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# MANPOWER PROBLEMS IN A CAPITAL-RICH COUNTRY: THE CASE OF SAUDI ARABIA

Robert E. Looney

## Introduction

While oil revenues have provided the key to development in Saudi Arabia, finance alone is no guarantee of economic success. Important requirements for development are labour, management skills, technology, land and above all, organization. Organization is vital because of the scale and pace of development in the Kingdom.

Given the small entrepreneurial class that existed at the beginning of the 1970s, economic planning has been an essential feature of the Government's economic policies, particularly following the oil price increases of 1973/1974. Through the planned expansion of the basic infrastructure, the Government hopes to stimulate sufficient private sector investment to eventually diversify the economy and make it less dependent on developments in the international oil market.

The first two five-year plans (1970-1980)<sup>1/</sup> concentrated almost exclusively on basic infrastructure to provide the foundations on which industry could be established. Tremendous progress was made in the construction of roads, ports and airports and in the expansion of telecommunications and power generation. At the same time, social welfare facilities such as hospitals, clinics and schools were established throughout the country. These activities had a major impact on the construction sector, while the heavy reliance on imports and foreign labour stimulated commercial growth.

In the Third Plan (1980-1985) the emphasis was changed. Particular emphasis was laid on the development of hydrocarbons and the manufacturing industry, and concern was voiced about the increasing dependence on non-Saudi Arabian labour. Massive growth in the capital stock led to an emphasis on operations and maintenance, causing a switch from capital to recurrent expenditures.

The completion of the Third Plan in early 1985, and the initiation of the more modest Fourth Plan following the decline in oil revenues and the weakening of the solidarity of the Organization of Petroleum Exporting Countries (OPEC), indicate that Saudi Arabia may have reached a watershed in its development efforts. In particular, the country may have to reassess the assumptions concerning manpower usage and productivity that are implicit in its development strategy.

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<sup>1/</sup> For a discussion of the evolution of Saudi Arabia's planning efforts, see Looney and Frederiksen 1985.

In order to gain an insight into possible problems in the Fourth Plan, this paper will assess several aspects of the manpower situation that were inherent in the Third Plan.

### Overview of the Third Plan

The Third Plan departed from the preceding plans (Looney 1982) in several areas. The First and Second Plans targeted high growth rates in all sectors; both had a policy of allowing the relatively free importation of foreign labour to satisfy manpower requirements. The Third Plan was much more selective, opting for high growth in those areas which Saudi Arabian planners felt had demonstrated proven potential. Clearly implied in the Plan was the country's major long-term objective: to contain and eventually to reduce the size of the foreign labour force.

In contrast to the emphasis placed by the Second Plan on infrastructure development designed to increase the absorptive capacity of the economy, the Third Plan concentrated on increasing the efficient utilization of the labour force - both domestic and foreign - in hydrocarbons (usually highly capital-intensive), and in other manufacturing industries (especially in the agricultural and mining sector). As in the past, the overall goal was to diversify the economic base of the nation.

In retrospect, it is clear that the development of the Plan largely revolved around the achievement of rapid increases in productivity (see table 1). If the Second Plan had not achieved the productivity increases that it did, labour force requirements would probably have been more than twice as great as they actually were. Similarly, the increase in productivity anticipated in the Third Plan would have required 550,000 fewer workers, a significant figure given the projected total of 155,000 required for the period. As the participation rate of Saudi Arabian nationals in the labour force was declining slightly, the bulk of the workers hired in the absence of increased productivity would have had to have been foreign (El Mallakh and El Mallakh 1982). It should be noted that the decline in Saudi Arabian participation was a direct result of the expansion of the Kingdom's education and training programmes.

Capital and skill-intensive developments within each of the specific sectors were assumed to be the driving force behind productivity during the Third Plan period. High productivity projects, financed with the aid of the Saudi Industrial Development Fund, were to provide the impetus through which manufacturing would achieve the targeted increases in productivity.

TABLE 1. GROWTH TARGETS FOR THE NON-OIL ECONOMY,  
1980-1985  
(Percentage annual growth)

	<u>Employment</u>	<u>GDP</u>	<u>Productivity</u>
<u>Producing sectors</u>			
Agriculture	-2.46	5.35	8.0
Other mining	6.07	9.78	3.5
Other manufacturing	9.52	18.83	8.5
Utilities	8.33	29.46	19.5
Construction	-5.77	-2.48	3.5
<u>Subtotal services</u>	-1.48	2.18	3.7
Trade	1.80	8.42	6.5
Transport	5.05	12.93	7.5
Finance	5.18	7.29	2.0
Other services	0.94	2.95	2.0
Government	5.57	7.16	1.5
<u>Subtotal</u>	3.06	8.84	5.6
Non-oil economy	1.16	6.19	5.0

Source: Saudi Arabia: The Development Dilemma. Economist Intelligence Unit, Special Report No. 116,.

