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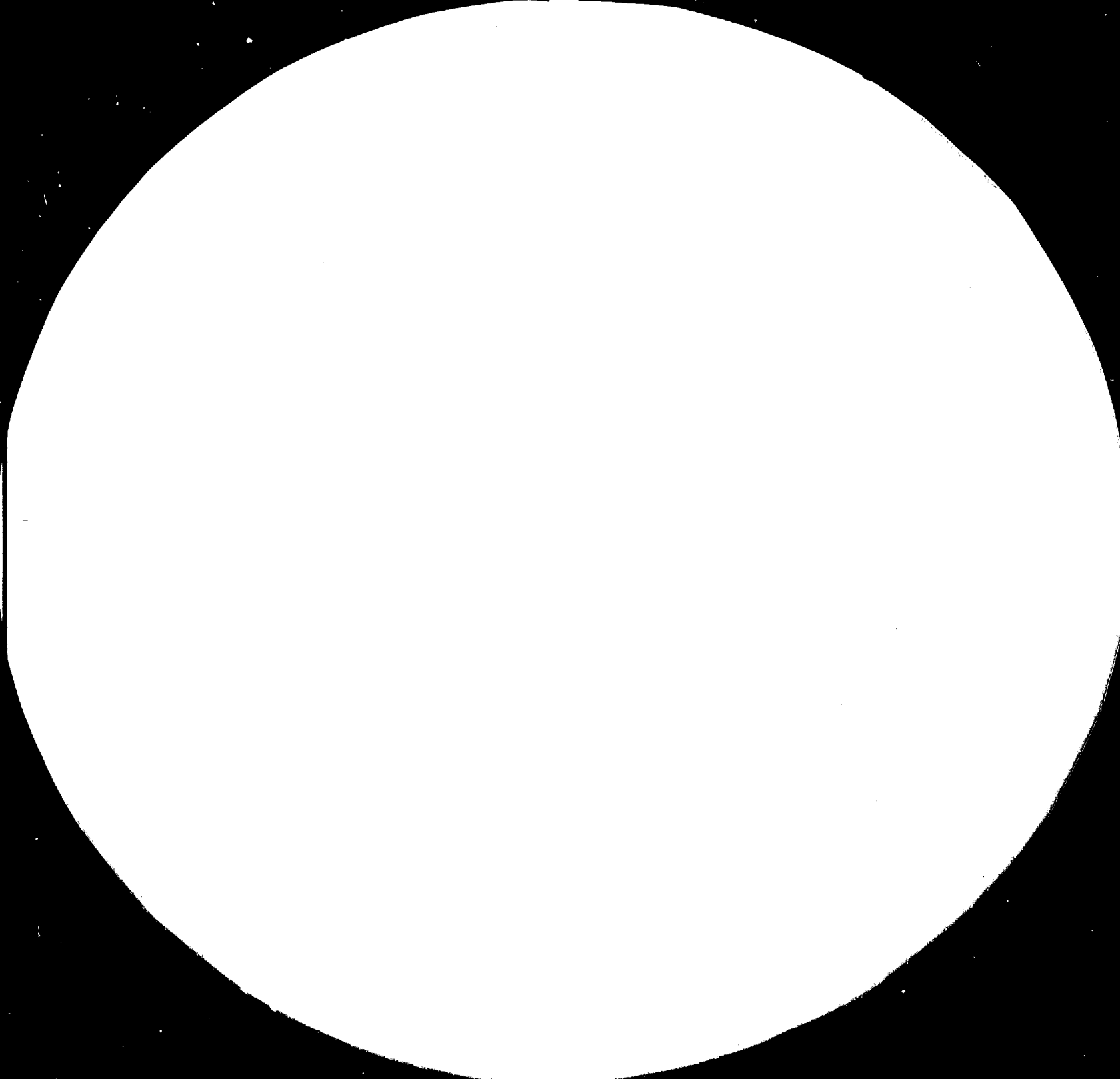
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A MODEL FOR DESCRIBING THE IMPACTS OF CHANGED BILATERAL EXPORT  
STRUCTURE ON PRODUCTION AND IMPORTS - TIMOD \*

Prepared by the

Global and Conceptual Studies Branch  
Division for Industrial Studies

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## Introduction

Co-operation among developing countries could be one of several tools helping them to find a long-term growth path through which their transition to a sustained growth can be assured.

Co-operation may be present in many fields of economic activity, including the establishment of the institutional system, and economic policy promoting and supporting it.

Any form of co-operation would result in the intensification of the international division of labour and thus in a more active participation of the developing world in this system. As a consequence, international trade and the level and mode of participation of the developing countries in it can be considered as a reflection of their part played in the system of international division of labour.

It can be asserted in theory that the developing countries could promote the modernization and by it accelerate their growth if they intensify participation in world trade. Thus, it is clear that the qualifying criteria of rationality is involved. This means that the impact of participation in world trade is rather dependent on the national economic conditions. Therefore it would be hard to justify the elaboration of any generally valid detailed prescription for actions. Though this point is of basic importance in growth theory and policy, in this paper we do not handle it.<sup>1/</sup>

The questions raised in this paper relate to rather different problems. Here the possibilities of South-South co-operation through trade intensification have been analysed. This problem was approached from two angles: (i) selecting possible Southern partners for a more intensified intra-southern trade co-operation; and (ii) measuring the impacts or requirements on or against the production side of such co-operation.

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<sup>1/</sup> We want to deal with the topic in a separate research project.

The further logical question, namely, that among the possibilities which one should really be considered as optimal solution, has not been raised at this stage. 2/ At this state of investigation we only want to raise simple questions and try to get simple answers, more focused on feasibility than on optimality. Therefore the model structure built for the analysis does not aim at embracing the totality of world economic activities and its working mechanisms. It limits itself to describing the so-called real sphere, without financial and monetary mechanisms considered. The model is not searching for a general equilibrium solution under a specified system of constraints.

1. Description of the system simulated

As mentioned above, the model has been built only for measuring in a straightforward and relatively simple way the impacts of trade (basically exports) scenarios. It is not a forecasting model, which will be clear from the hypotheses underlying it.

1.1 Hypotheses of the model

The model structure was defined in such a way that the following relationships should be expressed:

- (a) The growth of international trade is a precondition for the growth of all the participants, including the Third World economies.
- (b) A more intensive participation in world trade of the developing countries involves structural changes in the existing system both in the directional (partner) and commodity terms of international trade.
- (c) The developing countries play a passive role in the trade of manufactures, and have limited national markets of the same; thus growth of manufacturing exports is a precondition for the development of manufacturing production in the Third World.

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2/ See footnote 1 on previous page.

