27.	Plastic pipes and sheets	
28.	Bleaches - Clorox	
29.	Desert coolers	
30.	Ropes	from 3 percent to 10 per cent
31.	Paints	

Source: ISDC, A Guide to Industrial Investment in Saudi Arabia, 5th Edition, Riyadh-1977

(i) Commodities imported under chapters II and III (Brussel Tariff Nomenclature) are exempted from duties. As a matter of fact, some important food items are given import subsidies (negative tax).

(ii) Import duties have been reduced to an ad-valorem tax of 3 per cent on all those items which previously bore import duties between 5 and 10 per cent.

(iii) Import duties on all automotive vehicles have been reduced to a 3 per cent ad-valorem as against the previous rates of 10 per cent (commercial) and 15 per cent (passenger cars).

(iv) Specific duties, i.e., import duties on the basis of quantity (unit), remain unchanged, but the number of commodities subject to this tax is very small.

(v) The protective duty of 20 per cent on goods with domestic counterparts was to remain in effect.

224. The "effective tariffs" are definitely higher than 20 per cent, given that raw materials and machinery are exempted. But due to the small value added contributions made by domestic industries, the protective aspects of the tariff are reduced. Moreover, the import duties are granted for a limited period, which contributes in turn to a reduction of the "protective" impact of the tariff structure.

225. Tables VI.1 and VI.4 detail the value of custom duty exemptions made for imports by industry, the regional distribution of the exempted industrial machinery and raw materials imported in 1975, and a list of domestic manufactures granted import protection.

Tax Incentives

226. The Kingdom has a very liberal tax system. The tax rates are low and there are very few taxes to be paid.

227. Pure Saudi companies, whether commercial or industrial, are fully exempted from the corporate profit tax. They pay, however, a flat rate of 2.5 per cent of the assessable amount called Zakat. The amount on which Zakat is to be paid, is equal to the assessee's total capital resources not invested in fixed assets. Such resources include capital, retained earnings, reserves not created for special liabilities and net profits. According to a new Decree, only 1.25 per cent (i.e. half the Zakat) is to be paid to the Zakat and Incomes Department. The other half (1.25 per cent) is to be distributed by the assessee to needy people.

228. Taxable incomes of corporations include:

(1) profits of a foreign company;

(2) shares of non-Saudi shareholders in the profits of Saudi companies; and

(3) the total share of non-Saudi sleeping partners in the net profits of partnership firms.

229. Legitimate business expenses and costs including capital losses and depreciation are deducted in computing net profits. Any depreciation method may be used, but it has to be adhered to from year to year. Capital gains, however, are to be included in the profits of the company. The following rates are now in operation.

Profit level	Rate of tax (per cent)
SR 100,000 and under	25
SR 100,000 to SR 500,000	35
SR 500,001 to SR 1,000,000	40
over SR 1,000,000	45

230. For companies engaged in the production of petroleum and hydrocarbons in the Kingdom, income taxes are charged at different rates. Companies established under the provisions of the Foreign Capital Investments Regulations with Saudi participation greater or equal to 25 per cent are exempted from payment of income tax for a period of five years from the commencement of commercial production. Finally, there is presently no tax on personal income in Saudi Arabia.

231. The tax system of the Kingdom is simple, liberal and provides a definite and significant incentive to industry. The Kingdom is unquestionably a tax haven and will remain so as long as oil revenues are the principal source of government revenue. It is also worth noting that the Zakat system, simple and limited as it is, provides an incentive to allocate resources towards fixed assets and capital and minimizes working capital relative to fixed capital.

232. The tax rates on company profits may appear to be high, but the wide income brackets diminish their progressive effectiveness. Furthermore, compared to other countries, corporate profit taxes in the Kingdom are relatively low.

Industrial estates

233. The government has established three industrial estates, located in Riyadh, Jeddah and Dammam. Other estates are being developed in Al Ahsa, Al-Qassim and in Mecca. Extensions of the already existing estates in Riyadh, Jeddah and Dammam are currently in the planning stage.

234. The estates are managed by ISDC and the Ministry of Industry and Electricity, and are designed to provide most of the necessary facilities required by industry. Such facilities include roads, sewage systems, communication facilities, water and power, banks, police and fire stations,

health centres, technical centres, and canteens. Each estate is subdivided into plots of varying sizes to suit the requirements of different factories. Table VI.5 presents information on the location of the industrial estates and the number of plots available or planned.

235. Priority in allocating plots is accorded to:

(i) industries proposed in the development plan;
(ii) branches of existing industries in the same line of manufacture;
(iii) industries financed solely by local capital;
(iv) industries using newer technologies;
(v) industries complementary to other units; and
(vi) industries, the feasibility of which has been established on the basis of proper studies.

236. Given the high cost of land in the Kingdom and the difficulties of arranging agglomeration of industry, the provision of industrial plots assumes critical importance in the overall process of industrialization. Furthermore, given the low nominal cost per square meter per year (currently set at SR 0.08) in the industrial estate as compared to SR 1,000 on the outskirts of Riyadh, the magnitude of the monetary subsidy, regardless of the other conveniences, is substantial indeed.

Government Preference for Domestic Products

237. Local producers may charge a premium of 10 per cent above import prices for goods and services which they sell to government ministries and agencies. It is also true that given certain standards of quality, the government contracts to purchase Saudi products in preference to imports as a policy of encouraging local industries. Given the enormous size of the public sector, a detailed and comprehensive policy of local procurement is an essential part of an effective industrial development policy.

Table VI.5 INDUSTRIAL ESTATES - SAUDI ARABIA

	Area (sq. meters)	Number of plots
Riyadh (first estate)		
Stage I	271 916	
Stage II	179 082	
Total	451 028	114
Riyadh (second estate)(under development)		
Stage I	2 250 000	
Total Area	21 000 000	240
Jeddah (first estate)		
Stage I	498 000	
Stage II	1 044 000	
Total	1 542 000	107
Jeddah (second estate)	21 000 000	Not decided yet
Dammam (first estate)		
Stage I	570 000	
Stage II	1 480 000	
Stage III	1 200 000	
Total	3 250 000	82
Dammam (second estate)	21 000 000	Not decided yet
Mecca	860 000	Not decided yet
Al-Ahsa	1 500 000	Not decided yet
Al-Qassim	Not decided yet	Not decided yet

Source: ISDC, A Guide to Industrial Investment in Saudi Arabia, 5th Edition, Riyadh-1977.

Government Financing of Industrial Activities

238. There is now a number of financial institutions in the Kingdom that specialize in providing medium and long term credit to industries. The Saudi Industrial Development Fund (SIDF) discussed in the preceding chapters is the most notable one. It makes loans of up to 50 per cent of the total project cost for terms that extent to 15 years and with a grace period of one to one and a half years. It charges a nominal administrative fee of 2 per cent of the extended loan.

239. As noted in Chapter V, SIDF is not the only financial institution which extends funds for industrial development. Several other funds or banks, some of them with capital exceeding that of SIDF, participate in the financing of industrial activity. Among these institutions, it is possible to mention the Saudi Investment Bank, the Contractor's Financing Programme, the General Investment Fund and several other institutions.

240. Given the major role that the government plays in the industrial development of the Kingdom, and given that there are several industries almost wholly owned by the government which are now in the process of being transferred to the private sector, it is evident that financing of industrial projects appears to be primarily a matter of public domain and will perhaps remain as such for some time to come.

241. The pattern of allocation of loans among industries and between industry and electricity reveals a number of interesting features: first, the share of electricity is higher than the share of industry in terms of loans committed. Industry received 35.96 per cent of the total funds up to the end of January 1977, whereas electricity received 64.04 per cent, despite the fact that industry accounted for 72.40 per cent of the total loans requested, and electricity accounted for 27.60 per cent only. The preference for electrical projects over industrial projects reflects current emphasis on the development of the infrastructure vis-a-vis industry.

242. Second, the percentage of loans committed is less than 50 per cent of total loans requested. This gap is only true for industrial projects. Electrical projects are fully financed. The percentage of industrial loans committed to industrial loans requested is 21.4 per cent only.

243. Third, building materials' industries received almost half the total amount of the loan commitments to industry whereas they represented only 28.1 per cent of the total loans requested.

244. Fourth, metal products received substantial loans; it ranked second to building materials. Interestingly enough, it received a large percentage (23.21 per cent) of the total loan commitment whereas it accounted for only 16.64 per cent of the total loans requested.

245. Fifth, the share of plastics and chemicals in total loan commitments is rather low, but this is a reflection of the fact that most of the industrial projects in this area are government owned.

246. Sixth, textiles received the largest ratio of loan commitments to total loans requested.

Other incentives

247. The government extends a number of subsidies to industry, the most important of which is subsidized electrical power. The cost per KWH is SR 0.05 which is less than half the cost per KWH to the public. Furthermore, water per cubic meter is available to industry at SR 0.25, a figure significantly below the marginal cost of its production.

