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THE VIABILITY OF SAUDI ARABIAN INDUSTRIAL DIVERSIFICATION EFFORTS: THE CONSEQUENCES OF DECLINING GOVERNMENT EXPENDITURES

by
ROBERT E. LOONEY *

Introduction

Given the probability that Saudi Arabia will not be able to significantly increase its oil revenues in the near future, the major problem facing the government will be how best to utilize its dwindling oil revenues to generate positive overall rates of economic growth, while at the same time meeting to the fullest extent possible the basic needs of the majority of the population. Clearly any future growth strategy must involve devising means whereby the private sector will assume a more important role in expanding not only output, but perhaps more importantly in sustaining a level of effective domestic demand to stave off any further recessionary tendencies stemming from reduced government expenditures. This is especially critical in the non-hydrocarbon manufacturing sector, which is almost totally dependent on the local market for sales.

In this context, the main purpose of the analysis below is to examine the consequences of declining oil revenues for the Saudi Arabian economy. In particular, the paper is interested in examining several alternative austerity strategies open to the government. In which general areas of government expenditure – consumption (current), investment (infrastructure) or defense (military) – would budgetary cuts be the least disruptive on the non-oil manufacturing sector and in what sense?

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Post-Keynesian Assumptions

For this purpose, a series of Post-Keynesian type relationships were estimated. These examine the various impacts on the economy, and particularly the manufacturing sector stemming from the different classes of government expenditure – investment, consumption, and defense. The Post-Keynesian approach¹ is much too eclectic to adequately summarize here. However, one of its attractive features for examining government policy in Saudi Arabia is that the approach offers a framework for examining the relationship between the components of public sector demand, income distribution and sectoral output.

In place of the relative price variable which is the focal point of a neoclassical analysis, Post-Keynesian theory makes investment the key determinant of the economic aggregates listed above. This follows from an underlying belief that in a dynamic, expanding economy, the income effects produced by investment and other sources of growth far outweigh the substitution effects resulting from price movements. That is changes in demand, both aggregate and sectoral, are due more to changes in income than to changes in relative prices.

Perhaps more importantly, Saudi Arabia possesses a number of structural characteristics that would seem to preclude an automatic equilibration of most markets at or near full employment²:

1. Government expenditures play a pervasive role in the economy, accounting in recent years for well over half of aggregate demand.
2. Financial markets are underdeveloped, with the interest rate playing an insignificant role due to Islamic codes concerning usury.
3. The relatively low population base puts some limit on the size of the market and competition.
4. A sectoral imbalance is dominated by oil in accounting for real output and by services in respect to employment. This situation creates an environment whereby a large gap exists between income creation and demand generation that must be closed by government expenditures. The implications of this situation in terms of markets are:

¹ Cf. EICHNER and KREGEL (1975).

² NAGI (1982, p. 13).

(a) A price mechanism that is way above the real value, especially in real estate, land and non industrial properties, and

(b) A wage mechanism that is tied to inflation and oil revenue and is only remotely connected with real productivity.

In sum, a Post-Keynesian approach was selected for the analysis below because it is capable of explicitly considering, given the pervasive role of government expenditures (as opposed to market-determined allocations), how economic performance can be improved over the extrapolation of short run trends.

Fiscal Patterns

Budgetary revenue and expenditure increased steadily up to 1974, except for 1967/68 when dislocation following the Israeli-Arab war affected all economies in the region. However, the 1973/74 and 1979 oil price jumps, world recession and fluctuations in the world demand for oil, and political instability and warfare in the Gulf have led to sizeable year to year fluctuations in budgetary receipts compared to expectations.

Although the general trend remained buoyant until 1981/82 in 1977/78 and 1978/79, slight budget deficits followed unexpectedly low oil revenues, whereas expenditure and revenue both rose higher than projected during the next two years. The 1982/83 budget was the first in which an absolute decline in revenue was projected, the objective being to arrive at a balance, while in 1983/84 a planned deficit of SR35 billion was budgeted for the first time in recent history.

In 1984/85 the planned deficit was increased to SR46 billion (Table 1) with budget revenue and expenditure figures SR214 billion and SR260 billion respectively. The 1985/86 budget was supposed to balance at SR200 billion, but ended with a SR50 billion deficit. The 1986/87 budget was not published in March 1986 as due, because of uncertain revenue forecasts. Monthly disbursements continued on the basis of average spending in 1984/85. A new budget was finally released at the end of December 1986 to cover the 1987 calendar year. This projected revenue at SR117 billion, compared with SR340 billion envisaged in the budget for 1981/82.

Over the same period, the government had reduced government spending from SR298 billion to SR160 billion, a significant achievement, but not enough to close the deficit gap. In 1988 another large budget deficit was projected, but the government acknowledged the dwindling size of its budg-

TABLE 1

SAUDI ARABIA: GOVERNMENT BUDGET ESTIMATES, 1984-1988
(SR million)

	1984	1985	1986	1987	1988
Total Revenue	225,00	214,000	200,000	106,926	105,300
Oil Revenue	164,496	164,500	154,250	74,183	73,525
Other Revenue	60,504	49,600	45,750	32,743	31,775
Total Expenditure	260,000	260,000	200,000	159,646	141,200
Human Resources	27,736	30,413	24,533	23,689	23,388
Transport	24,950	22,175	14,497	10,904	9,493
Economic Development	13,202	12,533	9,081	6,615	5,888
Health	13,591	16,134	12,892	11,094	10,806
Infrastructure	9,582	9,833	6,924	4,299	3,555
Municipal Services	19,070	17,063	11,890	8,110	7,017
Defense	75,565	79,892	63,956	54,226	50,080
Public Administration	47,218	43,928	38,584	30,974	25,058
Govt Lending Inst.	20,000	17,500	9,300	3,590	590
Local Subsidies	9,086	10,529	8,343	6,145	5,325
Balance	-35,000	-45,900	-	-52,720	-35,900
Balance	-	-	-	-	30,000

Source: SAUDI ARABIAN MONETARY AGENCY, *Annual Report*, various issues.

et reserves by launching a local borrowing scheme to cover a substantial portion of the revenue shortfall. Import duties were also raised in an attempt to generate more non-oil revenue, but other measures such as tax increases were rescinded following public protest.

