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CURRENCY DIVERSIFICATION AND EXPORT
COMPETITIVENESS: A MODEL OF THE
"EGYPTIAN DISEASE"

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Currency Diversification and Export Competitiveness:
A Model of the "Egyptian Disease"

ABSTRACT

The paper presents a dynamic portfolio model under currency inconvertibility which rationalizes the recent Egyptian experience of real exchange rate appreciation and currency diversification following the increase in oil exports and the partial financial liberalization that took place after 1976. The two shocks are linked because the relative price of manufacturing exports in terms of oil is also the premium of the black market rate over the official exchange rate. The effects of various official exchange rate policies on the temporary equilibrium values of the premium and the real wage and on the steady-state values of asset stocks are examined. A review of the Egyptian experience shows that as the model suggests the official devaluation of 1979 was ineffective against the "Egyptian disease" so that little can be expected from the 1981 devaluation. In light of the model results, a crawling peg policy is proposed instead.

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The notion of an "economic disease" is frequently used in policy circles, but it is only recently that it has become popular in open economy macroeconomics. There are now about a half dozen models of the "Dutch disease,"[1] a catchword for the loss of international competitiveness in manufactures associated with a boom in natural resource-based exports. As the price of oil rises relative to the price of manufactured exports, the trade balance of the oil exporter moves into surplus and this leads to a combination of nominal exchange rate appreciation and reserve inflows. If the latter are not sterilized, there is domestic inflation and a decline in export competitiveness. Real appreciation has also been observed in the context of Southern Cone stabilization plans, entailing a financial liberalization and excessive capital inflows, as recently described in another collection of models.[2] Actually, the 1979-80 British experience can be seen as an example of Southern Cone-type excessive capital inflows exacerbating the effects of the oil surplus on the real price of sterling.[3]

Instead, in the recent Egyptian experience, oil-induced real appreciation has been associated with capital outflows and an increase in foreign money balances held by domestic residents. After Sadat's October Working Paper called for "the opening" in early 1974, in effect, tight trade and exchange restrictions were substantially relaxed.[4] First, the various premiums and surcharges on the official exchange rate were consolidated and expanded through the creation of a "parallel market," where foreign currency was exchanged at rates about 10% below the ones prevailing in the sizable "gray market" tolerated by the authorities. Second, "own" imports, not requiring the purchase of foreign exchange, were greatly expanded. Third, foreign currency deposits by domestic residents were allowed at competitive interest rates. Fourth,

current account transactions were gradually moved from the official to the parallel market. Effective January 1, 1979, raw cotton, rice, petroleum and petroleum products ceased to be transacted at the old official rate of 39 piastres per dollar and the parallel rate of 70 piastres became the new official (unified) exchange rate.[5]

The Egyptian pound has remained inconvertible for current as well as capital account transactions and the official foreign exchange market has continued to be dominated by the monetary authorities but the existence of the "gray" market has made it possible for the private sector to build up foreign currency balances via an unreported current account surplus made up of migrants' remittances, tourism and underinvoicing of exports. In short, while Dutch disease models generally neglect portfolio considerations, and the same is true of most macro models for developing countries,[6] the effects of real appreciation on the currency composition of financial wealth are a crucial feature of the "Egyptian disease." On the other hand, the real side of the model presented here is drastically simplified. In particular, a fundamental aspect of the industrialization of a relatively more absorptive oil exporter is ignored, namely the effect of the future exhaustion of oil reserves on capital accumulation.[7] The analysis of the effects of partial financial liberalization on relative prices and currency diversification is nevertheless useful to understand monetary and exchange rate policy in Egypt, and, given the increasing reluctance of governments to embark on full interest rate liberalization, these lessons can be applied to other financially open relatively more absorptive oil exporters, such as Mexico.

The paper is organized as follows. In Section I, a simple three-good two-asset dynamic model of portfolio diversification under inconvertibility is

described.   It is shown how the currency ratio changes with the relative price of a good traded through the official foreign exchange market, taken to be a natural resource-based export. Policies such as devaluation, exchange rate unification and a crawling peg are contrasted in this set up. Section II reviews the recent macroeconomic experience of Egypt and shows that the implications of the model are consistent with the stylized facts. Finally, the conclusion suggests better ways of coping with the "Egyptian disease" than the conventional monetarist cures. Specifically, it is claimed that the recent official devaluation cannot relieve the symptoms of the disease, whereas the implementation of an official crawling peg together with the channeling of manufactured exports at the gray market rate could restore competitiveness and increase the demand for assets denominated in domestic currency, even without bringing domestic interest rates to the world level.

I. CURRENCY DIVERSIFICATION AND EXPORT COMPETITIVENESS UNDER INCONVERTIBILITY

1. A three-good, two-asset model

Consider an economy producing and consuming two composite traded goods and one non-traded good. Theprice of the non-traded good, P^{NT}, can be thought of as a markup over unit labor costs in the usual way. The foreign currency price of the two traded goods, on the other hand, is determined in the world market, which allows the aggregation of exports and imports. The two traded goods are then distinguished by the fact that receipts and payments for one of them, the "official traded good," are channeled through the official foreign exchange market, at the official exchange rate $\tilde{e}$, while the other one is channeled through the black market for foreign exchange at a rate e, and will be denoted as the "smuggled good."[8] In fact, rather than a strict separation between the two goods, most goods are likely to traded in both markets, depending on the premium of the black market rate over the official rate. Proceeds from underinvoicing of official exports and the acquisition of official imports over a particular quantitative restriction are clear examples of the difficulty in distinguishing goods by the applicable exchange rate. While the introduction of this aspect is straightforward, it is not essential to the story and it is therefore left out.[9] In this connection it is more useful to interpret the official traded good as a natural resource-based export and the "smuggled good" as comprising manufactured exports as well as the usual invisible transactions that are more likely to evade the official channel. All that matters then is that the existence of a sufficient flow of unreported current invisibles allows the black market exchange rate to be seen by exporters as the rate applicable to their transactions, so that the premium becomes a measure of the export subsidy that would make exporters

indifferent between the two channels.

We therefore have two relative prices. Choosing the official traded good, whose price is P^O, as the numeraire, starring foreign currency prices, we define:

$$(1) \qquad p = eP_B^*/\tilde{e}P_O^*$$

$$(2) \qquad q = w(1 + \zeta)/\tilde{e}P_O^*$$

where $P^{NT} = w(1+\zeta)$, ζ being a markup and w unit labor costs.

If the factors of production are fully employed, domestic supply of each one of the three goods only depends on the two relative prices. Domestic consumption, on the other hand, will be taken to depend on goods prices, nominal income and nominal wealth—to be defined below. If demand is homogeneous of degree zero in prices and income, consumption can be expressed as a function of relative prices p and q and wealth in terms of the numeraire.[10] Excess demand functions, also homogeneous of degree zero, can then be defined. In fact the excess supply of the official traded good will be the reported trade surplus (RCAB) while the unreported trade surplus (UCAB) equals the excess supply of the smuggled good. We will assume that the market for non-traded goods always clears, so that we can write our three excess supply functions as:

$$(3) \qquad \tilde{B}(\overset{-}{p},\overset{-}{q},\overset{-}{\tilde{W}}) = UCAB$$

$$(4) \qquad B(\overset{+}{p},\overset{-}{q},\overset{-}{\tilde{W}}) = RCAB$$

$$(5) \qquad N(\overset{-}{p},\overset{+}{q},\overset{-}{\tilde{W}}) = 0$$

where $\tilde{W} = W/P^O$ is real wealth.

Wealth is composed of two assets, domestic money, M, and foreign money, F. Foreign money is valued at the black market rate in investor's portfolios, while domestic money represents the foreign assets of the central bank, F^G, valued at the official exchange rate plus the stock of domestic assets of the central bank, C.[11] Ignoring the banking system for simplicity (or interpreting M as high powered money) we have:

(6) $\qquad M = C + \tilde{e}F^G$

(7) $\qquad W = M + eF$

Now interpreting reported capital flows as transfer payments, which are included in RCAB, and assuming also that the stock of private foreign assets can only change by an unreported trade surplus, we have the change in asset stocks described by:

(8) $\qquad \dot{F} = B(p,q,\tilde{W})$

(9) $\qquad \dot{M} = \dot{C} + \tilde{e}\tilde{B}(p,q,\tilde{W})$

Valuing the domestic money stock in terms of the numeraire and using (3) we can rewrite (9) as

(9') $\qquad \dot{\tilde{M}} = \tilde{B} + \delta\tilde{M}$

where $\qquad \tilde{M} = M/P^O$ is the real money stock

and $\qquad \delta = \dot{C}/M - \hat{P}^O$ is the real increase in domestic credit creation.