Table VI.6 APPLICATIONS AND LOANS BY INDUSTRY UP TO THE END OF JANUARY, 1977
(in SR thousands)

Industry Classification	No. of applications	Per cent	Total loan requested	Per cent	No. of loans	Per cent	Loan commitments	Per cent	Loan commitments as per cent of loans requested
INDUSTRIAL									
Automotives	14	2.89	193 489	2.76	4	2.76	12 318	0.82	6.36
Textiles	6	1.24	58 024	0.83	3	2.07	46 649	3.11	80.39
Chemical/Gas/Medical	18	3.72	642 532	9.17	7	4.83	46 215	3.08	7.19
Plastics	20	4.13	112 212	1.60	12	8.26	47 993	3.25	42.76
Paper Processing/Printing	25	5.17	202 730	2.89	4	2.76	27 000	1.80	13.31
Metal products	69	14.26	1 165 002	16.64	28	19.31	348 076	23.21	29.87
Building Materials	192	39.67	1 968 469	28.11	56	38.62	737 952	49.21	37.48
Furniture	17	3.51	77 322	1.10	10	6.90	35 779	2.38	46.27
Food and beverages	26	5.37	300 183	4.29	7	4.83	42 060	2.80	14.01
Agro business	18	3.72	411 770	5.92	2	1.38	62 000	4.13	14.94
Shipping	30	6.20	1 289 401	18.41	2	1.38	67 500	4.50	5.23
Miscellaneous	49	10.12	579 910	8.28	10	6.90	25 770	1.71	4.44
TOTAL	484	100.00	7 003 044	100.00	145	100.00	1 499 312	100.00	21.40
Industrial	484	86.43	7 003 044	72.40	145	69.37	1 499 312	35.96	21.40
Electricity	76	13.57	2 669 240	27.60	64	30.63	2 669 240	64.04	100.00
Grand Total	560	100.00	9 672 284	100.00	209	100.00	4 168 552	100.00	43.09

Source: ISDC, A Guide to Industrial Investment in Saudi Arabia, 5th Edition, Riyadh-1977.

248. Domestic fuel prices are significantly below world market prices, a fact that indicates an implicit subsidy. There have been some recent changes in the prices of fuels, but with the new changes, the cost of fuel is still below its opportunity cost (at world prices).

249. An expanded programme of subsidies to underwrite the cost of in-plant training of employees is also in effect. Moreover, direct payments of subsidies to exporters are being paid and a system of expanded encouragement to exporters is being considered.

250. The sum total of all these incentives is an uncoordinated network of government measures to extend financial help to the private sector.

Conclusions

251. A number of constraints and values define and qualify the industrial policy of the Kingdom. To begin with, economic development of the Kingdom is inextricably linked with industrialization and the latter to government finance and support. However, the government is committed to the operation of a private enterprise system. To harmonize the givens with what ought to be done, there is no substitute for a deliberate and systematic policy that identifies and priorizes the objectives, and at the same time delegates responsibility for performance of necessary tasks to the appropriate parties.

252. The industrial policy of the Kingdom is undoubtedly clear for the most part on objectives. What is lacking, however, is a clear assignment of tasks over space, time and institutions. In particular, there appears to be some weak correspondences between authority and specialization among ministries and agencies. Furthermore, the institutional arrangements and policy considerations appear to pay little attention to two important aspects: the question of control and review, and the spatial aspects of industrial development. There have recently been some positive develop-

ments in this regard; for example, the Royal Commission for Yanbu and Jabail. However, further considerations are needed.

253. More fundamental perhaps is the urgent need to systematize the present uncoordinated system of benefits, loans and subsidies. As development proceeds, the industrial sector will increasingly require more effective protection, greater regional co-operation and allotment of support on solid but flexible grounds.

Chapter VII

FORECASTING THE FUTURE SAUDI INDUSTRIAL STRUCTURE

Introduction

254. Modelling the industrialization process for development necessitates the modelling of the entire economy. The inter-relationships between the industrial sector and the rest of the sectors of the economy render impossible and unjustifiable the study of the industrial sector in isolation. Furthermore, there is a number of distinguishing characteristics that are peculiar to the macroeconomy of Saudi Arabia that require special attention. Some of these distinguishing features are listed below.

255. (1) The prevailing Keynesian model is uniquely tied to the circumstances and conditions of developed industrial economies. It devotes a great deal of attention to aggregate demand and not enough attention to the conditions of supply. In Saudi Arabia, production bottlenecks, shortages of labour and deficient technological conditions are decisive variables that qualify and define the production process and pattern. Thus, Keynesian models are of limited utility in explaining and predicting economic performance in Saudi Arabia. What is needed is a supply determined model that takes into account the special supply elasticities of the Saudi economy.

256. (2) The excessive reliance on oil exports to propel economic growth in Saudi Arabia is indeed the most dominant feature of the economy. It is the impact of export proceeds on the supply factors that forms the basic nucleus of the model. The pattern of influence of export proceeds is through its influence on government revenues and expenditures. These ultimately determine investment and its composition as well as consumption.

In turn, consumption and investment determine imports. Thus, government expenditures can no longer be treated as an exogenous variable as they are generally treated in macroeconometric models.

257. (3) Dualism in the Saudi economy implies that one sector models are clearly inadequate. Dualism here is taken to mean that there is an advanced or modern sector and a backward or traditional sector. This does not mean that a two-sector is the ideal specification for the Kingdom's economy, because it may be important to sub-divide both the advanced and the backward sectors into smaller components.

258. (4) Saudi Arabia is a member of OPEC and oil prices and production are now determined jointly. Given the heavy dependence on oil, OPEC decisions have important consequences on the Saudi economy. Thus, modelling OPEC's decisions and linking them to the Saudi specific model is an indispensable exercise.

The Results

259. The system of models used in this study (see Appendix A) comprises four sub-models. The OPEC decision model generates data for oil revenues expected for the future under alternative hypotheses. The macro model utilizes the output of the decision model with other forecasts of exogenous labour requirements to predict macro-variables. The predicted macro-variables in turn serve as independent variables in determining the future structure of the manufacturing sector. The fourth model presents a qualitative picture of the expected industrial profile of the Kingdom.

The OPEC Decision Model

260. Ten cases were entertained by varying the rate of growth of world demand for oil and the discount rate. The values of the parameters obtained from the model adopted were used to generate oil revenues in constant 1974 U.S. dollars. These are displayed in Table B 1 in the Appendix B; whereas the revenue data are presented in table VII.1. Only one case (case 1) was adopted into the macro simulations. Indeed changes in the discount rate and/or the rate of growth of world demand for oil appear to generate significant changes in the magnitude of oil revenues of Saudi Arabia as well as in their time profile.

The Macro-simulation

261. Oil revenues in constant 1974 dollars were converted into Saudi Riyals at the fixed exchange rate of SR 3.5 per one U.S. dollar. Furthermore, value added in oil was regressed on oil revenues in the sample years 1960-1973 and the coefficients thus derived were used to convert oil revenues into oil value added. Exports were assumed to grow at an annual constant rate of growth of three per cent. Labour requirements in the various sectors were extrapolated into the future using Sherbiny's estimates.[1/] Net factor payments abroad were assumed to grow until 1980 and then to decrease to zero by 1990. It is perhaps more realistic to assume that they should be negative earlier than 1990 in view of the returns expected on Saudi foreign investments. We have, nonetheless, opted to use the zero value for 1990 to 2000 given that no specific value can accurately be forecasted.

262. The model was first applied as depicted in this section until 1975. From 1975 until 1985, a fixed capital-output ratio of 4:1 replaced the

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1/ N. Sherbiny "Sectoral Employment and Economic Development of Saudi Arabia", 1975-1990, (mimeo), 1976

old non-oil manufacturing value added. In 1985, the capital value was raised to 6:1 to reflect the capital intensive nature of Saudi industrialization. Furthermore, investment in construction was cut in half and investment in non-oil manufacturing was doubled. All these adjustments were not sufficient to alter in any significant way the old structure of production. Construction value added remained very high and did not taper-off as one should expect. Furthermore, manufacturing activity increased but its rate of increase fell short of the rate of increase of GDP. Thus a new set of forecasts were derived, that allowed construction to fall to an "acceptable" value of GDP and raised manufacturing value added to a higher percentage of total value added.

263. Obviously, the scenarios above are two of many that could be entertained to generate future profiles of the Saudi economy. The basic advantage of the model is that the scenarios are conducted within a consistent framework where macroeconomic identities and behavioural relationships are simultaneously satisfied.

264. The values of the exogenous variables from 1971-2000 are presented in Table VII.2, whereas the initial values of the endogenous variables in 1970 are presented in Table VII.3. The results of the first simulation exercise for 1975-2000 are presented in Table VII.4.

The projected structure of non-oil manufacturing

265. The non-existence of comparable data on a time series basis for manufacturing activity in Saudi Arabia precludes the use of sophisticated techniques and procedures in projecting the future performance and structure of this activity. The projections made here are based on several restrictive assumptions and should, therefore, be used without caution.

