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**Growth, Investment, and Saving in the Arab Economies<sup>1</sup>**

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**Abstract**

Sustaining a high rate of economic growth is the major policy issue facing the Arab economies. A detailed analysis of growth, investment, and savings for the period 1971-96, including through a growth accounting exercise, shows that increasing long-run growth requires improvements in both investment and domestic savings. In the past, the Arab region's growth was overly reliant on volatile external sources of funding, and total factor productivity growth was too low. The paper discusses the policy priorities to overcome the legacy of poor growth.

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<sup>1</sup>A summary version of this paper is to be presented at the seminar on "Sustainable Growth in the Arab World" hosted by the Government of Yemen.

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## Summary

Sustaining a high rate of economic growth—to address employment challenges and substantially improve living standards—is the major policy issue facing the Arab economies. The analysis presented in this paper demonstrates that, to meet this challenge, Arab economies will have to improve the level and efficiency of investment and the amount and sustainability of domestic savings.

The experience of 1971-96 highlights the positive correlation between growth, investment, and savings and the important role of external factors in determining all three variables. During the earlier part of the period, the windfall gains resulting from the sharply increasing real crude oil prices led to both higher per capita growth and investment ratios in all Arab economies, either directly or indirectly through such channels as remittances, other current transfers, and external financing. The process worked in reverse in the 1980s, when the decline in real oil prices affected all three variables negatively.

While the oil price cycle clearly had a large impact on growth, investment, and savings in the region, a growth accounting exercise highlights other, efficiency-related aspects in the long-run growth performance. Economic growth was primarily extensive in many Arab countries; it was driven by the rapid increases in the labor force and the cycle of the first accelerating and then decelerating capital stock growth. Intensive growth—generated by increases in total factor productivity—was generally low or even negative, a fact that is related to structural problems, such as the large share of the government sector in economic activities and distortionary interventions, and to the decline in investment ratios after 1985.

## I. INTRODUCTION

It is now widely recognized that sustaining a high rate of economic growth is one of the major policy issues, if not the major one, facing the Arab economies. The Arab economies need to build on the recent increases in their growth rates if they are to better meet their employment challenges and substantially improve the living standards of their population. This is not an easy task. It involves decisively overcoming the legacy of slow growth of the 1980s and early 1990s. To do this, the economies must reduce their dependence on external stimuli and develop comprehensive, broad-based and durable domestic sources of growth.

The recent strengthening of the economic reform efforts in the Arab region as a whole provides a clear indication of policy makers' realization of what is at stake and of what is needed in terms of changes in policy orientation. At the most fundamental level, the success of these reforms will depend on their effectiveness in improving the level and efficiency of domestic investment, and the amount and sustainability of domestic savings. Why? Because a better investment performance holds the key to higher growth—through its direct contribution in terms of a larger and more efficient stock of human and physical capital, and indirectly by inducing higher foreign direct investment and transfer of technology and managerial know-how. This investment must be financed in a manner consistent with low inflation and a comfortable balance of payments position. This can only be done if domestic savings increase, thereby also reducing the region's vulnerability to adverse external developments.

The purpose of this paper is to cast more light on the interlinkages between growth, investment and savings in the Arab region—this in order to better understand both the past and the future. The paper is organized as follows: Section II provides the historical perspective by discussing the region's growth, investment and saving record. It highlights the two distinct sub-periods that the region has gone through since the early 1970s in terms of the level of growth and investment, and the linkages to the nature and durability of the savings performance. In the following section, an attempt is made to develop further the analytical linkages between the various elements of this record. Specifically, the paper investigates the components of growth, focussing on linkages to capital accumulation and productivity enhancements. This provides the basis for Section IV's discussion of the policy implications for the future, identifying the key factors that will determine the sustainability of the current phase of higher growth. The paper's concluding remarks are contained in Section V.

The analysis in this paper is subject to two important qualifications. First, like most studies of this sort, it had to deal with data limitations—a factor accentuated by the length of the period of analysis in Sections II and III. Indeed, data gaps curtailed not only the country sample but also some of the questions that could be addressed fully. Second, because a multi-country approach was adopted, regional averages tended to conceal some important differences among the experience of individual countries. This is inevitable and highlights the importance of complementing this type of regional analysis with more detailed country studies.

## **II. GROWTH, INVESTMENT, AND SAVINGS IN THE ARAB REGION**

### **A. Overview**

In the 1960s and 1970s, the Arab countries' growth performance was bolstered by the discovery of natural resources and, at a later stage, favorable external terms of trade shocks. Growth during the boom period was associated with a high level of investment; however, with hindsight, the latter, which was dominated by public sector capital formation, proved to have efficiency problems and its financing tended to rely excessively on exogenous and temporary sources of savings.

The sharp decline in energy prices (starting in the mid 1980s) contributed to a fall in both growth and investment rates. For some countries, declining growth had at its root a sharp fall in national savings—reflecting an effort to maintain high consumption levels—which constrained investment expenditures. For others, the decline was reflective of a dwindling of other traditional investment financing sources.

In the most recent years, the region has experienced an improvement in its domestic savings performance, largely as a result of declining budgetary imbalances. The resulting amelioration in macroeconomic conditions has strengthened the enabling environment for the implementation of structural reforms aimed at enhancing the level and efficiency of investment. Indeed, some countries are already experiencing the beneficial impact of this process—in terms of higher growth, a pick up in private investment activity, and larger private capital inflows.

### **B. The Growth Picture**

For most Arab countries, the recent economic growth performance has been disappointing. Following the high growth period of 1970-85—in which real growth rate averaged 5 percent annually—the region's growth rate fell (Chart 1). As a result, the region's real per capita income level in 1996 was 3 percent lower than its level a decade earlier.

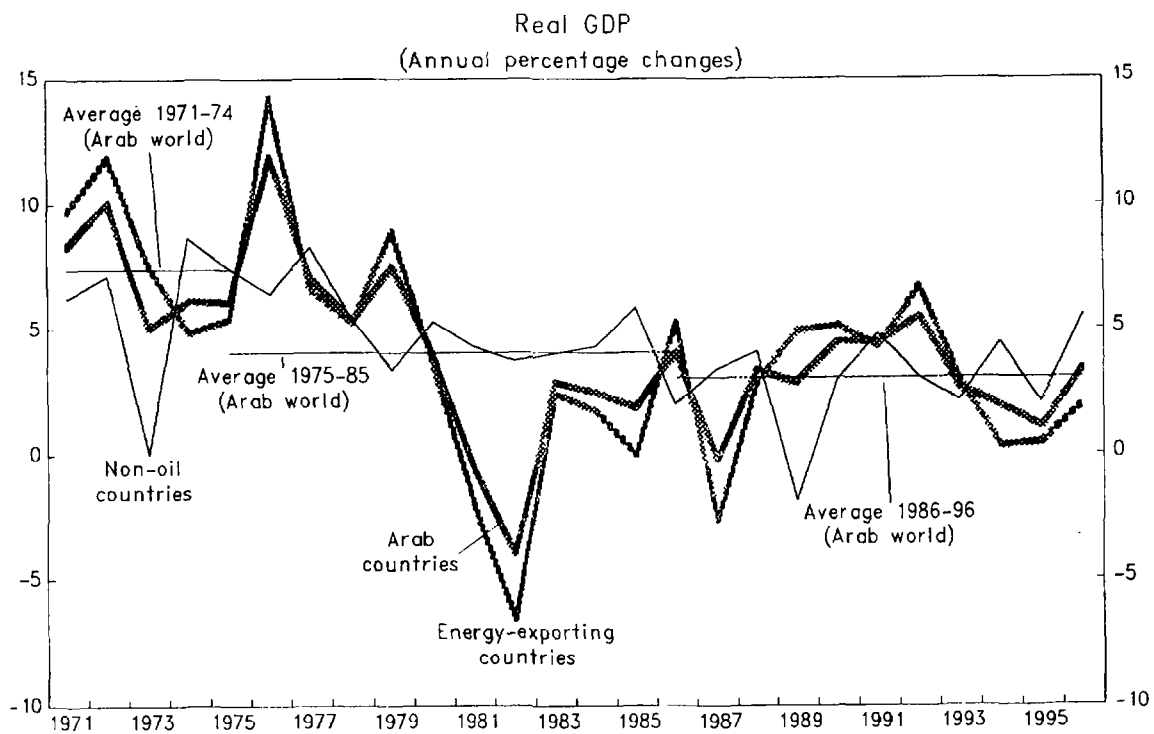
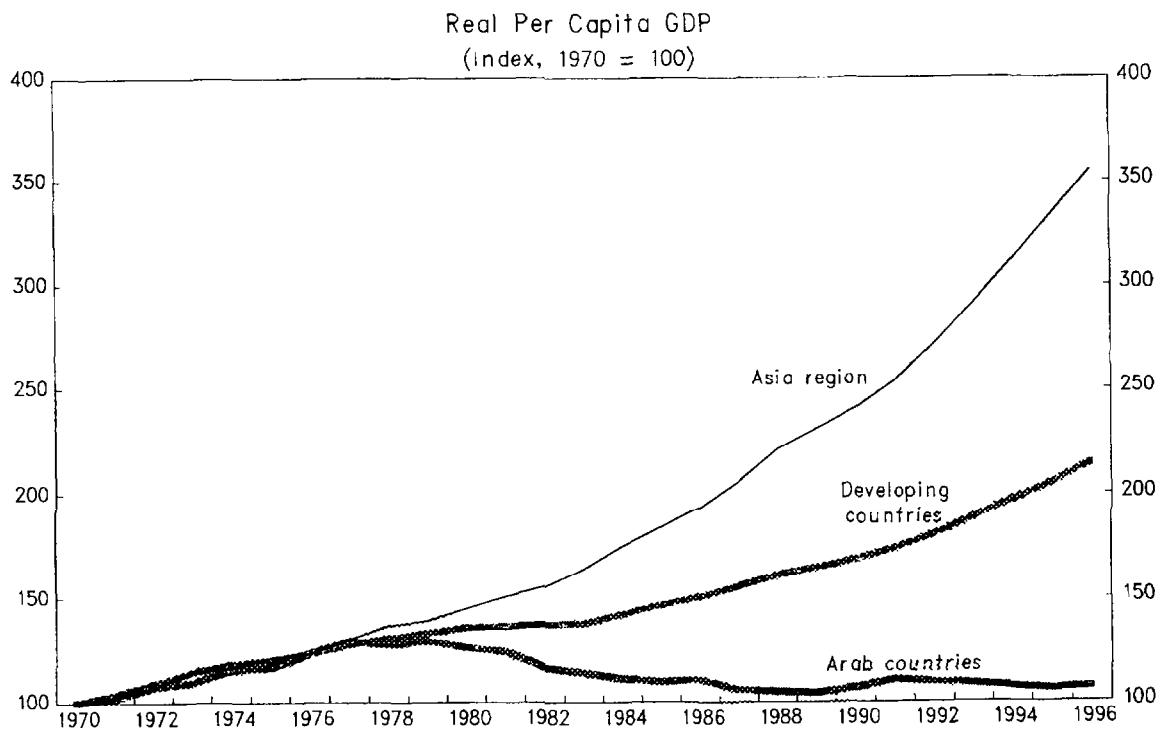
The disappointing growth performance is made more stark when compared to developments elsewhere in the world economy. Specifically, at a time when the Arab countries experienced a contraction in their per capita income, that of developing countries as a whole rose by 42 percent while that of the fast growing countries of East Asia increased by 82 percent.