Given the foreign currency price of the official traded good, $\hat{P}^O$ is simply the rate of crawl of the official exchange rate.

Now, given financial wealth, the private sector chooses its currency composition based on relative returns, transactions and wealth (with a unit elasticity for convenience). Transactions demands can be proxied by the prices of the goods. It will be assumed that an increase in the prices of the official traded good and the non-traded good increase the demand for domestic money while an increase in the price of the smuggled good increases demand for foreign money. Expressing asset demand fluctuations in terms of the numeraire, and eliminating the demand for domestic money by the wealth definition in (7) we write portfolio balance as

$$(10) \qquad pF = h(R^* + \overset{+}{\psi} - R, \overset{+}{p}, \overset{-}{q})\tilde{M}$$

where $R(R^*)$ is the nominal return to the domestic (foreign) money

and ψ is the expected rate of change of the black market rate.

In most of what follows the relative returns will be exogenous and indeed the interest account on private foreign assets will be subsumed into UCAB.[12] Reference can be made, however, to the consequence of allowing an endogenous expected rate of change of the black market rate as a measure of relative returns, r.[13] The first assumption is that expectations depend on the level of the black market premium

$$(11) \qquad \psi = g(p)$$

Depending on whether g' is positive or negative, we will have regressive or extrapolative expectations. From (11) we have

$$(12) \qquad \hat{\psi} = \rho\hat{p}$$

where ρ is the elasticity of expectations.

The alternative assumption is perfect foresight, according to which

(13) $\psi = \hat{e}.$

In that case we have a third dynamic equation, obtained by inverting (10), namely

(14) $\hat{e} = v(\overset{+}{p}, \overset{-}{q}, \overset{+}{\tilde{M}}, \overset{-}{\bar{F}})$

The model is now complete in its outline. Given asset stocks, and expectations, equations (5) and (10) determine the temporary equilibrium values of the two relative prices. Given relative prices, and expectations, equations (8) and (9') determine the steady-state values of the asset stocks. Expectations can be made endogenous by using either (12) or (14).

2.   Temporary equilibrium

The temporary equilibrium values of p and q are obtained from (5) and (10) above. From (5), an increase in q creates an excess supply of the non-traded good, which, given asset supplies, can only be offset by an increase in the black market premium. The combination of p and q consistent with equilibrium in the non-traded goods market are thus given by an upward sloping locus in p,q space, drawn as NT in Figure 1. From (10), an increase in q generates a decreased demand for foreign assets. Given asset supplies and expectations, this implies a decrease in the premium, so that the combinations of p and q consistent with portfolio balance are given by a downward sloping locus, PB in Figure 1. If an increase in the price of the non-traded good increased

Figure 1

Temporary Equilibrium
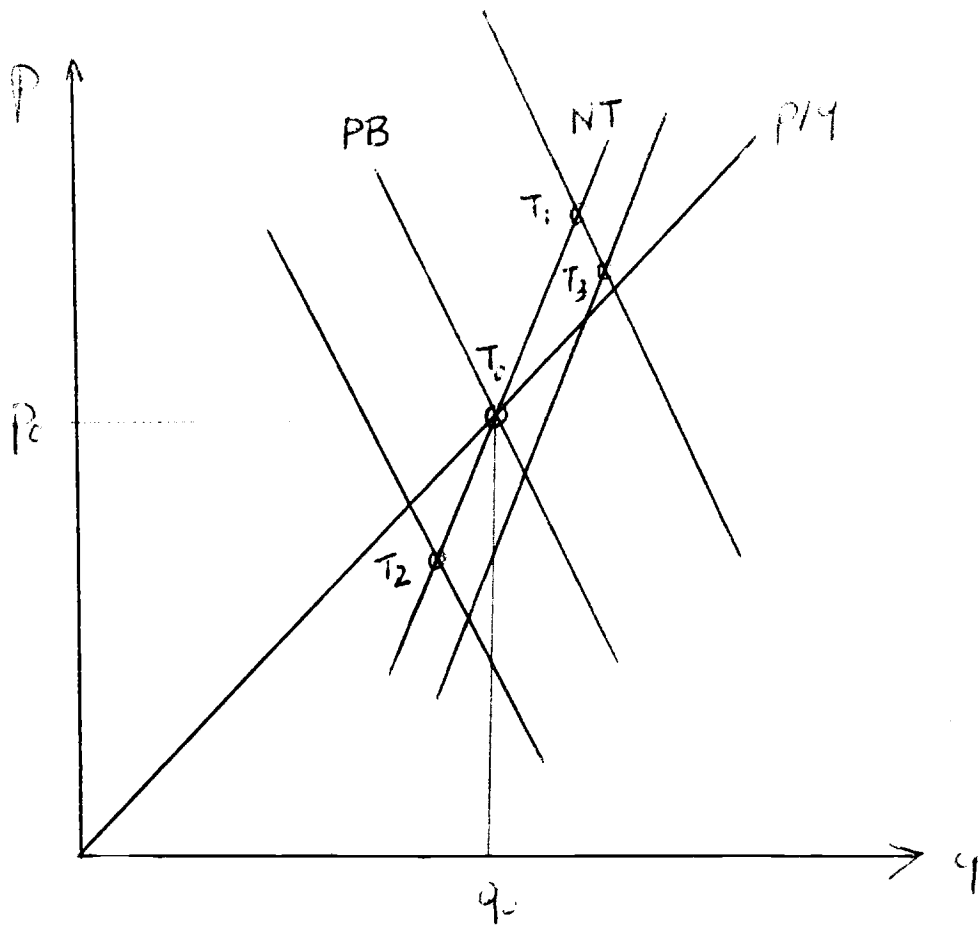
the demand for foreign assets (or if the effect of the premium thereon were larger than the valuation effect), the portfolio balance locus would be upward sloping.[14]

In any case, the slope of the NT locus (which has the "own" price effect on the non-traded goods market in the numerator) is steeper than a ray through the origin defining the price of the smuggled good in terms of the non-traded good, p/q. At the intersection of the NT and PB loci, the system is in temporary equilibrium with relative prices p_0 and q_0. To ascertain the effects of changes in asset stocks and expectations on the temporary equilibrium, logarithmic differentiation of (5) and (10) yields:

$$(15) \quad \begin{bmatrix} 1-\alpha-\varepsilon_1 & \varepsilon_2 \\ -\alpha\omega_1-\nu_1 & \nu_2 \end{bmatrix} \begin{bmatrix} \hat{p} \\ \hat{q} \end{bmatrix} = \begin{bmatrix} (1-\alpha) & -(1-\alpha) \\ (1-\alpha)\omega_1 & \alpha\omega_1 \end{bmatrix} \begin{pmatrix} \hat{\tilde{M}} \\ \hat{F} \end{pmatrix} + \begin{pmatrix} \varepsilon_3 \\ 0 \end{pmatrix} \hat{r}$$

where $\alpha = p F/\tilde{W}$ is the share of foreign assets in wealth;

$\varepsilon_1(\varepsilon_2,\varepsilon_3)$ is the positive elasticity of demand for foreign
assets with respect to the premium (the relative price
of non-traded goods, relative returns) e.g. $\varepsilon_2 = -\dfrac{\partial f/f}{\partial q/q}$;

$\omega_1 = -\tilde{W}\partial N/\partial\tilde{W}$ is the positive semi-elasticity of the excess supply
of non-traded goods with respect to real wealth;

$\nu_1(\nu_2)$ is the positive semi-elasticity of the excess supply of
non-traded goods with respect to the premium (the relative
price of non-traded goods), e.g. $\nu_1 = -p\partial N/\partial p$.

From (15), the slope of the NT and the PB loci can be written as:

$$\frac{dp}{dq}\bigg|_{NT} = (\nu_2/\nu_1 + \alpha\omega_1)p/q$$

$$\frac{dp}{dq}\bigg|_{PB} = (\varepsilon_2/1 - \alpha - \varepsilon_1)p/q$$

As indicated, the slope of the NT locus is positive and greater than p/q, while the PB locus will be downward sloping if the valuation effect of p dominates, so that:

(16) $1 - \alpha > \varepsilon_1$

Thus condition (16) puts as an upper bound on the premium elasticity of the share of foreign assets in wealth the share of domestic money in wealth: if domestic money is 80% of wealth, the elasticity has to be less than .8. [15] If the premium elasticity were at its upper bound the PB would be vertical.