1/ Table A1 in the Appendix presents the values of the coefficients used in our projection exercise.

Table VII.1 REVENUES ACCORDING TO SAUDI ARABIA FROM OIL PRODUCTION
(Millions of 1974 US Dollars)

Year	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
1974	28 257.588	28 330.995	28 403.710	28 157.106	28 231.135	28 260.662	28 284.435	28 297.163	28 361.001	28 335.803
1975	30 320.981	30 471.553	30 619.960	30 186.672	30 353.577	30 529.077	30 353.577	30 509.919	30 659.121	30 608.201
1976	33 229.146	33 466.009	33 698.424	33 052.175	33 361.878	33 670.812	33 361.678	33 601.602	33 836.304	33 979.030
1977	35 876.592	35 194.274	35 501.517	34 670.324	35 183.642	35 573.117	35 183.642	35 450.222	35 760.151	36 033.865
1978	35 691.413	36 081.398	36 460.150	35 469.562	36 066.207	36 667.323	36 066.207	36 471.913	36 866.304	37 273.118
1979	35 970.423	36 423.605	36 862.000	35 745.639	36 482.669	37 228.901	36 482.669	36 960.077	37 421.905	37 931.768
1980	37 708.427	38 241.637	38 753.003	37 481.010	38 300.390	39 331.882	38 303.300	38 967.413	39 515.375	40 032.259
1981	39 363.193	39 976.171	40 563.267	39 113.935	40 255.671	41 392.635	40 255.671	40 918.108	41 553.169	42 556.131
1982	40 707.683	41 391.961	42 050.432	40 508.930	41 809.578	43 169.671	41 809.578	42 571.169	43 293.162	44 557.169
1983	41 976.612	42 736.680	43 458.130	41 808.179	43 332.991	44 908.676	43 332.991	44 178.818	44 981.737	46 533.112
1984	43 356.873	44 191.268	44 979.527	43 229.951	44 986.305	46 810.800	44 986.305	45 995.814	46 819.215	48 707.560
1985	45 007.013	45 920.879	46 709.133	44 932.947	46 648.632	48 [illegible]	[illegible]	47 996.881	48 [illegible]	51 [illegible]
1986	46 633.133	47 626.175	48 555.465	46 623.559	48 317.350	51 325.512	48 317.350	50 071.554	51 157.167	53 255.922
1987	48 249.635	49 301.795	50 320.379	48 317.772	50 008.360	53 642.650	50 008.360	52 178.182	53 300.865	55 331.195
1988	49 930.522	51 083.401	52 152.013	50 089.736	53 001.093	56 [illegible]	53 001.093	55 [illegible]	56 [illegible]	59 371.572
1989	51 709.775	52 915.939	54 [illegible]	51 974.313	55 231.156	58 711.827	55 231.[illegible]	57 [illegible]	58 [illegible]	62 [illegible]
1990	53 583.724	54 905.812	56 [illegible]	53 938.733	57 606.652	61 593.[illegible]	57 [illegible]	59 [illegible]	60 767.[illegible]	65 697.2[illegible]
1991	55 508.619	56 910.500	58 [illegible]	55 929.969	60 07[illegible]	64 [illegible]	60 07[illegible]	61 868.[illegible]	63 [illegible]	69 [illegible]
1992	57 502.653	59 002.691	60 [illegible]	57 176.771	62 659.370	67 518.376	62 659.370	64 [illegible]	66 359.537	72 791.733
1993	59 567.850	61 177.303	62 [illegible]	58 [illegible]	65 385.115	70 [illegible]	65 385.115	67 [illegible]	69 [illegible]	76 677.732
1994	61 760.608	63 [illegible]	64 [illegible]	60 [illegible]	68 [illegible]	74 [illegible]	68 [illegible]	70 [illegible]	72 [illegible]	80 [illegible]
1995	64 028.267	65 [illegible]	67 [illegible]	65 [illegible]	71 [illegible]	77 [illegible]	71 [illegible]	73 [illegible]	75 [illegible]	85 [illegible]
1996	66 [illegible]	68 [illegible]	69 [illegible]	67 [illegible]	74 [illegible]	81 [illegible]	74 [illegible]	77 [illegible]	79 [illegible]	89 [illegible]
1997	68 [illegible]	70 [illegible]	72 [illegible]	70 [illegible]	77 [illegible]	85 [illegible]	77 [illegible]	80 [illegible]	83 [illegible]	94 [illegible]
1998	71 [illegible]	73 [illegible]	75 [illegible]	73 [illegible]	81 [illegible]	90 [illegible]	81 [illegible]	84 [illegible]	87 [illegible]	100 [illegible]
1999	74 [illegible]	76 [illegible]	78 [illegible]	76 [illegible]	85 [illegible]	95 [illegible]	85 [illegible]	88 [illegible]	91 [illegible]	105 [illegible]
2000	76 880.716	79 225.303	81 [illegible]	79 [illegible]	88 [illegible]	99 [illegible]	88 [illegible]	92 [illegible]	95 [illegible]	111 [illegible]

Table VII.2 THE EXOGENOUS VARIABLES OF THE MACRO SIMULATION
(Employers in thousands and others in millions)

Year	L_{TC}	L_A	L_C	L_{TL}	K	Y_O	MFP
1971	68.7	311.9	166.0	38.0	15 189	14 055	3 825
1972	76.1	311.8	194.7	39.9	19 862	18 373	5 680
1973	84.2	311.6	228.4	42.0	30 012	28 095	10 457
1974	93.2	311.5	267.9	44.2	85 682	82 691	15 966
1975	103.2	311.3	314.2	46,5	114 461	104 696	16 000
1976	110.9	311.2	345.5	48.7	120 284	107 860	16 000
1977	119.2	304.5	379.8	51.0	120 012	110 582	16 000
1978	128.1	298.0	417.6	53.4	122 598	112 964	16 000
1979	137.6	291.6	459.2	56.0	125 352	115 686	16 000
1980	147.9	285.3	504.9	58.6	128 506	118 408	16 000
1981	156.9	279.2	521.2	62.7	131 460	121 130	10 000
1982	166.5	276.0	538.0	67.1	134 783	124 192	10 000
1983	176.7	272.9	555.4	71.8	138 106	127 254	10 000
1984	187.5	269.7	573.3	76.8	141 800	130 657	10 000
1985	199.0	266.6	591.8	82.2	145 492	134 059	10 000
1986	204.3	263.6	618.3	87.6	149 554	137 802	5 000
1987	209.7	261.3	645.9	93.5	153 616	141 545	5 000
1988	215.3	258.9	674.9	99.7	158 047	145 628	5 000
1989	221.0	256.6	705.1	106.3	162 479	149 711	5 000
1990	226.9	254.4	736.6	113.3	167 279	154 134	5 000
1991	232.9	252.1	769.6	120.8	172 080	158 558	-
1992	239.1	249.9	804.0	128.8	177 249	163 321	-
1993	245.5	247.6	840.0	137.4	182 789	168 425	-
1994	252.0	245.4	877.6	146.5	188 328	173 529	-
1995	258.7	243.3	916.6	156.2	194 236	178 973	-
1996	265.6	241.1	957.9	166.5	200 513	184 757	-
1997	272.7	239.0	1 000.7	177.6	206 792	190 542	-
1998	279.9	236.8	1 045.5	189.3	213 807	197 006	-
1999	287.3	234.7	1 092.3	201.9	220 823	203 471	-
2000	295.0	232.6	1 141.2	215.3	228 209	210 276	-

Note: Definitions are given on page 142

Table VII.3 VALUES OF ENDOGENOUS VARIABLES IN 1970

1	Y_{WR}	1 252.500
2	Y_{TC}	1 919.600
3	Y_S	[illegible]
4	Y_A	1 [illegible].300
5	Y_C	1 [illegible]
6	Y_{MN}	37[illegible].100
7	H	3 812.500
8	C	7 21[illegible].300
9	CH	5 [illegible].000
10	I_{TC}	[illegible],2.300
11	GAI_{TC}	7[illegible]5.600
12	I_{CS}	2 03[illegible].900
13	GAI_{CS}	[illegible]9.300
14	I_{MN}	1[illegible]5.300
15	GAI_{MN}	[illegible]
16	PA	[illegible] 319.[illegible]
17	PM	1 [illegible]
18	GDP	13 [illegible].100
19	GNP	13 [illegible].100
20	K_{CS}	10 5[illegible].100
21	K_{MN}	773.2[illegible]

Note: Definitions are given on page 142

Table VII.4 MODEL PROJECTIONS 1970-2000
(SR millions)