Like other regions, there were significant variations among individual countries' growth performance within the Arab region. In the energy-exporting economies,<sup>2</sup> the large international oil price increases of 1973 and 1979 provided an important direct stimulus to

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<sup>2</sup> Defined to include the six members of the GCC (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates), Algeria, and Libya.

# CHART 1 GROWTH INDICATORS, 1970-96



Sources: National authorities; and staff estimates.

growth. Many of the other countries in the region experienced positive spillover effects, principally as a result of remittance flows and receipt of financial assistance. These countries were also positively impacted by international developments, including buoyant demand from outside the region for its labor services and higher availability of external financial assistance. Their growth was reflective of associated heavy investment by the public sector, typically in import substitution activities.

Since the early 1980s, there has been a sharp reduction in the real price of oil. The spillover effects from the oil to the non-oil economies worked in a contractionary manner at a time when labor demand subsided in the region's major external markets. Concurrently, the return from the earlier investment surge declined rapidly, leaving many non-oil Arab economies with a growing problem of external indebtedness, financial imbalances, and an aging capital stock.

Looking forward, most analysts agree that current prospects are that the Arab economies' external environment is unlikely to provide a major stimulus to growth;<sup>3</sup> indeed, a major challenge is to insulate the region more from the impact of unfavorable external developments. This is particularly true for the international oil market. Also, high unemployment in European countries is likely to limit demand for labor flows from the Arab region. Finally, the outlook for official bilateral assistance is uncertain as major donors and creditors face their own budget consolidation issues. At the same time, however, recent trends towards globalization offer the region great promise in terms of economic advancement.<sup>4</sup> Accordingly, the main challenge facing the region's authorities today is to implement domestic policies aimed at spurring high and sustainable growth and, more generally, raising general living standards—all while placing the region in a position that would permit it to reap the benefits of globalization. The crucial step in meeting this challenge is to increase both the level and efficiency of the region's capital.

### **C. The Investment Picture**

Like the growth performance, the Arab region's investment performance weakened in the latter part of the 1970-96 period. Specifically, after growing sharply in the 1970s (to peak at 32 percent of GDP in 1978), gross fixed capital formation has hovered just above 20 percent since the mid-1980s—a level that is lower than the average for developing countries as a whole (nearly 26 percent in 1996) and sharply lower than the ratios prevailing in the fast growing Asia region (31 percent; Chart 2).

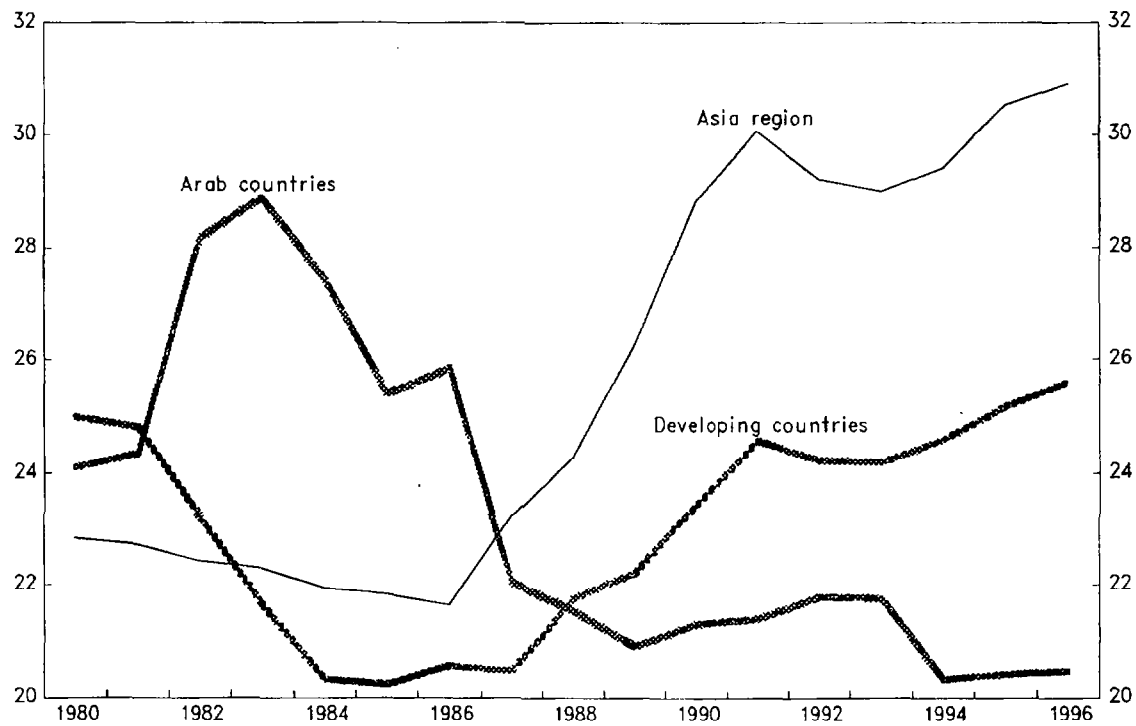
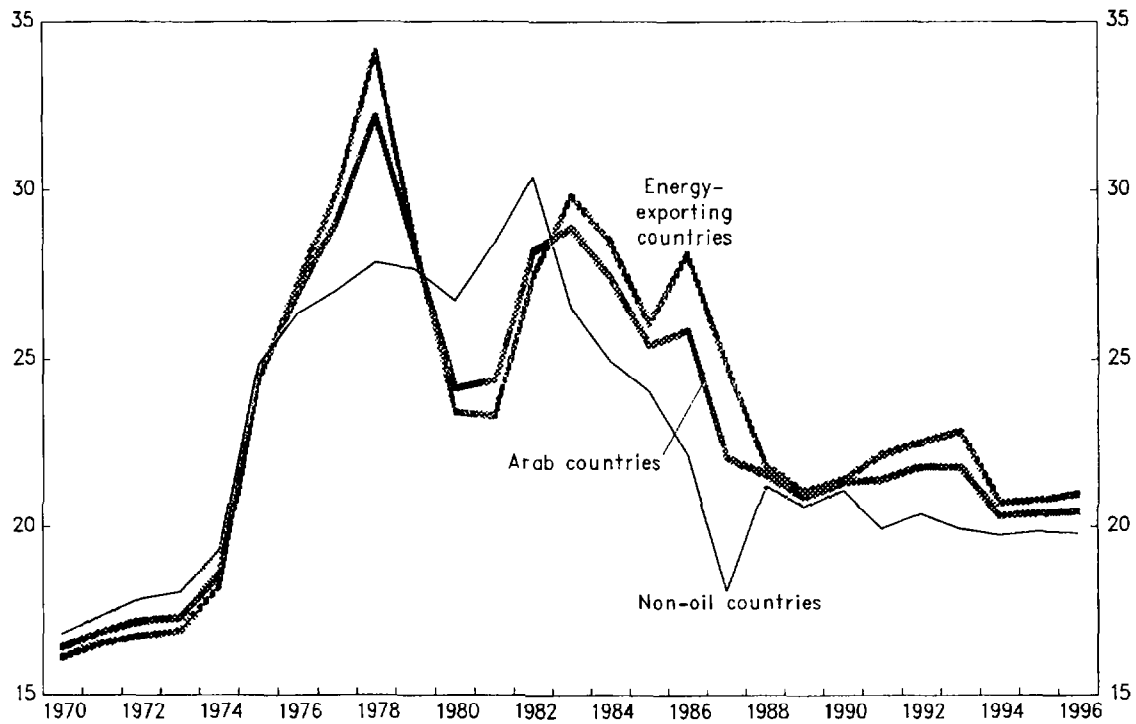
In the high growth/high investment period (1970s and early 1980s), governments in the oil-economies channeled surpluses from oil exports into infrastructure, basic social services, and (over time) industrial activities. Subsequently, investment expenditures were badly hit in the recession that ensued as real oil prices declined. By 1996, investment rates were more than

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<sup>3</sup> See, for example, El-Erian (1996).

<sup>4</sup> See Alonso-Gamo, Fedelino, and Paris-Horvitz (1997).

CHART 2  
INVESTMENT, 1970-96  
(In percent of GDP)



Sources: National authorities; and staff estimates.



10 percentage points of GDP below their peak of the late 1970s. The cyclic pattern of investment was as sharp in the non-oil countries. There, a period of very high investment (mostly by the public sector) ended in the early 1980s, and was followed by a period in which the share of investment expenditures in GDP fell by more than 10 percentage points between the early 1980s and 1996.

Consistent with low levels of domestic investment, the region has attracted only modest amounts of foreign direct investment (FDI), a significant share of which was concentrated in the energy sector.<sup>5</sup> Since the mid-1980s, the ratio of FDI to GDP has hovered just above 0.5 percent annually—a rate that is significantly below those in fast-growing developing countries. For comparison, the Asia region has for years attracted FDI flows equivalent to more than 1 percent of GDP per year, while in the Western Hemisphere region, the pattern is more recent but no less evident.

Not only has the level of investment in the Arab world been modest by international standards, and well below the aspiration of policy makers, its efficiency also appears to have been relatively low. The incremental-capital-output-ratio in the Arab region is much higher than that in other regions. More significant, perhaps, the trend in such an indicator has deteriorated, confirming the findings of a number of sector specific studies.

Low capital efficiency in the region is to some extent associated with the pattern of large public capital expenditures. While most Arab governments provide infrastructure services to households in quantities analogous to, or even higher than countries with similar incomes, the quality of such services is low.<sup>6</sup> In addition, while Arab countries devote a greater share of their national income to education than any other region in the world, the emphasis on higher education (as opposed to basic education or vocational training), and the (demography-induced) deteriorating quality of education have resulted in, inter alia, disappointing completion rates, high unemployment among graduates, and low labor productivity.<sup>7</sup>

#### **D. The Savings Picture**

Having discussed developments in growth and investment in the Arab world, this section examines the financing of capital accumulation by looking at the *savings-investment*

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<sup>5</sup> This pattern also extended to other forms of private capital flows; see El-Erian and Kumar (1995) and El-Erian and Sheybani (1997).