The effect of an increase in the demand for foreign assets on the temporary equilibrium can be seen by going back to Figure 1. From T_o, an increase in the return to foreign currency (increase in ψ) will shift PB up: given asset stocks, an increase in q would reduce the demand for foreign assets, while an increase in p would increase the valuation of the existing stock (since this effect dominates by assumption). The NT locus does not shift, so that the two relative prices increase to T_1, p increasing by more than q. Conversely, an increase in F shifts the PB locus down, while it shifts the NT locus to the right because an excess demand for non-traded goods implies an increase in its relative price, or a decline in the black market

premium. As a consequence p has to decrease to accomodate an increase in F but q may increase or decrease. In any event, p/q falls. In Figure 1, it is assumed that the PB curve shifts by more so that q is also smaller at T_2. To ascertain this, solve (15) given relative returns and write it compactly as:

$$(15') \qquad \begin{bmatrix} \hat{p} \\ \hat{q} \end{bmatrix} = \begin{bmatrix} P_M & P_F \\ q_M & q_F \end{bmatrix} \begin{bmatrix} \hat{M} \\ \hat{F} \end{bmatrix} \quad ,$$

where $\qquad P_M = (\nu_2 - \omega_1 \varepsilon_2)(1 - \alpha)/\Delta \quad ;$

$$P_F = -(\nu_2(1 - \alpha) + \omega_1 \varepsilon_2 \alpha)/\Delta \quad ;$$

$$q_M = (\nu_1 + \omega_1(1 - \varepsilon_1))(1 - \alpha)/\Delta \quad ;$$

$$q_F = -(\nu_1(1 - \alpha) + \omega_1 \varepsilon_1 \alpha)/\Delta \quad ;$$

and $\qquad \Delta = \nu_2(1 - \alpha - \varepsilon_1) + (\alpha\omega_1 + \nu_1)\varepsilon_2 > 0$

It is clear from (15') that, if condition (15) holds and $\Delta > 0$ as assumed,[16] then $q_F < 0$ and $p_F < 0$, the case depicted in Figure 1. Similarly, and increase in $\tilde{M}$ will unambiguously raise $q(q_M > 0)$ but it may increase or decrease p. In fact the increase in $\tilde{M}$ shifts the PB locus up because it generates an increase in the demand for foreign assets and requires an increase in p or in q to maintain portfolio balance. The effect on the NT locus is the same as the effect of an increase in F, it shifts to the right and requires an increase in q or a decrease in p . The condition for both q and p to increase (or for $P_M > 0$) as shown in Figure 1 by T_3, is the dominance of the "own" effect in the non-traded goods market, or:

$$(17) \qquad \nu_2 > \varepsilon_2 \omega_1 \quad .$$

Even when p increases, however, it will only increase by more than q if a stronger condition than (17) holds, namely $p_M > q_M$, which in turn will be true if:

(18) $\qquad v_2 > v_1 + \omega_1(1 - \varepsilon_1 + \varepsilon_2)$.

The effect of a once-and-for-all devaluation of the official rate is to lower p, q and $\tilde{M}$ in proportion. This will generate an excess demand for non-traded goods if $v_2 > v_1 + \omega_1$, so that the NT locus will shift to the right to maintain equilibrium and q will not decline in proportion. The effect on the demand for foreign assets hinges on whether the demand effect of the premium is stronger than the valuation effect of the premium plus the demand effect of the relative price of non-traded goods. In particular, demand for foreign assets will decrease if $\varepsilon_1 > \varepsilon_2$, so that the PB locus will shift down, the temporary equilibrium of the system will jump from T_o to T_3, and p, q and p/q will fall, just like when F increases.[17]

3. Steady-state equilibrium

The dynamics are governed by (8) and (9') above. Substituting for p and q , we can express asset accumulation as a function of asset stocks and (stationary) expectations:

(19) $\qquad \dot{\tilde{M}} = \tilde{B}(\psi, \tilde{M}, F) + \delta\tilde{M}$

(20) $\qquad \dot{F} = B(\psi, \tilde{M}, F)$

In long-run equilibrium, when B = 0, since the non-traded goods market and the asset markets are always in equilibrium, we have to have $\tilde{B} = 0$ as well. This implies an equilibrium relationship between credit

creation and the rate of crawl, such that $\delta = 0$. Taking a linear approximation of the system around the steady-state values $\tilde{M}^*$ and F^* (and assuming for clarity common semi-elasticities for the reported and unreported current accounts) we have:

$$(21) \quad \begin{pmatrix} \dot{\tilde{M}} \\ \\ \dot{F} \end{pmatrix} = \begin{bmatrix} -\pi p_M - J_M & -\pi p_F - J_F \\ \\ \pi p_M - J_M & \pi p_F - J_F \end{bmatrix} \begin{bmatrix} \dfrac{\tilde{M} - \tilde{M}^*}{\tilde{M}^*} \\ \\ \dfrac{F - F^*}{F^*} \end{bmatrix}$$

where $\quad J_M = \mu q_M + \omega 1 + \alpha(p_M - 1)$

$$J_F = \mu q_F + \omega 1 + \alpha(p_F + 1)$$

and $\quad \pi(\mu, \omega)$ is the positive semi-elasticity of the current accounts with respect to the premium (relative price of non-traded goods, real wealth) e.g. $\pi = -p\,\partial\tilde{B}/\partial p = p\,\partial B/\partial p$.

The determinant of the Jacobian in (21) is positive and given by:

$$(22) \quad DET = 2\pi(1 - \alpha)(\mu\omega_1 + \nu\omega_2/\Delta) > 0$$

Similarly, if ν_2 and π are large relative to ε_2 and ω_1, the trace will be negative and given by:

$$(23) \quad -TR = 2\pi(\nu_2(1 - \alpha) + \alpha\omega_1\varepsilon_2) + \omega - \omega_1(\varepsilon_2(\pi + \alpha\omega) - \mu(1 - \alpha - \varepsilon_1))$$

The dominance of the own effect has to be stronger than assumed in signing (23) for the two diagonal elements in (21) to be negative and the

two off-diagonal terms to be positive. Assuming that this is the case,

the two loci where $\dot{\tilde{M}} = 0$ and $\dot{F} = 0$ will be positively sloped. And, because

of condition (22), the $\dot{F} = 0$ locus will be steeper than the $\dot{\tilde{M}} = 0$ locus in

$\tilde{M}$, F space, as depicted in Figure 2. As shown by the arrows, above the

$\dot{\tilde{M}} = 0$ locus, the reported current account has a deficit larger than real

domestic credit creation and real money balances are decreasing, while

below they are increasing. Above the $\dot{F} = 0$ locus the unreported current

account is in surplus and the private stocks of foreign assets is increasing,

while below it is decreasing. Steady-state equilibrium obtains at A_o with

asset stocks F_o and M_o. Note from (10) that a ray through the origin has

slope p/h.

Consider first the long run effects of an exogenous increase in the demand

for foreign assets, from a position of equilibrium at A_o. As shown above,

given asset supplies, p and q go up. This moves the reported current account

into deficit, so the $\dot{\tilde{M}} = 0$ locus shifts to the right, and (if the "own" effect

dominates) the unreported current account into surplus so the $\dot{F} = 0$ locus also

shifts to the right. As shown in the Appendix, at the new steady-state (A_1),

there is a larger currency ratio. Consider next the effect of a once-and-for-all

devaluation of the official rate from A_1 , which decreases p and q (as well as

p/q). This brings the reported current account into surplus and the unreported

current account into deficit, so that $\tilde{M}$ has to increase (or F has to decrease) to

restore balance. Thus the $\dot{\tilde{M}} = 0$ locus shifts up and the $\dot{F} = 0$ locus shifts to

the left, while the premium also increases, moving the economy to A_3, where the

currency ratio is the same as at A_1. Conversely, from A_2, a decrease in δ

shifts the $\dot{\tilde{M}} = 0$ locus down because a decline in $\tilde{M}$ (or an increase in F) will

