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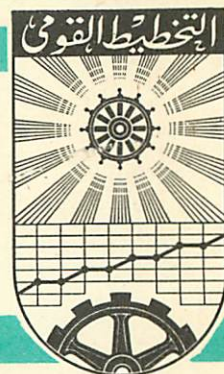
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THE APPLICABILITY AND UTILIZAT-
ION OF INPUT – OUTPUT MODEL IN
A DEVELOPING ECONOMY

by

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THE APPLICABILITY AND UTILIZATION OF THE INPUT-OUTPUT MODEL IN A DEVELOPING ECONOMY. THE CASE OF EGYPT EXAMINED

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PART I.
THE APPLICABILITY OF THE INPUT-OUTPUT MODEL
IN A DEVELOPING ECONOMY

So far two Input-Out tables have been constructed for the Egyptian Economy, one for the year 1954 and the other for the year 1959. In this paper reference will only be made to the 1954 table, and aggregated version of which is included in the Appendix. The original table is of the order of 83 X 83[1] and was later aggregated to 33 X 33 and 7 X 7. The final demand is divided into 6 sectors. A distinction was made between household consumption and government consumption and also between government and private investment. It should also be mentioned that the sectors "education" and "medical services" which are included in the interflow matrix represent those services which are rendered by the private sectors. Government education and medical services on the other hand are included in the final demand sectors under government consuption. This is due to the fact that it could always be argued that government policy in these two fields could not be conceived as matters to be determined through a set of technical coefficients. As regards the primary factors, the original table shows a detailed breakdown. However, this breakdown was dispensed with when reproducing the 33 X 33 table and only one row of value added appears.

As regards the prices utilized in the 1954 table we followed a traditional path. Transactions from domestic production were evaluated at producers' prices. Imports were evaluated at "CIF" prices. Trade & Transportation margins were included in separate sectors in the interflow matrix. In choosing producers' prices we were influenced by the idea that the use of purchasers' prices is somewhat inferior for analytical purposes. However this is not really of any significance particularly if we look at prices merely as veils covering the real significant figures which are in physical units. In fact it is sometimes maintained that it is preferable, particularly if the input-Output table is a detailed one to utilize purchasers' prices. As regards exports they were evaluated at FOB prices.

As it is clear the table shows gross transactions in the sense that the inputs from one sector to itself are recorded. This prodecure we preferred, as it gives additional information of vital importance. Another characteristic of the table and perhaps the most important, is that inputs from domestic production and from imports are shown separately in every cell. This is a very signif-icant step and a necessary one in constructing an input-output table in developing countries. This gives us two interflow matrices, one represents the inputs from domestic production and the other indicates the inputs from imports which will be referred to later as the import matrix.

[1] The 1959 table is of the order of 33 X 33 and a 7 X 7 table is also available. Both tables were constructed by the Input-Output Unit of the National Planning Committee and under my direction and the supervision of Dr. I.H. Abdel Rahman, then under Secretary of the Ministry of Planning and Dr. N. Dief, the Assistant Under Secretary.

Whereas it may be appropriate to group together the inputs from both the domestic production and imports in an input-output tables for a developed economy like that of the United States, this is not so in the case of a developing economy like that of Egypt simply because of the heavy reliance of the latter economy on imports. This is even more so in other economics where reliance on imports is heavier than in the case of the Egyptian Economy. Of course some Input-Output Analysts prefer to include all inputs in the appropriate cells leaving only inputs from noncompetitive imports to be grouped together in a separate row. This, however, we did not favor as we thought an important matrix would be an essential tool in the calculation of the net savings in imports which could be achieved from adopting a certain policy which aims at import substitution, a phenomenon which could be easily observed in Egypt at the present time. Furthermore, the grouping of the inputs from domestic production and import together in one figure would not give the straight forward answer which we would get if we used only the domestic production matrix. This is due to the fact that the inputs from inports are produced exogenously from the system, and in including them in the coefficients of the interflow matrix we are in fact allowing these inputs to have indirect reactions which will be embodied in the levels of production resulting from our solution, which means an overestimation of the latter and underestimation of imports.