As well as declining oil revenues the government has had to contend with a drop in overseas investment income, which has resulted from a fall in international interest rates and a reduction in the size of the government's overseas assets from around \$150 billion in 1982 to less (estimated) than \$60 billion by the end of 1988³.

One of the main problems for the government is that current expenditure has proved very difficult to pare back; there are huge costs involved in running and maintaining the activities established by development project capital inputs – in social services as well as physical infrastructure. Defence expenditure remains a major budget item.

³ RICHIE (1987, p. 169).

In terms of recently released figures, in 1986 (March-December), actual domestic revenue was only SR16.5 billion, government domestic spending was SR88.2 billion, and government direct foreign exchange spending was SR37.6 billion. By the end of 1987 central government reserve accounts lodged with SAMA had fallen to SR78 billion, down from SR118.5 billion at the end of 1986. This SR40.5 billion drop probably reflects fairly accurately the actual size of the 1987 budget deficit, against a budgeted SR52.7 billion. If the budgeted 1988 deficit of SR36 billion had been fully financed from reserves rather than borrowing, these government deposits might have been expected to have halved by the end of 1988 to less than \$10 billion.

The growing government preoccupation with cutting its budget deficit is being translated into a number of schemes devised to tap the savings of state organizations (the Pension Fund has around SR60 billion) and the private sector. Expenditure rationalization and efficiency increases have also been attempted but are proving elusive targets.

Government bond issues are the most obvious example of attempts to tap sources of savings other than the government's own dwindling reserves, the more so since various amendments to the offering terms have been introduced. These changes have gradually widened the groups of potential end-investors. Before the bonds were even offered to banks, it is estimated that some SR14 billion may have been placed with the government Pension Fund. The bonds were then offered to banks, some of which gained permission to place them in a package of national assets offered to private investors in the form of a unit trust.

Finally, towards the end of September 1988 the Saudi Arabian Monetary Agency (SAMA) announced that banks would be able to sell the bonds directly to the Saudi public in minimum tranches of SR1 million; purchasers would get a certificate of purchase rather than the bonds themselves as the banks would still collect interest from them, and would be forbidden to sell them on to non-Saudis. Firm details on the number and success of the bond offerings are scarce, which seems to confirm both that the bank's take has been lower than hoped for, and that the scheme itself is still seen as rather controversial.

The success of the government borrowing program will be judged not just by the levels of commercial bank and private sector subscriptions to tranche issue, but also by the extent to which these investors are prepared to repatriate funds from abroad to purchase the bonds. As yet there is no firm evidence to show whether the purchases are being financed from domestic or foreign savings.

Figures recently published by the Saudi Arabian Monetary Agency⁴ provide an insight into the extent of the government's problem, and the nature of commercial banks' net foreign asset position. In the ten month interval between budgets in 1986, direct government foreign exchange spending stood at SR37.6 billion, domestic spending at SR88.2 billion, domestic revenue at SR16.5 billion, and net domestic cash flows (defined as domestic spending minus domestic revenues) at SR71.7 billion. If the government could cover its foreign exchange spending with foreign currency repatriated via the bond issues, it would mean that government oil revenue and overseas investment income could all be put at the disposal of SAMA to meet private sector foreign exchange demand.

On the other hand, if government borrowings are to be covered by riyals savings, and could therefore be classified in the same vein as domestic revenue, it becomes clear that this method of borrowing will decrease the net domestic cash flow, along with the stimulus that the government budget has traditionally given to the economy. This might be expected eventually to lead to less demand for foreign exchange throughout the economy, rather than to bring about an increase in foreign exchange availability. Funding the bond issues from domestic resources thus has a much clearer deflationary impact, which might be expected to hurt the independent growth of the private sector.

As far as the commercial banks are concerned, the true extent of their net foreign assets position is often overstated, by a tendency not to net out residents' foreign assets denominated in Saudi riyals. In mid-1987 when Saudi commercial banks' foreign assets are standing at SR88.6 billion, and foreign liabilities at SR16.8 billion, giving a net foreign asset position of SR71.8 billion, the banks were also holding SR28 billion in residents' foreign currency deposits, while their net foreign position in Saudi riyals was SR20.6 billion. In other words, their true net foreign assets position could be more correctly stated at only SR23.2 billion.

The figure for the size of the offshore riyal market is only reported in the SAMA *Annual Report*, but it might be assumed to have grown in 1987/88 following the removal of withholding Tax. Assuming the net figure for this market has not risen to SR25 billion, a truer net foreign asset figure for Saudi commercial banks would seem to be SR17.7 billion – insufficient to cover more than half the planned 1988 budget deficit. It is clear then that the commercial banks alone cannot be expected to cover the budget deficit in foreign currency, or at least not until a clearer line of the

⁴ *Annual Report* (1986, 1987).

riyal persuades local depositors to switch out of foreign currency deposits.

It is clear then that the government will have great difficulties in raising sufficient funds to continue expenditures at recent levels. Other methods, expenditure reductions and/or redirection seem a more realistic solution to the country's budgetary problems.

Budgetary Strategies

At first sight, the most logical austerity program would be one of concentrating on a selective reduction in defense expenditure allowing resources to be freed up to finance (more productive) government programs. Defense alone accounts for 25-35 percent of the national budget. As noted above (Table 1) despite the decline in oil revenues, defense expenditures have fallen only moderately.

In relative terms, the kingdom ranks first in the world in military expenditures per capita, and in military expenditures per soldier. In contrast the country ranks fifth in education expenditure per capita, and thirteenth in health expenditures per capita⁵.

It is not at all clear how much of the allocations to defense are in excess of what is needed on purely strategic grounds. Although Saudi Arabia has spent massively on developing an extensive military infrastructure and in purchasing the most sophisticated hardware available, the rationales for this expenditure have been articulated in only the most general terms.

These are to enable the kingdom to protect its extensive borders from regional or superpower incursions and to ensure internal security⁶. In terms of constraints, the country's purchasing program has been limited only by the lack of absorptive capacity, trained manpower and the willingness of the U.S. to supply certain weapons systems.

The first dilemma therefore facing the Saudi authorities is whether the country can justify the high costs of military expenditures when a distinct possibility exists that cut backs in defense could free up sufficient funds to offset most of the budgetary cuts in the non defense area brought about by the oil price declines.