improve the reported current account to compensate for the decreased domestic

Figure 2

Steady-State Effects of Various Disturbances
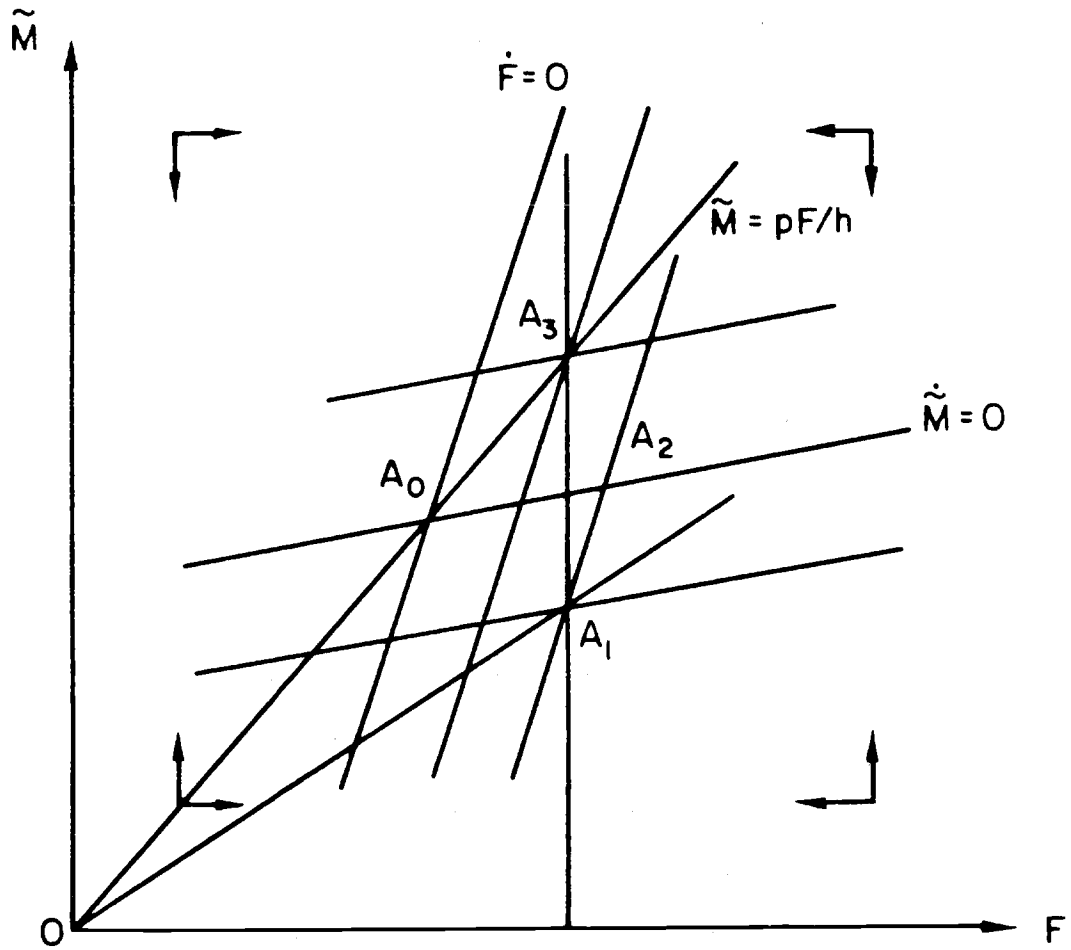
credit creation. The $\dot{F} = 0$ locus does not shift so that if the $\dot{\tilde{M}} = 0$ locus shifts back to A_1 the new steady-state will have a lower currency ratio. Thus, unlike devaluation, a crawling peg can decrease the steady-state currency ratio. The reason for this difference lies in the effect of the two measures on real balances. The improvement in the reported current account due to a once-and-for-all devaluation increases real balances (in proportion) while the crawling peg decreases them.[18]

Consider finally the effects of exchange rate unification. If unification is accompanied by a floating official exchange rate, central bank reserves do not change, portfolio balance is described by (10) above with $p = 1$, domestic money is given and the change in the stock of foreign assets is equal to the aggregation of the reported and unreported current account, so that we have the conventional portfolio model with non-traded goods.[19] If unification were accompanied by a fixed but fully-convertible official exchange rate, on the other hand, domestic and foreign money would become perfect substitutes and we could apply the simple monetary approach to the balance of payments. It is, however, difficult to believe that such a policy would be credible without full interest liberalization so that the reasons for the development of a black market for foreign exchange would probably remain and the private valuation of foreign currency would still differ from the official exchange rate, with the consequences suggested above.

We now proceed to review the recent Egyptian experience and to interpret it in light of the results of the model.

II. THE EGYPTIAN EXPERIENCE

The philosophy of the October Working Paper may not have succeeded in gener-
ating a private entrepreneurial class that would replace the bureaucracy of the
Nasser era: private investment is still less than 20% of the total. Never-
theless, the opening of the Egyptian economy is unquestionable. Imports and
exports increased from 15% and 21% of GNP in 1972-73 to 44% and 53% in the
late 1970's.[20] In 1979, furthermore, the increased oil revenues, Suez Canal
dues and reported migrants reached 17% of GNP, accruing mostly to the govern-
ment rather than to the private sector. If reported capital flows are also
interpreted as tranfer payments, balance of payments data shows a reported

transfer from abroad partly offset by an unreported private capital outflow.
Given that the propensity to save in Egypt is probably less than in its trading
partners, the net income effect of the reported transfer is expansionary. Coupled
with the effect of emigration on the supply of skilled labor, the transfer also
explains that real unit labor costs in manufacturing have been rising faster
than abroad. In short, the recent Egyptian experience can be seen as the
response of relative goods prices and the currency composition of financial
wealth to two shocks: an increase in the price of the official traded good
and an increase in the return to foreign assets.

Even though there has been some concern about the decline in export compe-
titiveness and the increase in currency diversification that are at the heart of
the "Egyptian disease," these do not seem to bother the authorities as much as the
acceleration of consumer price inflation from about 10% p.a. to perhaps 30% in
1980 (taking into account the free market price of some controlled commodities),
first because attempting to stabilize the price of wage goods has involved an

increasing share of government expenditure. The policy measures of May 1980
addressed the decline in real wages that came as a consequence of inflation
both by an increase in labor compensation and by an increase in the subsidy
of some essential consumer goods. These measures have thus required govern-
ment credit creation both to sterilize the deterioration in the foreign
asset position of the Central Bank in 1977 and 1978 and not to sterilize the
improvement in 1979 and 1980.

It is therefore no wonder that most analyses of Egyptian monetary
problems rely on conventional open economy monetarism, ignoring the two basic
features of the "Egyptian disease." To illustrate the conventional view,
define monetary equilibrium from the quantity equation and the purchasing
power parity hypothesis. Then, using changes in an average official import
exchange rate against the dollar (taking into account the gradual shift of
goods from the official to the parallel rate between 1975 and 1978 to be
described below) plus U.S. consumer price inflation as a proxy for the world
pound inflation, and the Egyptian CPI as a proxy for domestic inflation,
we do get a clear monetarist message for the period 1975-78: money growth
(24-30% p.a.) exceeded real output growth (19% p.a.) so domestic inflation
(about 10%) was bound to catch up with world pound inflation (13-14%). But
then the official devaluation (15% in 1978 and 30% in 1979) implied monetary
contraction at world prices (-8% and -26% respectively) even though inflation
continued to be repressed at 10-15% p.a. Nevertheless, domestic inflation
exploded in 1980 as "equilibrium" inflation dropped to the fixed exchange
rate level of U.S. inflation. As a consequence, monetary contraction at
domestic prices was exacerbated, while there was 12% excess money creation at
world prices, as shown in Chart 1. Before showing how real appreciation and