- (d) Because of their limited production capacities, any increase in southern exports requires an increase of production and imports. As industrialization is a long-term process, their additional imports can only be supplied in the short run by the traditional import partners. Thus any change in exports at any point of the trade system generates a process which will spread over and affect other regions ("spread" effect). Therefore, as a result of a change in exports, both the levels and structures of production, exports and imports will be changed.
  
- (e) In order to concentrate on impacts of export activities, in the present version of the model the only exogenous variable is export changes. At the same time other simultaneously occurring changes of other economic variables are disregarded. Therefore the policy concepts of any scenario are expressed only through the world trade structure and/or its changes.
  
- (f) In the model, prices do not figure as variables. It was supposed that observed tendencies in price movement will continue and no major deviations would occur. Thus changes in price elasticities were not taken into consideration.
  
- (g) At the time of building the model, attention was focused on the real possibilities of co-operation among Southern regions. We had to measure what would be the additional requirements in production to be able to supply the increased export flows with a view to allow for structural change. Therefore no constraints have been imposed on levels of production and of other variables.
  
- (h) On the other hand, it was supposed that incremental imports required will, without limitations, be supplied by the traditional supplier regions. This means that the North has still been considered as a major exporter to the South when manufactured goods are concerned. This means that in the model no trade restrictions were considered either.



## 1.2 The model structure

The equations were formulated with the intention of expressing supply-demand type relations or to put it in another way, to try to relate activities according to the input-output type of relations. Therefore, for the selection of explanatory variables, the relevant input-output tables were studied and the outputs of the major input supplier sectors have been considered as part of the set of explanatory variables. On the other hand, the major sectors which represent markets for the products of each producing sector also have been selected as explanatory variables. Upon similar economic considerations imports and/or exports of relevant groups of commodities could equally be selected for explanatory variables.

Given that the whole system was elaborated measuring the impacts of a change in exports, one of the explanatory variables in each equation has been the incremental exports of the commodity group(s) which can be considered as product(s) of the relevant producing sector. (For instance, equipment of the capital goods sector, non-durable consumer goods of the light industry etc.) Through the explanatory variables defined we have taken the following relationships into consideration. 3/

### The variables and equations of the model

The exogenous variables of the model are initial export flows of commodities (grouped into seven categories) which are derived from changes in export shares. (See Annex 1). These variables express the scenario elaborated in the previous phase.

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3/ Thus in a given regional model the very same production sector or final demand element figuring in one equation can represent once the demand side while in another model it would represent the supply side. These roles can be interchanged in the different regional models, depending on the peculiarities of a region's economy.

The endogenous variables are gross production and value-added in five manufacturing sectors, imports of seven commodities, value-added of agriculture, mining, construction, services and the main GDP final demand components: investment, private and government consumption.

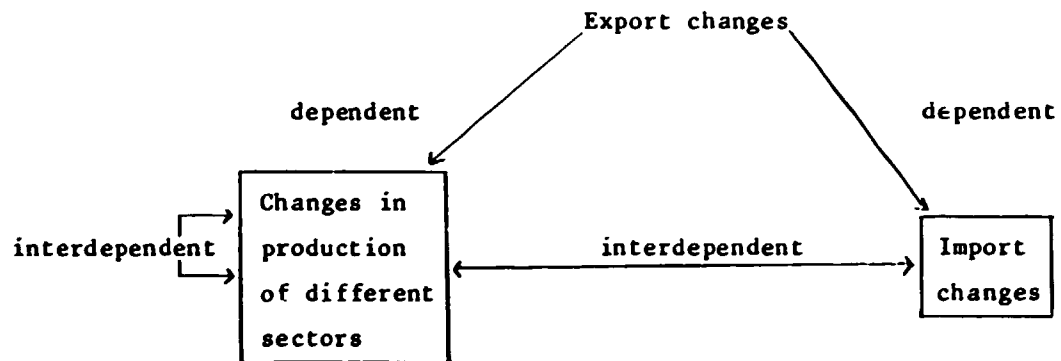
All variables are defined as differences between two successive years. A time series of each variable (in current prices) covering the period 1963 to 1980 was used for the estimation of the equations of the regional model structure. (The choice of current price data was determined by the fact that trade and related trade production data was only available in these terms).

The equations and their estimation

For the definition of the appropriate set of the explanatory variables in each regional model, input-output tables for the year 1975 were referred to.

For each of the nine regions (centrally planned regions were excluded for lack of data) a system of 24 linear equations was simultaneously estimated. The structure of the equation system is summarized in Chart 1.

Chart 1.



As initially decided changes in exports of seven different commodities are the only exogenous variables in each regional model, thus the commodity composition of the regional total exports determines the values of the independent variables (since the reduced form coefficients are fixed). Nevertheless for each bilateral trade partner the commodity composition of exports is different, thus requiring different production and imports. The impact of any change in exports will depend on the trade partner(s) and its (their) importance in the total exports of the region.

Thus the model provides two different ways to specify exogenous assumptions: The change in (1) the intensity of trade relationships, and (2) the commodity composition of exports with respect to specific partners. Both elements are used in the definition of any scenario.

The structure of the model

Notation used:

$i = 1, \dots, 9$  exporting regions  
 $j = 1, \dots, 9$  importing regions  
 $i = j = 6, \dots, 9$  developing regions  
 $n = 1, \dots, 9$  sectors of production \*  
 $T = 1, \dots, 7$  commodity groups in trade \*  
 $k = 1, \dots, k$  number of iterations with the model

Steering parameter of the model

$a_{ijT}$  = \*\*scenario defined bilateral export shares for the initial bilateral trade flows; exogenously given in the present model-runs. In our model these parameters express a South-South co-operation as they were defined for  $i = j = 6$  to 9 for all T-s.

Variables of the model (all are increments)

$x_{ijT}$  = incremental bilateral export flows  $i = j = 1, \dots, 9$   
 $T = 1, \dots, 7$

$x_{i.T}$  = total incremental exports of region  $i$  of commodity  $T$   
 $i = 1, \dots, 9$   
 $T = 1, \dots, 7$

$m_{ijT}$  = incremental bilateral import flows  $i = j = 1, \dots, 9$   
 $T = 1, \dots, 7$

$m_{i.T}$  = incremental total imports of region  $i = j = 1, \dots, 9$   
 $T = 1, \dots, 7$

---

\*A conversion between trade and industrial classification has been established.