#### Macro-economic Relationships

In order to evaluate the consistency and consequences of the provisions of the Third Plan for manpower and manpower-related concerns, a macro-economic model capable of simulating the economy under different sets of constraints and objectives was developed. The model was designed to examine the economy from the

perspective of the resource availabilities and requirements associated with alternative growth scenarios during the Third Plan, all within the ultimate framework of the optimal control programme.1/ A main feature of the model was its ability to determine the most efficient growth path available to the authorities during the early 1980s to enable end targets to be reached. The model forecasts the non-oil income growth rate, the inflation rate and the implications of the size of the foreign work-force on alternative spending rates.2/ The main features of the model include the following:3/

1. Seventeen accounting equations for real national income and three nominal monetary relationships;
2. A distinction between oil income and non-oil gross domestic product (GDP);
3. A production function (Cobb-Douglas) that links non-oil income to capital, labour and productivity;
4. The influence of government expenditure on private consumption, which probably reflects public-private competition for resources, i.e., the crowding out of public consumption;
5. Numerous structural shift dummy variables that depict the impact on oil revenues following the 1973/1974 oil price increases;
6. A casual monetary link between nominal government expenditure, reserve money, the money supply and inflation;
7. The influence of world inflation on the country's terms of trade;
8. A series of exogenous variables: oil prices and production rates, which depict the slow-down in world oil demand.

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1/ The concept of optimal control is fairly straightforward, involving the optimization of a certain objective given a certain loss function such as the rate of inflation. See, for example, Chow 1975. For an example of its application to an oil-based economy, see Looney 1985.

2/ The econometric model used to depict the major economic forces assumed to be at work in the economy during the Third Plan period was estimated by a two-stage-least-squares estimation method with annual data for the period 1960-1979. The data were obtained from the Saudi Arabian Monetary Agency, Annual Report (various issues).

3/ Copies of the equations of the model, together with its statistical specifications and underlying data base, can be obtained from the author.

## Simulation Methodology

Utilizing the macro-economic model presented above, the optimum control simulations were designed to test the consistency of the objectives of the Third Five-year Plan. Real government investment was selected as the instrument variable (the main policy variable at the disposal of the authorities) in each of the simulations. This was based on the assumption that the Saudi Arabian authorities were likely to have more control over capital expenditure than over current expenditure (salaries, etc.).

For the purposes of simulation, the major socio-economic objectives of the Third Plan were classified as follows:

1. Growth objective: the real non-oil gross domestic product was to increase at a minimum acceptable rate of 6.19 per cent per annum during the period 1980-1985;

2. Social objective: the labour force was to increase at a maximum of 1.6 per cent per annum, reflecting the priority of the gradual reduction of the country's dependence on foreign workers;

3. Stability of the absorptive capacity objective: operationally specified as a rate of inflation of under 10 per cent, and preferably in the range of 7 to 8 per cent;

4. Ideological objective: the gradual replacement of government involvement through the participation of the private sector in an essentially free market economy, wherein the share of private sector activity relative to government activity would increase fairly rapidly, particularly in view of the completion of many of the major government infrastructure projects.

With regard to the last point, it should be noted that the actual target of private to government involvement in the economy has never been publicly articulated by the Saudi Arabian authorities. For the purposes of simulation, however, it seemed appropriate to set as a target the rough balance between private and government expenditure which existed prior to the 1973 oil boom, that is, a ratio of about one to one (compared with the 1980 ratio of private to government expenditure of 0.66).

## Simulation Results

The first set of simulations were based on the assumption that the Saudi Arabian authorities were determined to gradually reduce the foreign work force throughout the Third Plan period; that is, the growth of the labour force was to be held to an absolute maximum of 1.16 per cent per annum.

The simulated growth paths (see table 2) illustrate several fundamental trade-offs that constrained Saudi Arabian policy makers throughout the Third Plan, and which may continue to do so well into the period of the Fourth Plan (1985-1990):

1. It is clear that strategies for high growth (6.19 per cent or more per annum) in real non-oil GDP, together with the objectives of price stability to increase private sector participation in the economy, were incompatible with a significant reduction in the foreign work-force;

2. Real income growth in the target range of 6.19 per cent per annum would probably be difficult to sustain without incurring double digit inflation (see paths I, II and VI of table 2);

3. A significant increase in the relative share of private sector expenditure could take place only at considerable cost in terms of reduced overall growth in GDP (see paths III and IV);

4. Similarly, inflation could be maintained at moderate rates (5 per cent and 10 per cent per annum) only at the expense of a significant reduction in real income growth (see paths III and IV);

5. The best compromise among policy objectives (assuming each has more or less equal priority) appears to be one of moderate growth with non-oil income expansion in the 5 per cent range, under conditions of minimum inflation (see path V of table 2).

It should be noted that if path V had been followed, such a strategy would not only have assured an increase in sustained real income, but would also have allowed price stability to be maintained while meeting objectives regarding the foreign labour force. At the same time, there would have been a significant increase in the relative participation of the private sector in the economy, with an increase in the ratio of private to government expenditure from 0.66 in 1980 to 0.91 by 1985.

From the perspective of the early 1980s, these simulations could be considered to be either encouraging or discouraging, depending on the point of view taken. On the one hand, without any fundamental structural change in the economy (and given the unprecedented rates of increase in labour productivity), from the beginning the Kingdom was quite unlikely to achieve its major development objectives (in the absence of any major changes in oil markets). On the other hand, the picture could have changed fairly drastically if the authorities had relaxed their policy on foreign workers. Again, from the perspective of 1980, this latter hypothesis was tested assuming:

1. Fixed growth targets (see table 3);
2. Inflationary ceilings (see table 4);
3. Relative rates of private sector expansion were given priority (see table 5).