THE INTERDEPENDENCY IN THE EGYPTIAN ECONOMY

The usefulness of constructing input-output tables for developed economies has more or less ceased to be a topic of argument. This, however, is not always the case as far as developing economies are concerned. The usefulness of constructing such tables for these economies has been a subject of lengthy discussions and the validity of the above statement has been under critical examination by a number of economists, particularly those who chose to construct tables in some of the highly underdeveloped countries of Africa and others who are engaged in planning activities in some Asiatic countries. Their argument is based on the idea that in these countries, there is a drastic lack of statistics, particularly that type of statistics which is necessary for the construction of an input-output table. Other accounting systems, like the national income accounts, were favored on the grounds that it requires less effort and serves better the needs of these economies which were sometimes naively stated. In the case of Egypt, however, a significant observation about the availability of data should be made. It could be safely stated that the necessary data for the construction of the input-output table was dispersed rather than scarce. Our main task therefore was the finding, verification and processing of this data in the proper form. This however did not exclude the fact that we were confronted, as is naturally expected, with a number of contradictory statements which were due in most cases to the adoption of different definitions by the barious statistical sources.

But the most serious among these criticisms is the one which rests upon the argument that in these economies there is hardly any significant interdependency among the different sectors, with the result that after exerting great effort to construct an input-output table one ends with a productive matrix which is practically ecpty except for some insignificant transactions. The table which was prepared for the Gold Coast has been quoted by some as an example of this lack of interdependency. It was maintained that only three of the 30 elements included in the productive matrix contained figures of any statistical significance.[1] It was also shown that the productive sectors received inputs worth 4.2million pounds out of the total domestic production of 59.7 million. The case of Tanganyka was by no means less depressing than the Gold Coast. Professor Peacock found that the state of interdependency is a grave one and illustrated his point by showing that it was possible to fill no more than 23 cells of the interflow matrix which contained 306 such cells. Moreover he points out a more discouraging sign of the lack of interdependency in the economy by stating the fact that the deliveries from domestic production to intermediate consumption were only 8.3 million pounds as compared to 181.6 million which was delivered by the productive sector to final demand. Cyprus is another example which may also be referred to. The two tables which were prepared for that Economy be Mr. Simous Vassiliou show insignificant structural relationship among the productive sectors of the economy.[2] A point of great significance, which Mr. Vassiliou attracts attention to, is the fact that the 14% increase in output which occurred between 1954 and 1957 had no significan effect on the structural relationship between the productive sectors, nor did it reduce their reliance on imports.

On the other hand, other experiences of Latin American countries show that the construction of Input-Output Models for those economies is not an impossibility as far as the basic statistical data is concerned. However the experiences of ECLA in Columbia shows that there is a heavy reliance on imports both for intermediate and final deman. Nevertheless it was found that the input-output model provided an unique tool for calculating the effects of an import substitution policy. But it may be argued that those economies, though not developed, are not the type which may be described as highly underdeveloped economies. The latter being characterized with lack of interdependency among the productive sectors.

Although the lack of reliable statistics is certainly a stumbling block for the construction of input-output tables in underdeveloped countries, yet this should not be a hinderance and the model should not be stamped on this account as a useless tool of analysis in those countries. In fact the postponement of constructing such tables may lead still to the postponment of a

1. Peacock, A.T. and Dosser, D.M. "Input-Output Analysis in an Underdeveloped Country", The Review of Economic Studies, Vol 25, No. 66, Oct. 1954.
2. Simous Vassiliou, Input-Output Analysis for the Economy of Cyprus, Harvard University, 1958 - 1959, p. 53.

serious review of the gaps in the data and its processing. On the other hand one is tempted to state that the lack of interdependency in the highly underdeveloped economies makes the rewards for the effort and costs spend on the construction of input-output tables extremely frail. It is this lack of interdependency rather than the lack of statistics which present the most serious charge against the construction of input-output table in underdeveloped countries. However at this point we should not make sweeping statements but we should be careful to distinguish between developing economies and highly underdeveloped economies.