	1970	1975	1980	1985	1990	1995	2000
Y_{WR}	2 852.5	11 196.5	20 784.9	26 629.9	32 359.5	42 083.0	57 059.0
Y_{TO}	1 519.6	2 869.1	5 966.2	7 606.3	8 806.7	10 076.8	11 598.7
Y_S	2 280.7	21 359.0	33 905.5	46 294.4	58 160.1	80 246.1	115 952.6
Y_A	1 002.3	1 310.0	1 712.1	2 237.6	2 924.5	3 822.2	4 995.4
Y_C	1 495.9	3 811.8	9 983.7	22 628.9	48 328.4	100 137.6	204 156.1
Y_{MN}	374.1	672.1	2 167.1	2 699.4	4 265.4	6 339.7	9 077.0
M	3 212.9	36 980.3	50 226.6	56 927.3	65 428.9	75 983.7	89 266.6
C	7 214.3	54 595.6	86 040.6	117 090.3	146 828.9	202 182.3	291 672.3
GR	5 966.0	58 112.4	86 610.5	98 699.1	113 305.8	131 437.3	154 238.8
I_{TC}	842.8	2 984.3	5 943.8	7 393.5	8 620.8	9 955.5	11 532.1
GAI_{TC}	705.6	8 930.1	13 404.3	15 302.2	17 595.5	20 442.1	24 022.0
I_{CS}	2 034.9	7 303.0	17 092.1	35 161.4	71 368.1	143 856.6	288 933.3
GAI_{CS}	929.9	13 970.4	20 930.9	23 954.7	27 548.0	32 008.3	37 617.5
I_{MN}	155.5	827.7	1 604.3	2 423.8	2 590.0	3 424.9	4 513.6
	86.4	971.9	1 455.7	1 660.8	1 908.8	2 216.5	2 603.6
F..	4 310.0	135 279.9	435 955.2	833 979.6	1 290 554.9	1 847 413.3	2 498 978.1
FF	1 820.0	61 430.2	62 279.4	87 564.7	96 350.1	118 252.3	138 912.4
GDP	18 257.1	145 914.4	192 932.4	242 155.5	303 978.5	421 685.4	613 114.8
GNP	13 410.1	129 914.4	176 932.4	241 155.5	303 978.5	421 685.4	613 114.8
K_{CS}	20 509.1	31 128.1	92 119.4	220 173.3	480 865.5	1 007 606.3	2 066 621.9
K_{MN}	773.2	2 683.3	8 668.4	17 996.2	28 435.8	42 264.9	60 513.4

Note: Definitions are given on page 142

Definitions used in Tables VII.2, VII.3 and VII.4

Y_{WR} = Value added in whole-sale and retail trade.

Y_{TC} = Value added in transport and communication

Y_S = Value added in services

Y_A = Value added in agriculture

Y_C = Value added in construction.

Y_{MN} = Value added in manufacturing

Y_o = Value added in oil

M = Total imports

C = Consumption

GR = Government revenue

I_{TC} = Gross investment in transport and communication

GI_{TC} = Government budgetary allocation to transport and communication

I_{CS} = ss investment in construction

I_{MN} = oss investment in manufacturing

GI_{MN} = vernment budgetary allocations to manufacturing

X = tal exports

FA = Foreign assets

FF = Surplus on current account

NFP = Net factor payments abroad

GDP = Gross domestic products

GNP = Gross national product

Y_P = Private income

D = Depreciation

K_{CS} = Capital stock in construction

K_{MN} = Capital stock in manufacturing

L_A = Labour employed in agriculture

L_{MN} = Labour employed in manufacturing

L_C = Labour employed in construction

L_{TC} = Labour employed in transport and communication.

266. The structure of production is allowed to change in response to two major forces: supply and demand. In table VII.5 the direction of change is determined by demand forces. The long-term income elasticity of demand for several products estimated from a Houthakker-Taylor specification for the United States were used as proxies of Saudi income elasticities.[1/] Of course, it is difficult to justify such an assumption; its use, however, was dictated by two considerations. As far as demand conditions are concerned Saudi Arabia is rich, its per capita income is above that of the United States. Secondly, dynamic long-term elasticities are readily available for the United States.

267. The projections made in Table VII.5 are predicated on the assumption that the level of gross output (final demand plus intermediate demand) of each sub-sector grows sufficiently to meet expected local demand increases. If export demand were to increase too, then an additional level should be added to the growth of local demand. Furthermore, if import substitution were to take place, then again an additional amount should be added to the projected levels in Table VII.5. As such the results in Table VII.5 present preliminary estimates that should be adjusted in the light of expectations of exports potential and import substitution possibilities. Following the discussions of clusters, a new projection will be made combining information in Table VII.5 and the new outlook expected when a set of complexes are introduced.

268. The results in Table VII.5 indicate an inconsistency with the macro-simulations. Given a ratio of value added to gross output which is higher than 0.25, the gross output in table VII.5 is larger than the corresponding value added of non-oil manufacturing in table VII.4. In addition, the gross output in VII.5 is the lowest possible value given that import substitution programmes and successful export promotion could lead to higher values. The macro-simulation will be changed in the light of the discussions of supply determined growth.

1/ Table B2 in the Appendix B presents the values of coefficients used in our projection exercise.

Table VII.5 PROJECTED VALUES OF GROSS OUTPUT OF SAUDI NON-OIL MANUFACTURING IN 1974/1975 PRICES (SR millions)

Sector	1975	1980	1985	1990	1995	2000
31	1 131	1 466	1 815	2 290	3 093	4 453
32	496	657	824	1 052	1 438	2 091
33	451	595	745	949	1 295	1 880
34	383	509	641	820	1 123	1 637
35	1 344	1 802	2 200	2 931	4 029	5 892
36	4 724	6 398	8 144	9 069	10 462	12 305
37	424	571	721	927	1 273	1 861
38	1 069	1 427	1 804	2 318	3 184	4 654
39	92	128	162	209	287	419
Total	10 113	13 553	17 136	20 565	26 184	35 192

269. A supply determined structure of production may be derived using cluster analysis. Three alternatives were used. The first pertains to that of West Virginia, a coal producing economy but where little attention has been devoted to establishing an industrial base. The structure that emerges is one that reflects a service-oriented economy. Retail gasoline service stations, hotels, trucking and warehousing, special trades contractors, insurance agents and brokers, wholesale trade and communications form the core of such an economy.

270. The second alternative is that of Texas; there petroleum products and petrochemicals establish the dominant cluster. But two major clusters account for the economy's structure, the second being services with very little in between. This seems to be a likely outcome for Saudi Arabia. The chemical industries including basic organic and inorganic chemicals, fertilizers and pesticides, synthetic resin, paints, varnishes and lacqueurs, drugs and medicines, cleaning preparation, perfumes and cosmetics, petroleum refined products, asphalt, tyres and tube industries, rubbers and plastics are the expected future industries of Saudi Arabia. The second major cluster includes most of the urban services.

271. The third alternative includes a new cluster and is derived using the major cluster in Philadelphia that was established rather recently (a large iron-steel complex). This cluster includes: heating and plumbing metal products, metal working machinery and equipment, special industry machinery and equipment, metal containers, stampings, screw machine products and bolts, engines and turbines, household appliances, material handling machinery and equipment and machine shop products.

272. What emerges from the use of cluster analysis is that the existence of a resource-based industry does not guarantee the emergence of clusters as is the case in West Virginia. On the other hand, reliance on the principal resource as in Texas leads to a gap in the structure of production. Alternatively, the establishment of an iron-steel network in Philadelphia has resulted in a massive agglomeration of fabricated metal industries.

273. Combining the demand and supply factors, the new structure of production of Saudi Arabia may very well include the following characteristics:

274. First, chemical products will dominate the economy's structure, export potential will be the basic factor in determining the extent of growth.

275. Second, non-metallic minerals will lose part of their importance as the construction industry begins levelling off.

276. Third, fabricated metal products will assume more importance as the cluster matures and agglomeration effects are allowed to take their course.

277. The outcome of such a structural change is a large contribution to GDP by the non-oil manufacturing. Thus the macro-simulations should be adjusted to reflect this fact. Industrial economies of a comparable structure of manufacturing indicate that what would be expected in Saudi Arabia is at least a twenty per cent contribution by manufacturing to GDP. Given that part of manufacturing activity in Saudi Arabia is already included in oil value added, we have reduced the contribution to 15 per cent in the year 2000.[1/] This resulted in the following revised forecast.

Table VII.6 A REVISED FORECAST

GDP	613,114.8
Value added in non-oil manufacturing	91,967.2
Capital in manufacturing	551,803.2

1/ In Norway in 1975, refined petroleum accounted for 4.2 per cent of total manufacturing activity. If we are to add this to the 15 per cent, we would be close to the 20 per cent share.

278. Such a change would result in a GDP elasticity of manufacturing activity of 7.5. Massive investment would be required as well as adequate supply of skills and export markets. Although the levels of investment implied by such a structure is within the Kingdom's resources, it is perhaps an ambitious programme, but is a structure consistent with a mature industrial structure.