Chart 1

Conventional Measures
of monetary disequilibrium

% p.2


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40 -|

35 -|

30 -|

25 -|

20 -|

15 -|

10 -|

     1975    1976    1977    1978    1979    1980
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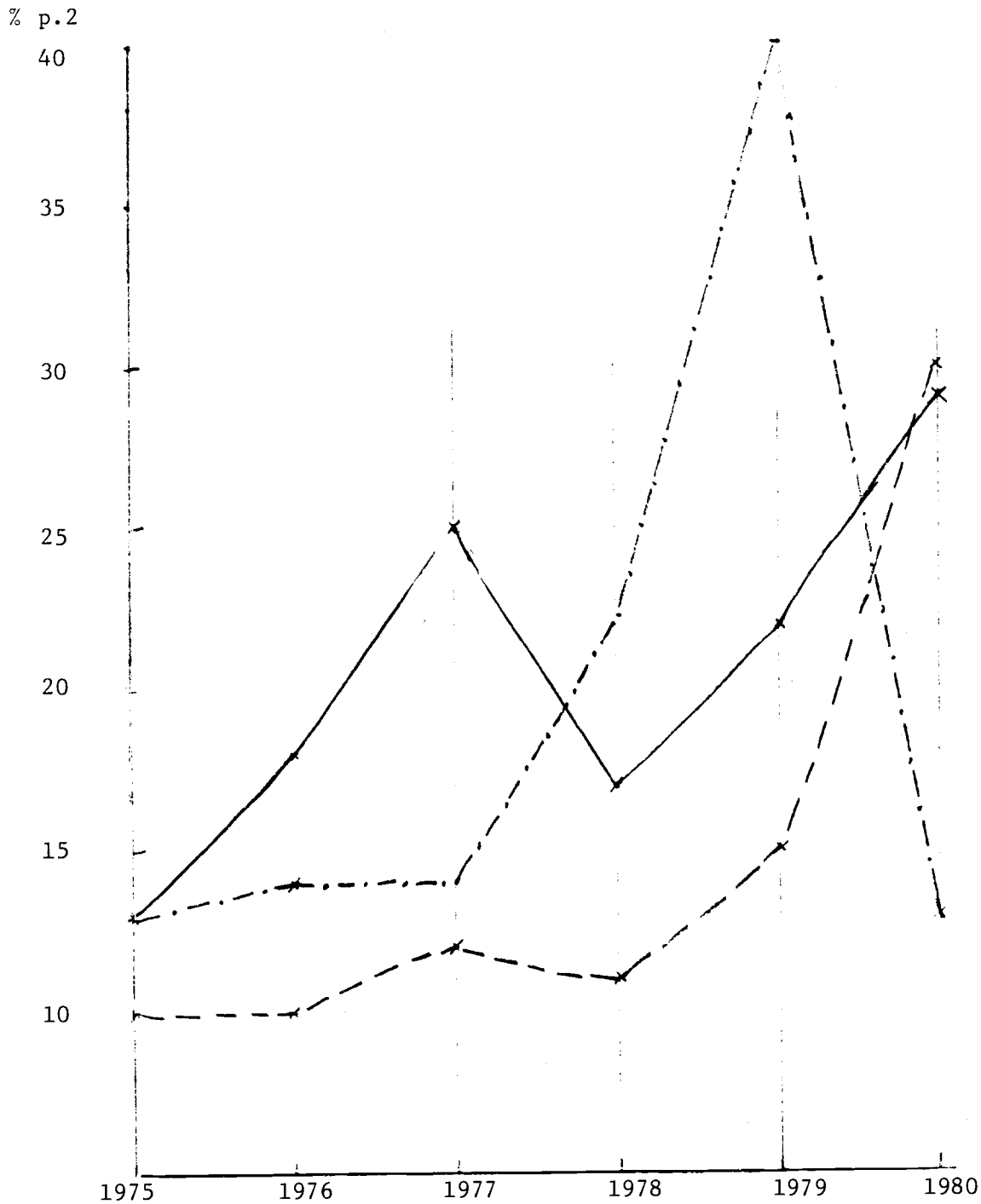
---- Excess supply of money $(\hat{W} - \hat{y})$

- - Domestic inflation $(\hat{P})$

-·- World pound inflation $(\hat{P}* + \hat{\tilde{e}})$

Sources: W from Appendix Table 2, line 1; $\tilde{e}$ from Appendix Table 1, line 3
P, P* from Appendix Table 1, line 6; y from Bhattacharya
et al. (1980, Table 1, p.1).

currency diversification qualifies the simply monetarist cure of reducing credit creation so as to bring "money growth" to the level implied by nominal output growth at world prices,[21] it is useful to take a closer look at the deviations from purchasing power parity, that is to say at export competitiveness.

A common measure of international competitiveness is provided by unit labor costs relative to major trading partners. For a semi-industrialized country such as Egypt, this measure should be interpreted with caution since the comparison of unit labor costs with, say, the United States, has to be made relative to an arbitrary base period, and has to ignore the implications for labor productivity of the substantial sectoral reallocations that are likely to take place as a consequence of industrialization. Furthermore, the existence of multiple exchange rates has to be taken into account. This is done in Chart 2, where unit labor costs in manufacturing relative to the U.S. are reported at both the average official export exchange rate and the gray market rate (see Appendix Table 1). The gain in competitiveness achieved by the gradual unification of 1977-79 is evident from the chart, as well as the appreciation of the official rate in 1980, but the striking feature is the deterioration in competitiveness of the goods valued at the gray market rate, whose relative costs in late 1980 were 30% above the base period level. The chart also shows relative real unit labor costs. The difference between these and unit labor costs is simply the change in either nominal exchange rate and a relative price index: the continued appreciation of the real gray market rate is evident from the widening distance between the two top curves in Chart 2.[22]

Now the share of foreign currency deposits in commercial banks rose from 8% of total (public and private) deposits in 1976 to 19% at the end of 1978

Chart 2

Measures of Relative Prices

(indices 1975 = 100)

1975   1976   1977   1978   1979   1980
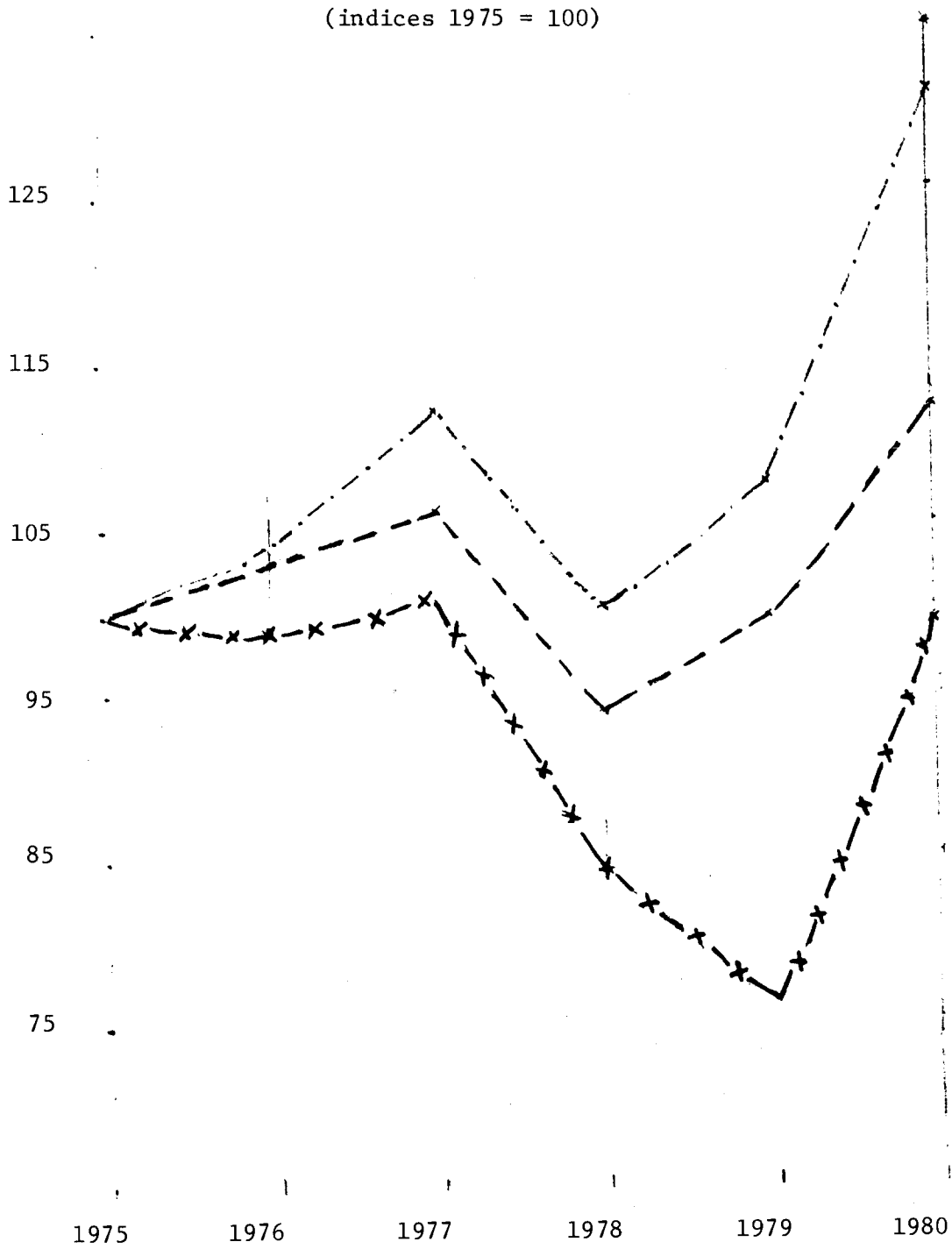
- - relative real unit labor costs in manufacturing