<sup>6</sup> See World Bank (1995) for indicators.

<sup>7</sup> Shafik (1994).

*balance*—specifically: at what level of savings and investment and at what composition of savings was the overall equilibrium condition met?<sup>8</sup>

Table 1 includes summary savings-investment balances for the Arab region with a breakdown between the energy-exporting and non-oil economies. The analysis also distinguishes between two periods: the high growth/high investment period (1974-85) and the low growth/low investment period (1986-96).

During the *high investment/high growth period*, the Arab world's investment rate rose by 10 percentage points of GDP relative to the early 1970s. On the financing side, national savings rose much more sharply (by 20 percentage points of GDP). Consequently, the Arab world became a net foreign saver (i.e., registering current account surpluses amounting to 11 percent of GDP per year).

To better understand these development, it is worthwhile considering intra-regional differences. For *energy exporting Arab countries*, investment rates during 1974-85 also rose by an average 10 percentage points of GDP per year relative to the early 1970s. National savings, however, increased by an average 24 percentage points of GDP to reach 45 percent—one of the highest levels ever registered. The increase in domestic savings was equally sharp.

The dramatic improvement in both savings rates was associated with the two oil price increases of 1973/74 and 1979/80. With the rise in national savings outstripping that of investment, energy exporting economies were able to use the excess to accumulate an estimated 13 percent of GDP in foreign assets *every year* (Table 2)—this being the mirror image of the enormous current account surpluses (amounting to 18 percent of GDP) registered during 1974-85.

A different picture emerges upon examination of the *non-oil Arab economies*. During the high growth/high investment period, investment grew by 9 percentage points of GDP but domestic savings rose by only 1 percentage points of GDP. This lackluster savings behavior reflected a number of factors. First, outlets for mobilizing and allocating higher private savings were

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<sup>8</sup>The balance distinguishes between two sources of savings: national and foreign. National savings include domestic savings, defined as the excess of domestically produced output (GDP) over consumption, and income earned on factors of production residing abroad including labor remittances and net interest payments on foreign assets/liabilities. Foreign savings are defined as foreign resources available to finance domestic expenditures and are equivalent to the negative of the balance of payment's current account position. In equilibrium, total savings equals total investment.

Table 1. Savings-Investment Balance of Arab Countries, 1970-96

(In percent of GDP)

|  | Average<br>1970-73 | Average<br>1974-85 | Average<br>1986-96 |
|--|--------------------|--------------------|--------------------|
| <i>Total Arab countries</i>            |                    |                    |                    |
| Investment                             | 16.9               | 26.5               | 21.6               |
| Total savings                          | 16.9               | 26.5               | 21.6               |
| National savings                       | 16.1               | 37.4               | 17.9               |
| Domestic savings                       | 22.9               | 39.6               | 20.3               |
| Factor income, net                     | -1.5               | 0.7                | 0.7                |
| Current transfers, net                 | -5.3               | -2.8               | -3.1               |
| Foreign savings                        | 0.9                | -10.9              | 3.7                |
| <i>Energy exporting Arab countries</i> |                    |                    |                    |
| Investment                             | 16.6               | 26.7               | 22.5               |
| Total savings                          | 16.6               | 26.7               | 22.5               |
| National savings                       | 20.9               | 44.9               | 18.3               |
| Domestic savings                       | 30.7               | 50.8               | 24.9               |
| Factor income, net                     | -1.9               | 1.5                | 2.4                |
| Current transfers, net                 | -7.8               | -7.4               | -9.0               |
| Foreign savings                        | -4.4               | -18.2              | 4.2                |
| <i>Non-oil Arab countries</i>          |                    |                    |                    |
| Investment                             | 17.5               | 26.2               | 20.2               |
| Total savings                          | 17.5               | 26.2               | 20.2               |
| National savings                       | 8.5                | 19.5               | 17.5               |
| Domestic savings                       | 10.7               | 11.9               | 12.4               |
| Factor income, net                     | -0.8               | -1.3               | -2.3               |
| Current transfers, net                 | -1.3               | 9.0                | 7.4                |
| Foreign savings                        | 9.0                | 6.6                | 2.7                |

Sources: National Authorities; World Economic Outlook, IMF; and staff estimates.

limited due to financial market imperfections.<sup>9</sup> Second, the per capita income of many countries in the region was quite low. Third, high inflation, negative real interest rates, and overvalued exchange rates biased incentives in favor of current consumption. In addition, macroeconomic instability created an uncertain environment which discouraged savings. Fourth, prevalent fiscal deficits resulted in low public sector savings which pushed downward total savings.

With investment growth in the non-oil countries rising much more sharply than domestic savings, the non-oil Arab economies depended to a very large extent on foreign savings, labor remittances, and foreign aid; indeed, this was a key characteristic of the 1974-85 period.<sup>10</sup> The current account deficits that emerged were "covered" by external borrowing from official and commercial sources: the level of external indebtedness in the non-oil Arab region rose by an average 6.3 percentage points of GDP *every year*. During that same period, non-debt-creating flows amounted to only 1.5 percentage points of GDP.

In the subsequent *low growth/low investment period*, both investment and domestic savings fell sharply. Again, looking at intra-regional developments, the investment rate of *energy-exporting Arab countries* fell by 4 percentage points of GDP in 1986-96 relative to the average during 1974-85. However, as the economies of the region attempted to smooth out their consumption levels, both national and domestic saving rates declined much more sharply. As a result, the external current account position turned from an average surplus of 18 percent of GDP in 1974-85 to an average deficit of 4 percent of GDP in 1986-96.<sup>11</sup> Fortunately, these countries were able to soften the impact by drawing down on the large foreign assets accumulated in earlier years as they took measures aiming to restore the surplus positions.

In the *non-oil Arab countries*, the fall in the investment rate during the 1986-96 period amounted to 6 percentage points of GDP relative to the high growth/high investment period. Recalling that investment spending during the earlier period was largely financed by exogenous and/or temporary sources of financing (viz, foreign aid, labor remittances, external indebtedness), it is no surprise that the latter's decline caused, to some extent, a fall in

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<sup>9</sup>For a discussion of savings behavior in developing countries, see Masson, Bayoumi, and Samiei (1995), Ogaki, Ostry, and Reinhart (1992), and Giovannini (1985).

<sup>10</sup>The non-oil countries ran current account deficits amounting to 6.6 percent of GDP which was financed by large external borrowing from official and commercial sources. If one adopts a slightly broader coverage, factor income from abroad (mainly labor remittances) and foreign aid amounted to an average of nearly 8 percentage points of GDP during this period.

<sup>11</sup>During this period, disruptions associated with the 1990/91 Iraqi invasion of Kuwait also played a big role—by increasing expenditure and by reducing investment income as a result of the decline in foreign assets. For details, see El-Erian and Sassanpour (1997) and Chalk, El-Erian, Fennell, Kireyev and Wilson (1997).

Table 2. External Financing of Arab Countries, 1970-96

(In percent of GDP)

|  | Average<br>1970-73 | Average<br>1974-85 | Average<br>1986-96 |
|--|--------------------|--------------------|--------------------|
| <i>Total Arab Countries</i>            |                    |                    |                    |
| Current account balance                | -0.9               | 10.9               | -3.7               |
| Net External Financing                 | 3.9                | -6.6               | 3.6                |
| Non-debt-creating flows, net           | 0.2                | 0.1                | 0.7                |
| Net external borrowing                 | 1.9                | 2.2                | 0.8                |
| Other 1/                               | 1.8                | -9.0               | 2.1                |
| Change in reserves (- = increase)      | -3.0               | -4.3               | 0.1                |
| <i>Energy-Exporting Arab Countries</i> |                    |                    |                    |
| Current account balance                | 4.4                | 18.2               | -4.2               |
| Net External Financing                 | -0.7               | -12.6              | 2.8                |
| Non-debt-creating flows, net           | 0.0                | -0.4               | -0.5               |
| Net external borrowing                 | 1.1                | 0.7                | 0.6                |
| Other 1/                               | -1.8               | -12.8              | 2.7                |
| Change in reserves (- = increase)      | -3.7               | -5.5               | 1.3                |
| <i>Non-oil Arab Countries</i>          |                    |                    |                    |
| Current account balance                | -9.0               | -6.6               | -2.7               |
| Net External Financing                 | 10.8               | 8.0                | 4.9                |
| Non-debt-creating flows, net           | 0.4                | 1.5                | 3.1                |
| Net external borrowing                 | 3.0                | 6.3                | 0.9                |
| Other 1/                               | 7.3                | 0.2                | 0.9                |
| Change in reserves (- = increase)      | -1.8               | -1.4               | -2.1               |

Sources: National authorities, World Economic Outlook, IMF; and staff estimates.

1/ Asset transactions, including net errors and omissions.

investment rates. In particular, the slowdown in economic activity in the energy-exporting economies contributed to factor income from abroad and foreign aid falling by 2.5 percentage points of GDP. At the same time, difficulties in accessing international financing sources in the context of mounting external debt pressures for several countries resulted in foreign savings shrinking by more than 4 percentage points of GDP.<sup>12</sup> These factors highlighted these countries' dependence on, and vulnerability to external developments. Indeed, the small increase in domestic savings (by an average 0.5 percentage points of GDP for the period as a whole, more from the low point) resulting from improved fiscal positions could not compensate for the reduction in foreign sources of investment financing, especially as private savings remained low.

### **E. Putting it all Together**

So where does this leave us? Our general analysis of the experience of Arab countries during the 1970-96 period *as a whole* highlights the similarities in developments in growth, investment and savings. It also points to the region's inability to attract sufficient foreign direct investment—not surprising given the disappointing domestic investment performance—and the vulnerability that the region faced as a result of excessive dependence on external sources of financing. In some non-oil economies, this excessive dependence led to the debt crises of the 1980s and the subsequent need for deep stabilization; in the case of the oil economies, it was associated with a drawdown of foreign assets.

Looking forward, and as is now widely recognized in the region, improving investment performance—both level and quality—and raising domestic saving rates are essential requirements for reinvigorating the growth performance. At a juncture in which the external environment can no longer be relied on as a beneficial stimulant role as previously, the region needs to sustain appropriate policies that aim to enhance domestic contributors to growth while placing the region in a position to reap maximum benefit from globalization trends. Accordingly, the following section investigates, in a growth accounting framework, the various contributors to the economic growth performance of a selected group of Arab economies.

## **III. GROWTH ACCOUNTING AND THE LINK TO INVESTMENT**

The disappointing growth and investment performance of Arab countries over the last decade raises several questions—questions that need to be answered if the region is to succeed in sustaining the very recent pick up in growth and investment. In particular, it is important to assess the linkage between growth on the one hand and the level and efficiency of investment on the other. To do so, this section attempts to identify the sources of long-run growth.