279. The allocation of output over sectors is assumed to parallel the pattern of Mexico and Norway in the mid 70's. The choice of Mexico and Norway was made on the basis of the dominance of oil in both of these economies. Table B 3 in the Appendix B presents the percentage share of gross-output by non-oil manufacturing sector in these two countries. Indeed, food, beverages and tobacco sector is more significant in Mexico and Norway than could be expected to prevail in the Kingdom. Thus the percentage share associated with this sector in both of Mexico and Norway was scaled to 11 per cent which is close to the demand determined share. Textile and leather products sector is assumed to have the share of this sector in Mexico. Wood and wood products sector was scaled down to below half the share of Norway. Paper and paper products are given Mexico's share. Chemical and chemical products are alloted more than double the average share of this sector in two countries. The same is true for the non-metallic mineral products. Basic metal sector was given less than half the average share of this sector in the two countries. Fabricated metals was alloted a share that is closer to Mexico's. Other manufacturing industries' share was estimated as a residual.

280. The pattern that emerged is displayed in Table VII.7 below. Fabricated metals and chemical products generate the largest contributions to output. This structure is significantly different from what prevailed in the early 70's as shown in table III.8.

281. Food, beverages and tobacco sector is expected to lose more than half of its contribution, and chemical products to double theirs. Textiles, wood and paper sectors are expected to retain their percentage shares. Non-metallic minerals is expected to undergo a significant reduction as the construction boom slows down. Fabricated metal products are expected to raise significantly their share. Thus, this structure and the high magnitude of value added attributed to the manufacturing sector are not independent of each other. Should the metal fabricating cluster prove non-viable, the structure and the magnitude of value added would be different.

Table VII.7 THE EXPECTED NON-OIL MANUFACTURING STRUCTURE IN SAUDI ARABIA IN THE YEAR 2000

	Sector	Share
31	Food, beverages and tobacco	11.0
32	Textiles, wearing apparel and leather industries	6.0
33	Wood and wood products including furniture	3.0
34	Paper and paper products, printing and publishing	5.0
35	Chemicals and chemical, petroleum, coal, rubber and plastic products	30.0
36	Non-metallic mineral products	9.0
37	Basic metal industries	5.5
38	Fabricated metal products, machinery and equipment	30.0
39	Other manufacturing industries	0.5

282. International comparisons are difficult to justify. Countries rarely duplicate one another's experience. Saudi Arabia is a unique economy and hardly resembles Mexico or Norway. Our adjustments reflect

our concern about the applicability of this approach. The limitations associated with transferring of economic experience across space and over time are such that even when dominant characteristics are shared by countries, other non-shared characteristics still pose difficult problems. Thus, even though Mexico and Norway have oil in common with Saudi Arabia, we felt that the similarities are limited. Using the pattern of economic growth or industrialization that includes a large sample of countries as the prototype of what could be expected to prevail in Saudi Arabia in the future would be very difficult to justify. We have, therefore, preferred not to recourse to this open approach.

283. Demand for labour in terms of different skills could be estimated using the projected levels of gross output by sector using industrial economies' norms of labour coefficients by sector. The allocation of capital over industries would be carried out using capital-output ratios by sector. Inconsistencies may arise here between the totals derived from the macro forecast and the sectoral norms. The two models are not independent of each other and should ideally be solved simultaneously. At the minimum, some consistency between the two should be preserved. Iterative procedures may be used to adjust the results of the sectoral coefficients and the macro totals.

Conclusions

284. Three models were used to generate alternative specifications of Saudi non-oil manufacturing in the future. The three models form a hierarchy with the OPEC decision model feeding into the macro-economic model. The latter generated the main variables used in forecasting the industrial structure. No interdependence among the three models was allowed. This was motivated by the desire to keep the system simple. Interdependence is expected and would have improved the results.

285. The quality of the results is not high as it depends on a number of assumptions that are restrictive and unrealistic. The alternatives derived were limited and could have been enriched by a consideration of different specifications.

286. The final results should be interpreted more in terms of what could be derived from the system of models used rather than as a forecast of what the economy will actually look like at some future date. However, a general pattern appears to be indicated. The economy could respond to domestic income elasticity and/or to the forces of comparative advantages and agglomeration. Should it respond to demand forces a structure would emerge that will reflect little change from 1972. Food, beverages and tobacco would lose a large share of its contribution to total non-oil manufacturing output whereas non-metallic minerals products would double its share. Little or no change takes place in the rest of the sectors.

287. Alternatively, responding to comparative advantage and agglomeration effects including a metal fabricating cluster, may result in substantial qualitative and quantitative changes. The structure of production that will emerge would show that the petro-chemical and metal fabricating industries are the largest contributors to the economy's output. Presently, and for the near future the economy will reflect a structure that is closer to the demand-oriented structure. But the massive public investment in the new clusters in Yanbu and Jubail, should they prove viable, are bound to re-structure the economy towards the second alternative specification.

Chapter VIII

SUMMARY AND CONCLUDING REMARKS

288. Economic activity in the Kingdom has and continues to be dominated by oil which constitutes not only the major sector and contributor to GDP, but through government expenditure of oil revenues, is also by far the single most important determinant of economic activity in other sectors as well. Saudi economic policy, however, has invariably aimed at lessening this dependence on oil by diversifying the economic base of the country.

289. The abundant supply of foreign exchange and the excess savings available for investment have reduced some of the major barriers to growth in the Kingdom. Nevertheless, development remains severely constrained by the relatively small population, scarcity of skills in the indigenous population, and hostile geography and climate. A major implication of Saudi geography and climate is that the opportunities for agricultural development are limited. This implies that industrialization is perhaps the only process through which the Kingdom can transform its non-renewable oil into a continuous productive capacity.

290. Industrialization, however, is not a random process and has never been automatic or inevitable. A host of "pre-requisites" and "pre-conditions" as well as a number of favourable activities should precede and accompany industrialization. Availability of raw materials, access to large markets, cheap energy, accumulation of capital, flexible social system, adequate supply of human skills, a core of scientific knowledge, an efficient public administration, and adequate social overhead are but a few of the "pre-conditions" for industrialization generally mentioned in the development literature. Moreover, apart from the "pre-requisites" already mentioned, industrialization entails vast increases in productivity

which only technological innovation and adaptation could bring. It is a generally held view that the industrial revolution was sustained by the application of machinery and power to textile production, by advances in the technology of iron manufacture, by the invention of the steam engine and the birth of engineering and the machine tool industry, and by the overhauling of methods in a host of other industries. It is worth noting here that industrialization was invariably composed of surges by "leading sectors" which, over long periods of time, replaced each other in economic primacy.

291. The Saudi industrialization effort is of recent vintage, and achievements fall short of their targets. Below is a summary of the present status of the manufacturing activity of the Kingdom and its expected future prospects.

292. 1. Manufacturing activity in Saudi Arabia is rather limited. It exhibits many of the characteristics of single-product export oriented developing economies. The activity is dualistic; oil employs the most efficient technology, is export oriented, has little or no links with the rest of the economy, is capital intensive and has high labour productivity. Non-oil manufacturing, on the other hand, has low labour productivity, little capital and limited export potential. In the 1970's non-oil manufacturing value added per capita was as low as that of Africa excluding South Africa.

293. 2. Saudi Arabia's comparative advantage demonstrates itself in the chemical and chemical product industries. Very high returns to labour and capital are reaped in these industries and the abundant supply of relatively cheap oil places the Saudi chemical industry in a very special and privileged position. Other industries appear more limited in growth potential on account of their domestic orientation. They are also often of inefficient size and show low labour productivity. The non-metallic mineral products industry assumes a significant position in terms of

its contribution to GDP and to absorption of labour. However, it is dominated by cement production catering to a construction boom that could not be expected to last for long. Light industry is expanding at a rapid rate. However, the objective conditions for such an expansion do not appear to be economic factors as much as cashing-in on some of the government subsidies and interest-free loans.

294. 3. The government is involved on a massive scale in developing joint ventures with multinational corporations. The future viability of these industries is not certain. But the Saudi Government appears willing to assume this risk rather than being left with a deficient and an empty industrial structure.

295. 4. The impressive developments in the oil sector have failed to provide sufficient stimulus to induce the growth of other non-oil industries. Several rigidities, inelasticities of supply and other obstacles such as high wages, fragmented markets, high transport costs, lack of water, deficient skills, heavy dependence on foreign raw materials, over-valued exchange rate (in terms of equalization of opportunity costs of production among trading partners), lack of regional cooperation among the Arab states, etc., collectively provide a formidable barrier that has in the past impeded, and may continue to impede the Kingdom's industrialization effort.

296. 5. There does not appear to be a coherent system of protection of domestic industry. Tariffs are limited in coverage and scope, quantitative restrictions are not used and protection is administered on a case by case basis.

297. 6. There are a number of institutions, primarily public, that promote, directly or indirectly, industrialization in the Kingdom. The pattern and growth of these institutions reflect a serious determination to construct an industrial environment conducive to effective industrialization.

