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Preliminary Estimates of Factors to Economic Growth in Egypt

Summary: In recent years, financing for Egyptian growth and foreign debt payments shifted increasingly from foreign financial inflows to national savings. In 1974, less than 20% of financing for investment and debt servicing came from Egyptian national savings. In 1978, nearly two-thirds of needed financing came from national savings. The key factor in the rise of national savings was workers' remittances. The portion of total financing needs met from remittances (and various minor other factor service earnings) increased from 4% in 1974 to 31% in 1978. Domestic savings increased from 21% of total needs to 35%. During the same period, foreign financing declined from 83% of the total to 34%.

One can also relate national savings and foreign savings (foreign financing less debt payments) to investment and thereby to growth. During the 1974-1978 period, the portion of Egyptian investment financed by foreign savings declined from 2/3 to 1/8. Correspondingly, national savings financing of investment increased from 1/3 to 7/8 of investment.

Discussion: Most people know that the economy of Egypt grew rapidly in recent years. What is not well known is that national savings as a percent of Gross National Product also grew rapidly from about 5% in 1974 to about 23% in 1978 (national saving is defined as that

portion of GNP that is not consumed). A natural question that arises is how much of the real growth is attributable to Egyptian sources and how much to foreign sources. This note is an attempt to answer this question.

In the economics and statistics annex of the CDSS for Egypt, we presented an expression for foreign savings based on a simple growth model of the Harrod-Domar type (see the attached copy). The need for foreign savings was found to depend on average Egyptian propensity to save, efficiency of investment, and desired real growth of the economy. That is, $FS_t = (1+r)^t Y_0 (K_t r - a p_s t)$ where FS_t = foreign savings in year t, r = real growth rate, Y_0 = initial year GNP, K = ICOR (the incremental capital output ratio which is equal to the amount of investment required to increase output by one unit), and $a p_s$ = average propensity to save out of GNP. The growth rate that would be obtained if foreign savings equalled zero is calculated by setting $FS=0$, this yields:

$$r = \frac{a p_s}{K}$$

Real growth in the absence of foreign savings is proportional to the share of national resources not consumed and the efficiency of investment. In other words real growth will be higher the more the economy saves and the more savings are invested in less-capital intensive investment. This simple formulation can be utilized to estimate sources of economic growth as shown in Table 1.

Table 1

An Approximation of Contributing Factors to Economic
Growth in Egypt

(In Percent)

| | <u>1974</u> | <u>1976</u> | <u>1977</u> | <u>1978</u> |
|--|-------------|-------------|-------------|-------------|
| 1. Domestic Savings as % GDP | 6.6 | 13.9 | 14.8 | 13.9 |
| 2. National Savings as % GNP | 5.4 | 16.1 | 19.5 | 23.4 |
| 3. Real GNP Growth ^{1/} | 3.2 | 10.2 | 8.3 | 9.2 |
| 4. Growth due to National Savings Savings ^{2/} (Line 2+3.05) | 1.8 | 5.3 | 6.4 | 7.7 |
| 5. Growth due to Domestic Savings ^{2/} (Line 1+3.05) | 2.2 | 4.6 | 4.9 | 4.6 |
| 6. Growth due to Remittances ^{3/} and other factor income ^{3/} (Line 4 minus Line 5) | -0.4 | 0.7 | 1.5 | 3.1 |
| 7. Growth due to Foreign Savings (Line 3 minus Line 4) | 1.4 | 4.9 | 1.9 | 1.5 |

Source: CDSS, USAID/Cairo

1/ GDP at factor cost estimated by Ministry of Planning and IBRD (1974).

2/ These estimates are obtained from a formula given in CDSS, Economics and Statistical Annex.
r = average propensity to save divided by ICOR assumed to equal 3.05 for all years.

3/ Difference between growth rates that can be attributable to National Savings and that to Domestic Savings.

4/ Difference between real GNP growth and growth due to National Savings.

Estimated real growth was 3.2% in 1974, 10.2% in 1976, and 9.2% in 1978. Estimated national savings increased rapidly from 5.4% in 1974 to 16.1% in 1976 and 23.4% in 1978—mainly as a result of rising workers' remittances. Real growth due to national savings, then, is estimated from the above formula as 1.8% in 1974, 5.3% in 1976 and 7.7% in 1978, (assuming ICOR values equal to 3.05 for all years).^{1/} On the other hand, contributions of domestic savings (national savings less workers' remittances) to growth has been steady at about 4.6% per year since 1976. Correspondingly, foreign savings played a declining role in recent economic growth. Calculated as a residual, growth due to foreign savings was 1.4% in 1974, 4.9% in 1976, 1.9% in 1977, and 1.5% in 1978. In summary, the general trend is that while real growth due to domestic savings maintained a constant percentage after 1976, growth due to workers' remittances increased and that due to foreign savings decreased.