-•- relative ulcm at gray market exchange rate

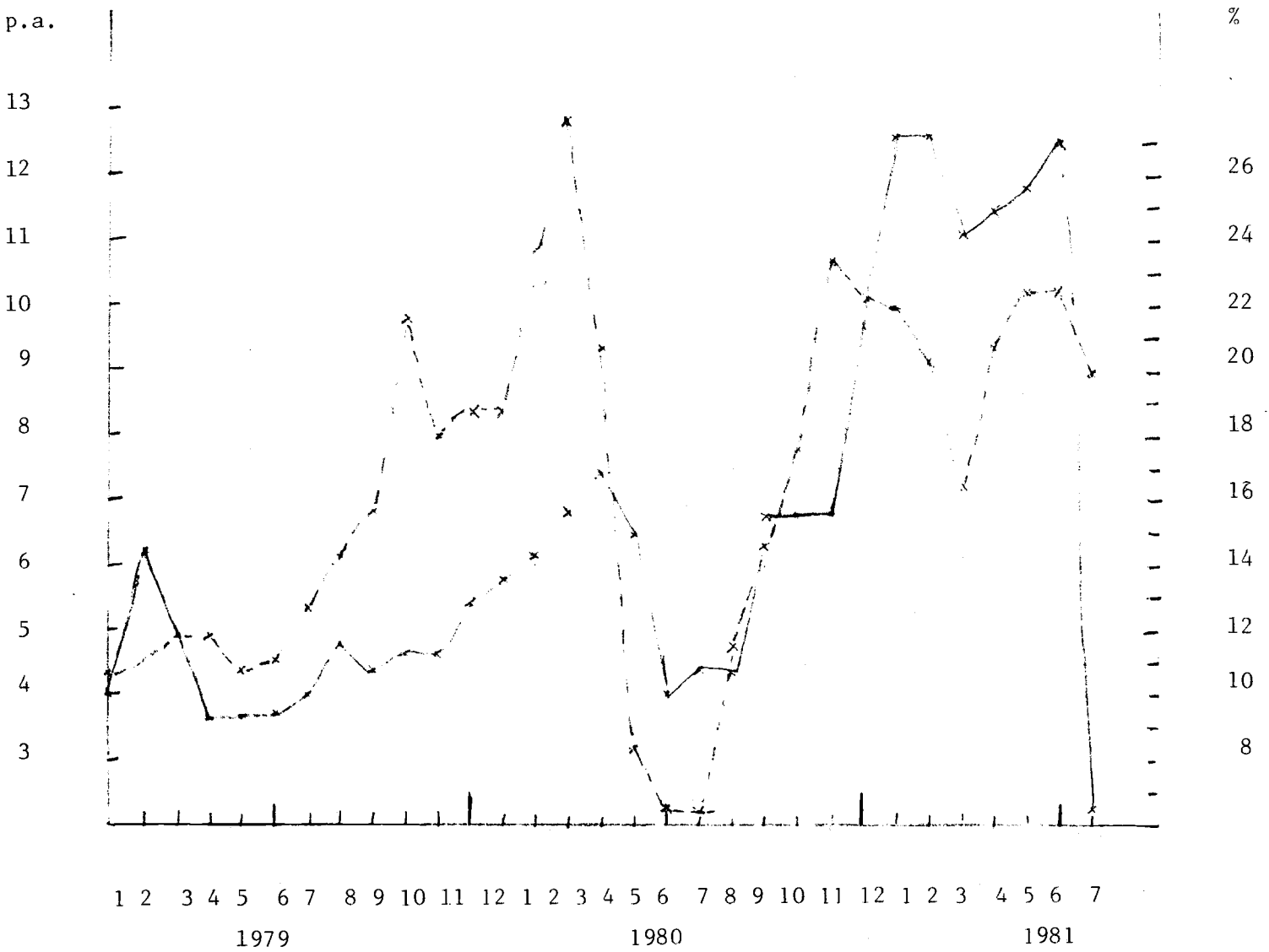-x- relative ulcm at average official export exchange rate

Source: Appendix Table 1, rebased.

and during the same period the premium of the gray market rate over an average official export rate (which takes into account the gradual shift of goods from the official to the parallel market) declined from 55% to 31%. After the unification, however, the gray market rate began to follow the rising foreign interest rates and the premium on the unified (parallel) rate increased steadily until mid-1980. At that time, the decline in foreign interest rates as well as the announcement by the government that customs dues on imported goods could again be paid for in local currency led to a drop in the premium to about 10% (Chart 3). But soon after the premium returned to over 20% and it reached 27.5% in mid-1981, to drop to less than 7% after the July devaluation which brought the unified rate to 83-84 piastres and raised interest rates from 7.5% to 10%. The increasing return differential also induced further currency diversification. Private holdings of foreign currency are hard to measure because of widespread hoarding of foreign bank notes, and substantial private foreign currency deposits in business and investment banks, and offshore banks.[24] Nevertheless, the currency ratio (private foreign currency deposits in commercial banks over domestic money supply) reached 15% at the end of 1979 and has continued to increase since then (Appendix Table 2).[25]

Behind this accumulation of foreign currency balances is a substantial change in the pattern of financing of a current account deficit around $1.5 million (Appendix Table 3). There has been a rise in the "autonomous" component of the capital account (which includes direct investment, suppliers credits and other private non-monetary operations as well as long term aid) from about $1.3 billion in 1977 to about $2.5 billion in 1980, the increase in direct investment in 1979, accounted for by foreign oil companies and by

Chart 3

The premium and
the return differential

p.a.   %

13

12   26

11   24

10   22

9   20

8   18

7   16

6   14

5   12

4   10

3   8

1 2   3 4 5   6 7   8 9 10 11 12 1 2 3 4 5 6   7 8 9 10 11 12 1 2   4 5 6   7

      1979   1980   1981

_____ Gray market premium (right scale)

- - 90 day deposit rate differential with eurodollar

Sources: (left scale) Appendix Table 2

Law 43 firms, being particularly noteworthy. This has more than matched

the decline in special balance of payments financing loans and grants to the

Government from $1.6 billion in 1977 to zero in 1979 and 1980, which was

largely due to non-economic considerations. The balance on non-monetary

transactions has therefore been in surplus and the net foreign asset position

of the monetary institutions has accordingly improved. In 1980 central bank

reserves increased almost $1 billion, while foreign assets held by commercial

banks declined by one third of this amount. In fact, from 1974 to 1976 and

again in 1980 commercial banks were borrowing abroad while on net they were

repaying loans and placing funds in external financial markets between 1977

and 1979. At the same time, there has been a growing "unallocated" capital

outflow: less than half of the commercial banks' outflow in 1977, it more

than offset commercial bank borrowing in 1980, so that, even after accounting

for errors and omissions, due to current account transactions, a sizeable

private (non-bank) accumulation of foreign assets remains.

Against this background, the stylized facts of the "Egyptian disease"

are apparent from Chart 4: on the left panel we plot the shocks--the

increase in pound oil revenues and the return differential, on the right

panel we plot the responses--real appreciation and currency diversification.