TABLE 2. SAUDI ARABIA: ALTERNATIVE GROWTH STRATEGIES UNDER  
LABOUR FORCE CONSTRAINTS, 1981-1985  
(Average annual growth rates)

Growth strategy	I	II	III	IV	V	VI
Non-oil GDP	7.8	6.2	1.0	1.3	5.0	6.2
Private consumption	5.4	9.2	11.3	11.8	13.9	12.6
Private investment	4.1	4.9	2.4	2.4	4.0	5.1
Private expenditure	5.1	11.1	9.4	9.8	11.2	10.9
Government investment	14.1	4.7	-4.6	-6.4	-1.3	6.7
Government consumption	11.9	9.2	1.7	1.1	6.9	9.8
Government expenditure	12.8	7.4	-0.7	-1.7	3.8	8.6
Non-oil deflator	10.1	13.2	5.1	5.0	11.8	13.5
Ratio of private/government expenditure (1985)	0.44	0.74	1.00	1.00	0.91	0.69

Source: Figures calculated by the author.

Note: The average annual growth of the labour force has been held at 1.16 per cent in all of the strategies.

Growth strategy assumptions:

- I High growth with price stability - non-oil gross domestic product deflator maximum is equal to 10 per cent per annum; maximum rate of increase in non-oil GDP.
- II Third plan target growth under minimum inflation conditions - target growth in non-oil GDP equal to 6.19 per cent; minimize inflation.
- III High private sector participation with growth - ratio of private to government expenditure was equal to one by 1985; maximum rate of growth.
- IV High private sector participation with price stability - ratio of private to government expenditure was equal to one by 1985; minimize inflation.
- V Moderate growth-high stability plan - target rate of non-oil GDP is equal to 5.0; minimize inflation.
- VI Third plan growth target with maximum private sector participation - non-oil GDP growth is equal to 6.19 per cent per annum; maximize private/government expenditure ratio.



TABLE 3. SAUDI ARABIA: MINIMUM PATTERNS OF INFLATION IN ALTERNATIVE GROWTH PATHS, 1981-1985  
(Average annual growth rates)

	Non-oil gross domestic product					Non-oil gross domestic product				
	growth target 10.0					growth target 8.0				
	Average of annual rate of increase in labour force					Average of annual rate of increase in labour force				
	1.16	2.0	3.0	4.0	5.0	1.16	2.0	3.0	4.0	5.0
Non-oil GDP	10.0	10.0	10.0	10.0	10.0	8.1	8.0	8.0	8.9	8.0
Private consumption	13.6	13.0	11.8	13.4	14.2	11.6	13.7	12.4	14.4	13.5
Private investment	6.5	6.5	6.6	6.5	6.7	5.5	5.5	5.6	6.5	5.7
Private expenditure	12.1	11.5	10.6	11.8	12.5	10.2	11.9	10.8	12.6	11.7
Government investment	11.7	12.4	13.9	10.9	9.7	10.9	7.0	9.4	8.9	5.9
Government consumption	14.9	14.6	14.2	13.0	12.3	12.4	11.0	11.0	11.7	9.0
Government expenditure	13.7	13.8	14.1	12.2	11.3	11.8	9.4	10.4	10.6	7.7
Non-oil deflator	18.9	18.0	16.5	16.2	15.8	15.3	15.8	14.3	16.1	11.9
Ratio of private/government expenditure (1985)	0.58	0.56	0.53	0.61	0.66	0.58	0.70	0.64	0.68	0.75
	Non-oil gross domestic product					Non-oil gross domestic product				
	growth target 6.19					growth target 4.0				
	Average of annual rate of increase in labour force					Average of annual rate of increase in labour force				
	6.2	6.2	6.2	6.8	7.9	3.4	3.9	4.5	5.2	5.8
Non-oil GDP	12.9	12.2	16.4	13.4	12.7	11.0	11.5	12.0	12.5	13.0
Private consumption	4.8	4.7	4.6	4.8	5.6	3.4	3.6	4.0	4.3	5.6
Private investment	11.2	10.5	13.9	11.5	11.1	8.4	9.7	10.2	10.7	11.1
Government investment	4.7	5.4	-6.3	4.4	9.1	2.0	2.0	2.0	2.0	2.0
Government consumption	9.2	8.8	6.5	8.1	10.1	5.6	5.6	5.6	5.6	5.6
Government expenditure	7.4	7.5	2.0	6.8	9.7	4.2	4.2	4.2	4.2	4.2
Non-oil deflator	13.2	11.6	13.1	12.1	12.9	8.2	8.3	8.4	8.5	8.7
Ratio of private/government expenditure (1985)	0.74	0.71	1.09	0.77	0.66	0.79	0.81	0.82	0.84	0.86

Source: Figures calculated by the author.

With the expansion of the labour force from the Third Plan target rate of 1.16 per annum to 5.0 per cent per annum, it would appear (see table 3) that:

1. Some inflationary pressures could be reduced by the greater infusion or retention of foreign workers than was originally planned;
2. With inflation held at about 8 per cent and the labour force increasing in the range of 4-5 per cent, real growth in the region of about 6 per cent could be achieved, together with a gradual increase in the relative share of private sector participation;
3. Growth rates of 8 per cent and above would clearly be undesirable in any reasonable labour force policy. Expansion of this magnitude would produce an unacceptable level of inflation and a probable decline in the relative participation of the private sector in the economy.

In general, these conclusions are supported by the results of simulations that identify the maximum non-oil GDP growth rates (see table 4) that would be attainable under alternative inflation constraints:

1. Rates of growth in the region of 6 or 7 per cent may be possible at the expense of the relative expansion of the private sector;
2. Significant private sector expansion seems possible only under greatly reduced overall growth conditions.

The following conclusions can be drawn with regard to relative private sector expansion (see table 5):

1. Higher labour force growth rates facilitate the relative expansion of the private sector;
2. A significant increase in the relative contribution of the private sector to expenditure can only take place at the expense of overall income and growth;
3. Moderate increases in the relative degree of private sector participation in the economy would be possible with fairly high single digit inflationary growth paths.