Along these lines, classical theory would predict on the basis of resource allocation that increases in defense will decrease investment and/or civilian consumption and thus reduce industrial output. Increased military

⁵ SIVARD (1985, pp. 40-41).

⁶ ECONOMIST INTELLIGENCE UNIT (August 1986, p. 6).

burdens would, in this situation, have to be justified on the basis of other social welfare gains such as an increase in collective security. Keynesian theory, on the other hand, suggests that in the presence of inadequate effective demand the operation of the income multiplier would result in an increase in industrial output, resulting from additional defense expenditures. Of course one could always argue that expenditure on either consumption or investment would have a greater domestic expenditure multiplier on private sector incomes and rates of production than that produced by military expenditures. Thus, there are purely economic rationales for increased military spending. Whether or not military expenditures have a positive economic impact relative to other sources of demand is ultimately an empirical question ⁷.

The second budgetary dilemma currently facing the Saudi authorities concerns the wisdom of further expanding the kingdom's infrastructure. During the last decade, Saudi Arabia has had perhaps the largest ever program of investment in transport and related infrastructure. Since the expansion in oil revenues in 1973/74 the country invested in a wide variety of programs to expand not only its road network, but sea and air ports as well. In large part, the rationale for this program was based on the presumption that the cost reducing impact of this investment would make private investment much more profitable, and thus stimulate a major expansion in private sector output.

The possibility that public sector investment in infrastructure can stimulate not only increased levels of private sector investment, but overall increases in industrial output as well, has long intrigued economists. This possibility is clearly suggested by infrastructure's key role in Hirschman's unbalanced development strategy ⁸.

Tersely put, Hirschman advocated that in countries where the private sector is somewhat squeamish about risk-taking, the government could stimulate private sector capital formation, and follow on increases in industrial output through massive investments in such areas as transportation, and energy thereby reducing the costs of commercial production. While not explicitly acknowledged, Hirschman's notions of imbalance through massive investments in infrastructure underlie Saudi Arabia's development strategy ⁹.

In terms of financing, the Saudi authorities have spent more on infrastructure in the last fifteen years than any country in history over a similar time period. Since 1970 when the country initiated its first development

⁷ DEGER and SMITH (1985, p. 6).

⁸ HIRSCHMAN (1958).

⁹ LOONEY and FREDERIKSEN (1985).

plan, the government with the completion of the Third Plan in 1985 had allocated approximately 375 billion riyals to development infrastructure (during most of this period the exchange rate was around 3.5 Rls to the U.S. dollar).

In terms of the focus of the present study, the relevant question is whether the Saudi Arabian government's strategy of infrastructure led investment has been successful in the Hirschman sense i.e., has it resulted in distinctly higher levels of industrial output over and above the levels likely to exist in the absence of these programs? If not, what impacts have been associated with infrastructural investment and have these effects been superior to those that would have resulted from either consumption or military expenditures?

The third major area of budgetary concern involves the role of government consumption in Saudi Arabia. How the government divides its expenditures between consumption (current) and other types of allocations has a significant impact on the relative incomes of the middle- and high- income groups in the kingdom¹⁰.

The mechanisms the Saudi Authorities have for transferring oil income to the private sector are: (1) subsidies of various types, (2) the wages and salaries the government pays its employees, and (3) profits generated in the private sector. The first two mechanisms involving government consumption are fairly self explanatory. The third, however, requires some elaboration. Since the government is the most important buyer and investor in the kingdom, a major source of private income is the profits earned by Saudis acting as middlemen between the government and foreign firms in the purchase of imported goods or large construction contracts¹¹. In addition, many of these businessmen own large construction firms and act as contractors themselves.

How the government spends its oil revenues can therefore have a significant impact on the relative incomes of the middle- and high-income groups in the kingdom. A major middle income group is made up of professionals and administrators employed in the public sector. By raising the salaries of these employees, the government can easily improve the position of the middle class. On the other hand, an increase in purchases of military hardware and expansion of government investment expenditures at the expense of public sector salaries would increase the relative income of middlemen and contractors.

Government expenditure may also affect the distribution of income

¹⁰ KAVOURSSI (1983, pp. 74-75).

¹¹ BEBALWI (1987).

through its differential impact on various income groups. Here, the presumption is that the upper income groups and middlemen will be in a better situation to avoid the inflation tax relative to their middle income, administrator counterparts. We should, therefore, expect to find that inflation tends to reduce the over all level of consumption, while quite possibly increasing private investment (on the presumption that the upper income groups do most of the investment in the kingdom, and that a large share of this investment is financed from income rather than the financial markets).

Unfortunately in testing these assertions about the impact of government activity on the private sector, we do not have reliable data on changes (or for any year for that matter) in income distribution over time. Implicitly, however, the analysis below assumes that government expenditures affect income distribution as manifested in the over all impact it has on aggregate private investment and consumption. Based on the assumption that middle and lower income groups account for a relatively high share of consumption and a low share of investment, movements in these two aggregates as affected by government expenditures should provide a general picture of the direction in which the country's income distribution has changed over time.

Operational Definitions

In order to gain some insight into the manner in which public expenditures – infrastructure, consumption and defense – impact on various facets of the Saudi economy, several Post-Keynesian type equations were first estimated examining the impact of these allocations on private consumption and investment. Here the greatest difficulty involves the lack of data as to the value and composition of the kingdom's stock of infrastructure. In particular official Saudi data on government investment contains both infrastructural and non-infrastructural type expenditures. Conceivably the cost reducing effect of the infrastructure component of government investment could be offset by the potential (inflationary) crowding out of private sector activity stemming from the non-infrastructural component.

To avoid these potential problems it was first necessary to separate out and estimate the independent effects of the different categories of public investment. Since the raw data itself does not allow these distinctions to be made, a proxy measure for the infrastructural and non-infrastructural components of government investment had to be developed. Operationally this involved making a distinction between types of public investment on the basis of whether or not that investment was expected.

Expected investment was assumed to be depicted by the trend in government investment¹². Again, it is assumed that expected public investment, *GIE*, reflects investment in infrastructure. Similarly, transitory government investment was assumed to be depicted by that component of public investment that was unexpected. Operationally, unexpected public investment (*GIU*) was defined as the difference between the actual (realized) level of government investment (*GI*) and what was expected (*GIE*). Clearly, the basic assumption underlying these proxies is that infrastructure investment is an on going process that moves slowly over time and cannot be changed very rapidly.