\*\* 
$$a_{ijT} = \frac{X_{ijT}}{X_{i.T}}$$

$o_{ni}$  = gross incremental production of sector n in region i  
 $i = 1, \dots, 9$   
 $n = 1, \dots, 9$

$va_{ni}$  = incremental value added of sector n in region i

n = 1, 2, 3, 4, 5, 7, 8, 9 represent: food products, light products, basic products, capital goods, oil refining industries, agricultural products, mining, construction and services

$c_i$  = incremental private consumption of region i

$g_i$  = incremental government consumption of region i

$s_i$  = total investment of region i

Serv = incremental services of region i

$gdp_i$  = incremental GDP

Equations

$$1. \quad o_{ni} = f_i(x_{i.T}, o_{ni}, c_i, s_i, g_i, m_{i.T}) \quad n = 1, \dots, 5$$

$$i = 1, \dots, 9$$

$$2. \quad m_{i.T} = f_i(o_{ni}, x_{i.T}, m_{i.T}, s_i, c_i) \quad n = 1, \dots, 8$$

$$T = 1, \dots, 7 \quad i = 1, \dots, 9$$

$$3. \quad x_{i.T} = f_i(o_{ni}, m_{i.T}, x_{i.T}) \quad n = 1, \dots, 8 \quad T = 1, \dots, 7$$

$$i = 1, \dots, 9$$

$$4. \quad va_{ni} = f(x_{iT}, m_{iT}, o_{ni}) \quad n = 6, 7, 8 \quad T = 1, \dots, 7, \quad i = 1, \dots, 9$$

$$5. \quad Serv_i = f(gdp_i, o_{ni}, m_{iT}, x_{iT}) \quad n = 1, \dots, 7 \quad T = 1, \dots, 7 \quad i = 1, \dots, 9$$

$$6. \quad c_i = f(gdp_i, o_{ni}, m_{iT}) \quad n = 1, \dots, 7 \quad T = 1, \dots, 7 \quad i = 1, \dots, 9$$

$$7. \quad s_i = f(gdp_i, o_{ni}, m_{iT}) \quad n = 1, \dots, 7 \quad T = 1, \dots, 7 \quad i = 1, \dots, 9$$

when the model is working by:

$$8. x_{i.T}^k = \sum_j (a_{ijT} m_{ijT} b_{ijT}) - x^{k-1}$$

where:  $a_{ijT}$  = exogenously given export share

$x_{i.T}^k$  = level of exports in iteration k

$b_{ijT}$  = import share

### Identities of the model

$$va_{ni} = \alpha_{ni} \quad n = 1, \dots, 5$$

$$mva_i = \sum_{n=1}^5 va_{ni}$$

$$g_i = \beta gdp_i \quad \alpha, \beta = \text{parameters calculated}$$

$$gdp_i = mva_i + Agriculture_i + Mining_i + Construction_i + Services_i$$

$$gdp_i = c_i + s_i + g_i + \sum_{i.T}^m - \sum_{i.T}^m$$

### 1.3 The working of the model

As it has been mentioned, the exogenous assumptions of the model are formulated by the changes of the trade structure between any base year and a terminal year (expressing the scenario). The trade scenario structure is described by export shares, which are defined as the shares of a specific partner j in the total exports of a given region i in the world trade of commodity T.

$$\text{Export shares: } a_{ijT} = x_{ijT} / \left( \sum_j x_{ijT} \right)$$

The policy assumptions expressed by export shares can concern any number of bilateral relationships among the regions in the different commodity groups. (For the sake of linking trade to production, bilateral export and import flows have to be calculated.) These trade flow matrices for each commodity group must correspond to the exogenously defined bilateral trade structure.

The generation of new export flows is described below:

Step 1: Exogenous elaboration of new (changed) export share matrices for each commodity group for the terminal year (scenario building).

Step 2: Conversion of the structural changes into flow terms. The following formula was used for this purpose:

$$x_{ijT}^1 = \text{newsh}_{ijT} \left( \sum_{i=1}^9 \text{oldsh}_{ijT} x_{ijT}^0 \right)$$

where:  $x_{ijT}^0$  ... trade flow between region i and j for commodity T in the base year

$x_{ijT}^1$  ... trade flow, defined as  $x_{ijT}$  for next year  
 $\text{oldsh}_{ijT}$  export share of region j in region i's total export exports of commodity T in the base year

$\text{oldsh}_{ijT} = x_{ijT} / \sum_{i=1}^9 x_{ijT}$   
 $\text{newsh}_{ijT}$  ... exogenously given export share of region j in region i's total exports of commodity T in the next year.

This formula takes two different effects into account:

- a creation effect, expressed by the term under summation which increases the bilateral trade flow according to the change in export shares;
- a diversion effect which reallocates the newly created total exports according to the new export shares.

Step 3: The export flows generated by the preceding step serve as exogenous variables in the system of linear equations. The values of the increments of the endogenous variables are calculated by running the regional models with the new export flows.

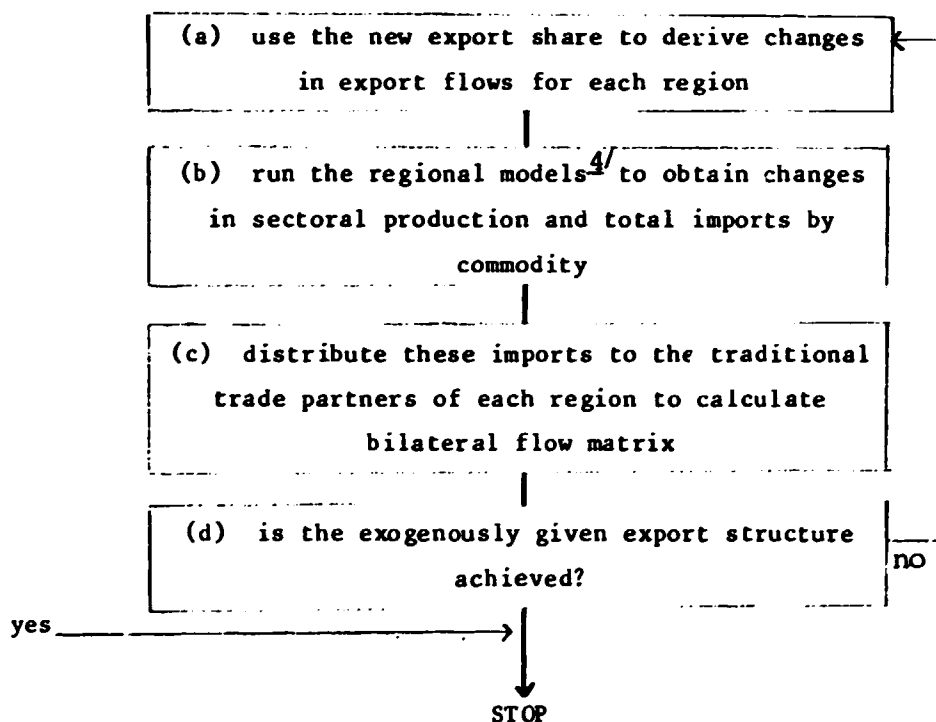
Step 4: Distributing the resulting import requirements of each region to the traditional trade partners according to the existing import structure.

Through the interdependent world system of bilateral trade on the one hand and the linkages between exports, production and imports on the other, any single change occurring at one point in this system affects the whole. Our model has been built in a way that it can handle simultaneously occurring changes.