### Implications of the Third Plan

The above analysis describes a number of growth plan projections that differ from the original Third Plan targets. This results primarily from assumptions about the rate of growth in the labour force which deviate from those of the Plan. The assumptions about changes in the labour force, the capital stock and productivity required for these simulations were within reasonable (albeit politically sensitive) bounds in terms of the situation that existed in the early 1980s. The main conclusion to be drawn from an analysis of the possibilities open to the authorities during the Third Five-year Plan is that, given the oil revenues assumed at that time, it was unlikely that all of the Plan's objectives could be achieved simultaneously. This is not to say that

TABLE 4. SAUDI ARABIA: PATTERNS OF GROWTH UNDER INFLATIONARY CONSTRAINTS,  
1981-1985  
(Average annual growth rates)

	Inflationary constraint 14.5						Inflationary constraint 12.5					
	Average of annual rate of increase in labour force						Average of annual rate of increase in labour force					
	1.16	2.0	3.0	4.0	5.0	10.6	1.16	2.0	3.0	4.0	5.0	10.6
Non-oil GDP	8.6	8.9	9.5	10.1	10.6	10.6	7.2	7.5	8.1	8.6	9.2	9.2
Private consumption	9.0	10.3	9.9	10.5	11.0	11.0	8.5	10.5	9.8	10.1	11.7	11.7
Private investment	5.5	5.8	6.1	6.3	6.5	6.5	4.6	5.1	5.1	5.3	6.0	6.0
Private expenditure	7.2	9.2	9.0	9.2	10.0	10.0	7.6	9.2	8.8	9.0	10.4	10.4
Government investment	14.7	13.3	14.6	14.6	14.5	14.5	12.3	10.3	11.9	12.5	10.9	10.9
Government consumption	13.7	13.3	13.6	13.6	13.6	13.6	11.6	11.1	11.5	11.4	11.3	11.3
Government expenditure	13.9	13.3	14.0	13.8	13.9	13.9	11.9	10.8	11.7	11.6	11.1	11.1
Non-oil deflator	14.5	14.5	14.6	14.7	14.7	14.7	12.0	12.5	12.3	12.2	12.7	12.7
Ratio of private/government expenditure (1985)	0.47	0.52	0.50	0.51	0.52	0.52	0.52	0.58	0.55	0.55	0.60	0.60
	Inflationary constraint 10.0						Inflationary constraint 7.5					
	Average of annual rate of increase in labour force						Average of annual rate of increase in labour force					
	1.16	2.0	3.0	4.0	5.0	10.6	1.16	2.0	3.0	4.0	5.0	10.6
Non-oil GDP	5.6	6.5	7.0	7.6	8.2	8.2	3.4	3.8	7.4	5.0	8.6	8.6
Private consumption	9.1	10.5	11.0	11.4	11.8	11.8	10.2	10.7	1.9	11.3	2.6	2.6
Private investment	3.8	4.6	4.8	5.1	5.4	5.4	3.1	3.3	2.9	3.8	3.4	3.4
Private expenditure	7.9	8.2	9.6	10.0	10.4	10.4	8.6	9.1	2.1	9.6	2.5	2.5
Government investment	8.1	6.9	6.8	6.8	6.8	6.8	2.5	2.3	17.5	2.6	16.9	16.9
Government consumption	9.0	8.8	8.8	8.8	8.7	8.7	5.5	5.4	11.2	5.2	11.5	11.5
Government expenditure	8.6	8.0	8.0	8.0	8.0	8.0	4.3	4.2	13.3	4.2	13.9	13.9
Non-oil deflator	9.9	10.0	10.0	10.0	10.0	10.0	7.5	7.5	7.5	7.3	7.5	7.5
Ratio of private/government expenditure (1985)	0.60	0.65	0.67	0.68	0.70	0.70	0.76	0.78	0.37	0.80	0.37	0.37

Source: Figures calculated by the author.

TABLE 5. SAUDI ARABIA: MAXIMUM PARTICIPATION OF THE PRIVATE SECTOR  
IN ALTERNATIVE GROWTH PATHS, 1981-1985  
(Average annual growth rates)

Non-oil gross domestic product growth target 8.0						Non-oil gross domestic product growth target 6.19					
Average of annual rate of increase in labour force						Average of annual rate of increase in labour force					
	1.16	2.0	3.0	4.0	5.0	1.16	2.0	3.0	4.0	5.0	
Non-oil GDP	8.0	8.0	8.1	8.0	8.0	6.2	6.2	6.2	6.2	6.2	
Private consumption	12.9	13.3	13.8	13.9	14.3	12.6	12.8	13.1	13.3	13.3	
Private investment	6.0	6.1	6.1	6.1	6.0	5.1	5.1	5.0	5.0	4.8	
Private expenditure	11.3	11.7	12.1	12.2	12.4	10.9	10.1	11.3	11.5	11.4	
Government investment	9.9	9.1	8.1	7.0	5.9	6.7	5.8	4.8	3.6	2.7	
Government consumption	12.4	11.7	11.0	10.1	9.2	9.8	9.1	8.3	7.3	6.3	
Government expenditure	11.4	10.7	9.8	8.9	7.9	8.6	7.8	6.9	5.8	4.9	
Non-oil deflator	16.1	15.6	15.0	14.1	13.2	13.5	12.8	11.9	10.9	9.6	
Ratio, private/government expenditure (1985)	0.62	0.65	0.69	0.72	0.72	0.69	0.72	0.76	0.81	0.84	
Non-oil gross domestic product Growth target 4.0						Non-oil gross domestic product Growth target 2.0					
	4.0	4.0	4.5	5.1	5.7	1.9	0.1	1.9	0.9	0.1	
Non-oil GDP	11.5	11.8	12.2	12.6	13.1	10.3	9.3	10.2	10.5	11.2	
Private consumption	3.8	3.8	4.0	4.3	4.6	2.5	1.6	2.4	1.9	1.7	
Private investment	9.7	10.7	10.3	10.8	12.3	8.5	7.6	8.5	8.8	9.2	
Government investment	3.0	1.9	1.5	1.5	1.5	-1.5	-4.2	-2.8	-7.6	-12.4	
Government consumption	6.6	5.8	5.4	5.4	5.4	2.8	-0.4	1.2	-2.1	-5.1	
Government expenditure	5.2	4.2	3.9	3.9	3.9	1.1	-1.9	-0.4	-4.2	-7.8	
Non-oil deflator	9.6	8.8	8.4	8.5	8.7	5.3	1.4	3.1	0.8	-1.3	
Ratio, private/government expenditure (1985)	0.77	0.82	0.84	0.86	0.88	0.89	0.99	0.95	1.18	1.45	