A final factor that needs to be taken into account is the potential problem of real or physical crowding out. It is a well-accepted proposition that in Saudi Arabia absorptive capacity has been a problem, particularly in the early oil boom years¹³. By definition, public sector expenditures can result in crowding out if it utilizes physical and financial resources that would otherwise go to the private sector. Furthermore, the financing of public sector investment, whether through taxes, issuance of debt or inflation will lower the resources available for the private sector thus creating a situation that may depress private investment activity. Operationally a negative sign on unexpected government investment (*GIU*) can be assumed to reflect crowding out of private sector investment due to excessive allocations to non-infrastructure uses.

In a similar manner, proxies were developed for permanent and transitory government consumption, with permanent consumption (*GCE*) reflective of long term trends in government salaries and subsidies and transitory government consumption (*GCU*) reflecting short term adjustments to changing revenues.

Expected military expenditures (*MEE*) are reflective of long term weapons acquisition and infrastructure development, while unexpected military expenditures (*MEU*) were assumed to reflect short run responses to changes in the kingdom's perceived security situation.

Impact of Government Expenditures

The Post-Keynesian approach towards investment and output is much more eclectic than its neo-classical counterpart. Here, investors rather than

¹² The trend in expenditures was estimated using a linear regression with time. Expected expenditures were calculated as in BLEJER and KHAN (1985).

¹³ LOONEY (1982).

attempting to bridge the gap between the existing capital stock and an optimal one, are seen as largely responding to changes in expectations concerning future profitability.

Post-Keynesians also emphasize the importance of credit availability in enabling business firms to bridge any gap between their desired level of discretionary spending and the current rate of cash inflow. Of course Post-Keynesian models have been developed largely for the advanced, mature industrial countries where sophisticated financial systems exist, together with central banks capable of altering such variables as the level and structure of interest rates.

Adapting the Post-Keynesian approach to the Saudi Arabian situation entails making a number of assumptions as to the relevant indicators used to reflect perceived changes in business profitability:

1. Subsidies either direct or indirect by the government to the private sector, while very important are, given the data, somewhat difficult to pin down. For purposes of estimates here, they are assumed to vary more or less in line with the amount of distributed loans (*INDCR*) from the Saudi Industrial Development Fund.
2. The expected rate of inflation (*INFE*) may affect investment and output decisions in manufacturing, particularly as anticipated increases in future prices may increase the perceived profitability of non-traded activities relative to manufacturing. This is one aspect of the so called "Dutch Disease" effect¹⁴.
3. Credit tightness (*CBPSPE*) is depicted as the expected level of real commercial bank credit, and is computed in a manner similar to the expected levels of investment described above. Presumably increases in the expected level of credit would be reflective of easing credit conditions.
4. In a Post-Keynesian framework crowding out of private sector activity can result from excessive military expenditures (*MEU*), government consumption (*GCU*) in addition to non-infrastructure investment (*GIU*).

Impact on Inflation

Operationally, the impact of infrastructure investment on inflation is

¹⁴ LOONEY (1988/89).

modeled by a blending of the Hirschman/Voigh¹⁵ and Glover/Simon¹⁶ approach towards impacts stemming from the infrastructure development process. If infrastructure plays a role similar to that envisaged by Hirschman and Voigh, we should expect to find the resulting potential increase in the rate of return on various commercial activities inducing the private sector to increase its level of real output. While likely to be inflationary in the short run, over time, this should result in a closing of the inflationary gap created by the infusion of purchasing power associated with the construction phase of the infrastructure expansion program.

On the other hand, if the Glover and Simon view of the role of infrastructure is more appropriate in explaining private sector behavior, we would expect the private sector's expectations of future government actions, including likely extensions of the country's infrastructure to play a predominant role in shaping its decisions to expand output and or investment. However, the new higher level of output, depending on the way it is financed, may result in an over-expansion of the money supply neutralizing the longer run anti-inflationary effect of the induced expansion of infrastructure.

In the model that follows attempts are made to incorporate the inflationary effects of infrastructure implicit in both the Hirschman/Voigh and Glover/Simon approaches.

The model used to examine the differential impact of government expenditures on inflation in Saudi Arabia incorporates the considerations outlined above:

1. In particular proxies for "permanent expenditures", the expected level of government investment (*GIE*), consumption (*GCE*), and defense (*MEE*) were included in the regression equation to determine the longer run inflationary effect (if any) associated with the expanding role of the government in the economy.
2. Shorter run impacts of government expenditures on inflation were modeled using the measure of unexpected increases – *GIU*, investment, *GCU* consumption and *MEU*, defense defined above.
3. The impact of world price movements on the Saudi Arabian price level was included to reduce any biases stemming from the period of world

¹⁵ VOIGH (1974).

¹⁶ GLOVER and SIMON (1974).

inflation occurring in the mid to late 1970s. Since Saudi Arabia does not publish figures on the price of imports, this variable was proxied by the International Monetary Fund's industrial countries' export price index. This index was lagged one year (*INFWL*) to allow changes in import prices to work themselves through the domestic cost structure.

4. Inflation is also assumed to be a function of inflationary expectations (*NODEE*). As with the other expected values derived above, this factor was proxied by regressing the non-oil price deflator on its value in the previous year, and using each year's predicted value in the regression equation.

5. The potential impact of excess money balances on the non-oil price deflator was treated by including the money supply (*M1*) in the regression equation.

6. The reduction in inflationary pressures stemming from increased real supplies of goods and services was proxied by non-oil *GDP* (*YNO*).

In terms of expected signs, the inflationary impact of infrastructure was assumed negative, while government consumption and military expenditures by creating demand, but not augmented supplies were assumed to be positive. Unexpected values for all three types of expenditure were assumed, for similar reasons, to have a positive impact on inflation.

Finally, to test the generality of the model regressions were performed using both the non-oil *GDP* deflator (*NODF*) and the consumer price index (*CPI*).