The accuracy of the estimated growth contribution of each factor is almost certainly not as straight forward as the above discussion would

^{1/} Note that in the CDSS annex, an estimated ICOR value of 3.4 for 1976 was used to illustrate sources of growth in that year. But a better estimate of investment efficiency in the medium to long run is the average value of ICOR over several years, for the long run ICOR will average out output fluctuations due to changing levels of capacity utilization. The ICOR of 3.05 is the average value during the period 1971-76.

indicate. (Not all investment expenditures are equally productive and other factors than investment also influence the value of output). Nonetheless, the general trend seems to agree with the overall development picture of recent years.

The above analysis pertains to foreign savings and investment only. If debt and interest payment and changes in foreign exchange reserves are included, we can also relate gross financial flows to overall financial needs. In national income accounts, total resources available for expenditures are given by GNP plus the import surplus (the latter being equal to foreign savings) which in turn are disposed of either as investment or consumption.

At equilibrium, aggregate investment must equal aggregate savings, which is the sum of national savings (NS) and foreign savings (FS), i.e.,

$$I = S = NS + FS$$

Foreign savings is equal to gross foreign financing (GFF) less debt repayment (DR), less changes in foreign exchange reserves (ΔFX).

$$FS = GFF - DR - \Delta FX$$

Therefore,

$$I = NS + GFF - DR - \Delta FX$$

or

$$I + DR = NS + GFF - \Delta FX$$

The last equation states that total financing required for growth and debt repayment come from three sources: national savings, gross foreign financing, and drawdown of foreign exchange reserves. To estimate approximately the changing role of gross foreign financing in response to aggregate financial needs of growth and debt repayment, we assume, for simplicity, that $\Delta FX = 0$ (in fact, Central Bank reserves have not changed much in recent years).

Table 2 points out that resources mobilized through national savings financed approximately 66 percent of total investment and debt repayments in 1978. This is a remarkable change from the 17 percent figure in 1974. When national savings are broken down to domestic savings and workers' remittances and other net factor income transfers, we find that a dynamic change took place in the latter. The proportion of necessary financing provided through net resources earned by Egyptians abroad increased from -4 percent in 1974 to 31 percent in 1978. Correspondingly, gross foreign financing declined as a proportion of total financing needs from 83 percent in 1974 to 34 percent in 1978. Workers' remittances are conventionally included in national savings in a country's national economic accounts. However, it is also appropriate to note that this component of national savings is in a very real sense external to the functioning of the domestic Egyptian economy. From this perspective remittances are more appropriately considered

Table 2

FINANCIAL RESOURCES AVAILABLE FOR
INVESTMENT AND FOREIGN DEBT REPAYMENT

(In Millions of LE)

| <u>Demand</u> | <u>1974</u> | <u>1976</u> | <u>1978</u> |
|---|-------------|-------------|-------------|
| Investment | 668 | 1455 | 2600 |
| Debt Repayment* | <u>621</u> | <u>819</u> | <u>849</u> |
| Total | 1289 | 2274 | 3449 |
| <u>Supply</u> | | | |
| National Savings | 224 | 1040 | 2263 |
| (Domestic Savings) | (275) | (875) | (1193) |
| (Worker Remittances and Other Net Factor Income) | (-51.) | (165) | (1070) |
| Gross Foreign Financing | 1065 | 1234 | 1186 |
| <u>Proportions</u> | | | |
| NS as % Financing Needs | 17.4 | 45.7 | 65.6 |
| (Domestic Savings) | (21.3) | (38.5) | (34.6) |
| (Workers' Remittances and Other Net Factor Income) | (-4.0) | (7.3) | (31.0) |
| GFP as % Financing Needs | 82.6 | 54.3 | 34.4 |

Source: USAID/Cairo

* These are IBRD estimates of amortization and interest payments.

analogous to the contribution of foreign savings to overall financing needs. From this viewpoint, gross foreign financing combined with workers' remittances and other net factor income provided 79 percent of total financing needs in 1974. Comparable figures in 1976 and 1978 were 62 percent and 65 percent, respectively.

Correspondingly, the contribution of the domestic economy (domestic savings) grew from 21% of total financing needs in 1974 to 39 percent in 1976, but then fell to 35% in 1978.