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<sup>12</sup>Reflecting both country-specific and systemic issues, net external borrowing during 1986-96 fell by 5 percentage points of GDP (to less than 1 percent of GDP) relative to the boom period.

Specifically, and following a brief introductory discussion of growth theory, an attempt is made to identify the contribution of total factor productivity and factor inputs to the growth performance of the Arab countries. The results, which complement the discussion of Section II, provide the basis for the subsequent discussion of the main policy issues.

### **A. Background**

Growth theory seeks to explain the trend growth rate of total output per capita in an economy. Two sources of growth can be distinguished: (i) growth that is accounted for by increases in the quantities of factor inputs (capital and labor); and (ii) growth that is accounted for by increases in the efficiency in the use of inputs. The latter source of growth is labeled as total factor productivity (TFP). Often referred to as "technology," TFP encompasses all methods used to produce goods and services with factors of production. Improvements in technology increase the productivity of all factors of production, and thus also raise total output. Growth based on increases in factor inputs is sometimes called "extensive growth," whereas growth based on TFP is called "intensive growth."

The identification of sources of growth is an important element from the perspective of neoclassical growth theory, which emphasizes the impact of increases in TFP (or, in other words technological progress) on sustained long-term growth. Specifically, policies that affect the accumulation of knowledge and technology have long-run effects on economic growth. Policies that only support extensive growth, i.e., the accumulation of physical capital, tend to have a more limited impact in the long run given the declining marginal productivity of capital. Recent developments in growth theory, focusing on endogenous growth models, have provided other important insights. In some models, government policies that support the accumulation of physical capital can have a permanent effect on the rate of growth. Nevertheless, intensive growth based on increases in TFP remains the core of long-run economic growth and has not lost its relevance.

Unlike in neoclassical growth theory, in which TFP growth is exogenously given, endogenous growth models aim at explaining the conditions under which economic units face positive incentives to increase their knowledge and/or productivity, the mechanisms through which these increases are diffused in the economy, and the conditions under which they raise the rate of long-run growth.<sup>13</sup> In this sense, the identification of total factor productivity remains an important element in the empirical assessment of long-run economic growth even in light of the most recent theoretical developments.

Questions of whether the growth process in the dynamic South East Asian economies has been mainly of an extensive or intensive nature has again re-ignited interest in identifying the sources of growth through growth accounting exercises. Young (1992, 1994, and 1995) and

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<sup>13</sup>Endogenous growth theory derives its name from its attempt to endogenize the steady state growth rate.

Krugman (1994) postulated that the rapid growth of per capita output in the newly industrializing economies in South East Asia can be explained largely by the high growth rates of capital and labor, and that TFP growth in those countries is relatively unimportant. Others have questioned this view on a number of grounds.<sup>14</sup>

## B. Growth Accounting

Growth accounting exercises attempt to decompose a country's long-run growth rate into factors generating (i) extensive growth and (ii) intensive growth. Such exercises may be thought of as a parametrized implementation of standard growth models based on some specific production technology. Typically, the long-run growth rate of output is decomposed into the weighted growth rates of capital and labor, and the growth rate of TFP. The weights for the growth rates of capital and labor are the factor shares, which are essentially determined by the production technology in a competitive economy.

Growth accounting is a data exploration exercise. It can be used to examine statistical relationships between data series; it does not constitute a theory of growth because it does not relate the exogenous growth rate of TFP to fundamentals such as preferences, technology, and government regulation.<sup>15</sup> Nevertheless, one can infer the possible sources of growth as well as on possible problems underlying low growth rates from growth accounting exercises.

In the most basic form, growth accounting exercises are based on Cobb-Douglas production functions:

$$y_t = A_t K_t^\alpha L_t^{1-\alpha} \quad (1)$$

where  $y$  is output,  $A$  the level of technology,  $K$  the amount of (physical) capital,  $L$  the labor force employed, and  $t$  a time index. The parameter  $\alpha$  is the share of the capital in the total compensation of factors of production. Equation (1) implies that the growth rate of output can be decomposed into the growth rate of technology and the weighted growth rates of the input factors capital, and labor:

$$\frac{\Delta y_t}{y_{t-1}} = \frac{\Delta A_t}{A_{t-1}} + \alpha \frac{\Delta K_t}{K_{t-1}} + (1-\alpha) \frac{\Delta L_t}{L_{t-1}} \quad (2)$$

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<sup>14</sup>Sarel (1995b, 1997) surveys this discussion and provides an in-depth overview of methodological and data issues arising in growth accounting exercises.

<sup>15</sup>Barro and Sala-i-Martin (1995).



Equation (2) is the basis of most empirical growth accounting exercises. TFP is measured by  $\Delta A/A_{t-1}$  and typically follows as a residual, that is, as the unexplained portion of growth once the weighted growth of capital and labor has been taken into account.

The share of capital in the total compensation of factors of production used in growth accounting exercises is typically derived from one of the following three methods: (i) a priori measures, (ii) national account estimates, or (iii) regressions estimates. A frequently used a priori measure is 0.3.<sup>16</sup> National account measures are based on the actual compensation of labor and capital as reported in national income accounts. Regression measures are based on econometric estimates of factor shares in aggregate or sectorial production functions, typically based on equations such as (1) or (2). All three methods are subject to some caveats, and none of them has yet been identified as the most appropriate technique for growth accounting purposes. For this reason, all three methods are used to derive TFP measures for Arab countries in this study.

TFP measures derived from growth accounting are also subject to other problems. The most notable difficulty is probably the fact that these measures are residuals that incorporate other influences on growth which are not incorporated in the evolution of either capital or labor. For example, it is well known that TFP is a strongly procyclical variable over the business cycle because it captures short-term demand effects. For this reason, TFP measures reported in the literature are usually averaged over many years in order to isolate spurious effects unrelated to long-run growth.

Multiperiod averages do not always guarantee that other residual effects in empirical TFP measures are eliminated. If, for example, an economy is unable to produce at full capacity for a long time period, say as a result of distortionary policy measures, even a long-run average of TFP growth rates will still reflect the effects of these policies. Under such circumstances, the discrimination between changes in "real" TFP and other residual effects is generally impossible because of too many degrees of freedom. Nevertheless, in the long-run, all residual effects on growth are arguably observationally equivalent, that is, they tend to have an impact on the efficiency of production.

In Arab countries, where the production and export of oil generates a large share of its GDP, this identification problem might be even more severe for other reasons. In these economies, the real value of the oil resources is an important factor of production that should be taken into account in the analysis. The recent experience suggests that the fluctuations in the real value of oil resources are large and persistent. They can thus obscure the TFP measure insofar

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<sup>16</sup>See, for example, Sarel (1995b), and Obstfeld and Rogoff (1996).

as oil resources are another important input into the production process.<sup>17</sup> Thus, the growth accounting exercise was also conducted on the basis of data for GDP, non-oil capital, and non-oil labor.

### C. Application to the Arab Countries

Having reviewed the framework, the question is now the extent to which Arab economies experienced an improvement in their TFP in the periods under consideration. In answering this question, and like many other studies, the analysis had to confront the problem of weak data bases. To overcome some of these problems, two steps were taken. First, the sample was reduced to 13 countries for which sufficient data were available. Second, a number of proxies were derived to substitute for direct measurements of certain variables.<sup>18</sup>

TFP measures for the 13 Arab countries based on a capital share of 0.3 are reported in Table 3. For the period 1971-96, the average annual TFP growth rates are mostly negative for oil exporting countries—with the exception of Oman—and mostly positive for other Arab countries—with the exception of Jordan and Morocco. These results indicate that the average annual TFP growth has been positive in only 4 out of a total of 13 countries over the entire sample period. The implication is that, in general, Arab countries suffered from the effects of factors which reduced the aggregate production efficiency over time. This result is perhaps surprising in view of the growth accounting literature covering industrial countries. It confirms, however, the results of previous studies covering developing countries, which have found sizable negative TFP growth rates in some countries.<sup>19</sup>

The average annual TFP growth rates reported in Table 3 vary across time. For the period of high growth/high investment identified in Section II, 6 out of 13 countries reported positive average annual TFP growth rates. For the subsequent period of low growth/low investment, positive average annual TFP growth rates were found for 4 countries. Egypt, Oman, and

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<sup>17</sup>This issue is similar to the inclusion of land in the production function. Given the large share of the oil sector in the overall value added, however, the implications of neglecting the real value of oil resources in growth accounting are potentially much more important.

<sup>18</sup>In the case of the capital stock, time series for this variable (in constant prices) were constructed under the assumptions that (i) the capital stock in 1900 was zero, (ii) the annual growth rate of real gross fixed capital formation during the period 1901-69 could be approximated by the average annual growth rate over the period 1971-95, and (iii) the annual depreciation rate was 5 percent.

<sup>19</sup>See Dhareshwar and Nehru (1994), Elias (1992), Fischer (1993), and World Bank (1993).

Table 3: Selected Arab Countries: Growth Accounting with a Capital Share of 0.3

(Average annual growth rates in percent)

|                           | Algeria | Bahrain | Egypt | Jordan | Kuwait | Lebanon | Morocco | Oman | Qatar | Saudi Arabia | Syrian Arab Rep. | Tunisia | United Arab Em. |
|---------------------------|---------|---------|-------|--------|--------|---------|---------|------|-------|--------------|------------------|---------|-----------------|
| 1971-96                   |         |         |       |        |        |         |         |      |       |              |                  |         |                 |
| Total factor productivity | -3.6    | -0.9    | 0.8   | -2.9   | -3.0   | -2.3    | -0.2    | 2.4  | -2.8  | -1.1         | 1.4              | 1.4     | -3.2            |
| 1974-85                   |         |         |       |        |        |         |         |      |       |              |                  |         |                 |
| Total factor productivity | -0.8    | -1.7    | 1.7   | 1.5    | -7.5   | -2.0    | 0.1     | 5.7  | -4.5  | -4.6         | 2.6              | 1.1     | -5.8            |
| 1986-96                   |         |         |       |        |        |         |         |      |       |              |                  |         |                 |
| Total factor productivity | -7.9    | -1.1    | 0.3   | -7.5   | 1.2    | -4.8    | -0.7    | 0.9  | -2.2  | -0.1         | -1.0             | 0.7     | -0.9            |

Sources: IMF; World Bank; and staff calculations.

Tunisia are the only 3 countries in the sample for which the calculations yielded positive average annual TFP growth rates for all three periods examined. A last noteworthy feature of the comparison of TFP growth rates during 1974-85 and 1986-96 is the general decline observed in most countries. For countries that recorded negative average annual TFP growth during the period 1974-85, the situation often deteriorated even during the subsequent period.