Deviations from purchasing power parity were already discussed in connection

with Charts 1 and 2. Now Chart 4 suggests that defining money correctly will

substantially reduce the rate growth of the money stock. Indeed conventional

monetary equilibrium would obtain in 1980, rather than the 12% increase in

excess money creation reported in Chart 1. The results from the model in

the previous section--gathered for convenience in Table 1--provide a ration-

alization for the stylized facts in Chart 4 that are missed by the conventional

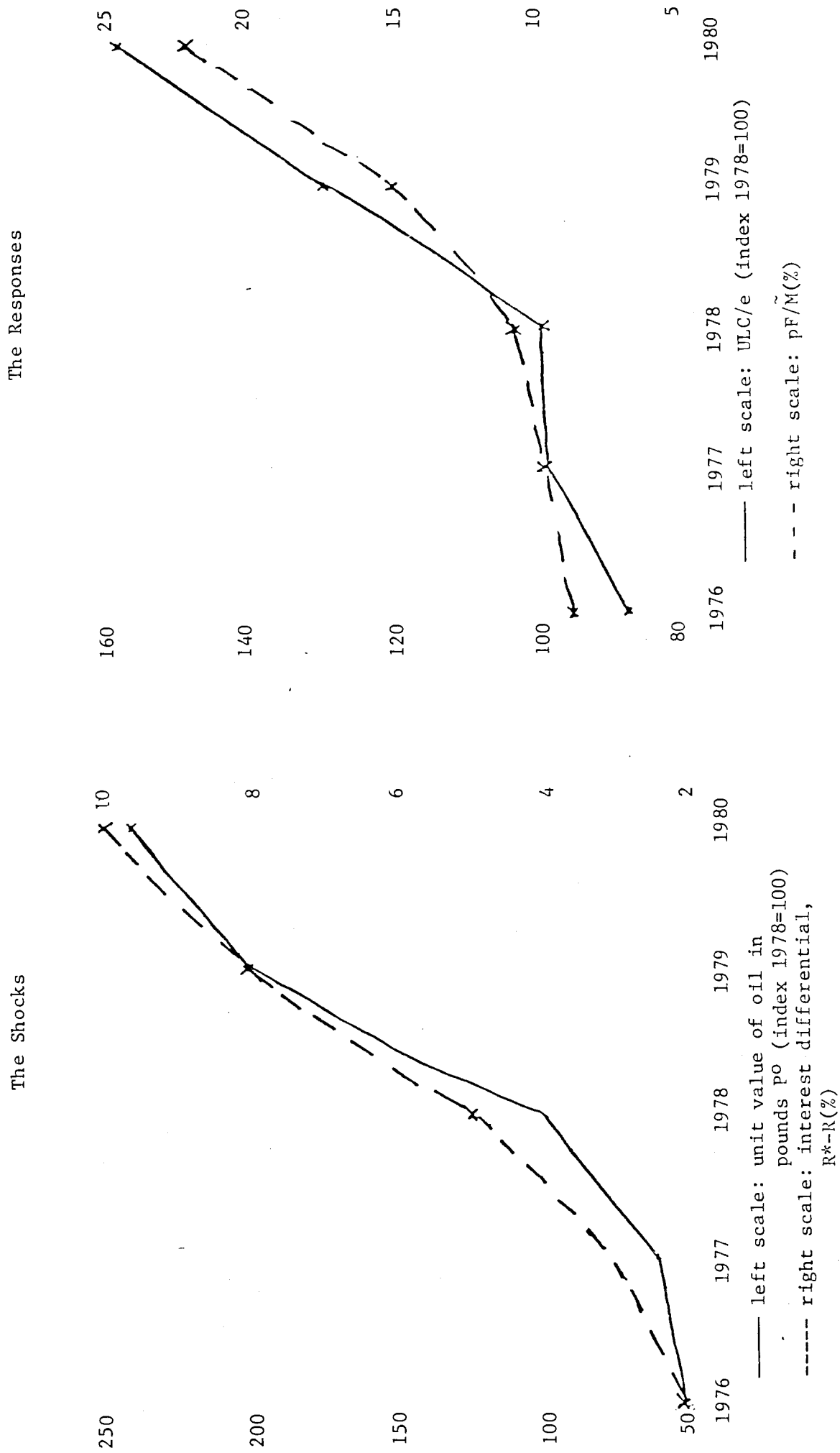Chart 4

The "Egyptian Disease": Stylized Facts

The Responses

The Shocks

left scale: ULC/e (index 1978=100)

- - - right scale: pF/M̃(%)

left scale: unit value of oil in
pounds P⁰ (index 1978=100)

---- right scale: interest differential,
R*-R(%)

Table 1

The "Egyptian Disease": Model Results

response shocks	temporary			steady-state			
	p	q	q/p	$\tilde{M}$	F	$F/\tilde{M}$	h
return differential(r)	+	+	−	−	+	+	+
oil price(P^o)	−	−	+	+	0	−	0

explanation, even after the corrections suggested. It is clear from the
table that the return differential in favor of the foreign currency increases
the currency ratio but causes real depreciation while the increase in the
domestic currency price of the official traded good causes real appreciaton
but has no steady-state effect on the currency ratio: it is the coincidence
of the two shocks that explains the two responses of Chart 4. It was shown
above, however, that a crawling peg would succeed in lowering the currency
ratio, while an official revaluation could temporarily offset increases in
P_o^*. In short, allowing manufactured exports at a rate closer to the gray
market seems to be the only way to preserve export competitiveness, fight
inflation and prevent a continued increase in the currency ratio.

Conclusion

The present stance of the government to try and eliminate currency
diversification by a new unification--or at least by a once-and-for-all
devaluation--is obviously misguided. The financial openness that Egypt has
achieved makes it impossible for the government to control the stock of
foreign assets of the private sector. The existence of a black market
premium naturally follows from the reluctance to raise interest rates. If
the crawling peg is implemented--possibly after a once-and-for-all revaluation--
it may stabilize the black market rate somewhat, but it is the earlier
practice of allowing exports at the black market rate, rather than the
ensuing unification, that should be followed.

Even though these conclusions would need to be checked by a model
with real capital formation, the major point can be restated: invisible
receipts in an oil exporting country are likely to be diverted from the

official exchange market so that, in order to avoid full interest libera-
lization and real appreciation, official exchange rate policy has to reduce
the incentives to hold foreign assets. Since an official once-and-for-all
devaluation does not alter these incentives, a crawling peg policy suggests
itself.

NOTES

*Earlier versions were presented at the World Bank, the State Department, the Williams Development Conference, and the N.B.E.R. Summer Institute. Comments from the participants and encouragement from Kemal Dervis are gratefully acknowledged. Errors are my own.

1. See Corden (1981), Corden and Neary (1980), van Wijnbergen (1981a), Boutros-Ghali (1981), and Buiter and Purvis (forthcoming). Corden (1980) credits The Economist with the invention of the term and states that in Australia it is known as "the Gregory problem."

2. See Diaz (1981), van Wijnbergen (1980), Krugman (1980a), Dornbusch (1980, Chapter 12) and further references to the Argentine experience in Calvo (1981).

3. See Corden (1980).

4. On the economic experience since "the opening," see Ikram et al (1978), Dervis et al (1980) and Bruton (1981).

5. As Pick's Currency Yearbook (1978, p. 201) writes in characteristic style: "Unable to 'beat' the black market, Cairo finally decided to 'join' it."

6. Taylor (1979, Chapter 9). A portfolio model of the Portuguese black market rate was estimated in Macedo (1979b); for the "dollarization" of Mexico, see Solis and Ortiz (1981). A currency substitution model of Egypt is in Boutros-Ghali (1980).

7. See Dixit (1981) and van Wijnbergen (1981b).

8. The parallel with the dual exchange market literature is evident. See references in Macedo (1981b).

9. See Macedo (1979a) for a model incorporating this feature.

10. See demonstration in Macedo (1981b).

11. Domestic credit creation, in particular to the public sector, is thus exo-genous and, in particular, capital gains and losses on foreign exchange

reserves are offset by changes in central bank net worth. For the case discussed in the Addendum to Johnson (1976) that these induce credit creation, see Macedo (1979a).

12. The importance of this assumption in models of dual exchange rate systems has been emphasized by Marion (1977).

13. See Macedo (1981b) for the demonstration that ψ captures relative returns.

14. This is assumed in Macedo (1979a). It does not change the main results.

15. For evidence on these proportions for major currencies, see Macedo (1981a).

16. If condition (16) does not hold, it is unlikely that $\Delta > 0$ because ν_2 captures the "own" price effect in the non-traded goods market, which is larger than the "cross" price and the wealth effects, captured by ν_1 and ω_1 respectively.

17. Conversely, if $\varepsilon_1 < \varepsilon_2$ the PB locus will shift up and the equilibrium will be at T_3, with a higher p, q and p/q, just like in the case of an increase in $\tilde{M}$. Since this case is implausible, we see that ε_2 also has an upper bound given by condition (16) in the text.

18. Calvo (1979) elaborates on the differences between and once-and-for-all devaluation and an increase in the rate of crawl.

19. See Kouri (1981) and Calvo and Rodriguez (1977).

20. Political economy views are in Taylor (1977) and Waterbury (1981), but there still is no systematic study of the trade and payments regimen such as the one by Hansen and Nashashibi (1975) for the Nasser period. See also the references in footnote (4) above and Bhattacharya et al. (1980).