Summarizing the above in equation form (with expected signs):

$$INF = f[INFE (+), INFWL (+), M1 (+), YNO (-), GEE (- +), GEU (+)]$$

where:

INF = the non-oil *GDP* deflator (and the consumer price index);

INFE = expected increase in the non-oil *GDP* deflator (and the consumer price index);

INFWL = export price index of the industrialized countries (lagged one year);

M1 = the money supply as defined by the International Monetary Fund;

GEE = expected government expenditures

GIE = government investment (mainly infrastructure)

GCE = government consumption (mainly permanent salaries)

MEE = military expenditures

GEU = unexpected government expenditures

GIU = unexpected changes in government expenditure

GCU = unexpected government consumption

MEU = unexpected military expenditures

Empirical Results:

Impact of government investment on the non-oil price deflator

$$(1) \text{ INF} = 0.89 \text{ INFE} + 2.64 \text{ INFWL} + 0.003 \text{ M1} - 0.03 \text{ YNO}$$

(8.89) (5.27) (0.03) (- 1.50)

$$- 0.05 \text{ GIE} - 0.02 \text{ GIU} - 0.33 \text{ RHO}$$

(- 2.05) (- 0.34) (- 1.65)

$$r^2 = 0.999; F = 2770.5; DW = 2.13$$

Impact of government consumption on the non-oil GDP deflator

$$(2) \text{ INF} = 0.94 \text{ INFE} + 2.17 \text{ INFWL} - 0.005 \text{ M1} - 0.09 \text{ YNO}$$

(29.19) (14.26) (- 2.03) (- 8.74)

$$0.10 \text{ GCNPE} + 0.04 \text{ GCNPELT} - 0.83 \text{ RHO}$$

(9.42) (3.75) (- 7.10)

$$r^2 = 0.999; F = 22550.03; DW = 2.88$$

Impact of military expenditures on the non-oil GDP deflator

$$(3) \text{ INF} = 0.81 \text{ INFE} + 2.02 \text{ INFWL} - 0.001 \text{ M1} - 0.02 \text{ YNO}$$

(9.44) (2.65) (- 0.15) (- 1.12)

$$+ 0.03 \text{ MEE} - 0.04 \text{ MEU} - 0.16 \text{ RHO}$$

(0.70) (- 0.79) (- 0.75)

$$r^2 = 0.998; F = 1959.2; DW = 1.93$$

Several interesting patterns appear in the results:

1. It is clear that infrastructure investment in Saudi Arabia has reduced inflationary pressures.
2. The transitory (non-infrastructure) component of government investment does not appear to have contributed to inflationary pressures over the period examined (1960-85).
3. World inflation has been imported into Saudi Arabia, and has contributed significantly to increases in the non-oil GDP deflator.
4. Contrary to the situation found in many other countries, the money supply does not appear to have made an independent contribution to inflation.
5. Government consumption, both permanent and transitory appears to have made a major impact on the price level.
6. Military expenditures appear somewhat neutral in their inflationary impact.

The importance of the composition of government expenditures in affecting inflation is also illustrated by the fact that the over-all level of government expenditures (including both permanent, *GEE* and transitory components, *GEU*) is not statistically significant in affecting the price level:

$$(4) \text{ INF} = 0.84 \text{ INFE} + 1.91 \text{ INFWL} - 0.008 \text{ MI} - 0.02 \text{ YNO} \\
\begin{array}{ccccccc}
(9.88) & & (3.68) & & (-0.91) & & (-1.03) \\
+ 0.003 \text{ GEE} & + & 0.004 \text{ GEU} & - & 0.28 \text{ RHO} & & \\
(1.04) & & (0.21) & & (-1.35) & &
\end{array}$$

$$r^2 = 0.999; F = 2163.5; DW = 1.80$$

The results obtained using the consumer price index were very similar to those found for the non-oil GDP deflator, and hence do not appear to warrant further discussion.

Impact on Manufacturing

The mechanism by which exports could act as an engine of growth (or leading sector) and the determinants of the overall impact of an export stimulation on the economy is well known. In the classic situation of staples, exports contributed to economic growth directly (through direct con-

tributions to Gross Domestic Product), and indirectly through contributions to *GDP* per medium spread (or carry-over) effects.

Since oil revenues in the Middle East accrue, for all practical purposes, solely to the host governments and in addition have very few linkages to the domestic economy, their impact on development largely depends on when and how they are spent. As with the classic case of staples, we can conceptualize two major impacts on economic development: a direct one through the government allocation process for consumption, investment or defense, and an indirect one over time where the general increase in non-oil gross domestic product stemming from earlier government allocations spreads through the economy.

This indirect contribution to growth embraces Hirschman-type linkages, and can broadly be considered as a sequence of multiplier-accelerator mechanisms whereby increases in non-oil *GDP* augment demand for various sectoral – manufacturing, services, distribution – outputs. Theoretically, indirect contributions (or spread effects) can continue to accrue long after some export stimulus has occurred. The overall impact of an export stimulus on the economy has many determinants including technology, the propensity to import, the extent to which investment opportunities generated are accepted domestically, the ability to attract foreign factors and so on.

Obviously, neither the timing pattern exhibited by, nor the relative sizes of, exports' direct and indirect contributions to growth need to be fixed and could conceivably vary between subperiods, especially over long periods of economic development. Provided that investment opportunities generated by the growth of the export sector are exploited, the model predicts that economic growth will be a process of industrial diversification around an export base.

Has Saudi Arabian industry been able to diversify around their export bases directly, through increases in government expenditures? Or has the process of industrial growth stemmed largely from indirect or spread effects? Do similar patterns exist for the country's other major sectors – agriculture, construction, trade and services?

The general form of the equation used to estimate the relative importance of spread vs linkage effects was of the type:

$$MANUF = DUTCH, SPREAD, LINKAGE, CREDIT$$

Where:

1. *DUTCH* refers to the increase in the relative profitability of non-traded goods brought about as a result of oil boom related government expendi-

tures. This effect is proxied by the expected, *INFE* and unexpected rates of inflation *INFU*.

2. *SPREAD* refers to the increase in demand for output brought about by the overall growth of the non-oil sector of the economy, and is depicted by the expected *YNOE* and unexpected *YNOU* increases in non-oil *GDP*.

3. Linkage refers to the link in output to government expenditures and is depicted by the expected *GE* and unexpected *GU* increases in government expenditures. Here government expenditures are government consumption, investment, military and total expenditures. As a basis of comparison, private consumption both expected *PCE* and unexpected *PCU* are included.

4. *CREDIT* refers to Saudi Industrial Development Fund, *INDCR*, and the expected rate of commercial bank credit, to the private sector, *CBPSPE*.