TABLE V ATTACHMENT: Relationships Among Economic Growth, Domestic Savings, and Required Foreign Savings

The model used to obtain the projection in Table V can be described as follows:

$$1. Y_t = (1+r)^t Y_0, \text{ where } Y = \text{GDP, } r = \text{real growth rate, } t = \text{year.}$$

$$2. C_t = Y_t \cdot \text{apc}_t = (1+r)^t Y_0 \cdot \text{apc}_t$$

Where C_t = total consumption

apc = average propensity to consume

$$3. S_t = Y_t - C_t = (1+r)^t Y_0 \cdot \text{aps}_t$$

Where S_t = domestic savings

$$\text{aps} = 1 - \text{apc}$$

$$4. I_t = k_t r Y_t = k_t r (1+r)^t Y_0$$

Where k = ICOR

$$5. \text{FS}_t = I_t - S_t = (1+r)^t Y_0 (k_t r - \text{aps}_t)$$

Where FS_t = foreign savings

An interesting feature of equation (5) is that the foreign savings can be reduced to zero at different levels of growth rates depending on the levels of domestic savings and investment efficiency. Thus, we have

$$r = \frac{\text{aps}_t}{k_t}$$

For instance, in 1976 $\text{aps}_t = 11.5\%$ and $k_t = 3.4$, the implied real growth without foreign savings would be 3.4% (11.5/3.4), but the actual estimated growth rate was 9.4%, which means that foreign assistance was responsible for the extra 6% of real growth realized during 1976.

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Available Resources, Aggregate Demand and Savings
(In Millions of LE)

| | <u>1974</u> | <u>1975</u> | <u>1976</u> | <u>1977</u> | <u>USAID Est.</u> <u>1978</u> |
|---|--------------|--------------|--------------|--------------|----------------------------------|
| <u>GDP at Mkt Prices</u> | <u>4,197</u> | <u>4,886</u> | <u>6,276</u> | <u>7,341</u> | <u>8,600</u> |
| Net Factor Income | - 112 | - 163 | - 158 | - 202 | - 158 |
| Workers' Remittances | 61 | 75 | 323 | 623 | 1,228 |
| <u>GNP at Mkt Prices</u> | <u>4,146</u> | <u>4,798</u> | <u>6,441</u> | <u>7,762</u> | <u>9,670</u> |
| <u>Import Surplus (Foreign Savings)</u> | <u>444</u> | <u>862</u> | <u>415</u> | <u>359</u> | <u>337</u> |
| Imports | 1,395 | 1,831 | 1,772 | 2,740 | 3,460 |
| Exports | - 951 | - 969 | -1,357 | -2,381 | -3,123 |
| <u>Available National Resources</u> | <u>4,590</u> | <u>5,660</u> | <u>6,856</u> | <u>8,121</u> | <u>10,007</u> |
| <u>Investment</u> | <u>668</u> | <u>1,278</u> | <u>1,455</u> | <u>1,870</u> | <u>2,600</u> |
| Fixed | 643 | 1,228 | 1,385 | 1,770 | 2,400 |
| (Public) | (613) | (1,048) | (1,149) | (1,400) | (1,900) |
| (Private) | (30) | (180) | (236) | (370) | (500) |
| Stock Changes | 25 | 50 | 70 | 100 | 200 |
| <u>Consumption</u> | <u>3,922</u> | <u>4,382</u> | <u>5,401</u> | <u>6,251</u> | <u>7,407</u> |
| Public (GOE) | 1,101 | 1,200 | 1,571 | 1,576 | 1,850 |
| Private | 2,821 | 3,182 | 3,830 | 4,675 | 5,557 |
| <u>Domestic Savings</u> | <u>275</u> | <u>504</u> | <u>875</u> | <u>1,090</u> | <u>1,193</u> |
| % GDP | 6.6 | 10.5 | 13.9 | 14.8 | 13.9 |
| <u>Foreign Savings</u> | <u>444</u> | <u>862</u> | <u>415</u> | <u>359</u> | <u>337</u> |
| % GNP | 10.7 | 18.0 | 6.4 | 4.6 | 3.5 |
| % Available Resources | 9.7 | 15.2 | 6.1 | 4.4 | 3.4 |
| % Investment (Fixed) | 69.1 | 70.2 | 30.0 | 20.3 | 14.0 |
| <u>National Savings</u> | <u>224</u> | <u>416</u> | <u>1,040</u> | <u>1,511</u> | <u>2,263</u> |
| % GNP | 5.4 | 8.7 | 16.1 | 19.5 | 23.4 |
| % Available Resources | 4.9 | 7.3 | 15.2 | 18.6 | 22.6 |
| <u>Investment</u> | | | | | |
| % GDP | 15.9 | 26.2 | 23.2 | 25.5 | 30.2 |
| % GNP | 16.1 | 26.6 | 22.6 | 24.1 | 26.9 |
| % Available National Resources | 14.6 | 22.6 | 21.2 | 23.0 | 26.0 |

Sources: Ministry of Planning, IMF, and USAID/Cairo