When constructing the input-output table for Egypt we were highly aware of these arguments and our doubt as to the possibility of constructing the table as well as its usefulness was not related to the lack of the necessary data but rather to the amount of interdependency which exists in the economy, and whether or not this would justify our efforts. However, these fears did not seem to have solid grounds as it was clear to any economic analyst that a substantial interdependency exists among the different productive sectors of the Egyptian Economy, despite the heavy reliance of the economy on imports. Out of the 1056 cells which are included in the productive matrix of the aggregated table for 1954, 542 cells contained entries from domestic production or about 50% of all the cells in the matrix. These figures, as it is clear, represent a sharply contrasted picture from that given in the case of the countries cited above. In the case of Italy, however, Paul G. Clark stated that out of 462 cells in the interflow matrix (he excluded the row of construction) of the aggregated 22 X 22 table for 1950, 340 cells contained entries[1] or 73% of all the cells. This is a higher percentage if compared to that given for Egypt. It could also be taken as an indication of the higher level of development of the Italian economy which is indicated by the higher degree of interdependency which one could consider as a good indication of the level of development. However it must be mentioned that in comparing the two percentages we sought a rough illustration of the degree of interdependency in the two economies. This is only a rough comparison simply because of the fact that the level of aggregation in the two tables is not the same since the Italian table to which Clark referred is of the order of 22 X22, whereas the Egyptian table to which we referred is of the order of 33 X 33. As it is clear, the more aggregated the table is, the higher the number of cells to contain entries.

Furthermore the extent of interdependency in the Egyptian Economy could be illustrated by the fact that the deliveries from domestic production to intermediate consumption in 1954 were 847 million Egyptian Pounds as against 1006.9 million pounds which were delivered to the final demand sectors. This extent of interdependency will be even more vivid if one compares these figures with those given by Peacock for Tanganyika.

1 See Chenery & Clark, The Structure and Growth of the Italian Economy.

THE STABILITY OF THE INPUT COEFFICIENTS OF THE EGYPTIAN TABLE

The lack of interdependency among the productive sectors of the Egyptian Economy is not , as we mentioned, a phenomen to worry about. In fact what deserves examination is the stability of this type of interdependency which reflects itself in the stability of the technical coefficients. The examination of the degree of stability of these coefficients in developing countries is of paramount importance as this would indicate the degree of dependence on the input-output table for projection purposes. As it is known, the technical coeff- icients included in the interflow matrix of the Input-Output table are expressed in values. Therefore they are bound to be sensitive to any change in relative prices. Those coefficients would also change under two other circumstances, if the economy adopts a new technology or a change in the scale of production occurs. It is important, therefore, to examine how frequently those factors occur in a developing economy like that of Egypt and in what manner do they affect the technical coefficients.

In order to predict the frequency and nature of these changes one should examine closely the structure of the Egyptian economy as well as the path of development which this economy will tend to take in future years. For a long time the Egyptian Economy depended on imports for its supply of goods which it needed for its production capital intensive investments. Although this picture has changed substantially since 1952 yet there is still a heavy reliance on imports for the supply of that type of goods. Before 1952 these types of commodities were imported to satisfy the consumption needs, but from 1952 on a shift in the type of imported commodities has occurred. Egypt started an extensive industrialization program, as well as programs designed for the dvelopment of the remaining sectors of the economy. The shifts therefore have been from consumer commodities to capital goods. This in itself made the reliance on imports more prominent than before. This is supported by the fact that the import content in the type of investments included in the national plan is almost 47% whereas this is only 15% for household consumption, 12% for government consumption and only 7% for exports. For this reason we found it essential to show separately the inputs from imports and those from domestic production in our input-output table.

For the sake of our argument it is important to examine briefly what has happenedsince 1952 and what will be the pattern of develop- ment in the future. Before that date it could be safely stated that the Egyptian Economy was mainly an agrarian one with a minor indstrial sector. But as we mentioned before, the country embarked on a large development program. These were even increased in their magnitude in the last couple of years. These programs aimed at a balanced develop- ment of all the sectors of the economy. However the achievement of a faster rate of growth meant that a larger investment had to be poured into the industrial sector. For a country with a minor irdustrial sector this means that any new production from that sector will substitute a commodity which was imported before or an increase in the production of a commodity which was being produced beforehand in quantities insuffic- ient to meet the demand that this difference had to be imported. This