In general the results for manufacturing (Table 2) indicate that:

1. Inflationary factors associated with the Dutch Disease have had a considerable retarding effect on Saudi Arabian manufacturing. This is evidenced by the negative sign and generally high statistical significance on the expected inflation term, *INFE*. Unexpected inflation appears to have had a lesser impact.

2. Spread effects have been considerably stronger than government expenditures in stimulating manufacturing. In fact there is some evidence that the crowding out of resources from manufacturing, particularly as a result of government investment, has been a major problem in Saudi Arabia.

3. Private consumption and industrial credit appear particularly important in stimulating increases in manufacturing output (Table 2, equation 5).

As a basis of comparison, similar equations were estimated for the agricultural sector (Table 3), construction (Table 4), trade (Table 5), and transport/communications (Table 6).

The results for agriculture (Table 3) show some similarities to those obtained for manufacturing:

1. In general inflationary expectations have had a negative impact on the growth of the agricultural sector. Since agriculture is also a good traded

TABLE 2

SAUDI ARABIA: EXPENDITURE IMPACT ON MANUFACTURING, 1965-85

Impact of government consumption				
(1) MANUF =	- 1.36 INFE (- 4.20)	- 1.57 INFU (- 1.90)	+ 0.79 YNOE (5.03)	+ 0.74 YNOU (3.86)
	+ 0.04 GCE (0.19)	- 0.19 GCU (- 1.51)	- 0.16 RHO (- 0.70)	
	$r^2 = 0.996; F = 576.87; DW = 1.97$			
Impact of government investment				
(2) MANUF =	0.07 INFE (0.14)	- 0.94 INFU (- 1.25)	+ 0.67 YNOE (8.76)	+ 0.59 YNOU (5.48)
	- 0.39 GIE (- 3.32)	- 0.19 GIU (- 1.10)	+ 0.42 RHO (2.10)	
	$r^2 = 0.991; F = 246.74; DW = 1.82$			
Impact of defense expenditures				
(3) MANUF =	- 1.14 INFE (- 2.79)	- 0.76 INFU (- 0.76)	+ 0.91 YNOE (8.01)	+ 0.80 YNOU (4.97)
	- 0.26 MEE (- 1.62)	- 0.06 MEU (- 0.36)	+ 0.27 RHO (1.28)	
	$r^2 = 0.990; F = 218.49; DW = 1.76$			
Impact of total government expenditures				
(4) MANUF =	- 0.62 INFE (- 1.76)	- 0.18 INFU (0.23)	+ 0.98 YNOE (12.33)	+ 0.87 YNOU (6.87)
	- 0.30 GEE (- 3.34)	- 0.21 GEU (- 3.21)	+ 0.12 RHO (0.52)	
	$r^2 = 0.996; F = 494.21; DW = 1.92$			
Impact of private consumption and industrial credit				
(5) MANUF =	- 1.56 INFE (- 3.70)	- 0.74 INFU (- 5.51)	+ 0.75 INDCR (4.46)	+ 0.41 YNOE (2.75)
	+ 0.18 YNOU (0.95)	+ 0.56 PCE (3.62)	+ 0.34 PCU (2.62)	- 0.76 RHO (- 5.27)
	$r^2 = 0.998; F = 1062.65; DW = 2.56$			

Notes: Estimates were made using a Cochrane-Orcutt iterative estimation procedure to correct for serial correlation. r^2 = coefficient of determination; F = F statistic; DW = Durbin Watson Statistic; () = t statistic

TABLE 3

SAUDI ARABIA: EXPENDITURE IMPACT ON AGRICULTURE, 1965-85

Impact of government consumption				
(1) AG =	- 3.02 INFE (- 5.11)	- 6.94 INFU (- 4.57)	+ 0.90 YNOE (3.22)	+ 0.03 YNOU (- 0.07)
	+ 0.21 GCE (0.19)	- 0.17 GCU (- 1.51)	- 0.50 RHO (- 2.62)	
			$r^2 = 0.962$; $F = 55.51$; $DW = 2.06$	
Impact of government investment				
(2) AG =	- 2.71 INFE (- 3.62)	- 7.44 INFU (- 5.38)	+ 0.68 YNOE (5.67)	- 0.32 YNOU (- 1.17)
	+ 0.04 GIE (0.26)	- 0.15 GIU (- 0.34)	- 0.64 RHO (- 3.81)	
			$r^2 = 0.967$; $F = 63.95$; $DW = 2.15$	
Impact of defense expenditures				
(3) AG =	- 2.89 INFE (- 7.68)	- 3.65 INFU (- 2.74)	+ 1.22 YNOE (8.13)	+ 0.63 YNOU (2.02)
	- 0.76 MEE (- 2.96)	- 0.32 MEU (- 1.48)	+ 0.49 RHO (2.51)	
			$r^2 = 0.981$; $F = 113.23$; $DW = 2.34$	
Impact of total government expenditures				
(4) AGP =	- 2.79 INFE (- 4.81)	- 7.58 INFU (- 5.18)	+ 0.66 YNOE (3.72)	- 0.25 YNOU (- 0.71)
	+ 0.05 GEE (0.27)	- 0.06 GEU (- 0.36)	- 0.59 RHO (- 3.24)	
			$r^2 = 0.996$; $F = 60.79$; $DW = 2.06$	
Impact of private consumption, expected commercial bank credit				
(5) AGP =	- 4.35 INFE (- 7.32)	- 7.12 INFU (- 7.12)	+ 3.69 CBPSPE (5.63)	- 0.31 YNOE (- 1.17)
	- 0.33 YNOU (- 1.44)	+ 0.93 PCE (4.58)	+ 0.74 PCU (4.42)	+ 0.23 RHO (1.07)
			$r^2 = 0.964$; $F = 46.73$; $DW = 2.22$	

Notes: Estimates were made using a Cochrane-Orcutt iterative estimation procedure to correct for serial correlation. r^2 = coefficient of determination; F = F statistic; DW = Durbin Watson Statistic; () = t statistic