Therefore, what emerges from this first set of calculation is that, with some exceptions, Arab countries were unable to secure a sufficient improvement in the efficiency of their factors of production; for those which were successful, the extent of their success tended to diminish over time. Before exploring reasons that could explain these results, the robustness of the calculations needs to be examined with respect to the main underlying assumptions and the data used. A capital share of 0.3 is, of course, the first and foremost of these assumptions. In Table 4, the capital shares  $\alpha$  resulting from national accounts-based estimates and regression estimates are reported. The national accounts' estimates imply that the average capital share, measured by the operating surplus and the consumption of capital, has been larger than 0.3 in all Arab countries covered in the sample; indeed, it has been above 0.5.<sup>20</sup> In oil exporting countries, with an average share of 0.7, it was generally higher than in the other countries for which an average value of 0.59 was recorded.

Regression estimates of equation (1) also indicate that the capital shares were generally larger than 0.3, except in Bahrain and Saudi Arabia.<sup>21</sup> For some countries, the estimates of  $\alpha$  fell outside the interval (0,1), over which the production function (1) is defined, and they are therefore neither reported nor used in the calculations. The signs of the estimated coefficients

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<sup>20</sup>The estimates are based on data provided in country Table 1.3—Cost Components of Gross Domestic Product—in United Nations, *National Accounts Statistics: Main Aggregates and Detailed Tables*, (New York: United Nations, various issues).

<sup>21</sup>The results are based on a least squares estimates of the equation:

$$\ln \left( \frac{y_t^i}{L_t^i} \right) = \beta^i + \gamma^i t + \alpha^i \ln \left( \frac{K_t^i}{L_t^i} \right) + \epsilon_t^i \quad (3)$$

where the index  $i$  denotes the country and where  $\epsilon$  is a stationary residual. The coefficient  $\gamma$  is equivalent to the average annual TFP growth rate. The estimations were performed for each country individually for the period 1972-96. The standard errors in Table 4 are autocorrelation- and heteroskedasticity-consistent (Newey-West estimates based on a Bartlett window with 2 lags). The estimates for the constant  $\beta^i$  are not reported.

Table 4. Selected Arab Countries: Capital Shares Based on National Account and Regression Estimates

|   | Algeria           | Bahrain             | Egypt            | Jordan              | Kuwait  | Lebanon | Morocco           | Oman             | Qatar   | Saudi Arabia      | Syrian Arab Rep. | Tunisia             | United Arab Em.   |
|---|-------------------|---------------------|------------------|---------------------|---------|---------|-------------------|------------------|---------|-------------------|------------------|---------------------|-------------------|
| National account based estimates 1/       |                   |                     |                  |                     |         |         |                   |                  |         |                   |                  |                     |                   |
| 1970                                      | 0.55              | ...                 | 0.55             | 0.53                | 0.85 3/ | ...     | 0.63              | ...              | ...     | 0.79              | ...              | ...                 | 0.85 6/           |
| 1980                                      | 0.57              | 0.68                | 0.64             | 0.54                | 0.84    | ...     | 0.62              | ...              | ...     | 0.82              | ...              | ...                 | 0.86              |
| 1990                                      | 0.53              | 0.52                | ...              | 0.57 2/             | 0.66 4/ | ...     | ...               | ...              | ...     | 0.54 5/           | ...              | ...                 | 0.77              |
| Average                                   | 0.55              | 0.60                | 0.60             | 0.55                | 0.78    | 0.59 7/ | 0.63              | 0.70 8/          | 0.70 8/ | 0.72              | 0.59 7/          | 0.59 7/             | 0.83              |
| Regression based estimates 9/             |                   |                     |                  |                     |         |         |                   |                  |         |                   |                  |                     |                   |
| Level estimates [equation (3)]            |                   |                     |                  |                     |         |         |                   |                  |         |                   |                  |                     |                   |
| Capital share                             | 0.97<br>(0.013)   | 0.23<br>(0.184)     | 0.39<br>(0.004)  | 0.86<br>(0.033)     | ...     | ...     | 0.39<br>(0.125)   | ...              | ...     | 0.17<br>(0.133)   | 0.68<br>(0.147)  | 0.45<br>(0.088)     | 0.96<br>(0.286)   |
| Trend                                     | -0.026<br>(0.002) | 0.017<br>(0.003)    | 0.005<br>(0.004) | -0.038<br>(0.002)   | ...     | ...     | -0.005<br>(0.003) | ...              | ...     | -0.021<br>(0.007) | 0.004<br>(0.003) | 0.004<br>(0.002)    | -0.013<br>(0.013) |
| Adjusted R <sup>2</sup>                   | 0.996             | 0.804               | 0.961            | 0.979               | ...     | ...     | 0.501             | ...              | ...     | 0.480             | 0.575            | 0.933               | 0.886             |
| D.W.                                      | 0.590             | 0.753               | 0.507            | 1.072               | ...     | ...     | 1.307             | ...              | ...     | 0.430             | 0.710            | 1.080               | 0.444             |
| First-difference estimates [equation (4)] |                   |                     |                  |                     |         |         |                   |                  |         |                   |                  |                     |                   |
| Capital share                             | 0.64<br>(0.387)   | 0.42 10/<br>(0.612) | 0.30<br>(0.149)  | 0.95 10/<br>(0.021) | ...     | ...     | 0.34<br>(0.14)    | 0.25<br>(1.065)  | ...     | 0.180<br>(0.125)  | 0.35<br>(0.407)  | 0.05 10/<br>(0.304) | 0.32<br>(0.237)   |
| Constant                                  | -0.028<br>(0.014) | -0.009<br>(0.011)   | 0.008<br>(0.008) | -0.026<br>(0.042)   | ...     | ...     | -0.002<br>(0.008) | 0.026<br>(0.024) | ...     | -0.011<br>(0.019) | 0.019<br>(0.012) | 0.006<br>(0.006)    | -0.04<br>(0.029)  |
| Adjusted R <sup>2</sup>                   | 0.821             | -0.019              | 0.290            | 0.915               | ...     | ...     | -0.007            | 0.016            | ...     | -0.007            | 0.020            | 0.030               | 0.03              |

Sources: IMF; World Bank; and staff calculations.

1/ Based on data from United Nations, *National Accounts Statistics: Main Aggregates and Detailed Tables*, (New York: United Nations, various issues).

2/ 1991

3/ 1976

4/ 1987

5/ 1988

6/ 1975

7/ Based on average capital share in non-oil exporting countries in the sample.

8/ Based on average capital share in oil exporting countries in the sample.

9/ OLS and IV estimates of equations (3) and (4) in footnotes 21 and 22 in the text. Autocorrelation- and heteroskedasticity consistent (Bartlett-window with 2 lags) standard errors reported in parenthesis.

Results are not reported if the estimated capital share fell outside the interval (0,1).

10/ OLS estimates. See text for details.

of the time trend—measuring the average annual TFP growth rate—are similar to the signs of the average annual TFP growth rates obtained with a capital share of 0.3. The value of the coefficient can be quite different, however, indicating that point estimates of the average annual TFP growth rate are sensitive to the method underlying the calculation.

As the estimation of the production function could suffer from simultaneity problems in small samples such as ours, equation (1) was also estimated in first-difference form (equation (2)) with an instrumental variable procedure, using the lagged output and capital growth rates as instruments.<sup>22</sup> In general, the capital share and the average TFP growth rate obtained in this way are quite similar to those obtained with the level regressions, except in the case of Bahrain, where the average annual TFP growth rate is positive in the level estimate and negative in the first difference estimate. For some countries, the adjusted  $R^2$  obtained in the estimations suggests that a large fraction of growth remains unexplained.

A comparison of the average annual TFP growth rates implied by the three methods shows that the average value can vary considerably with the method used in the calculation (Chart 3). The sign of the average value, however, does not change with the method except in the cases of Egypt and the U.A.E. It follows that the methodology used to derive the capital share can potentially have an important impact in the identification of the sources of growth in Arab countries. In most cases, however, it only matters for the average value, but not for the sign. The qualitative conclusions are, therefore, quite robust with respect to the underlying methodology of obtaining the capital share  $\alpha$ .

Another set of important assumptions underlying the calculations is that related to the construction of the capital stock series. The arbitrary estimates for the calculation of the initial capital stock in 1970, which determines the capital intensity of production at the outset of the sample period, can affect the growth rate of the capital stock given the growth rate of investment in a small sample. The larger the initial stock, the lower the capital stock growth rate for a given growth process of investment.

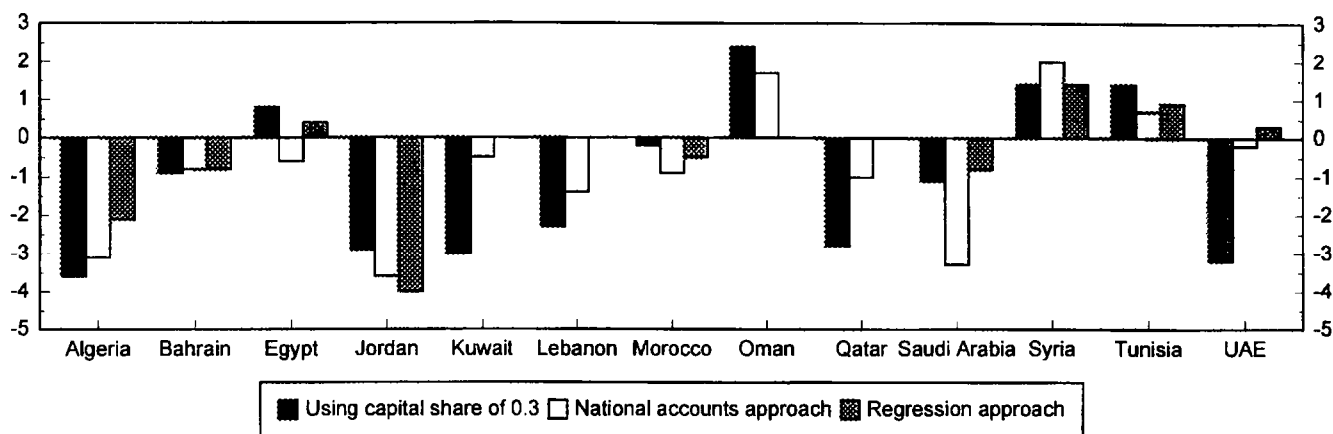
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<sup>22</sup>The instrumental variable (IV) regressions are based on the equation:

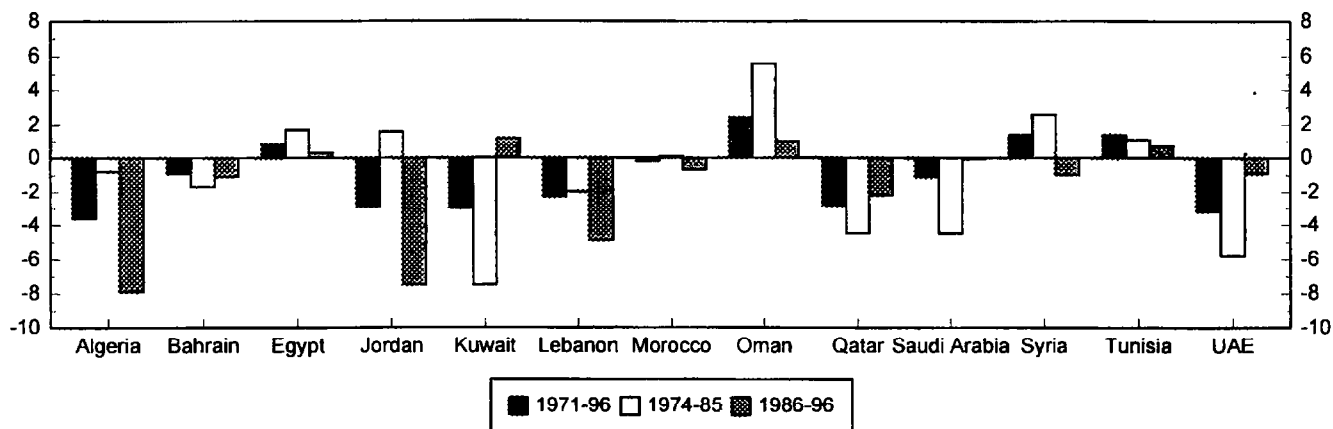
$$\Delta \ln \left( \frac{y_t^i}{L_t^i} \right) = \gamma^i + \alpha^i \Delta \ln \left( \frac{K_t^i}{L_t^i} \right) + v_t^i \quad (4)$$

with  $v$  denoting a stationary residual series. Equation (4) was estimated for each country individually over the period 1972-96, using lagged values of the dependent and the explanatory variable as instruments. The constant  $\gamma$  again represents the estimated, average, annual TFP growth rate. If the IV estimates of  $\alpha$  lie outside the interval (0,1), OLS estimates are reported. The standard errors in Table 4 are autocorrelation- and heteroskedasticity-consistent (Newey-West estimates based on a Bartlett window with 2 lags).

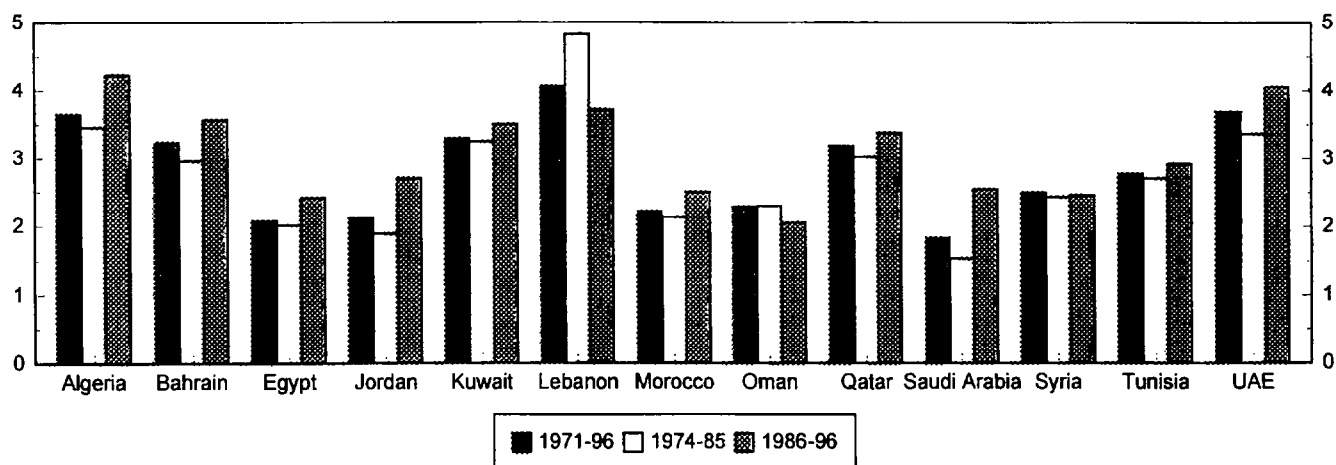
**Chart 3**  
**Selected Arab Countries**  
**Comparison of Total Factor Productivity Growth, 1971-96**  
 (Average annual growth rates, in percent)



**Comparison of Total Factor Productivity Growth Rates, 1971-96, 1974-85, and 1986-96**  
 (Average annual growth rates, in percent, based on a capital share of 0.3)



**Comparison of Average Capital-Output Ratios, 1971-96, 1974-85, and 1986-96**



To test for the effects of the initial capital stock used in the calculations, three alternative capital stock series were constructed. Each of them was based on a different average annual growth rate for the approximation of the real gross fixed capital formation during the period 1900-69.<sup>23</sup> The impact of the alternative capital stock series on the capital shares obtained in the estimation of the first-difference regressions (4) and the estimated average annual TFP growth rate can be found in Table 5. As shown in Chart 4, both values do vary with the initial capital stock used in the calculations, but the change in values is typically rather small. The sign of the average annual TFP growth rate changes only in the case of Morocco, for which this value oscillates around zero. It follows that the principal results of our calculations of average annual TFP growth rates are robust with respect to the initial capital share.

If the oil sector generates a significant share of the value added in an economy, TFP growth can be obscured by changes in the real value of the oil resources as previously discussed. Unfortunately, specific data covering oil sector employment, GDP, and investment for a period longer than 15 years are not available for most oil exporting Arab countries. The effects of the oil sector on TFP growth measures had to be examined with a subset of two countries only. In Table 6, the results of instrumental variable estimates of equation (4) for Saudi Arabia and the U.A.E. are shown.<sup>24</sup> Using non-oil GDP, which covers all activities other than the exploration of crude oil, and the corresponding capital stock and employment measures in the estimations shows that the average annual TFP growth in the non-oil sector in both countries was positive, unlike the average annual TFP growth rate for the total GDP. The estimated capital shares also allow one to calculate the average TFP growth rate during subperiods on the basis of equation (2). In Saudi Arabia, the average annual TFP growth rate in the non-oil sector amounted to 5.9 percent during the period 1974-85 and to -1.4 percent during the period 1986-95. In the U.A.E., the same value reached 0.8 percent during the first sub-period (1976-85) and 1.5 percent during the second sub-period (1986-96). It follows that (i) the non-oil sector benefitted from technological progress at least during several years since 1974 and (ii) the fall in the real value of oil resources after 1986 has had an important impact on TFP measures for the non-oil sector. Unfortunately, it is difficult to draw any more general conclusion about the contribution of TFP growth to non-oil related output growth in the oil-exporting countries given the lack of data. The widespread increase in the share of non-oil output in total GDP suggests, however, that the strongly negative average TFP growth rates obtained for the total GDP of these countries suffer from an oil price induced, negative bias.

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<sup>23</sup>The three periods 1971-80, 1971-85, and 1971-90 were used for the calculation of the average annual growth rate of real investment, which was then used for the backward extrapolation of real gross fixed capital formation.

<sup>24</sup>Unfortunately, the data for the non-oil sector GDP and gross fixed capital formation did not cover the same period as the other data. For this reason, the estimation results for equation (4) with total GDP are also shown in the case of Saudi Arabia for sake of comparison. In the case of the U.A.E., the estimated capital share for total GDP fell outside the interval (0,1) and is thus not reported.



Table 5. Selected Arab Countries: Capital Shares Implied by Different Initial Conditions

|                               | Algeria           | Bahrain           | Egypt            | Jordan            | Morocco           | Oman             | Saudi Arabia      | Syrian Arab Rep. | Tunisia          | United Arab Em.   |
|-------------------------------|-------------------|-------------------|------------------|-------------------|-------------------|------------------|-------------------|------------------|------------------|-------------------|
| Regression based estimates 1/ |                   |                   |                  |                   |                   |                  |                   |                  |                  |                   |
| 1971-80 2/                    |                   |                   |                  |                   |                   |                  |                   |                  |                  |                   |
| Capital share                 | 0.65<br>(0.25)    | 0.19<br>(0.16)    | 0.21<br>(0.101)  | 0.25<br>(0.366)   | 0.30<br>(0.115)   | 0.25<br>(1.067)  | 0.26<br>(0.121)   | 0.49<br>(0.28)   | 0.25<br>(0.255)  | 0.35<br>(0.293)   |
| Constant                      | -0.036<br>(0.013) | -0.012<br>(0.011) | 0.008<br>(0.008) | -0.038<br>(0.002) | -0.004<br>(0.008) | 0.025<br>(0.024) | -0.019<br>(0.018) | 0.011<br>(0.011) | 0.009<br>(0.007) | -0.038<br>(0.029) |
| Adjusted R <sup>2</sup>       | 0.842             | -0.014            | 0.369            | 0.395             | 0.031             | 0.015            | 0.055             | 0.102            | 0.041            | 0.017             |
| 1971-85 2/                    |                   |                   |                  |                   |                   |                  |                   |                  |                  |                   |
| Capital share                 | 0.66<br>(0.281)   | 0.15<br>(0.111)   | 0.248<br>(0.115) | 0.247<br>(0.366)  | 0.32<br>(0.123)   | 0.018<br>(0.985) | 0.23<br>(0.116)   | 0.45<br>(0.331)  | 0.18<br>(0.255)  | 0.32<br>(0.293)   |
| Constant                      | -0.033<br>(0.013) | -0.012<br>(0.011) | 0.008<br>(0.008) | -0.038<br>(0.002) | -0.004<br>(0.008) | 0.025<br>(0.026) | -0.016<br>(0.018) | 0.015<br>(0.011) | 0.012<br>(0.007) | -0.032<br>(0.026) |
| Adjusted R <sup>2</sup>       | 0.844             | -0.021            | 0.283            | 0.395             | 0.001             | 0.009            | 0.024             | 0.063            | 0.008            | 0.026             |
| 1971-90 2/                    |                   |                   |                  |                   |                   |                  |                   |                  |                  |                   |
| Capital share                 | 0.64<br>(0.363)   | ...               | 0.272<br>(0.129) | ...               | 0.326<br>(0.126)  | 0.231<br>(1.078) | 0.205<br>(0.119)  | 0.25<br>(0.448)  | 0.065<br>(0.365) | 0.31<br>(0.28)    |
| Constant                      | -0.028<br>(0.014) | ...               | 0.002<br>(0.008) | ...               | 0.003<br>(0.008)  | 0.027<br>(0.023) | -0.013<br>(0.018) | 0.021<br>(0.013) | 0.015<br>(0.009) | -0.035<br>(0.023) |
| Adjusted R <sup>2</sup>       | 0.829             | ...               | 0.289            | ...               | -0.001            | 0.007            | 0.004             | 0.001            | -0.026           | 0.029             |