Sources: Figures calculated by the author.

the Plan was based on an unsound analysis, but only that even under the most favourable assumptions concerning external factors, it was unlikely that all of the main targets of the Plan would be fulfilled. It is of interest to examine the outcome of the Plan so as to ascertain what the Government decided to emphasize and what it decided to sacrifice.

### Results of the Third Plan

The targeted average annual growth rate of 6.2 per cent for the non-oil economy was higher than the planned growth of the labour force. Productivity growth was perceived to be critical in the attempt to limit foreign manpower. In reality, however, this relationship did not materialize. The foreign labour force grew by over 1.1 million during the Third Plan period (representing an overall annual rate of 11.7 per cent), compared with the planned increase of 0.2 per cent (Saudi Arabia, Ministry of Planning 1985, p. 12).

The moderate rate of growth apparently resulted from a reduction in the demand for crude oil, latent domestic inflation, together with possible supply bottle-necks. Increased oil revenues in the early years of the Plan and the subsequent sharp decline affected the scale and annual distribution of government expenditure over the entire Plan period. In particular, the oil price increases of 1979 and 1980, together with the surge in demand for oil, combined to modify assumptions about the volume and value of oil exports. Increased defence requirements and special infrastructural developments claimed additional government funds. As oil exports and revenues rose immediately at the start of the Third Plan, so did government spending. Following the downturn in the demand for oil in the later years of the Third Plan, government spending, especially that on new projects, was reduced. This brought the average growth of the non-oil economy closer to its planned course (Saudi Arabia, Ministry of Planning 1985, p. 12).

The net effect of these trends over the Plan period as a whole was that the non-oil economy grew at an average rate of 5.1 per cent, somewhat below the 6.2 per cent targeted in the Plan. At the same time the sectoral growth rates in the non-oil economy began to reflect the desired structural change toward strong growth in manufacturing, agriculture and financial services. As anticipated, the construction sector entered a phase of gradual contraction (see table 6).

In terms of private/public sector expenditures (expressed in billions of Saudi Arabian riyals, SRIs), in the period as a whole there was an unanticipated shift towards the private sector:

TABLE 6. GROSS DOMESTIC PRODUCT BY SECTOR IN THE THIRD PLAN

	Value		Average annual growth	
	(based on current prices) 1399/1400	1404/1405 (Millions of SRIs)	(based on 1399/1400 prices) Planned	Actual (Percentage)
Producing sectors				
Agriculture	4,648.3	10,575.3	5.4	8.7
Mining	1,360.7	1,594.5	9.8	5.7
Manufacturing	6,466.5	13,533.6	18.8	14.1
Utilities	270.8	(-1,486.9) <sup>a/</sup>	29.5	24.0
Construction	43,107.6	45,541.4	(-2.5)	(-1.4)
Service sectors				
Trade	17,759.7	27,591.5	8.4	8.8
Transport	15,748.6	23,430.6	12.9	7.1
Real Estate	10,962.3	12,394.9	7.3] <sup>b/</sup>	2.1
Finance <sup>c/</sup>	4,574.5	16,695.6	]	13.1
Other services	5,260.4	11,057.1	3.0	7.9
Government	23,383.8	54,700.1	7.2	5.8
Subtotal: non-oil sectors	133,543.2	215,627.7	6.2	5.1
Oil sectors	250,046.4	142,488.5	1.4	(-14.6)
Gross domestic product	383,589.6	358,116.2	3.2	(-5.8)

Source: Saudi Arabia, Ministry of Planning, 1985, p.15.

## Notes:

- <sup>a/</sup> Negative value added in 1404/1405 reflecting subsidized producer prices.  
<sup>b/</sup> Planned growth for real estate and financial services combined.  
<sup>c/</sup> Less imputed bank service charges.