TABLE 4

SAUDI ARABIA: EXPENDITURE IMPACT ON CONSTRUCTION, 1965-85

Impact of government consumption				
(1) CON =	2.32 INFE (8.40)	+ 2.23 INFU (3.87)	- 1.32 YNOE (- 1.06)	- 0.90 YNOU (- 0.74)
	- 0.36 GCE (- 0.24)	+ 1.23 GCU (1.55)	+ 0.38 RHO (- 2.62)	
	$r^2 = 0.984; F = 141.25; DW = 1.67$			
Impact of government investment				
(2) CON =	1.33 INFE (4.09)	+ 2.30 INFU (4.22)	- 0.46 YNOE (- 0.97)	+ 0.75 YNOU (0.86)
	+ 0.25 GIE (3.25)	+ 0.15 GIU (1.034)	- 0.02 RHO (- 0.07)	
	$r^2 = 0.994; F = 384.31; DW = 2.03$			
Impact of defense expenditures				
(3) CON =	2.03 INFE (8.86)	+ 1.38 INFU (2.07)	- 0.25 YNOE (- 3.50)	- 0.16 YNOU (- 1.44)
	+ 0.33 MEE (3.13)	+ 0.02 MEU (0.20)	+ 0.08 RHO (0.34)	
	$r^2 = 0.993; F = 298.4; DW = 1.88$			
Impact of total government expenditures				
(4) CON =	1.68 INFE (6.76)	+ 1.36 INFU (2.53)	- 0.24 YNOE (- 4.36)	- 0.16 YNOU (- 1.90)
	+ 0.21 GEE (3.40)	+ 0.18 GEU (4.23)	+ 0.17 RHO (0.77)	
	$r^2 = 0.993; F = 328.79; DW = 1.95$			
Impact of private investment				
(5) CON =	2.58 INFE (8.12)	+ 2.45 INFU (4.54)	- 0.60 YNOE (- 1.08)	+ 0.30 YNOU (0.35)
	- 0.73 PIE (- 2.01)	+ 0.17 PIU (0.78)	+ 0.19 RHO (0.87)	
	$r^2 = 0.991; F = 233.24; DW = 1.88$			

Notes: Estimates were made using a Cochrane-Orcutt iterative estimation procedure to correct for serial correlation. r^2 = coefficient of determination; F = F statistic; DW = Durbin Watson Statistic; () = t statistic

TABLE 5

SAUDI ARABIA: EXPENDITURE IMPACT ON
WHOLESALE AND RETAIL TRADE, RESTRAINTS AND HOTELS, 1965-85

Impact of government consumption				
(1) <i>DIST</i> =	- 1.44 <i>INFE</i> (- 1.83)	+ 4.46 <i>INFU</i> (2.66)	+ 1.82 <i>YNOE</i> (5.10)	+ 1.52 <i>YNOU</i> (4.34)
	- 0.28 <i>GCE</i> (- 0.63)	- 0.18 <i>GCU</i> (- 0.76)	+ 0.35 <i>RHO</i> (1.70)	
			$r^2 = 0.993; F = 319.77; D = 2.17$	
Impact of government investment				
(2) <i>DIST</i> =	- 1.71 <i>INFE</i> (- 1.58)	+ 4.34 <i>INFU</i> (2.78)	+ 1.66 <i>YNOE</i> (10.32)	+ 1.49 <i>YNOU</i> (6.59)
	+ 0.11 <i>GIE</i> (0.45)	- 0.40 <i>GIU</i> (- 1.15)	+ 0.44 <i>RHO</i> (2.18)	
			$r^2 = 0.993; F = 315.08; D = 1.90$	
Impact of defense expenditures				
(3) <i>DIST</i> =	- 1.27 <i>INFE</i> (- 1.60)	+ 4.02 <i>INFU</i> (2.27)	+ 1.60 <i>YNOE</i> (7.65)	+ 1.36 <i>YNOU</i> (4.78)
	- 0.13 <i>MEE</i> (- 0.47)	+ 0.17 <i>MEU</i> (0.60)	+ 0.37 <i>RHO</i> (0.34)	
			$r^2 = 0.993; F = 302.21; D = 2.13$	
Impact of total government expenditures				
(4) <i>DIST</i> =	- 1.46 <i>INFE</i> (- 1.59)	+ 3.45 <i>INFU</i> (1.92)	+ 1.57 <i>YNOU</i> (8.18)	+ 1.33 <i>YNOE</i> (4.89)
	+ 0.08 <i>GEE</i> (0.38)	- 0.02 <i>GEU</i> (- 0.11)	+ 0.36 <i>RHO</i> (1.75)	
			$r^2 = 0.993; F = 313.04; D = 2.09$	
Impact of private consumption and commercial bank credit				
(5) <i>DIST</i> =	0.09 <i>INFE</i> (0.13)	+ 4.01 <i>INFU</i> (3.53)	+ 1.00 <i>CBCRP</i> (2.55)	+ 1.07 <i>YNOE</i> (4.32)
	+ 0.85 <i>YNOU</i> (3.49)	- 0.03 <i>PCE</i> (- 0.12)	- 0.28 <i>PCU</i> (- 1.63)	+ 0.37 <i>RHO</i> (1.79)
			$r^2 = 0.997; F = 537.13; D = 1.86$	

Notes: Estimates were made using a Cochrane-Orcutt iterative estimation procedure to correct for serial correlation. r^2 = coefficient of determination; F = F statistic; DW = Durbin Watson Statistic; () = t statistic