Nevertheless, it is clear that any impact on the trade system requires some time until all regions are affected. An iterative process was elaborated to implement gradually the changes in the trade structure which correspond to a given scenario.

The iterative process is summarized in the following chart.

Chart 2:



4/ These are the systems of econometric equations described above.

1.4 Further calculations using the structural equations

a. Elasticity type calculations

The system of the reduced form equations has been used for calculating the impacts (and elasticities) of changes in the export structures of the individual regional economies.

Let R equal the reduced form coefficients of our structural equations. (Note, that the exogenous variables are the export changes of the seven traded commodities ( $x_1, \dots, x_7$ ).

Define the commodity structure of exports of a region i to regio. i by

$$C_{ijT} = 100 \cdot \frac{x_{ijT}^k}{\sum_{T=1}^7 x_{ijT}^k} \quad T = 1, \dots, 7$$

The impacts of an additional 100 units of exports (distributed as defined by C) from region i to its partners j can then be calculated by using the following formula:

$$v_{ni} = \sum_T R_{niT} C_{ijt}$$

where:

$v_{ni}$  = n-th endogeneous variable (can be any of e.g.  $o_{ni}, v_{ni}^e, m_{iT}$  etc.) in the i-th regional model<sup>5/</sup>

$R_{niT}$  = is the coefficient of the n-th endogenous variable in the reduced form of the i-th regional model, relative to the T-th traded commodity.

With the help of the same relationships, so-called elasticities can also be expressed. For example, GDP elasticities have been calculated.

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<sup>5/</sup> For the list of variables see p.6.



The interpretation of elasticities

The analysis of the results of the elasticity calculations was based on a hypothesis according to which there is a relevant qualitative link between the absolute value(s) and their time tendency of elasticities on the one hand and structural changes on the other.

It has been supposed that in the framework of our model the GDP elasticities of exports reflect the requirements for increasing GDP needed for a raise in the exports rather than incremental contributions to GDP generated by the additional exports.

In our system the change in production is a function of a commodity composition of exports. The production elasticities of exports depend on the relative weights of the commodities and thus reflect a composite effect.

For the sake of simpler interpretation we give a detailed definition of our elasticity concept  $\epsilon_i$ .

$\epsilon_i$  in this formulation can express the "elasticity" of any of the endogenous variables ( $v_{ni}$ ) of the variables in the i-th regional model. Thus for  $v_{ni}$  one can substitute value added, imports, investment, etc.

The nominator of the first expression gives the ratio of increment to the base value of the n-th endogenous variable in percentage. This increment is the result of increasing exports of region i in all of its seven traded commodities. The denominator of the expression gives the ratio of total export increments to total base year exports also in percentage.

Thus, letting n = GDP, the GDP elasticity is calculated as follows:

$$\epsilon_i = \frac{\frac{gdp_i}{GDP_i}}{\frac{\sum X_{i.T}}{\sum X_{i.T}}} = \frac{\frac{\sum R_{nT} \cdot C_{i.T}}{GDP_i}}{\frac{\sum X_{i.T}}{\sum X_{i.T}}}$$

For the interpretation of the numerical results of elasticity calculations both the absolute value and the tendency in time of the absolute values of elasticity are of importance.

First, it should be made a point on the two qualitatively different cases, i.e., when the elasticity is bigger or smaller than unity ( $\epsilon_i > 1$  or  $\epsilon_i < 1$ ).

Second, it should be mentioned that the value of elasticity ( $\epsilon_i$ ) may change in time and the change can follow a time trend too.

The value of  $\epsilon_i$  increases if the percentual increase of value added (or of any other endogenous variable of the model) is bigger than the percentual increase of the exports of commodities.

In our analytical framework this would mean that more and more "efforts" (increments) are needed for this increase of exports in the given commodity structure. As it always happens, this commodity structure of exports differs from the previous one. Thus we can suppose that the changes which took place in the export composition required additional structural changes in the production and imports too. These lead to increases in their levels and those in turn proved to be bigger than proportional. <sup>6/</sup>

Having in mind this increasing tendency of the elasticity, one should see that when the time series of  $\epsilon_i$  is exhibiting a switch from being smaller than 1 to become bigger than 1 (or vice versa) this change reflects a qualitative change in the relationship of output to exports. If the increments of the endogenous variables generated by an increase of exports are considered as the costs of export expansion, then the crossing of the threshold where  $\epsilon_i = 1$  has to be interpreted as the threshold where these marginal costs become increasing.

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<sup>6/</sup> The lower case always represents increment of the variable the total base year value of which is represented by capital letter.

As it can be seen the concept in this sense is close to a "cost of expansion" interpretation. If the production increment related to the incremental exports is bigger than the ratio of production and exports was before the export expansion took place, i.e., if  $\epsilon_1 > 1$  then this relation corresponds to a functional relationship between production and exports analogous to an increasing cost function.

The results can be analysed from two aspects: once it is possible to compare the elasticities for each region by time. Second, the cross regional comparison is possible. In the first case we get a picture on the tendency of impacts of the structural changes in exports of the very exporter region while in the second case, a comparative analysis can reveal the differences in the export orientation of a given region. The two types of analyses can be combined and the focus put on the changes in the regional differences of the market orientation of a given region.

b. Calculations of the impacts in absolute terms

A second type of calculations has also given interesting results. In this case the problem we wanted to answer was directed to the evolution of the Northern and/or Southern orientation of a given region from the point of view of the induced effects generated by those policies. Once again, both time and cross-regional comparisons are possible.

For this purpose the total exports of each developing region was increased in turn by a uniform amount of additional exports (equivalent to US\$ 10,000 in fact). By the additional exports once we increased only the exports of the region to the north and in a second run only the exports of the region to the South. The first case was called the Northern and the second, the Southern co-operation scheme. The additional exports were distributed according to the 1975 and the 1979 historical and Northern and/or Southern trade structures of each region in turn. Afterwards the same procedure was followed according to the South-South scenario.

For calculating the "induced" effects the speciality of the model was made use of; i.e. in the iterative procedure trade creation effects are generated.

## 2. The applications of the model for scenario calculations

Following the lines described in the methodological part, several calculations were performed.

First a given South-South co-operation trade scenario was applied to the system. By this exercise both the working of the model and the numerical results of the scenario were tested.

Later, the calculations described under 1.4 have been executed, to be able to analyse the historical structural changes brought about between 1975 and 1979. These results will be presented in Chapter III. Our South-South scenario structure was also compared to the historical structures for evaluating the tendencies of changes generated by the scenario.

### 2.1 Criteria used for defining the South-South co-operation potentials

The purpose of this exercise is to define the feasibilities of a more intensified South-South co-operation and elaborate trade scenarios based on the results.