Year	Government investment	Government consumption	Private investment	Private consumption	Private to government ratio
1980	61.6	77.6	23.2	102.4	0.90
1981	66.8	81.9	28.7	114.9	0.97
1982	73.9	128.5	35.8	126.5	0.80
1983	66.4	126.9	34.2	151.3	0.96
1984	50.0	121.8	41.1	157.3	1.15
1985	43.0	115.8	38.6	146.0	1.16

Furthermore, the ratio of government expenditure to value added in the non-oil economy became less dependent on the demand generated by public spending. It should be pointed out, however, that economic growth remained dependent on the high overall rate<sup>1/</sup> of investment relative to non-oil GDP, as can be seen from the following (where expenditures are expressed in billions of Saudi Arabian riyals):

Year	Total investment	Non-oil GDP	Investment/ non-oil GDP
1980	84.8	130.9	0.65
1981	95.5	157.3	0.61
1982	109.7	184.3	0.60
1983	100.6	205.4	0.49
1984	91.1	209.6	0.43
1985	81.6	203.4	0.40

With regard to the composition of government expenditure, the reduction in investment was in part compensated for by increased expenditure on health and social development (see table 7).

The increase in total employment at an average annual rate of 8.0 per cent (or 1,420,000), in the Third Plan period far exceeded the targeted rate of 1.2 per cent. By the end of the period, the employment of civilians by the Government declined from 13.2 per cent to 10.5 per cent of total employment. The service sectors, trade and financial services showed the greatest proportionate growth in employment.

However, while total employment expanded rapidly during the Third Plan period, the Saudi Arabian component of this growth was

<sup>1/</sup> Saudi Arabia's rate of increase and level of investment relative to GDP is one of the highest in the world. See World Bank 1986.

TABLE 7. ALLOCATION OF DEVELOPMENT GOVERNMENT EXPENDITURE IN THE THIRD PLAN:  
A COMPARISON OF PLAN ALLOCATIONS, BUDGET APPROPRIATIONS AND ACTUAL  
EXPENDITURE

A. Development sectors	Distribution		Actual expenditure	
	Plan	Budget (Percentage)	Actual	As percentage of Plan Value (Thousands of millions SRls)
Economic and social				
Economic resources	27.6	17.7	18.3	120.4 63.1
Human resources	18.8	18.8	18.8	124.3 95.9
Health/social development	8.8	10.1	10.5	69.6 113.7
Infrastructure				
Municipalities/housing	12.9	19.3	16.5	108.9 121.9
Transport/ communications	19.9	20.1	21.1	139.1 100.4
B. Specialized credit institutions	12.0	14.0	14.8	97.3 120.0
Total percentage	100.0	100.0	100.0	
Total expenditure (thousands of millions of SRls)	692.5	738.9	659.6	95.2

Source: Saudi Arabia, Ministry of Planning, 1985, p.26



only 292,800 persons, or approximately 21 per cent. The national labour force grew at an average annual rate of 3.7 per cent, compared to the non-national growth rate of 11.8 per cent. The net result of these developments was a decline in the share of Saudi Arabian nationals in the total labour force, which fell from 49.4 per cent in 1980 to 40.2 per cent in 1985 (World Bank 1986, p. 31).

The failure to achieve the desired increase in productivity probably constituted the greatest disappointment of the Third Plan. As was noted above, the growth in employment exceeded the rate of economic expansion in the period as a whole. The increase in private sector activities was a major factor behind the rapid increase in employment. Over-expansion was not limited to employment, but was also evident in the accumulation of fixed assets and stock in the commercial sector. As a result, parts of the private sector, particularly construction, trade and distribution suffered from overstaffing, underemployment, increased competition, lower margins and a substantial loss in productivity. By the end of the Third Plan period, therefore, the private sector was forced to initiate its own adjustments to the new economic conditions (World Bank 1986, p. 36).

Although value added in the non-oil sector continued to grow throughout the period of the Third Plan, its rate of growth fell faster than that of employment, especially from the end of the second year. The net result was a progressive annual loss in the rate of growth of productivity:

Year	Value added	Employment	Productivity (value added/employment)
1981	10.9	14.3	-2.9
1982	10.8	12.8	-1.8
1983	8.6	11.8	-2.8
1984	6.9	11.0	-3.7
1985	5.1	8.0	-2.7

Over the entire period, productivity declined at an average annual rate of 2.7 per cent. Therefore, while employment rose by 46.9 per cent in the Third Plan period, output - as measured by value added - increased by only 28.0 per cent.

#### Industrial Employment Patterns

While a comprehensive discussion of the productivity and manpower problems encountered during the Third Plan are beyond the scope of this paper, several clues as to the sources of these

difficulties can be found in a brief examination of the country's industrial strategy.

It is interesting to note that much of the literature on technology transfer to the third world focuses on the problem of adapting technologies designed for labour-scarce, advanced, industrial economies to environments that have a relative abundance of labour. The employment problems of Saudi Arabia have been largely disregarded, perhaps because of abundant capital (from oil revenues), combined with a small population. Most observers presume that because of the relative similarities between the factor endowments in this part of the world and those of advanced countries, the labour-saving aspect of imported technology actually increases the competitive position of the Kingdom in the international system (Rad-Serecht 1979). Unfortunately for Saudi Arabia, however, the labour-saving capability of foreign industrial technology may have been more efficient in reducing national, rather than foreign manpower requirements.

Since the mid-1970s, much of the Government's industrial development strategy has focused on the downstream activities of the petroleum sector. In order to import technology that is capable of utilizing oil and gas as feedstock for refining and petrochemical operations, joint Saudi Arabian-foreign ventures were undertaken. Most primary production facilities were completed by the end of 1985, and major petrochemical plants are currently operational. Equipped with these facilities, Saudi Arabia is capable of achieving between 4 and 5 per cent of the world's primary petrochemical production.