However, there is an inadequate correspondence between industrial objectives and the institutional practices. More co-ordination and harmonization is needed among the institutions and between the institutions and policy-makers.

298. 7. A number of constraints and values define and qualify the industrial policy of the Kingdom. The government is wedded to the principles and practices of free enterprise. However, development in the Kingdom is inextricably linked with industrialization and the latter to government finance and support. A clearer view of this seeming contradiction is needed on account of the fact that for years to come, there will be no substitute for concerted government action.

299. 8. Demand oriented growth will mean very little change in the industrial structure of the Kingdom. On the other hand, supply-push growth could alter significantly the structure of production. Two major clusters are expected. A petro-chemical cluster and an urban-service oriented cluster. However, development along these two axis would polarize the economy and may leave substantial gaps in the economic base of the Kingdom. More importantly, dependence on oil would perhaps increase rather than decrease. The development of an iron-steel cluster should contribute to the invigoration and balancing of the economy.

300. Supply oriented growth carries a number of risks, particularly in so far as other countries in the region are undertaking similar developments. Regional co-ordination and export promotion should play central roles in the planning and implementation of cluster-oriented industrialization.

301. 9. Dependence on the foreign sector in the future is likely to increase rather than decrease. For a considerable period of time Saudi Arabia will be importing goods and services, particularly capital goods.

The rising incomes of Saudi nationals are expected to increase their consumption of imported goods. Furthermore, the economy would rely in an increasing manner on foreign labour and the Saudis will most likely become one of the major foreign investors. If the activities of the foreign sector are not co-ordinated with the industrialization effort, it may very well frustrate the development of a viable domestic industrial sector. Imports should be examined in terms of their substitutability with local products, foreign investment should be evaluated against somestic opportunities and foreign labour allocated according to a scale of national priority. As things stand now, the foreign sector in some major respects is outside the authority of the planners of the Ministry of Planning.

302. 10. Finally, the nature of the planning process in the Kingdom is such that a well co-ordinated system of resource allocation cannot be expected. Each individual ministry has its own political base, and it is difficult for outside institutions or organizations to change their plans. Furthermore, as long as Saudi planning is still after conceiving a sufficient number of projects and programmes to exhaust a surplus of government funds, the Ministry of Planning is relegated the task of adding-up the shopping-list with little or no power or need to synthesize, prioritize and harmonize the activities of the separate parts.

303. Industrialization is the outcome of deliberate action and the outcome of a strategy. As such planning is an integral part of the industrialization process. Saudi planning should be rehabilitated in such a manner that it is possible to formulate and implement the industrial strategy of the future.

Appendix A

The structure of the model used in this study

The model has three basic components: an OPEC oil decision system, a macro-econometric model and an industry specific model. The three components form a hierarchy. The OPEC model generates data considered exogenous to the macro-econometric model and the latter generates exogenous data to the industry model.

The main objective of the formulation of the model is to predict and simulate the future outlook of the Saudi manufacturing sector. The exercise is to be extended until the year 2000. Forecasting is a hazardous exercise even when it is restricted to the near future. It is all the more difficult and vulnerable when extended for the distant future. Given that in an economy such as that of Saudi Arabia, the past is a poor indicator of the future, the forecasting exercise is stripped out of an important foundation. The approach adopted is that of simulation, the main consideration being the ability to consider several alternatives in a consistent and in an all-embracing manner.

The OPEC Decision Model

This model shares the same methodology framework with the original paper by Hotelling (1931) and subsequent refinements of the theory of exhaustible resources by Gordon (1967), Smith (1968) and Solow (1974). It is similar in many respects to recent OPEC decision models like that of Blitzer et.al. (1975), Kalymon (1975), Kyle and Moshowitz (1975), Uzzati (1976), Marshalla (1977), Jideonwo and Kubursi (1978).

The structure of the model includes an objective function on the basis of which OPEC seeks to maximize its discounted stream of net benefits

$$(1) \quad \text{Max } J(t) = \int_0^T \left[R(q) - C(q,x)\right] e^{-rt} dt$$

Where $R(q)$ is the revenue function which depends on the quantity of oil extracted per period (q). $C(q,x)$ is the cost function which depends not only on the quantity of oil extracted per period, but also on the cumulative extraction at time t $\left[x(t)\right]$. It is assumed that the cheapest oil is extracted first and the formulation takes account of the increasing cost of additional extractions.

Two constraints are added to the maximization problem which incorporate the initial and terminal conditions:

$$(2) \quad X(o) = 0 \text{ and } X(T) = \bar{X}$$

Where T is variable and represents the terminal period and $\bar{X}$ represents total available reserves.

The analysis of the optimal rate of extraction is made more explicit by specifying particular cost and demand functions that statisfy a number of mathematical and statistical properties.

Thus, the revenue function is specified as follows:

$$(3) \quad R\left[q(t)\right] = P(q(t))q(t) = \left[\alpha - Bq(t)\right] q(t)$$

Where the values of α and B are chosen such as to reflect the long-term elasticity of the world demand for OPEC's oil specified at (-.33), while at the same time generating the equilibrium price per barrel that ruled in 1975.

Similarly, we specify the following cost function:

$$(4) \quad C = eq + \frac{h}{2} q^2 + hxq + \frac{h}{2} x^2$$

The values of the basic parameters are taken from recent studies, including Kalymon (1975), and Marshalla (1977), mainly on the basis of the extent to which they reflect the current situation in the world oil market and the Arabian Gulf production costs. The cost parameters e and h are such that the marginal cost per barrel increases to 22 cents after 10 billion barrels and further to $ 3.62 after 500 billion barrels have been produced.

Substituting (3) and (4) in the equation of motion of the model we obtain:

$$(5) \quad q'(t) = rq(t) + \frac{h(1+r)}{2B + h} x(t) - \frac{r(\alpha - e)}{2B + h}$$

Using $q(t) = x'(t)$, (5) translates into

$$(6) \quad x''(t) - r\,x'(t) - \frac{h(1+r)}{2B + h} x(t) = - \frac{r(\alpha - e)}{2B + h}$$

The general solution of (6) takes the following form:

$$(7) \quad X(t) = A_1 e^{\lambda_1 t} + A_2 e^{\lambda_2 t} + \frac{r(\alpha - e)}{h(1 + r)}$$

The definite values of A_1 and A_2 depend, of course, on the initial conditions. Equation (7) describes the optimum profile of cumulative extraction over time, it is then used to determine $q(t)$, the optimum extraction rate, per period.

The share of the Kingdom in total OPEC production will be determined using a number of assumptions. One of which is the past production record. Other specifications assure that the Kingdom operates as the residual supplier, etc. Whatever the share of the Kingdom that is determined in this process, it is then used in the general model below as a constraint on the production of an revenue from oil.

The macroeconometric model

The most distinctive feature of this model is the disaggregated supply side with five broad sectors; oil, agriculture, manufacturing, infrastructure and services.

Output in this system is determined by supply components. There is no definitional relationship which connects demand with gross domestic product. Employment demand is determined within the model, however, supply is constrained exogenously. The model is a revised version of Al Bashir's model of the Kingdom[1]. Although the Al Bashir model suffers from a number of deficiencies, it was felt that with the adjustments introduced and for the purposes at hand, it is adequate[2]. The structure of the model is as follows:

$$Y_{MR} = -262.869 + 0.156M + 0.161\ C_{-1}$$

$$Y_{TC} = 459.3\ 0 + 5.826\ L_{TC} + 0.839\ I_{TC-1}$$

$$Y_{S} = -424.645 + 0.399\ C$$

$$Y_{A} = 1.055\ Y_{A-1}$$

$$Y_{C} = 432.318 + 1.047\ L_{C} + 0.098\ K_{CS}$$

$$Y_{MN} = 290.580 + 1.413\ L_{MN} + 0.042\ K_{MN}$$

$$M = -392.573 + 0.243 + 0.396\ M_{-1}$$

$$C = 522.676 + 0.321\ GNP + 0.350\ C_{-1}$$

$$GR = -409.925 + 0.372\ Y_{o} + 0.512\ GR_{-1}$$

$$I_{TC} = -170.745 + 0.219\ GAI_{TC} + 0.576\ Y_{TC-1}$$

$$GAI_{TC} = 193.531 + 0.157GR$$

$$I_{CS} = -421.760 + 0.202\ GAI_{CS} + 1.590\ Y_{C-1}$$

1/ Faisal Al-Bashir, A Structural Econometric Model for Saudi Arabia, 1960-1970

2/ First simulations with Al-Bashir's model resulted in negative values for several key variables such consumption, several adjustments were introduced and these are explained in the Appendix B.