#### a) Selecting promising products

The considerations used for selecting promising products have been the resource complementarities and dynamic factors generating competitive production changes. Resource complementarities are prominent in this step since it is the heterogeneity in the factor endowments and production structures of the South economies that indicate the potentialities. The dynamic considerations are given a greater role in subsequent steps.

For some of the variables we have quantitative information while for others the information can only be qualitative. The criteria for locating trading potentialities are:

- (1) the technology of production must be characterized as being intensive in the use of factors which, although not available in sufficient quantities in any single country of the South, are so available in the South as a whole; intensiveness being defined as having a ratio of input use above the average;
- (2) the industry should not require a high rate of new product development;

- (3) the share of imports from the North in apparent consumption of the South should be at least 10 per cent;
- (4) the feasibility, flexibility and competitiveness of Southern production should be demonstrated on the basis of above-average growth rates in both production and exports of such products by the South; and
- (5) the learning-by-doing benefits of actual production should be relatively great.

In summary we require that products use those resources more intensively in which the South as a whole is better endowed, that these products have a low rate of new product development but are substantially imported from the North. In addition South must have demonstrated ability to produce these products and there must be dynamic benefits to be derived from producing these products.

b) Criteria for selecting future Southern trade partnerships

In order to select potential trading partners, an analysis of trade and production structures was made. By this, the complementarities have been searched for and defined. The match indicated by demand conditions on part of the region importing and supply conditions of the region exporting had to be defined.

Demand conditions

- (1) The importing region should be dependent on the North for more than 50 per cent of its imports of the particular commodity.
- (2) The reliance of the importing region on the potential Southern exporter should be increasing, i.e., the import of the commodity should relatively increase during the 1960-79 period. (Its share should be increasing, the production of it should not increase more rapidly than its import, etc.)
- (3) The exporter region could be considered as a potential supplier on the basis of its ever increasing production of the commodity.

Supply conditions

- (1) The importer region M has already been a major partner for the Southern exporter X (its market share has been substantial or ever increasing).
- (2) The commodity's share in the exporter region's total output should show a steady growth.
- (3) The export/output ratio of the commodity in the exporter region X should grow and the import share of the same commodity in the X region should not be increasing.

There are in addition minor conditions to ensure that the demand-supplier pair (respectively the supplier-demand pair) be not reversible.

The partnership identification process was applied to trade and industrial data on the 28 manufacturing sectors of the 3-digit ISIC level of disaggregation.

Applying these criteria to the detailed data, the product lines that qualify for greater South-South trade fall into three groups:

- (1) Food and Light Industries: processed food, textiles, wood products, rubber products, metal products.
- (2) Basic Products: paper, industrial chemicals, other chemicals, glass, non-metallic minerals, iron and steel, non-ferrous metals.
- (3) Capital Goods: non-electrical machinery, electrical machinery, transport equipment.

An important omission is coal and petroleum products. In energy it is the North which is dependent on the South rather than the other way around. Thus one of our major criteria for pairwise trade opportunity is not satisfied. Moreover, since this industry is already relatively well developed in the South as a whole and particularly in the Near East region, in large parts on the basis of exports to the North, it is not considered a priority sector for development via South-South co-operation in this exercise.

## 2.2 The application of the model to a South-South co-operation scenario

The model described has been used for studying the impacts of a South-South scenario. In conformity with the structure of our model a South-South co-operation export policy had first to be defined and expressed in terms of bilateral trade shares for each commodity group. The exogenously given export shares had been derived from an analysis based on a disaggregated sectoral level.

The bilateral North-North, South-North and North-South trade structures and flows and well as the production requirements are results of the model.

It is assumed that the trade structure described by the scenario can be achieved within ten years. Since the functions of the model relate annual changes of variables, this implies that ten iterations are required in the model. Note again that only the South-South trade flows are subject to assumptions in each iteration; the other flows are determined by the model. The iterative procedure is demonstrated on page 10.

Using the first three iterations it can already be visualized how the impacts of the initial changes spread over to the whole trade system while the South-South trade is growing in a more intensified manner (see Annex 1).

It is supposed that the resulting changes in exports, imports and production are additional impacts or deviations from a historical trend and are due to the South-South co-operation scenario constructed.

The model is bound to achieve the exogenously defined scenario, i.e., the export shares for the South-South trade relation.

### 2.3 Basic scenario assumptions

In this scenario a hypothetical and in its structure modified bilateral system of international division of labour was defined by which Southern have to grow faster than the increasing total world trade. Still, the following considerations apply:

1. In the existing system of international economy the South is dependent on the North. Thus a still higher Southern export performance will maintain dependency on the North through the invariably high import requirements of the South. At the present and in medium terms, the South, for its own expansion, needs more trade with the North.
2. The prevailing commodity structure of imports is an inherent part of the whole Southern economy. Therefore it is very difficult to modify it. Thus, in a scenario built for promoting the general growth of the South together with a more intensive South-South division of labour one can only suggest that stronger structural changes should affect the incremental exports only and therefore the possibilities for new export activities should be put in the focus of our attention.

3. The regional structure of international trade also proved to be rather rigid. Therefore changes can be expected to happen only in a rather gradual measure and on smooth path. Time has to be given for the necessary adjustment processes and for the full development of structural changes of major importance.
4. Some past modifications could already be observed in the role played by the South in world economy, namely the promotion of manufacturing exports and the rising share of some regions in world trade. If the individual regions are compared, clear evidence can be given of an increasing gap among the performances of the Southern regions, and within given regions, among the individual national economies. Therefore the South-South co-operation scenario formulated aims at a slowing down of this process of polarization and gives preference to a more evenly distributed growth to all of the developing regions: structural changes assigned by the scenario were relatively higher in the case of the least developed regions than for the more developed ones.
5. Though it is fully recognized that within a relatively short period, the growth possibilities both in production and exports for the most under-developed areas are very limited, our underlying hypothesis is that considerable efforts on behalf of policy-makers within the South would not fail to improve this state of affairs.
6. As the mostly under-developed regions (and/or countries) fail to be markets for other Southern exporters by their non-elastic and rigid demand and supply structure, in our South-South co-operation scenario the infant industries in the African and Indian Subcontinent were strongly "helped". As opposed to it the growth of the South-East Asian region's trade activities within the very Southern world was limited: it was not allowed that its export shares and participation in total world trade should increase too rapidly.
7. In the scenario a further rapid development of intra-regional trade was visualized, based on the supposition that the necessary institutional and policy intra-structure for promoting it, will exist. Therefore, it also was supposed that together with developing new industrial activities and export co-operation among Southern regions, a rational specialization will



take place. That is the only base on which the least developed countries also will be able to participate in the international division of labour. By this they not only will become suppliers of certain products for other developing regions (and countries) but will also become larger markets for the products of the others.