in fact has happened. Leaving aside the investments in the high
dam and the other sectors whose production could not be imported —
electricity for instance — the bulk of the investment allocated for
the industrial sector aimed at the production of the type of goods
which we imported. Here we are not interested in examining the wisdom
of this policy of import substitution or its effect on the balance
of payment or whether this policy will result, in the long run, in
a net savings in imports or not. All that we are concerned with at
the moment is to state the fact that this trend of import substitut-
ion has been a decisive element in forming the industrial policy in
the country. It is my opinion, if we accept the argument that a
faster rate of growth in Egypt necessitates a faster growth of the
industrial sector, that this is an inevitable step merely because
of the fact that a larger number of the newly produced commodities
will be substitutes for imports. It is therefore not merely a
deliberate policy but rather a consequence of the industrialization
drive, a fact which cannot be escaped. This, in my opinion, will be
the main characteristic of the industrialization in Egypt for some
years to come and in the light of this statement we could proceed
with the examination of the stability of the technical coefficients
of the input-output table for Egypt and how the table could be used
effectively under such conditions. To be able to do that, we will
examine the factors which affect the technical coefficients, which
are mentioned above, assuming of course that for some years to come
import substitution will play an effective role in the pattern of
industrilization in Egypt.

A. TECHNOLOGICAL CHANGE

In a developed economy technological change may be looked upon
as continuous attempts to increase the amount of output per unit of
input or to reduce the amount of inputs per unit of output. To
achieve this, substitution plays a prominent role. This may be
substitution of capital for labor or capital for materials or mater-
ial for material which means that such changes will be reflected in
the input structure of the productive sectors. The frequency of such
changes has been the subject of extensive examination (see Leontief's)
in developed economies like that of the U.S. and it was found, as it
is widely known, that input-output tables in such economies need not
be subject to extensive revision except every ten years.

This, however, is not the case, in an economy like that of Egypt.
If economic development is pursued as it is determined, the technical
structure of the Egyptian economy, is bound to change rapidly. In
fact the introduction of the majority of the new industries in Egypt,
which had fewer major ones before, should be looked upon as a positive
step in that direction. Here we are assuming that the types of new
industries installed are those using the highest techniques which
are available in the more developed economies. The wisdom of this
step as well as the reasons for is are not of major interest here.
What is important to emphasize is that the introduction of these

techniques will mean major changes in the technical structure of the economy. If in the meantime we accept the argument that the results of these investments will be in the direction of substitution of imports be locally produced goods, then in this case we will have to examine separately the effect of substituting competitive imports and those of non-competitive imports on the technical coefficients.

I. SUBSTITUTION OF COMPETITIVE IMPORTS

The definition of a competitive import used here is similar to that which is traditionally used. According to that definition a competitive import is that which has already a similar product from local production, whatever the magnitude of the latter may be. Local production of this commodity may only supply a very minor part of the demand for that commodity yet the fact still remains that the production of the commodity in question could be increased whenever it is found possible and desirable to do so. Having separate entries in every cell from both domestic production and imports we have therefore two sets of input coefficients representing inputs from local production andcoefficients representing inputs from imports (no distinction is made in our table between competitive and non-competitive imports in the sense that the input coefficients from imports include both types of imports, but this should not affect our argument [1]). The separation of the input coefficients into those from local production and from imports is, as we mentioned before, a desirable thing in an economy which depends heavily on improts, like that of Egypt. Now the substitution of a competitive import will have a variety of repercussions on the technical coefficients, the magnitude and type of which will depend on a variety of factors regarding the magnitude of subsitution, the distribution of the new production over the purchasing sectors as well as the technology utilized in the new production.

The straight forward effect of any such substitution would be expressed in a higher input coefficient from local production and a lower import coefficient. The simplest form of change of this type will occur if the new production will be distributed along the row with the same proportions. That is to say, if we are substituting 40% of the imports from agriculture then all deliveries from imports from agriculture to all the purchasing sectors including the final demand sectore will be reduced by 40%. In this case the correction of the coefficients along the row will not require elaborate changes. Along the colums also it will be an easy job once we know the magnitude of the substitution and its distribution.

But this is not always the case since the substitution of a certain competitive import may be limited to a particular brand of this commodity which goes entirely to the final demand sectors or to a particular sector or sectors. If all the new production will substitute for the imports which were purchased by the final demand sectors this will not require the introduction of any changes on the technical coefficients of the productive sectors. But if the new production will substitute, the imports purchased by a particular sector or sectors, this, as it is clear, will necessitate a change in the

[1] In the table which was prepared for Prof. Ragner Frisch we differentiated between competitive and non-competitive imports as in that table only non-competitive imports appear in a separate row.

input coefficients of these sectors.