For purposes of classification, government officials distinguish between six types of industry:

1. Group I includes chemicals, fertilizers, drugs and medicine, crude oil refining, rubber products and plastic products;
2. Group II comprises iron and steel, aluminium, structural metal products and fabricated metal products;
3. Group III industry includes structural clay products, cement and cement products and non-metallic mineral products;
4. Group IV is composed of textiles, clothing, footwear, paper products, chinaware and glass products;
5. Group V includes furniture, machinery, equipment, consumer appliances, air conditioners and motor vehicles;
6. Group VI comprises food products, carbonated products, bakeries, ice storage and warehousing.

Saudi Arabian officials place heavy industry in the primary and secondary industries classification; these designations refer both to their industrial function and to the size of plants. For the purposes of the present study, the most useful classification is the size of investment. Primary industry refers to investments greater than \$US 100 million, while secondary industries include those within the range

TABLE 8. CAPITAL PER WORKER IN SAUDI ARABIAN INDUSTRIES

Industry type	Light manufacturing	Secondary industries	Primary industries
Group I:			
Operating	83,000 (8,230)	208,200 (1,073)	1,051,000 (2,268)
Under construction	108,000 (3,592)	416,300 (588)	2,302,900 (5,955)
Group II:			
Operating	47,500 (10,414)	149,200 (1,329)	437,700 (1,300)
Under construction	93,000 (2,745)	274,100 (742)	— —
Group III:			
Operating	55,100 (21,204)	116,300 (4,354)	714,400 (2,644)
Under construction	91,900 (3,441)	339,400 (274)	944,700 (900)
Group IV:			
Operating	43,300 (3,626)	75,300 (1,638)	— —
Under construction	72,100 (2,367)	163,800 (810)	— —
Group V:			
Operating	41,300 (15,560)	53,900 (2,897)	359,000 (446)
Under construction	80,700 (5,452)	280,800 (672)	189,600 (750)
Group VI:			
Operating	71,200 (11,200)	173,700 (1,315)	189,900 (665)
Under construction	136,800 (4,230)	192,300 (1,066)	— —

Source: Derived from Donald A. Wells 1986 "The Effects of Saudi Industrialization on Employment," Journal of Energy and Development (1986), pp. 273-284.

Note: Number of workers appears in parentheses.

of \$US 20 million to \$US 100 million. Light manufacturing corresponds to investments of less than \$US 20 million (Wells 1986).

The recent emphasis of Saudi Arabian industrialization clearly indicates that there is a movement toward capital-intensive operations (see table 8). For all categories of firms under construction (which presumably were completed by the end of 1985), capital per worker was greater than that of enterprises in operation at the end of 1983. For primary industries in Group I, capital per worker was \$US 1,051,000 for firms in operation and \$US 42,302,900 for firms under construction. For the purposes of comparison, during 1976 in the United States, capital per worker (in 1972 dollars) was \$US 151,000 in the petroleum sector, \$US 65,000 in primary metals and \$US 55,000 in chemical industries (Birks and Sinclair 1980).

In terms of employment, the 180 per cent increase in industrial investment in new projects will increase the industrial labour force by approximately 35 per cent. The change in emphasis from light manufacturing to heavy industry is primarily responsible for this relatively small increase in the industrial labour force. Employment in light manufacturing accounts for about three quarters of total employment for the firms under construction.

In spite of the massive investment in industry, the industrial labour force will continue to form only a small proportion of the total labour force. In the period 1985-1990, the Saudi Arabian labour force will comprise between 1.8 and 2.0 million persons. The figure of 125,000 for industrial employment will represent only about 7 per cent of the Saudi Arabian total.

At the same time, it is estimated that by 1990 there will still be more than 500,000 foreign workers in Saudi Arabia. Although there are no official statistics, it is clear that most workers in industry are non-Saudi Arabians (Birks and Sinclair 1980).

As was noted above, the labour force increased during the Third Plan period by an annual average of 8.0 per cent (or by 1,420,000), which exceeds the target rate of 1.2 per cent. Interestingly enough, by the end of the Third Plan period, government civilian employment had declined from 13.2 per cent of total employment to 10.5 per cent. The service sectors, trade and financial services experienced considerable growth in their share of total employment.

However, while total employment expanded rapidly during the Third Plan period, the Saudi Arabian component of this growth accounted for only 292,800 persons, or approximately 21 per cent. The Saudi Arabian labour force grew at an annual average of 3.7 per cent, while the non-Saudi Arabian growth rate was 11.8 per cent. The net result was a decline in the share of Saudi Arabian nationals in the total labour force, which fell from 49.4 per cent in 1980 to 40.2 per cent in 1985 (Saudi Arabia, Ministry of Planning 1985, p.31).

## Generalizations Concerning Saudi Arabian Industrialization

These above-mentioned trends in employment and productivity, together with recent assessments<sup>1/</sup> of industrialization in Saudi Arabia, suggest the following:

1. Investments have largely been made in projects that aim to utilize locally available raw materials.

2. Basic industries have been created in isolation, without the support of vital intermediate and trans-sectional industries that might in time allow the growth of a self-perpetuating industrial base. Industrial development began as a function of factors unrelated to the socio-economic reality of the Kingdom, and resulted from the need to use the flared associated gas and accumulating capital. In other words, external conditions rather than the needs and capabilities of domestic society dictated the pace of the process of industrialization. This led to a dependence on foreign manpower, expertise, management and technology.

3. Abundant oil revenues in the 1970s and early 1980s tended to create a consumer-oriented society in which the relationship between productivity and reward largely disappeared. Many investment decisions were based on overly-optimistic economic assumptions and therefore were often speculative rather than economically viable. In other words, technology was selected on the basis of extrapolated resource factor endowments that assumed continued high oil revenues; they were based on an assessment of the country's long-range sustainable production factor proportions. The post-1982 decline in oil revenues changed the relative factor proportions from those of the period immediately following the years 1973/1974 (Al-Moajil 1986, p.8).