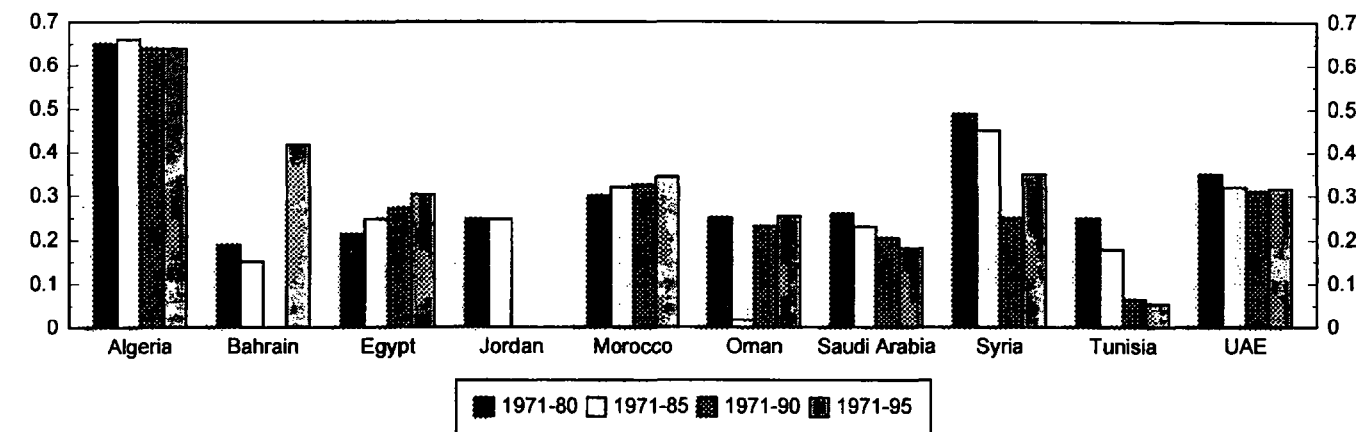
Sources: IMF; World Bank; and staff calculations.

1/ IV estimates of equation (4) in footnote 22 in the text. Autocorrelation- and heteroskedasticity consistent (Bartlett-window with 2 lags) standard errors reported in parenthesis Results are not reported if the estimated capital share fell outside the intervall (0,1).

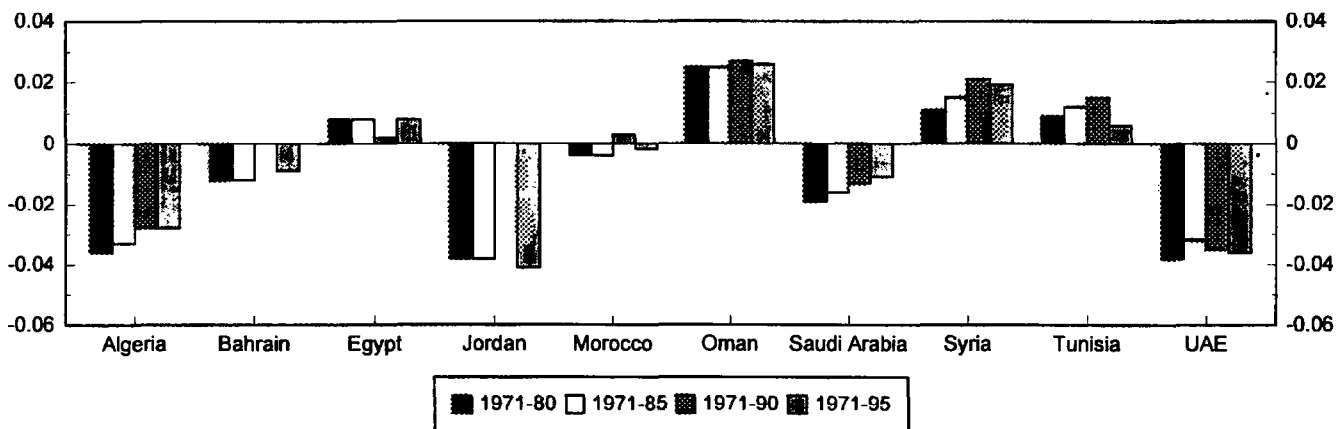
2/ Period used in the calculation of the average annual growth rate of real gross fixed capital formation. This growth rate was used in the log-linear approximation of the real capital stock.

# Chart 4 Selected Arab Countries

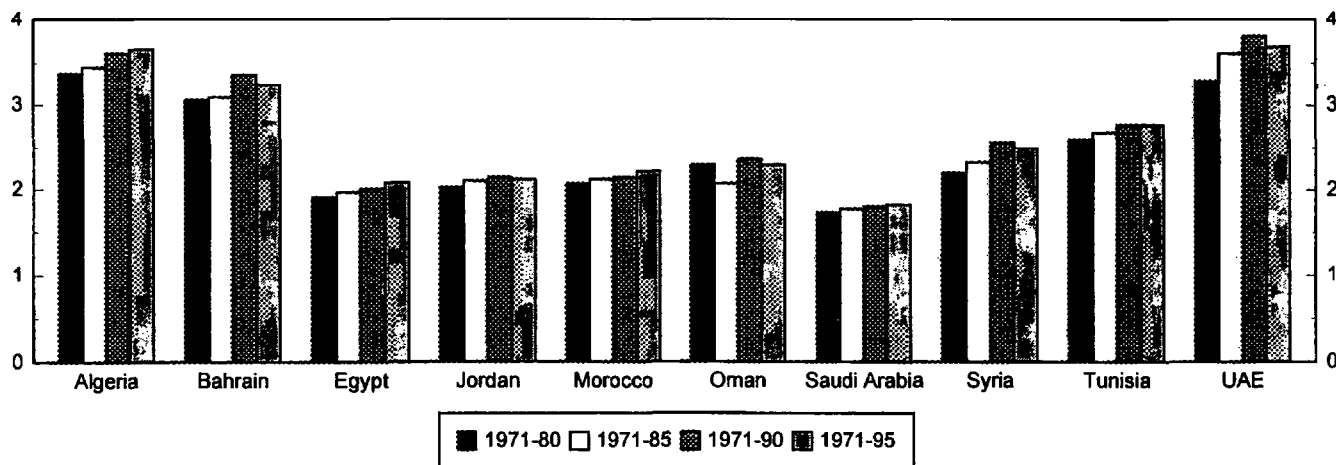
Comparison of Capital Shares, 1971-96 1/  
(Regression approach)



Comparison of TFP Growth Rates, 1971-96 1/  
(Average annual growth rates, in percent)



Comparison of Average Capital-Output Ratios, 1971-96 1/



Source: IMF, and World Bank.

1/ Based on capital share estimates using average investment growth rates for selected periods.

The "true" production efficiency in the oil exporting countries is likely to have decreased by less or even increased somewhat as indicated by the results for Saudi Arabia and the U.A.E. On a more general level, the calculations also illustrate that the sectorial composition of GDP can have a significant impact on TFP growth rates.

In sum, therefore, and regardless of the fine-tuning made to the approach, the calculations of TFP growth rates suggest that productivity increases have not been an important source of growth in some Arab countries, particularly after 1986. Many factors are likely to have contributed to this outcome. As discussed above, TFP growth and the growth in the accumulation of factors of production have to be related to economic policies and other factors by which they are determined in order to explain their movements and to draw policy conclusions. Given the focus of the paper, the discussion is limited to the linkages between the level and efficiency of investment and TFP growth and between employment growth and TFP growth.

It was argued in Section II that the decrease in investment relative to total GDP has been, at least to some extent, either been policy induced or related to external shocks. While this decrease has undoubtedly contributed to a decrease in the growth rate of the capital stock, it is not immediately obvious that it would affect TFP growth. There is one argument, however, which suggests that low or negative average annual TFP growth rates could be related to this decline. The argument is that of embodied technological progress.

A substantial body of literature has shown how technological progress is often embodied, that is, it comes along with investment into new capital equipment.<sup>25</sup> Investment plays thus an important role in the diffusion of knowledge, efficiency improvements, and innovations. Hence, the decline in investment ratios during the period 1986-96 may well have affected TFP growth rates through this channel. In this respect, it is worth noting that the average growth rate of the capital stock per worker, a measure of the capital intensity of the production technology, has been positively correlated with the average TFP growth rate in Arab countries (Chart 5). Long periods of low investment shares in total expenditure, therefore, exact a toll on an economy because of the impact on knowledge and the diffusion of technological progress. The experience of many countries that recorded a declining capital stock per worker over the sample period is consistent with this hypothesis.

An external factor that Arab countries are facing concerns the effects their demographic structures have on TFP growth. Most Arab countries have registered high rates of employment (and unemployment) growth. Given these demographics structures, the average age of the labor force in Arab countries is low; consequently, the average employee is young and relatively inexperienced, and thus likely to less productive than more experienced

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<sup>25</sup>See De Long and Summers (1991, 1992) for a recent restatement and related references.