In all the above cases, however, we assumed that the substitution of these competitive imports will be done by an investment using the same techniques which have already been utilized. Consequently we anticipated no changes in the coefficients of the industries which are increasing their production to substitute for imports except by the portion of the increase of the delivery from local production from the sector itself. But this is not always the case as the substitution of a certain import may be accompanied also by the introduction of new technology. As we have not made it a condition, when defining the competitive imports, that it should be produced by the same technology which is utilized in the production of the domestic commodity, we therefore cannot make sure that the substitution of such commodity will not entail the introduction of an entirely new technology. In fact what happens in a developing economy is that there is a strong leaning towards the introduction of the latest techniques which are available in the more developed economies. If this is the case, then substitution of competitive imports will entail certain modifications in the input structure of the particular industry, the magnitude of which depends upon the deviation of the new technique from that which is already being utilized as well as on its magnitude. The new technology may utilize less labor or different types of inputs in different proportions. The new technical coefficients in this case should embody all these changes in a weighted manner.

As we can see from the above discussion, the substitution of competitive imports will entail certain changes in the technical coefficients. We can also see that these changes will depend on the magnitude of the substitution, the distribution of the new production on the purchasing sectors and the introduction of new technology. The frequency of these changes, however, will be closely tied to the rate of industrialization which we assumed will maily take the shape of import substitution. The reader's attention should be attracted to the fact that we are not cncerned, at this level of discussion, about the nature of the substitutions, i.e. what type of imports to be substituted and in what proportion as this is a strictly programming problem, the examination of which would take us from the realm of our discussion. All that concerns us here is the assumption that import substitution will take place and if it does how will it affect the technical coefficients. This we have tried to answer, and what we should attempt to answer now is that, given this state of affairs, how can these changes be embodied in the solution so that the table would be effectively used for projecting the future production levels required to meet a final bill of goods.

This could be done in different ways, the first of which is to restrict the coefficients in the interflow matrix to only one type which would embody the inputs from domestic production and from competitive imports. Only non-competitive imports should be excluded and grouped in one row of inputs. These coefficients (i.e. of domestic and competitive imports) are the ones to be inverted instead of inverting only the coefficients of inputs from domestic production, as is normally the case when we separate the inputs from imports.

This means that in solving for the levels of production required to meet a final bill of goods our production targets will be overestimated simply because we allowed the inputs from imports to have indirect effect which they do not actually have. This may be a correct procedure in an economy with insignificant reliance on imports or if we are substituting all competitive imports by domestic production. However if this is not the case, which generally is true, then the following should be done to correct this overestimation. We can consider the imports which are not going to be substituted as final demand and then by utilizing the same inverse of the matrix we can calculate the direct and indirect requirements necessary for the production of these goods. This should be deducted later from the levels of gross production which we get from our solution, and the result will present new levels of production which should be achieved after taking into consideration the magnitude of imports for which substitution will be made.

This is more or less a satisfactory method if the substitution of competitive imports does not entail the introduction of a new technology or a different distribution of the new production. However another method or solution may be offered to deal with those last points. Provided that the magnitude of substitution, the distribution of new production along the purchasing sectors and the new technology, if any, are known, we can then incorporate their effects on the technical coefficients from domestic production and consider that these will be the coefficients from domestic production and consider that these will be the coefficients in the year for which the production level will be calculated. Then we can proceed as usual by ulitizing the inverse of the new coefficients of domestic production which incorporat all the changes necessitated by the substitution of domestic production for part of the imports. In this case we will not have to have another set of calculations as in the first case simply because inputs from imports were not included in the inverted matrix. Imports could later be calculated by simply multiplying the required production from every sector by the import coefficient. Having an import matrix, a greater breakdown of the required imports could be achieved.

2. SUBSTITUTION OF NON-COMPETITIVE IMPORTS

For our purpose a non-competitive import is an import which has no similar from domestic production. This may be due to the fact that it is impossible, except with too high cost, to produce it or that the state of development did not so far allow for its production. It may be concluded therefore that the number of such imports corresponds inversely with the state of economic development in the country and that the faster the rate of development the faster the rate at which non-competitive imports become competitive in the sense that each commodity will be produced domestically. If we accept the definition of a non-competitive import just given then we consequently accept the fact that the substitution of such imports would mean the installation of an entirely new activity in the economy and with it a new

technology would be introduced. Motor cars were up to recently a
non-competitive import in Egypt, but as new motor factories are under
.construction such import will be a competitive one. Now let us examine
how this substitution will affect the technical coefficients in a
country like Egypt.