8. In this scenario it was supposed that protectionism and financial problems would not limit the full realization of the policy visualized by the scenario.
9. While it was assumed that the commodity composition of total world trade is rather rigid, an outstandingly rapid increase of the trade of manufactures (and within it even more of capital goods) was assigned for the developing countries. It also was supposed that according to historical trends within the South the South-East Asian region will remain the major supplier of these goods, followed by Latin America. In order to limit further polarization the trade of manufactures in the least industrialized regions would increase above the average rate. (First of all in the African region, which by its actually marginal capacities even under these new conditions would contribute only by a very limited share to the trade of these products.) In spite of the above elements, according to the scenario the share of the South in the world trade of machinery would not be able to increase very significantly.
10. No special changes in the relative price system and in the time behaviour of prices were taken into account or allowed for explicitly by this scenario.
11. Considering the effects of the historical redeployment processes in this domain, it was supposed that some Southern regions (mainly the South-East Asian) could already play an important role in the future world trade of consumer durable and non-durable goods.
12. According to the regional specialities of the composition of the very heterogenous commodity group called "intermediate products", detailed and very differentiated regional scenario policies were elaborated and applied.

13. In the case of metallurgical products the production capacities of the developing countries has been rapidly growing during the last decade. This tendency will continue and probably will even strengthen itself as a result of the crisis in the developed world. On this basis it was due to "predict" also a stronger policy of import-substitution within the South. We have supposed that the rapidly developing metallurgy of Latin America and South-East Asia and partly that of the rapidly growing but still marginal Near Eastern capacity will be decisive for the developing world. In other areas capacities serve for satisfying parts of domestic demand. On the other hand the faster general growth of the different Southern regions will contribute to an increase of their exports of these products.
14. The chemical products are the second most important components of the intermediate products. We took into consideration that during the last decade some regions which formerly exported raw materials, like Africa, Near East and Latin America have followed a rapid development policy in favour of a modern and competitive chemistry. Therefore we could count with a considerable increase of supply coming from the South, which of course will not necessarily lead to an equally increased export share. Given that the oil-exporters can link their oil exports to the exports of petrol chemical products, it was supposed that the South will increase its share in the world exports of chemical products in spite of the competition they have to face from the North.
15. As far as agricultural products are concerned, it was supposed that developing countries will make efforts to increase production and try to promote self-sufficiency. Therefore, the intra-regional trade seemed to be the most reliable export orientation.
16. Food industry is of course the most important branch of the manufacturing industry in the developing countries. Some countries and through them certain regions already could establish a rather competitive food industry and thus become exporters in processed food. The developing countries and regions, on the other hand, are the biggest markets for food imports, which have been mainly supplied by developed countries. But the commodity composition of their exports and imports is rather different in the most of the cases. Therefore the main stream of Southern food exports has been

oriented to the North while imports came from the North. The scenario supposed that without losing the already existing northern markets a promotion of import substitution would be an approach to solve the problem. There is no real possibility to increase in a considerable manner the South-South food exports though all regions would be possible importers.

17. As far as energy trade is concerned, in the scenario we supposed that neither the bilateral relationships nor the share of energy in trade would change. We considered these relationships are technically more or less determined and as no changes in relative prices have been taken into account, the structure prevailing in 1979 was considered as invariant.

#### 2.4 Some more important results of the South-South scenario trade flows

##### a. The new total flows

As a result of the scenario trade structure and the intensified Southern co-operation not only South-South trade but total world trade and North-South trade also increased as compared to the base year.

The significant increase in the Northern exports to the South finds its explanation in the fact that the South, in the fulfillment of import-demands, has to rely upon the Northern supply even when South-South trade is bigger than before.

The high level of dependency of the Southern economies on the Northern exports of a series of manufactured goods has prevailed and in a realistic scenario still has to prevail. This relationships of the interdependency of the two big markets will form the basis of international trade also in the near future. That relationship assures that the high Southern growth rates generate positive impacts on the growth and the trade of the North.

On the other hand, the increase of Northern export flows to the South, as a whole, are coupled with a decrease in the market share of the North in the Southern import markets.

South-South trade increase more than total Southern exports do. This means that this envisaged South-South co-operation generates "induced"

positive effects also for the North. (Nevertheless these impacts are distributed unevenly among the different regions, i.e., one is gaining more than the other, depending on the intensity of its bilateral relationship and on its commodity composition with the given Southern region.) For numerical results see Table 1.

Table 1. The growth and share of exports and gross value-added of manufactured goods in the Southern regions (relative to 1979)

	LA	TA	NE	IN	AS	South Total
Growth rate of						
Exports of manufactures	3.5	4.4	3.6	3.8	3.2	3.4
Gross production of manuf.	2.8	3.4	.2	3.9	2.4	2.9
MVA	2.9	3.1	1.9	4.0	2.3	2.8
Share of manufacturing in total exports						
1979	26.8	14.7	4.5	45.1	58.2	25.3
"1990"scenario result	30.1	17.8	5.4	49.0	60.9	28.2

b. Structural change in the Southern exports

In the formulation of the scenario a preference was given to the exports of so-called non-traditional exports. Accordingly it was supposed that the share of manufactures would increase in the total of Southern exports. With the scenario trade structure defined for the South-South relationships, the model finally increased by more than 3 per cent the total world trade flow and on the average a 3 per cent higher share of manufactured goods in the export of the South.

Although the share is only slightly increasing, this structural change requires quite considerable growth performances both in terms of production and export flows. This result also supports our view that the supply conditions of the South have to be taken first into consideration.

The change of export shares of the individual product groups within the total of manufactures varied within a given region and also according to the different regions. The export growths required for the completion of these slight structural changes are extremely high. The changes in shares and related growth rates of the individual commodity groups are presented in Table 2.

Table 2. Share and Cumulated Growth of Exports of Manufactures in the Southern Regions (1979 - 1990)

	LA	TA	NE	IN	AS
<u>Intermediate Products</u>					
Share in total exports in % 1979	14.01	9.56	2.34	25.01	20.96
1990	13.94	10.60	2.93	26.54	21.54
Cumulated growth of exports 1979-90 (%)	22.88	37.66	37.61	39.74	32.03
<u>Non-durable Consumer Goods</u>					
Share in total exports in % 1979	3.37	0.43	0.57	6.84	13.05
1990	3.74	0.68	0.61	7.36	11.80
Cumulated growth of exports 1979-90 (%)	35.88	92.01	23.33	41.50	16.55
<u>Equipment</u>					
Share in total exports in % 1979	6.02	1.09	0.98	5.55	11.78
1990	8.07	1.51	1.33	6.08	13.75
Cumulated growth of exports 1979-90 (%)	61.58	68.11	53.91	41.47	48.31
<u>Durable Consumer Goods</u>					
Share in total exports in % 1979	3.43	3.58	0.46	7.73	12.40
1990	4.32	5.05	0.57	8.98	13.79
Cumulated growth of exports 1979-90 (%)	53.03	71.07	41.30	51.10	41.20

It is of immediate interest to measure which is the volume of incremental output which would be needed to supply the increase of exports of these commodities. When evaluating the model results nevertheless it should be kept in mind that they reflect historical behaviours and relationships.