TABLE 6

SAUDI ARABIA: EXPENDITURE IMPACT ON
TRANSPORT, STORAGE, COMMUNICATIONS, 1965-85

Impact of government consumption				
(1) TSC =	- 4.64 INFE (- 4.14)	- 5.06 INFU (- 2.33)	+ 2.93 YNOE (6.16)	+ 2.13 YNOU (4.76)
	- 1.73 GCE (- 2.96)	- 0.58 GCU (- 1.97)	+ 0.50 RHO (2.61)	
	$r^2 = 0.969; F = 68.38; D = 1.77$			
Impact of government investment				
(2) TSC =	- 6.65 INFE (- 4.18)	- 6.27 INFU (- 5.75)	+ 1.91 YNOE (7.93)	+ 1.02 YNOU (3.17)
	+ 0.88 GIE (2.39)	+ 1.64 GIU (3.34)	+ 0.18 RHO (2.82)	
	$r^2 = 0.968; F = 66.47; D = 1.86$			
Impact of defense expenditures				
(3) TSC =	- 4.52 INFE (- 2.79)	- 7.69 INFU (- 2.91)	+ 2.03 YNOE (5.23)	+ 1.56 YNOU (3.57)
	- 0.31 MEE (- 0.70)	- 0.29 MEU (- 0.69)	+ 0.71 RHO (4.54)	
	$r^2 = 0.903; F = 20.27; D = 1.63$			
Impact of total government expenditures				
(4) TSC =	- 4.01 INFE (- 2.41)	- 7.97 INFU (- 2.88)	+ 1.88 YNOE (5.41)	+ 1.31 YNOU (3.13)
	- 0.18 GEE (- 0.52)	+ 0.06 GEU (0.26)	+ 0.65 RHO (1.75)	
	$r^2 = 0.927; F = 27.62; D = 1.41$			
Impact of private consumption and commercial bank credit				
(5) TSC =	- 4.27 INFE (- 2.77)	- 7.29 INFU (- 5.20)	+ 0.54 CBCRP (0.78)	+ 1.26 YNOE (2.46)
	+ 0.91 YNOU (1.92)	- 0.34 PCE (0.78)	- 0.74 PCU (2.10)	+ 0.80 RHO (5.96)
	$r^2 = 0.917; F = 19.02; DW = 1.79$			

Notes: Estimates were made using a Cochrane-Orcutt iterative estimation procedure to correct for serial correlation. r^2 = coefficient of determination; F = F statistic; DW = Durbin Watson Statistic; () = t statistic

internationally, Dutch Disease effects are most likely diverting resources to other (non-traded) activities in the kingdom.

2. As with manufacturing, spread effects are considerably more important in affecting output than the direct linkage effects associated with increased government expenditures. However, military expenditures are the only apparent source causing a crowding out of resources from the sector.

3. Credit, but not private consumption have aided agriculture's rather phenomenal growth.

In contrast to the traded activities examined above, non-traded sectors follow a somewhat different pattern:

1. Construction (Table 4) has been largely stimulated by government investment and inflation. This is consistent with the non-traded character of the sector and the direct link of sectoral activity with the government's infrastructure programs.

2. Trade (Table 5) has been largely linked to activity in other sectors – spread effects are predominant. While inflation might be expected to have drawn resources towards the sector, this appears to be only true in the case of unanticipated inflation.

3. Transport, Storage and Communication sectors have experienced (Table 6) a blend of factors responsible for the expansion of the construction and trade sectors. Inflation has drawn resources towards these activities as their profitability most likely increased relative to traded activities. While the direct links to government investment have been important, spread effects have been particularly strong elements affecting this sector's output.

Conclusions

The main thrust of the analysis undertaken above has been to assess the possibility of reduced government expenditures as a way of overcoming the deflationary effects associated with falling oil revenues and the need for sustained austerity in public sector expenditures. Particular attention has been given to the ability of the government to sustain manufacturing output

through altering the composition (but not necessarily level) of public sector expenditures.

With regard to the government's infrastructure program, one can only conclude that the Saudi Arabian development strategy, based largely on the assumptions of a Hirschman type unbalanced growth strategy greatly overestimated the willingness of entrepreneurs to shift resources to manufacturing as costs of production fell. Put differently the Saudi Arabian private sector does not appear interested in investing in fixed plant and equipment solely as a result of the Hirschman-type cost reducing linkages stemming from the public sector's infrastructure led development strategy.

On the other hand, the demand creation or spread effects stemming from the government's infrastructure led investment program has been successful in creating a non-inflationary environment, which in turn has tended to stem the potential flow of resources out of the sector and into non-traded activities.

Clearly, private sector demand still remains to a certain extent a function of government expenditure.

It appears however¹⁷ that private sector demand is likely to remain reasonably buoyant even with lower government expenditures because a significant portion of the demand is financed by past savings. This seems to confirm the more optimistic observations of certain Gulf officials that the fall in oil revenues and in government expenditure may have set in motion some degree of cure for any Dutch Disease problems that remain.

As the Economist Intelligence Unit notes:¹⁸

It is something of a truism to say that private capital steers clear of inflationary situations, but it may yet come to have considerably more relevance in the Gulf than in any sophistry involved in breaking oil revenue into component income and capital parts. With the easing of the governments pull on the availability of manpower, services and goods, and with a greater emphasis on efficiency in both the oil and government sectors, the costs of doing business have fallen, and the returns have become more predictable.

The results presented above are consistent with the Intelligence Unit's assessment that the willingness of the Gulf private sector to repatriate incremental income derived from past government spending, or to liquidate foreign currency deposits held in local banks to finance investment in industry or even to fund certain government projects will be crucial over the next few years. The private sector needs reassurance that the government will not engage in policies likely to initiate another round of inflation.

¹⁷ LOONEY (1987/88).

¹⁸ ECONOMIST INTELLIGENCE UNIT (1988a, p. 17).

In terms of government expenditures themselves, the results presented above suggest that all efforts should be made to shift allocations from consumption to the Saudi Industrial Development Bank. In this sense the recent decline in government sponsored lending activity (Table 1) must be reversed if industrial output is to sustain another phase of expansion.

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EFFICACIA DEGLI SFORZI DI DIVERSIFICAZIONE INDUSTRIALE DELL'ARABIA SAUDITA: CONSEGUENZE DI UNA DIMINUZIONE DELLE SPESE PUBBLICHE

Scopo principale di questo articolo è di esaminare le conseguenze della riduzione dei ricavi petroliferi per l'economia dell'Arabia Saudita. In particolare, l'articolo esamina varie strategie di austerità alternative che si aprono al governo.

I principali risultati sono che il programma del governo di investimenti in infrastrutture si è rivelato deludente nello stimolare l'investimento del settore privato. D'altra parte, la creazione di domanda o gli effetti collaterali originati dal programma di investimenti in infrastrutture ha avuto successo nel creare un ambiente non inflazionistico. Questo a sua volta ha avuto la tendenza a dirigere il flusso potenziale di risorse fuori da questo settore. Evidentemente, la domanda del settore privato rimane ancora in certa misura una funzione della spesa pubblica.

In termini di spese pubbliche, i risultati qui presentati suggeriscono che si dovrebbero intensificare gli sforzi per spostare le disponibilità dal consumo verso la Banca per lo Sviluppo Industriale dell'Arabia Saudita.