As we mentioned, the substitution of non-competitive imports would
mean the installation of new industries which did not exist before.
This means that the inputs from such commodities which had to be impo-
rted will now be produced domestically. As is the case with competitive
imports, a shift in the input coefficients from import to the coeffic-
ients from to the coefficients of the inputs from domestic production
will occur. But unlike the competitive imports, the non-competitive im-
ports could not be fit into the old matrix as that industry did not exist
before. This fact, therefore, necessitates the insertion of a new row to
show the deliveries from the new industry. Similarly that new industry
will have to be represented by a column which shows its purchases from
the other sectors of the economy as the introduction of such industry
will entail automatically a claim on the domestic resources as well as
imports.

In short we can say that the substitution of non-competitive imports
will not only change slightly the technical coefficients as it is the
case with the competitive imports but will also entail the insertion of
new rows and columns in the interflow matrix. In such a case it would be
necessary to introduce, as explained before, the necessary changes on the
technical coefficients before utilizing the table for projecting the
levels of production for a future year during which these changes will
be anticipated. The important point to emphasize here is that the subs-
titution of non-competitive imports will affect the technical coeffic-
ients and the frequency of the changes in these coefficients will be
tied with the rate of substitution which in itself is tied with the rate
of development.

B. THE STABILITY OF RELATIVE PRICES

The second factor which affects the technical coefficients is the
change in relative prices. It is the assumption that prices move in the
same general direction with a minimum of relative changes. This being
the case it is assumed that changes in the technical coefficients on the
account of changes in relative prices would be negligible. This assump-
tion was made to fit the case of a developed economy with minimum
reliance on foreign trade to satisfy the need of its productive sectors.
It is also generally stated that prices are nothing but a veil which
covers the real coefficients which are set originally in physical units
and they are only restored to for the sake of convenience. It is also
argued that changes in relative prices, once they are known, could always
be incorporated in the solution.

These arguments are only partly satisfactory when if comes to the
case of a developing economy. The mere fact that we express the coeffi-
cients in value terms makes us concerned about the changes in prices in
general and in these economies in particular. It is difficult in a case
of an economy where movements in prices are accompanied with changes
in technology to separate the effects of each on the technical coeffi-
cients. Also if these changes occur freauently, and that is what we
like to examine, costly operations like to examine, costly operations
like inverting a

sizeable matrix would be a less fruitful investment and in this case
a close observation of these changes should be kept, if the utiliza-
tion of the input-output table is to be of value and therefore other
methods of solutions should be restored too.

Now let us examine the frequency of these changes in the light
of our previous statement, that the Egyptian economy relies to a
sizable degree on imports and that import substitution will play a
dominent role in economic development in the coming years. If we
accept the first part of our statement then the technical coefficients,
expressed as they are in value terms, will not only depend on the
stability of relative prices of the domestically   produced

commodities but also on the stability of the prices of imports. These
prices, as it is known, are subject to world supply and demand and
also other exogenous factors, and therefore their stability depends
a great deal on movements in these factors. Not only that but a
country like Egypt with limited supply of hard curriencies may decide
or be obligated to change the suppliers of its imports, a step which
often entails drastic revision of the previous cost structure of the
productive sectors. The frequency of such moves could not be predic-
ted a long time ahead as they are subject to economic as well as
political considerations. The point to emphasize here, however, is
that these changes do happen and that their frequency is very likely
to be higher than it is in other developed countries with less
reliance on imports and with stable foreign markets.

If we consider the second part of our statement then relative
prices of inputs most likely will be subject to change, the frequency
and magnitude of which depends on the role of import substitution.
It is not always the case that the inputs from the new domestic
production will have the same prices as those of the old inputs from
imports. In fact the contrary is more frequently the case. The
point to emphasize here, however, is that the frequency of these
changes in a developing economy is more than it is in an already
developed economy with less reliance on imports and with minor amounts
of substitution among the inputs.

From the above we can see that the likehood of changes in relative
prices is greater in a developing economy than in a developed one.
In dealing with this problem the technical coefficients will not only
have to be adjusted to take into consideration the changes in technol-
ogy, which we have already discussed, but should also take into cons-
ideration the anticipated changes in relative prices which are likely
to happen more frequently than assumed. The discussion of this point
is very difficult indeed, neverthless it is of paramount importance
if the most realistic picture is to be drawn from the utilization of
its input-output table.