It should be underlined that even in the fast growing South-East Asian region the additional "supply capacity" needed is considerable, especially in the basic products industry. The other regions also have to make rather big efforts to extend the production in the different branches of manufacturing industry (see Table 3).

Table 3. Total Increments in Gross Production Corresponding to the Changed Exports According to the South-South Scenario (1979 = 100)

	LA	TA	NE	IN	AS	South
Agrofood	128,95	138,62	112,14	143,68	121,03	127,48
Light industry	135,00	140,71	123,77	146,79	127,26	133,35
Basic production industry	132,05	139,01	131,03	148,75	133,91	134,16
Capital goods industry	134,43	151,44	122,95	147,80	128,04	133,70
Oil refining	123,85	122,87	106,19	147,53	121,60	122,78
Total gross manuf. prod.	132,10	139,64	121,44	146,96	126,72	131,58

The import requirements related to these output increments are also high. First, the related export-import growth rates will be presented (see Table 4), thereafter some comments on this issue will follow.

The import intensity of developing regions historically has been very high. As the system of equations is based on long-term observations the model results reflect this fact. The high import elasticity is due to several facts. First, the level of production of manufactures is low both in absolute

Table 4. Average Annual Changes in Exports and Imports - Results of the South-South Scenario (in percentage)

Commodities	Latin America	Tropical Africa	Near East	Indian Sub-continent	South-East Asia
<u>Agricultural products</u>					
Exports total	1.72	2.43	2.74	2.16	2.10
Exports Southern	6.51	13.73	8.13	4.41	5.25
Imports total	3.59	2.70	0.73	2.89	2.05
<u>Raw materials</u>					
Exports total	1.59	2.13	2.64	2.82	1.69
Exports Southern	8.96	19.94	10.71	12.69	6.97
Imports total	0.69	0.69	1.40	2.04	2.18
<u>Energy</u>					
Exports total	2.07	1.63	1.39	1.31	2.06
Exports Southern	5.00	8.15	2.62	1.43	3.51
Imports total	4.51	3.34	1.33	4.23	3.07
<u>Intermediate products</u>					
Exports total	2.23	3.41	3.41	3.57	3.02
Exports Southern	5.87	17.54	9.14	11.19	7.27
Imports total	0.73	1.18	0.84	2.87	2.11
<u>Consumer non-durables</u>					
Exports total	3.37	7.20	2.28	3.71	1.71
Exports Southern	7.38	21.45	5.29	16.28	7.32
Imports total	2.36	3.14	1.01	1.68	2.26
<u>Equipment</u>					
Exports total	5.31	5.77	4.66	3.89	4.34
Exports Southern	11.11	14.84	11.09	7.23	10.24
Imports total	2.69	3.86	1.23	2.70	2.33
<u>Consumer durables</u>					
Exports total	4.69	5.93	3.75	4.50	3.83
Exports Southern	12.95	27.51	9.44	11.89	11.76
Imports total	3.03	6.31	0.92	3.44	3.15

and relative terms. It is true for the whole of manufacturing but more especially it is valid for the production of capital goods. Therefore any type of development linked to investment generates demand for these products. In the actual version of the model we did not build into the system an exogenously defined import substitution procedure.

Second, in most of the developing countries, the industrialization process went along with a relatively high level of specialization. Therefore, even when certain manufacturing activities exist already in a given country, the big majority of its demand for intermediate manufactured products related to the existing activities would fail to exist within the country. Thus, the progress of industrialization itself creates a high level of import dependency in the missing complementary (or supplementary) activities.

Incidentally it is just for that very reason that Southern co-operation has a sound basis. Namely a harmonized specialization in the creation of these missing production lines would make possible co-operation and relieve dependency on the North in these imports. Thus sufficiently large markets for new industries would also be assured. Nevertheless it cannot be supposed that all the above mentioned production constraints could be eliminated within a short time period. To assure economy of scale and avoid initial competition among or the taking of protectionist measures against other Southern producers would require sophisticated institutional-political measures. In the short run only a very slow process of import substitution can be visualized and this one would not result in a basically modified level of import dependency. Only the directions would change. But this process requires time.

Third, the high import elasticity is consistent with the general tendency of growth, i.e., with the intensification of the international division of labour. This general rule of economic growth applies also to the developing economies, and as a general tendency will prevail. As a result, it can be expected that while the import elasticity will stay high, the composition and bilateral orientation will change.

At the present stage of development, the highest import requirements for equipment are followed by the energy and finally the consumer durables sectors (see Table 4). The case of energy imports is slightly special as an increase



in the intra-regional energy trade could solve a great part of this problem. Nevertheless the conflicting problems of the structural change and growth processes of the non-oil exporting countries are closely related, and implicit to it are the conditions of a further polarization among developing countries. (See Table 5.)

Table 5. Growth Rates of the Value Added and GDP components. Results of the South-South Co-operation Scenario

	LA	TA	NE	IN	AS	South total
Agriculture	2.26	3.00	1.86	3.91	1.69	2.64
Mining	1.00	0.29	1.52	4.31	2.19	1.40
Manufacturing	2.86	3.12	1.87	3.98	2.33	2.76
Construction	2.70	3.25	1.61	3.65	2.83	2.49
Services	2.64	2.23	1.14	3.70	2.08	2.35
Government consumption	2.49	2.28	1.45	3.36	2.32	1.15
Private consumption	2.52	2.88	1.27	3.83	2.08	2.46
Investment	2.84	2.90	1.41	4.84	2.12	2.52
GDP	2.58	2.41	1.48	3.77	2.11	2.37

c. The structure and growth of macro-variables: Increments generated by the South-South co-operation scenario

The results of using a given trade scenario in the model are the values of the deviations of variables relative to their long-term behaviour. Given that our scenario gave preference to the promotion of Southern exports of manufactured goods, the share of the manufacturing industries increased in the GDP in Latin America and South-East Asia. It became clear, that despite of our intention (expressed by the scenario) to allow for a more rapid industrialization in Tropical Africa, the share of MVA in its incremental GDP can be only very low.

While in the incremental total world MVA the share of the South will reach 46.4 per cent, its share in total Southern incremental GDP reaches only 21.7 per cent. (This means, that the South's share in total world MVA will increase considerably.)