$GAI_{CS} = -325.232 + .246\ G_R$

$I_{MN} = -6.162 + .718\ GAI_{MN} + .313\ Y_{MN-1}$

$GAI_{TC} = 7.972 + .069\ GAI_{CS}$

$X_t = X_o\ (1+r)^t$

$FA = FA_{-1} + FF$

$FF = X-M - NFP$

$NFP = \overline{NFP}$

$GDP = Y_A + Y_{WR} + Y_{MN} + Y_S + Y_o + Y_C + Y_{TC}$

$GNP = GDP - NFP$

$K_{CS} = K_{CS-1} + I_{CS}\ (1-.05)$

$K_{MN} = K_{MN-1} + I_{MN}\ (1-.10)$

where:

Y_{WR} = Value added in whole-sale and retail trade.

Y_{TC} = Value added in transport and communication

Y_S = Value added in services

Y_A = Value added in agriculture

Y_C = Value added in construction.

Y_{MN} = Value added in manufacturing

Y_o = Value added in oil

M = Total imports

C = Consumption

GR = Government revenue

I_{TC} = Gross investment in transport and communication

GAI_{TC} = Government budgetary allocation to transport and communication

I_{CS} = Gross investment in construction

I_{MN} = Gross investment in manufacturing

GAI_{MN} = Government budgetary allocations to manufacturing

X = Total exports

FA = Foreign assets

FF = Surplus on current account

NFP = Net factor payments abroad

GDP = Gross domestic products

GNP = Gross national product

Y_P = Private income

D = Depreciation

K_{CS} = Capital stock in construction

K_{MN} = Capital stock in manufacturing

L_A = Labour employed in agriculture

L_{MN} = Labour employed in manufacturing

L_C = Labour employed in construction

L_{TC} = Labour employed in transport and communication.

The model structural form can be expressed in matrix-vector notation as follows:-

$$H\ Y = D\ Y_{-1} + F\ X + K$$

or if the inverse H^{-1} exists

$$Y = A\ Y{-}1 + B\ X + C$$

where $A = H^{-1} D$, $B = H^{-1} F$ and $C = H^{-1} K$

The vector Y represents the endogenous variables

Y_{-1} is the vector of endogenous variables lagged one year

X is a vector of exogenous variables

K is a vector of constants

For forecasting purposes, the system may be solved as follows: Let us first delete the vector of constants to simplify the calculations. First, we have:

$$Y + A\,Y_{-1} + B\,X$$

then substituting for Y_{-1}, we obtain

$$Y = A\,A\,Y_{-2} + B\,X_{-1} + B\,X$$

or,

$$Y = A^2\,Y_{-2} + ABX_{-1} + B\,X$$

ultimately, we obtain the following expression:

$$Y_t = A^s\,Y_{t-s} + \sum_{k=0}^{s-1} A^k\,B\,X_{t-k}$$

Expressed in forward time,

$$Y_{t+s} = A^s Y_t + \sum_{k=0}^{s-1} A^k\,B\,X_{t+k}$$

If A^s approaches the zero matrix as s grows larger, the system can be expressed as:

$$Y_{t+s} = \left[I - A\right]^{-1} B\,X_t$$

The industry model

Starting from the simple definitional equation

$$S_i = D_i + X_i - M_i$$

where

S_i = is the local supply of industry i products
D_i = is the local demand for industry i products
X_i = exports of industry i products
M_i = imports of industry i products

But

$$D_i = f(GDP, time)$$

and

$$M_i = (M, time)$$

$$X_i = \bar{X}_i \text{ exogenous}$$

Given the GDP, M and perhaps other variables from the macroeconometric model, it will be an easy task to forecast S_i. Furthermore, given S_i, it is easy to forecast capital requirements using capital-output ratios, and labour and skill requirements using labour and skill coefficients. The lack of available data on D_i, X_i and M_i on time series basis forced the use of a less sophisticated technique. Resort was made to long-term Engel Curves estimated using Houthakker-Taylor demand functions for the US economy. The income elasticities Θ_i was used to derive S_i in the year 2000 in accordance with the following formula:

$$\frac{\dfrac{S_i(1970)}{S_{i(T)} - S_i(1970)}}{\dfrac{GDP_{(1970)}}{GDP_{(T)} - GDP_{(1970)}}} = \Theta_i$$

where Θ_i represents the long-run income elasticity of commodity i. Surely $S_{i(T)}$ is the only unknown in the equation above and is easily determined by it.

The qualitative model

Both location and development theory support the view that attractiveness of an economy and the pull it exercises upon industries

seeking suitable locations are a function not only of geographical and socio-economic factors taken in isolation, but of a complex interplay of external economies characteristic of a prior industrial agglomeration. Accordingly, a group of industries complementary to one another, characteristic of an industrial complex, forms the most propitious background for initiating self-supporting growth processes. Under modern conditions, the strength of backward and forward inter-industry links generates economies of scale and agglomeration which are the basis of growth and development.

The introduction of new industries progressively produces linkages and reinforces the indirect impact of new activities until a point is reached when a group of related industries linked by flows of goods and services generate multiplier effects that are significantly stronger than those that exist in the absence of the new industries signalling a qualitative as well as a quantitative change. It is, therefore, essential to identify from, among all the sectors of which the economy is comprised, those forming an industrial cluster with strong internal and relatively weak external flows. More specifically, existing industrial complexes have to be identified in order to study patterns of clusters existing under various circumstances. There is also the question of urban agglomeration which represents the various ancilliary links with suppliers of technical, commercial, or financial services. These links often take precedence over links based on flows of raw materials, basic production ingredients or even the flow of outputs.

The discussion above of clusters is general. Technically two industries, r and s, may be operationally defined as belonging to a cluster if they are connected by strong flows of goods or services. Four coefficients may describe this type of relationship:

$$a_{sr} = \frac{Y_{sr}}{X_r} \quad ; \quad a_{rs} = \frac{X_{rs}}{X_s} \quad ; \quad b_{sr} = \frac{X_{sr}}{X_s} \quad ; \quad b_{rs} = \frac{X_{rs}}{X_r}$$

where X_{ij} is the flow of output of industry i to industry j and X_j is the output of industry j.

An "a" coefficient exceeding a certain designated "cut-off" point ($a_{sr} \geq b^*$) indicates a dependent industry, while a large "b" coefficient ($b_{sr} \geq b^*$) indicates a complementary industry.

The indirect linkages among industry may prove to be more important than the direct linkages. Two industries, r and s, may be members of an industrial complex in the absence of direct links. For example, an oil refinery and a pharmaceutical plant may both belong to a petrochemical complex even though they may not trade with one another. More specifically, two industries, s and r, may be considered to be members of a complex if their trading patterns with suppliers and purchasers involve the same set of industries. This type of link is revealed by correlation analysis.[1/]

Four coefficients of correlation are often identified as indices of cluster formation between two industries.

$$R(a_{is}, a_{ir}),\ R(b_{si}, b_{ri}),\ R(a_{is}, b_{ri}),\ R(b_{si}, a_{ir})$$

A high $R(a_{is}, a_{ir})$ coefficient indicates that the two industries, s and r, have similar input structures or draw their supplies from the same producers.

A high $R(b_{si}, b_{ri})$ coefficient indicates that the two industries supply their products to the same set of industries.

A high (a_{is}, b_{ri}) coefficient implies that the suppliers of s industry are users of the products of r. Finally, a high $R(b_{si}, a_{ir})$ coefficient signifies a reverse relationship between s and r, namely the users of products of s are the suppliers of r.

1/ S. Czamanski. "Some Empirical Evidence of the Stength of Linkages Between Groups of Related Industries in Urban-Regional Complexes." Papers, Regional Science Association, Vol. 27, 1971, pp. 137-150.

The formal model for studying inter-industry linkages as developed by Czamanski involves the following steps:

(1) A set of four zero-order correlation coefficients of the form

$R(a_{is}, a_{ir})$, $R(b_{si}, b_{ri})$, $R(a_{is}, b_{ri})$, $R(b_{si}, a_{ir})$ is derived for all possible pairs of industries included in the inter-industry flow table.

(2) A symmetric inter-correlation matrix Z is set up by selecting the highest of the four coefficients.

$$R_{rs} = R_{sr} = \left[\text{Max } R(a_{is}, a_{ir}), R(b_{si}, b_{ri}), R(a_{is}, b_{ri}), R(b_{si}, a_{ir})\right]$$

The entries of Z help to identify affinities between pairs of industries based on their links with a sub-group forming a hypothetical complex.

Next a covariance matrix is formed.

$$K = E\left[(R-\bar{R})\,(R-\bar{R})^{t}\right]$$

The coveriance matrix is then used to generate an n x n correlation matrix Z.

$$Z = D\left(\frac{1}{\delta i}\right)\ KD\left(\frac{1}{\delta i}\right)$$

Where D = diagonal matrix of standard deviations of the variates (R,s).

(3) In order to eliminate similarities based on hgih import and export contents, all industries are removed from the matrix for which both

$$\frac{m_i}{x_i} \geq \bar{\sigma}^{*} \quad ; \text{ and } \frac{e_i}{x_i} \geq \bar{B}^{*}$$

when m_i is total imports of industry i; e_i = total exports of industry i and $\bar{x}^*$, $\bar{B}$ are constants determined by an iterative process.