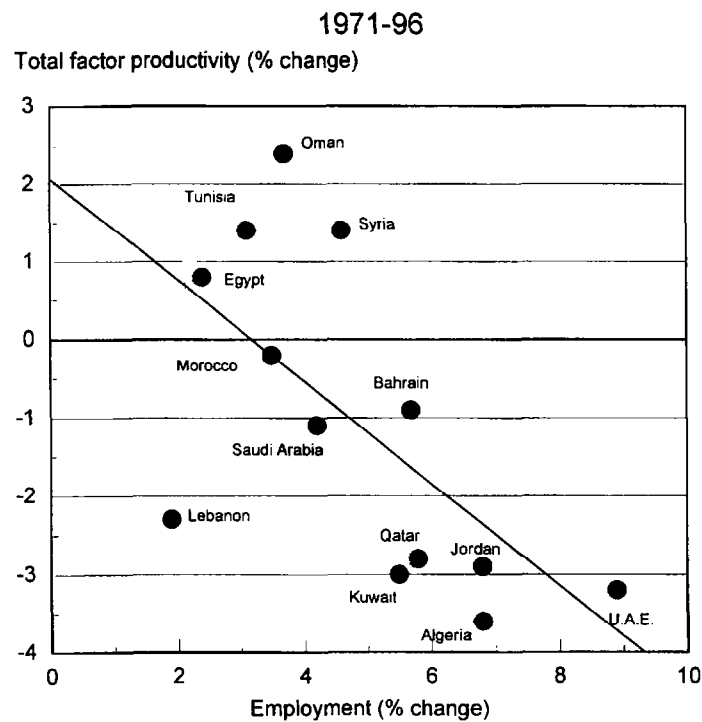
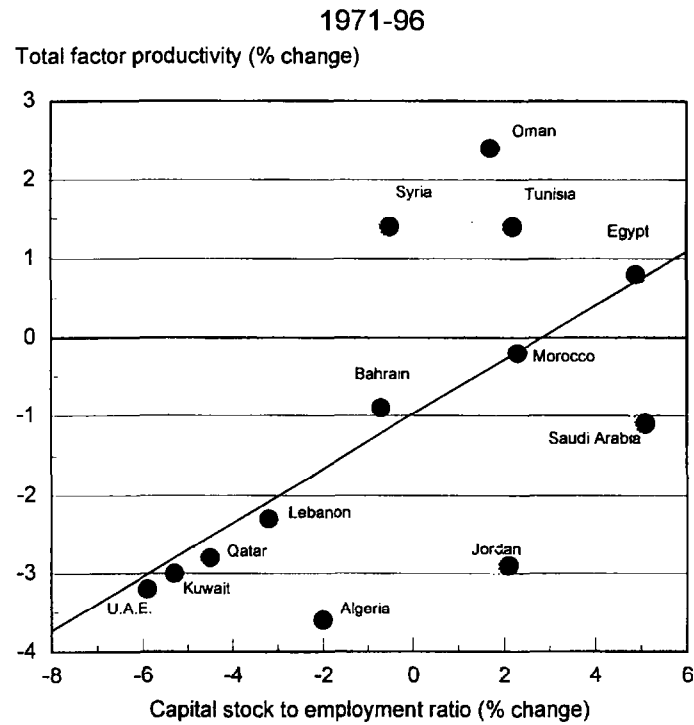
Table 6. Selected Arab Countries: Capital Shares in Non-oil Sector of Oil-Exporting Countries

|                               | Saudi Arabia         |                        | United Arab Emirates   |
|-------------------------------|----------------------|------------------------|------------------------|
|                               | Total GDP<br>1974-95 | Non-oil GDP<br>1974-95 | Non-oil GDP<br>1976-95 |
| Regression based estimates 1/ |                      |                        |                        |
| Capital share                 | 0.17<br>(0.161)      | 0.44<br>(0.55)         | 0.25<br>(0.977)        |
| Constant                      | -0.021<br>(0.018)    | 0.026<br>(0.031)       | 0.01<br>(0.055)        |
| Adjusted R <sup>2</sup>       | 0.035                | 0.122                  | 0.055                  |

Source: IMF; World Bank; and Fund staff calculations.

1/ IV estimates of equation (4) in footnote 22 in the text. Autocorrelation-and heteroskedasticity consistent (Bartlett-window with 2 lags) standard errors reported in parenthesis. Results are not reported if the estimated capital share fell outside the interval (0,1).

Chart 5  
Selected Arab Countries: Total Factor Productivity, Capital Stock, and Employment Growth



employees.<sup>26</sup> These arguments could explain the negative correlation between the average employment growth rate and the average TFP growth rate shown in Chart 5. The relatively high capital share resulting from national accounts' estimates, which is probably linked to low labor productivity, is yet another indication supporting the hypothesis that the recent growth experience of Arab countries could be associated to the demographic structure and population growth.

#### IV. POLICY IMPLICATIONS

The analysis of this paper raises three inter-related key challenges for Arab countries seeking to sustain a high growth rate and, thereby, put behind them the generally disappointing performance of recent years: first, provide for a continued growth in the capital stock; second, ensure a more marked broad-based improvement in TFP; and third, ensure a sufficiently high and stable source of funding for investment activities (in terms of both higher domestic savings and more sustainable external financing).

These findings assume added relevance at this time. Indeed, Arab economies are now actively engaged in enhancing the environment for high and sustained economic growth. Emphasis is rightly being placed on private sector investment as the engine of growth, with the public sector complementing rather than substituting for private sector activities. Beneficial returns from these efforts were already evident in 1996. The economic growth rate for the region *as a whole* doubled to 4 percent per annum, accompanied by further reductions in inflation, current account imbalances and debt burdens.<sup>27</sup> If the growth performance is repeated in 1997, it would imply the first consecutive years of positive per capita growth rates for the Arab economies as a whole since the mid-1980s.

While a temporarily more favorable external environment contributed to the macroeconomic improvements in 1996, domestic policy changes played an important role.<sup>28</sup> Countries that have implemented successful stabilization and reform programs have, as a group, recorded better results as compared to other countries:<sup>29</sup> their inflation rates, while still high by industrial country standards, have declined faster, and their current account deficits (relative to GDP) have been lower.

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<sup>26</sup>Sarel (1995a) explores the links between the age structure of the labor force, labor productivity, and growth.

<sup>27</sup>For details, see El-Erian and Fennell (1996) and IMF (1996).

<sup>28</sup>The main external development related to significantly higher oil prices. These prices have since fallen sharply.

<sup>29</sup>For details, see Bisat, El-Erian, El-Gamal, and Mongelli (1996).

Behind these factors is a pronounced adjustment in fiscal imbalances. It is also encouraging that structural reforms have picked up in a number of countries. For instance, the region has witnessed more intensive privatization activity in both oil and non-oil economies. This has been accompanied by a number of steps aimed at regulatory reform, including the opening up of certain sectors previously reserved for the public sector. We are also witnessing a trend in the region towards greater trade liberalization, and towards financial sector reform (e.g., Egypt, Jordan, Morocco, and Tunisia). Indeed, in response to a more favorable economic enabling environment, domestic investment picked up in certain countries, financed by larger domestic savings. At the same time, the region started to attract higher inflows of foreign direct and portfolio investments.<sup>30</sup>

With a good start having been made in restoring a more favorable economic and financial performance, the key policy question is how to consolidate the recent gains and build on them in order to sustain growth rate levels that are close to those of the "East Asian miracle." So, what needs to be done to meet the three policy challenges that comes out from the analysis of this paper?

Both theory and international experience indicate that there is no magical set of *short-cut* policy instruments that necessarily achieve these objective in the short-run (without undue side effects) and in a sustainable manner over the long run. Rather, a durable improvement in investment and savings performance depends most fundamentally on a favorable change in the overall economic environment impacting on private sector productive activity, with appropriate public sector support. The analysis in this paper also points to the need to pay greater attention to some specific complementarity issues emerging from various market failures and incomplete markets.

What are the key elements of an improved enabling environment? We have argued elsewhere that they consist primarily of four factors:<sup>31</sup>

- Maintaining stable macroeconomic conditions;
- accelerating structural reforms;
- investing more effectively in the social sectors; and
- strengthening the institutional and information base.

All these factors have been shown to contribute to higher and more efficient investment. The reduction in macroeconomic stability and the implementation of private sector friendly

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<sup>30</sup>El-Erian and Sheybani (1997).

<sup>31</sup>See Bisat, El-Erian, El-Gamal and Mongelli (1996).

structural reforms tend to widen the scope for private sector investment and increase the return to such investment. At the same time, many of the associated elements enhance private savings over time while ensuring a durable reduction in public dis-saving. Social sector investment should aim at reinforcing better human capital development, not only by strengthening basic education and health, but also by enhancing vocational training in light of the low labor productivity levels.

The strengthening of institutions imparts greater durability to the improvement in economic and financial situation. The stronger the institutions are in terms of competence and organization and the more insulated they are from the vagaries of the political process, the better they are able to maintain a sound environment for private sector investment and savings.

Sound investment decisions—by domestic and foreign investors—need to be based on comprehensive, timely and accurate information about the current economic situation and outlook. It is therefore not surprising that an increasing number of advanced and developing countries have found it in their interest to enhance the amount, quality, timeliness, and credibility of information available to the markets. This not only helps overcome information failures, but also minimize undue disruptive market behavior in response to changes in economic conditions.

Not surprisingly, all these factors were also found important for enhancing the responsiveness of private sector investment to gaps in actual output relative to its potential level—another facet of improving investment performance. The analysis of the preceding section also highlights the importance of removing distortions that undermine the transfer of technology, as well as the need to stress direct labor productivity enhancing measures such as better basic health and educational provision and focussed vocational training.

What can be expected if Arab countries' efforts in these various policy areas are deepened in a lasting manner?

- First, an increase in fixed capital formation by the private sector which, as demonstrated earlier, would have both direct and indirect beneficial effects on the economic growth process;
- Second, an increase in the overall productivity of capital and labor which, again, has been shown to be a critical element of the growth equation.
- Third, a more robust and predictable source of financing for investment activity resulting from the increase in domestic savings.



- Finally, complementary investment financing from abroad, principally in the form of higher and more stable foreign direct investment inflows; in addition to augmenting resources, this would involve larger transfers of embodied technological progress.

If Arab countries succeed in this, they will achieve a sustained high economic growth rate, generate a growing number of jobs for their young populations, and realize substantial improvements in the welfare of their people.

## V. CONCLUDING REMARKS

Arab countries are rightly seeking to improve their growth performance. This is needed to meet the significant employment challenge and improve in a durable way living standards in the region. The challenge is not an easy one. It involves the region putting decisively behind it a legacy of stagnant per capita income growth and marginalization in a rapidly changing world economy. Fortunately, recent indicators confirm that not only are policies being formulated to address these issues, but also that these policies are already bearing fruit.

Economic theory and international experience tell us that the manner in which Arab economies' investment and saving patterns evolve will have a large impact on their growth outlook. To this end, this paper sought to explain the historical experience of the region—specifically, why the high growth/high investment period of the 1970s and early 1980s proved unsustainable, thus giving way to a period of low growth/low investment?

Three factors emerged from the analysis. First, that the investment process throughout the two periods was not accompanied by sufficient improvements in total factor productivity. Second, the disappointing evolution of total factor productivity was compounded in the second half of the period by declining investment rates. Third, that the funding of investment activities was overly dependent on volatile external sources.

These findings help to better define some of the critical aspects of the current growth policy challenge facing the Arab countries. Fortunately, the economic strategy increasingly being adopted in the region—and which stresses private sector investment as the engine of growth with the public sector playing a complementary rather than substituting role—provides the right basis for addressing these aspects. Several countries' recent success in strengthening their macroeconomic conditions provides a critical element of the needed enabling environment for enhancing investment and savings through deep-rooted structural reforms and the strengthening of institutions and information mechanisms. Measures aimed at a continuing improvement in the environment for private investment can be usefully accompanied, but not substituted by a set of more targeted measures aimed at enhancing factor productivity. In this way, the Arab region will be able to exploit its considerable economic potential and improve in a lasting manner the welfare of its people.

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