21. There are, of course, other reasons to qualify this argument. Thus, according to McKenzie (1979) and Crockett and Evans (1980), the income elasticity of money demand might be closer to two than to one. Alternatively, even

for low interest rate elasticities, Krugman (1980b) has shown that (complete) price rigidity during two to four years would lead real appreciation to be magnified by a factor of similar magnitude.

22. In fact, starring foreign variables, we have, by definition:

$$\frac{wL}{PQ} \Big/ \frac{w^*L^*}{P^*Q^*} = \frac{ULC}{zULC^*} \Big/ \frac{P}{zP^*}$$

where $w(w^*)$ is the wage rate in manufacturing,

$L(L^*)$ is manufacturing employment,

$Q(Q^*)$ is industrial production,

$P(P^*)$ is the consumer price index,
$ULC = wL/Q$ (ULC^*) is unit labor cost in manufacturing,

and $z = e, \check{e}$ the exchange rates in the gray and official markets respectively.

The index in chart 4 is therefore obtained by multiplying lines 9 and 5 in Appendix Table 1.

23. Excluding earmarked deposits. Including these would not make much difference in 1978, but the share would increase to 28% in 1979.

24. Decisions regarding the currency denomination of financial wealth are not restricted to the differential between Egyptian pound and Eurodollar rates. Changes in other Eurocurrency rates and in the expected exchange rates between major currencies will indeed be more important if the wealth-holder's consumption basket includes only a small share of goods produced in Egypt. See Macedo (1981a).

25. Monetary statistics in Egypt are notoriously defective. To begin with, they exclude business and investment banks as well as offshore banks (which

only deal in foreign currency),and even for commercial banks (which include four belonging in the Government's foreign exchange budget and a number of joint venture banks) foreign currency deposits have only been available since the exchange rate unification. In terms of domestic currency assets and lia-bilities, the statistics generally include public sector companies on the grounds that they behave like private companies (and may now have private equity participation). However, it has been argued that their deposits should be excluded from the money supply in order to calculate a more mean-ingful public sector borrowing requirement; this approach is followed in Appendix Table 1. See the discussion in McKenzie (1979) and Bhattacharya et al (1980).

Appendix

Using (5) to substitute for q in (8), (9') and (10) and totally differentiating, taking into account that aside from changes in ψ and δ we have an exogenous devaluation of $k\%$, the system can be written as:

$$
\begin{bmatrix}
1-\alpha\tilde{\omega}_1-\varepsilon_1+\varepsilon_2\tilde{v}_1 & -(1-\alpha)\tilde{\omega}_1 & 1-\alpha\tilde{\omega}_1 \\
\\
\pi + \alpha\Omega + \mu\tilde{v}_1 & (1-\alpha)\Omega-\delta\tilde{M} & \alpha\Omega \\
-\pi + \alpha\Omega + \mu\tilde{v}_1 & (1-\alpha)\Omega & \alpha\Omega
\end{bmatrix}
\begin{bmatrix}
\hat{p} \\
\\
\hat{\tilde{M}} \\
\hat{F}
\end{bmatrix}
=
\begin{bmatrix}
\varepsilon_3\hat{\psi} + (1-\tilde{\omega}_1-\varepsilon_1+\varepsilon_2\tilde{v}_1)k \\
\\
\delta\tilde{M}\hat{\delta} + (\pi+\Omega+\mu\tilde{v}_1 - \delta\tilde{M})k \\
- (\pi-\Omega+\mu\tilde{v}_1)k
\end{bmatrix}
$$

where $\tilde{\omega}_1 = 1 - \varepsilon_2\omega_1/v_2$

$\quad\quad \tilde{v}_1 = v_1/v_2$

$\quad\quad \Omega = \omega + \omega_1\mu/v_2$

The determinant is given by

$$\Lambda = 2(1-\alpha)\pi\Omega - \left[(1-\alpha\tilde{\omega}_1)(\pi-\mu\tilde{v}_1)+ \alpha\Omega(\varepsilon_2\tilde{v}_1-\varepsilon_1)\right]\delta\tilde{M} > 0$$

The effect of an increase in ψ on the three remaining endogenous variables is

$$(\Lambda/\varepsilon_3)\hat{p}/\hat{\psi} = -\alpha\Omega\delta\tilde{M}$$

$$(\Lambda/\varepsilon_3)\hat{\tilde{M}}/\hat{\psi} = -2\alpha\pi\Omega$$

$$(\Lambda/\varepsilon_2)\hat{F}/\hat{\psi} = 2(1-\alpha)\pi\Omega - (\pi-\alpha\Omega-\mu\tilde{v}_1)\delta\tilde{M}$$

so that $\hat{p} = 0$ if $\delta = 0$. Also $(\Lambda/\varepsilon_3)\hat{h}/\hat{\psi} = 2\pi\Omega - (\pi-\mu\tilde{v}_1)\delta\tilde{M}$

The other results are similarly derived.

Appendix Table 1

Exchange Rates and Prices

		1976	1977	1978	1979	1980
1.	Gray market rate: ($/£E)	1.34	1.35	1.30	1.29	1.20
2.	Average official rate: $/£E					
	a) export	2.01	1.89	1.72	1.43	1.43
	b) import	2.21	2.10	1.85	1.43	1.43
3.	Consumer price inflation: % p.a.	10	13	11	15	30
4.	Wage bill in manufacturing and mining: £E million	485	555	620	770	975
5.	Value of industrial production:£E million, indices base 1978 = 100	993	1120	1319	1478	1833
6.	Consumer prices relative to U.S. at gray market rate	94	99	100	101	110
7.	Labor share in manufacturing (5)/(6)	104	106	100	111	113
8.	Unit labor costs at the gray market rate	86	100	100	128	158
9.	Labor share in manuturing relative to U.S.	104	106	100	114	117
10.	Dollar unit value of oil	87	95	100	202	242

Sources:
1. 1976-78 International Reports, Inc. average of weekly data. 1979-80 own estimates average of monthly data.

2. Computed from rates in Dervis et al. (1980, Table B.3) and shares in dollar current account, ibid. (Table B.9).

3. 1976-78 CAPMAS, Monthly Bulletin of Statistics, 1979-80 own estimates.

4. Ministry of Planning, adjusted for bonuses (9% in 1979, 25% in 1980).

Appendix Table 1, continued

5. 1976-79: National Accounts Data from Ministry of Planning,
    1979-80 Ministry of Industry.

6. Index from (3)* index from (1)/IFS, U.S. line 64.

8. ((7)/(6))*U.S. inflation

9. (7)/IFS. U.S. lines (65 ey* 67..c)/(64*66..c).

10. Egypt General Petroleum Corporation. 1980 June.

Appendix Table 2

Domestic and Foreign Money
(end of year)

	1976	1977	1978	1979	1980
1. Money including foreign currency deposits (£E billion)	2.4	3.2	4.1	5.3	7.1[1]
2. Money excluding foreign currency deposits (£E billion)	2.2[2]	2.9[2]	3.7	4.6	5.9[1]
3. Premium of gray market over parallel rate index 1978 = 1	.97	.96	1.00	1.03	1.09
4. Currency ratio at parallel rate (1) - (2)/(2): %	9	10	11	15	20
5. Currency ratio at gray market rate (4)*(3)	9	10	11	15	22
6. Interest differential on 3 month time deposits	2	3	5	8	10

Sources: 1. Central Bank of Egypt. Includes earmarked deposits.

2. Central Bank of Egypt, IMF, own estimates (starred), excludes earmarked deposits.

3. End of year gray market rate same sources as Appendix Table 1, line 1.

6. 1976-78 McKenzie (1979), 1979-80 own estimates, euro dollar rate from World Financial Markets.

Notes: 1. Extrapolated from September data in 1980 and 1979.

2. Own estimates.

Appendix Table 3

Summary Balance of Payments

($ Million)

	1977	1978	1979	1980*
1. Current Account	-1519	-1415	-1572	-1355
2. Autonomous non-monetary transactions	1270	1582	2269	2450
3. "Overall" balance (1 + 2)	-251	167	697	1095
4. Unallocated	-435	-504	-462	-415
5. Special Financing	1601	809	72	-
6. Monetary operations	-915	-472	-307	-630
a. Commercial banks	-1005	-494	-101	280
b. Central bank	90	22	-206	-910

*estimated

Source: Central Bank of Egypt, IMF, IBRD, own estimates.

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