(4) In order to identify, from the set of all industries, the sub-group belonging to a complex, an iterative process is applied. Here all industries having a zero column or a zero row in the Z matrix are removed.

(5) The relative strength of the links binding the remaining industries together is determined with the help of latent (eigen values) roots of the Z matrix, computed as follows:

$$(Zx - \lambda Ix) = 0$$
$$(Z - \lambda I)x = 0$$
$$|Z - \lambda I| = 0$$

where x = eigen vector or characteristics vector. λ = eigen value or characteristic root.

The ratios of the characteristic roots to the trace (the sum of the diagonal entries of the matrix) of Z define the index of association.

$$C_i = \frac{\lambda i}{trZ} \times 100$$

The $C_{i(s)}$ provide an aggregate measure of the strength of the ties connecting the remaining industries in the R matrix in a large e_1 indicating the existence of an industrial complex, and a fairly large C_1 and C_2 point towards the existence of two identifiable complexes.

The characteristic roots $\lambda i(s)$ are interpretable as variances along a particular dimension. They determine the degree of association (affinity) of industries forming a sub-system. This follows the normalization of the eigen vectors $X_i^t X_i = 1$.

The above model has been tested by Czamonski by applying it to the input-output tables of the United States, Philadelphia SMSA, Washington State, West Virginia and Nova Scotia and by us to the Western Provinces of Canada and Texas. The results of these applications will be used to designate the future outlook of the Saudi economy in the year 2000.

Appendix B

The Adjustments Introduced to Al Bashir's Model

Several adjustments were introduced to the Al Bashir's model to drive the macro-economic simulation results.

First, the investment in construction was re-specified.

$ICS = 421.76 + 0.202\ GAI_{CS} + 1.59\ Y_{c-1}$

$R^2 = 0.996$

Second, the consumption equation used is different from that used by Al Bashir. It is nonetheless estimated by him. The import equation is also one that is estimated by Al Bashir but not used by him. These adjustments were necessitated by the attempt to remove private income Y_p from the equations as it was identified to be responsible for some negative values of forecasted variables.

Third, Al Bashir does not close his model with respect to foreign trade and flow of capital. It was felt that it is necessary to generate the values of foreign assets and the corresponding net factor payments.

Fourth, the variables related to the capital stock in construction and manufacturing were inappropriately treated by Al-Bashir as exogenous variables. These were incorporated in as endogenous variables.

Fifth, the equation explaining value added in agriculture was changed to reflect growth in this sector even though labour in this sector may not grow.

Table B 1 **SAUDI ARABIA'S OIL REVENUE UNDER DIFFERENT SPECIFICATIONS: THE VALUES OF THE PARAMETERS USED**

	Demand parametres		Cost parametres		Discount rate	Growth rate of world oil demand
	α	B	h	c	r	g
Case 1	19.912	.667	.005	.120	.040	.050
Case 2	19.912	.667	.005	.120	.040	.055
Case 3	19.912	.667	.005	.120	.040	.060
Case 4	19.912	.667	.005	.120	.045	.045
Case 5	19.912	.667	.005	.120	.050	.050
Case 6	19.912	.667	.005	.120	.055	.055
Case 7	19.912	.667	.005	.120	.050	.065
Case 8	19.912	.667	.005	.120	.050	.055
Case 9	19.912	.667	.005	.120	.050	.060
Case 10	19.912	.667	.005	.120	.060	.060

Source: J. Jideonow and A. Kubursi "Optimal Utilization of Oil in Economic Development" (Unpublished, 1978).

Table B 2 THE LONG-RUN INCOME ELASTICITY COEFFICIENTS ADOPTED FROM HOUTHAKKER-TAYLOR

Sector	Coefficient
1) Food, beverages and tobacco	.58
2) Textiles, wearing apparel and leather industries	1.01
3) Wood and wood products	.92
4) Paper and paper products; printing and publishing	1.21
5) Chemicals and chemical, petroleum, coal, rubber and plastic products	1.76
6) Non-metallic products	3.49*
7) Fabricated metals	1.65**

Source: Phillips. Consumer Expenditure Systems: New York, Addison. Wellsley, 1977, p. 195.

* This value was reduced to 3 in 1990, to 2.5 in 1995 and to 2 in 2000.

** The corresponding values for basic metals and other manufacturing were derived from the fabricated metals coefficient.

Table B3 GROSS OUTPUT BY SECTOR, MEXICO AND NORWAY 1975
(percentage shares)

Sector	Mexico	Norway
31 Food, beverages and tobacco	27.1	20.4
32 Textiles, wearing apparel and leather industries	5.5	3.5
33 Wood and wood products including furniture	0.5	7.7
34 Paper and paper products, printing and publishing	5.4	11.9
35 Chemicals and chemical, petroleu, coal, rubber, and plastic products	16.6	8.4
36 Non-metallic mineral products	5.6	3.1
37 Basic metal industries	18.2	11.3
38 Fabricated metal products, machinery and equipment	21.3	33.2

Source: United Nations - UNIDO. Yearbook of Industrial Statistics, 1976.

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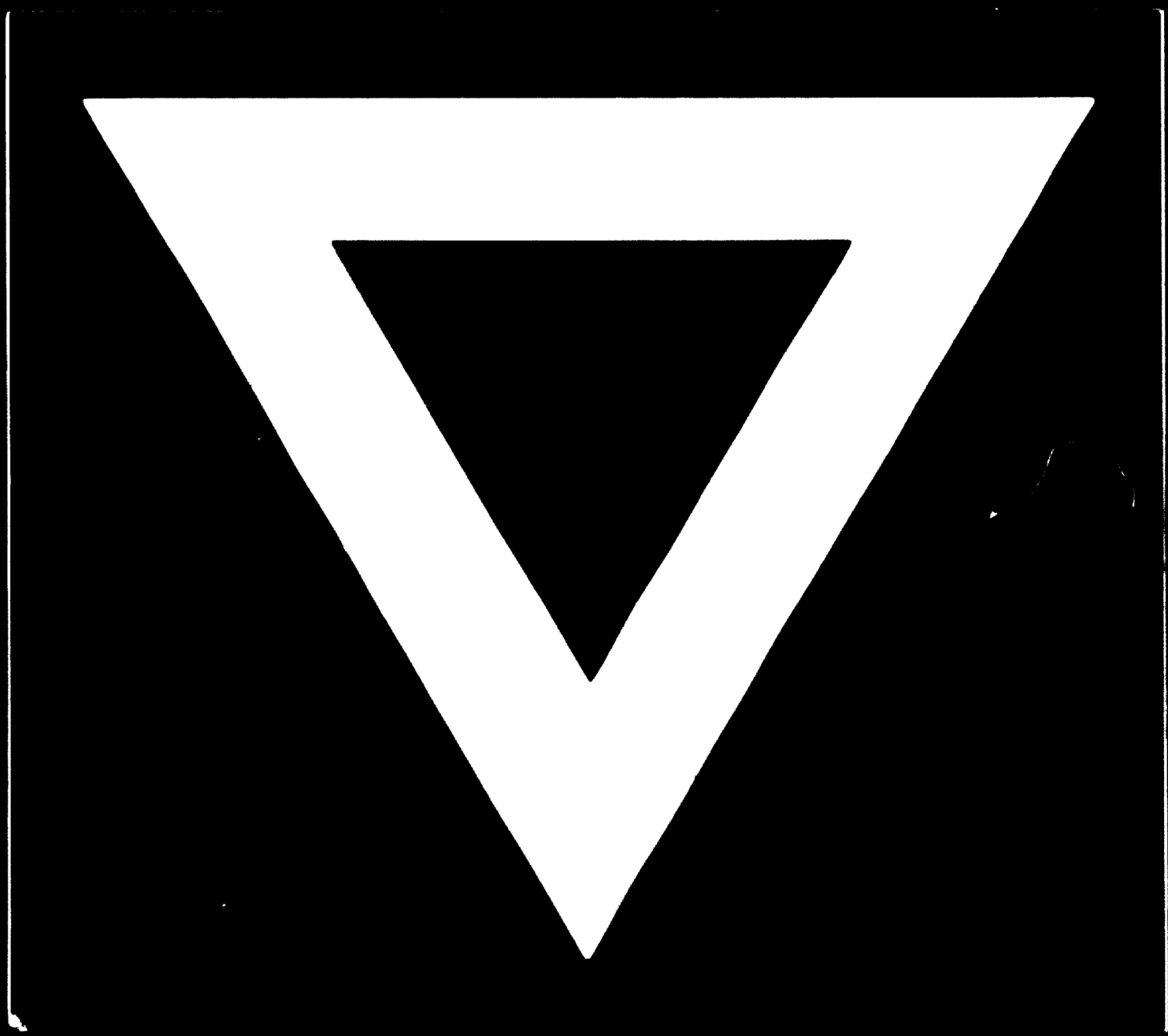

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