## Development in a Capital-surplus Economy

The abundant supply of capital has made it easier for Saudi Arabia to acquire modern forms of western technology. However, in practice there are a number of factors that offset these advantages:

1. Because of the limited supply of skilled labour, the Kingdom was forced to adopt a development strategy based on capital as a substitute for labour. This reliance on capital-intensive technology increases the Kingdom's dependence on western countries;

2. The complexity of modern technology aggravates this situation in that it requires a greater number of foreign technicians;

3. Packaged technology (turn-key projects) in which elite skilled

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<sup>1/</sup> See Looney 1988, Nagi 1986 and Nagi 1982.

labourers, technicians and managers form part of contract agreements, allows the prompt and efficient execution of contracts, but seldom enables Saudi Arabian nationals to acquire work experience and training (Nagi 1986).

These patterns suggest that the possession of capital may not be a sufficient pre-condition for productive investment in the Kingdom in view of the limited absorptive capacity of non-oil-related production. The net result of these developments has been the creation of an industrial sector that is not capable of meeting the local demand for consumer goods. Slack petrochemical export markets (resulting from the excess world capacity), together with the post-1982 decline in oil revenues and high levels of aggregate demand (which are facilitated and sustained by oil revenues), have placed further pressure on the country's balance of payments because of the underdeveloped local consumer goods industries. Since 1983, Saudi Arabia's current account deficit has been second only to that of the United States. The country's external investments have declined from approximately \$US 150 billion to less than \$US 70 billion in order to support the high level of consumption enjoyed by the population. In principle, Saudi Arabia's supply of capital should have provided for both capital formation and consumption.

In short, the country's current economic problems lie not so much in a lack of capital supply as in the ability of the economy to manufacture consumer goods locally (Nagi 1982).

### Consequences for Employment

The pattern of industrialization and technology transfer in Saudi Arabia has resulted in an employment structure where (El-Shishini 1978, p. 208):

1. Imported industrial plants have a low labour-absorptive capacity;
2. Workers moving out of agriculture have had to accept jobs in the low productivity tertiary sector, the only opportunity open to them;
3. The sectoral distribution of the labour force was skewed in favour of the tertiary sector at a very early stage in economic development.

As a result of these developments, several labour force patterns stand out in Saudi Arabia:

1. The proportional importance of employment in the tertiary sector in Saudi Arabia during the first stages of industrialization constituted a premature and unfavourable phenomenon;
2. Increases in employment in the tertiary sector do not reflect actual economic needs when they precede the growth of the commodity; rather they indicate unsuitable technical and investment policies in other sectors;

3. Whereas in the advanced countries during the first stages of industrialization, labour movements occurred in response to objective economic needs and were influenced by strong sectoral integration and the gradual dissemination of technological innovations, in Saudi Arabia labour shifts were mainly motivated by strong social aspirations;

4. While revenues have provided the key to development in Saudi Arabia, finance alone is no guarantee of economic success. The prerequisites for development are labour, management skills, technology, land and, above all, organization. Given the scale and pace of development in the Kingdom, organization is vital;

5. The abundance of fixed capital, or at least the means to acquire it, only emphasizes the scarcity of other resources in the Kingdom, notably the shortage of skilled indigenous labour to run new industries.

### Conclusions

The Fourth Plan was initiated in March 1985. As was noted above, several of the Government's macro-economic targets had not been met by the end of the Third Plan. The Government met its overall targets for inflation, growth and private sector development, but did so with a foreign work force that was much larger than desired. In the political context of Saudi Arabia, this was clearly the most expedient strategy.

The Fourth Plan is based upon four principal themes that address the Kingdom's long term challenges. First, there is increased concern with the operational efficiency of the Kingdom's resources and facilities. Secondly, the plan focuses on the diversification of production activities, especially in areas such as manufacturing, agriculture and finance. An annual GDP growth of 4 per cent is projected for the five-year period, with a planned growth of 15.5 per cent in industry, 9 per cent in financial and business services and 6 per cent in agriculture. The plan includes no provisions for further expansion in Government and envisages only negligible activity in large-scale construction.

The third theme emphasizes the goal of reducing the number of foreign nationals working in the Kingdom by 500,000 persons. Labour-saving devices and techniques are expected to reduce the dependence on unskilled workers from abroad. The final - and possibly the most important - theme of the plan is to promote a more active role for the private sector in industries that are currently financed or administered by the Government. As an incentive, the Government has proposed that financial resources and facilities be made available to prospective investors. Other incentives to stimulate investment in domestic production and to promote local

growth will be implemented in the hope that the capital that is created can then be invested within Saudi Arabia.

The Fourth Plan includes a substantial number of carry-over projects from the Third Plan, some of which are underway, while others have not yet been started. Of the 3,226 projects set out in the Fourth Plan, 1,782 are listed being as under construction and due for completion in the new plan period. The remaining 1,444 projects are listed as "new" (Thomas 1985). The Fourth Plan is based on a projected average oil production of 3.85 million barrels per day for the five years of the plan. The plan also assumes an average net price of \$US 25 per barrel (Thomas 1985).

While it is too early to comment on the likely success or failure of the Fourth Plan, particularly in view of the continued decline in oil revenues, the experience of the Third Plan means that it is likely that the Government will use the size of the foreign work-force as a safety valve to achieve its priorities.

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