The efforts needed for a bigger export capacity are necessarily the largest in the least industrialized regions. As the increase of manufacturing was put in the focus of the development policy, all the related branches are affected. The investment requirements increased substantially. These investments need more equipment (mainly imported, as it is well known) as well as enlarged construction activities. Therefore the increase of construction output is rather high. In almost every region, except of the Indian Subcontinent, the average growth rate of the construction industry exceeds that of GDP and is very close to that of the total manufacturing. (In the South-East Asian region it even exceeds it). This result is closely related to the well-known high investment elasticity of the developing economies. The construction industry has more importance for the least industrialized Tropical Africa and Near East. It is increasing very rapidly also in the explicitly export oriented and rapidly industrializing South-East Asian region. (See Table 6.) This phenomenon is most probably due to the big necessities in building new factories and also to the urgent needs for better conditions in housing and solving infrastructural problems.

The close relationships of the complementary and linked activities are noticeable through interrelated sectoral rates of growth within a given region. For the very same reason the growth rates of the same branch or sector vary quite significantly among regions as well. The data in Table 6 should support this statement.

Nevertheless it should be emphasized that with the exception of the two most industrialized developing regions the growth process generated by the South-South co-operation is rather "agriculture intensive" (see Table 5). As a result, the contribution of the different industrial sectors to the incremental GDP deviates from the 1979 structure (see Table 6).

Table 6. The Industrial Structure of GDP in 1979 and according to the South-South Scenario (in percentage)

	LA		TA		NE		IN		AS	
	1979	S-S	1979	S-S	1979	S-S	1979	S-S	1979	S-S
Agriculture	12.47	10.8	31.34	40.2	11.43	14.6	36.35	37.9	21.9	17.2
Mining	4.62	1.7	13.89	1.4	32.64	33.7	1.4	1.6	6.9	7.3
Manufacturing	25.06	28.2	8.21	11.0	11.42	14.7	16.61	17.7	21.2	23.6
Construction	5.43	5.7	7.55	10.6	9.72	10.6	4.9	4.7	7.0	9.7
Services	52.27	53.7	40.0	36.8	34.80	26.4	38.87	38.0	42.9	42.2

Increased agricultural production would contribute to the intensification of intra-regional trade of the products of the sector and provide also raw materials for the food and light industries. These relationships are extremely fundamental and even vital in the case of the Tropical African region.

The opposite holds for the services. The extremely high correlation between the growth and the importance of the service sectors is obvious, but would deserve separate analysis. The case of the Latin American growth process seems to be of particular interest.

### 3. Different applications of the model

#### 3.1 The impacts of an additional US\$10,000 increase of southern exports to the North

To give a picture on the structure and degree of interdependencies of the world economy captured by the model, the likely impact of US\$10,000 in additional exports of the South is given below. The distribution of these additional exports has been based on two hypothetical structures: once it has been supposed that the initial increases were directed to North and second, they were directed to the South. These basic cases were called Northern and

Southern co-operation schemes. Both the Northern and the Southern co-operation schemes were calculated in turn on the basis of two different historical trade matrices.

Thus four hypothetical cases have been elaborated. The calculations were made using the trade matrix 1975 and second that of 1979 in the framework of the two co-operation schemes.

The analysis of the results can follow two lines: the differences in the impacts of the two co-operation schemes can equally be analysed as those of the change between the 1975-1979 trade structures. The exercise accomplished allowed us to have a deeper than usual insight in the structural changes and their interrelationships occurred during 1975-79. It also made possible to reveal some of the differences between the growth processes of the different Southern regions which by other means were not possible. These results can be made use of when elaborating development scenarios and/or some parts of policies.

Due to the big differences in the commodity and market structures the whole exercise is really meaningful only on a more detailed regional-level. Thus in our presentation only regional results will be dealt with.

Through the export-production-import linkages captured by the model any given initial change in exports will have direct and indirect effects. These latter will be called induced effects. All the variables will go through changes as a result of the changed exports, including the exports themselves, as by the linkages the exports also will be changes to correspond to the changed imports. (On world level total exports and imports of the 7 commodity groups have to be balanced.)

a. Results of highly aggregated level of analysis

If the initial increase in export of \$10,000 were directed to North, according to the trading relationships established in 1975, this would have required the Southern producers to import \$6,981 worth of goods and services to cater for both the increased external as well as domestic demand resulting from a multiple impact on GDP (\$28,795). Those regions which supply the initial import demand by the South would experience a similar process of

income and output expansion, requiring additional importation of their own. And, to the extent that South participates in supplying this second round import requirements, the entire chain of events taken anew. The resulting figures are: increase in export \$25,869, increase in import \$17,419 and increase in GDP \$73,727 (Case I).

The magnitudes of all these figures become larger if the whole calculation were done based on the trading northern relationships observed in 1979. Products become more sophisticated requiring specialization in production which in turn increases intra and external trading. Under this circumstances, the initial \$10,000 export will induce \$89,138 in GDP, \$28,136 in exports and \$19,527 in imports. (Case II)

Since the export-income-import linkage differs from commodity to commodity, switching from a traditional trading partner would bring a significantly different economic impact. This aspect of the model is used to design the South-South co-operation scenarios presented in Chapter 3 of the Global Report <sup>7/</sup>, in which commodity and region specific details are given. Here we complete our illustration of the model by adding the cases for trade creation within the South itself.

Surprisingly, if the initial export drive were directed to the South to start with, the income and trade creation effects would have been much greater but, with a significant deterioration in the balance of trade position vis a vis the North.

Under the 1975 trade structure, a \$10,000 additional export from South to South would have resulted in an increase in GDP by \$83,725, in exports by \$26,787 and in imports by \$28,681. Since exports to South equal by definition imports from the South the overall excess in imports means a \$1,894 deficit in the trade account with the North (Case III).

Using 1979 production and trading structure results in significantly larger figures for GDP (\$103,926), export (\$30,369) and import (\$31,791)

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<sup>7/</sup> Industry and Development, Global Report 1985, UNIDO, 1985.

increments. The balance position also improves. All these figures reflect the degree of industrialization undergone by South between 1975 to 1979. (Case IV)

Using the above described procedure another very important aspect of interdependencies can be presented.

By the use of the above mentioned procedure it can be shown how much North and South are interdependent, and how these linkages developed during the 1975-79 period.

This is done if total impacts are disaggregated according to the occurrence of them: i.e., whether they occur in the North or in the South they occur. It can be shown how the additionally created exports are distributed among the North and the South and also where these side effects are large or small.

Once again we start from the hypothetical case that the initial US\$10,000 increase of exports were directed to the North from the South and distributed first according to the 1975 and then the 1979 commodity and partnership relations (Case I and II). It can be seen that through the chain of import linkages these South-North additional exports create also additional Southern exports, these are smaller than the Northern ones, but increasing between 1979 and 1975.

The additional exports require more production and consequently more imports. Given the market structure of the South, the imports from the North would be greater than the Southern ones, but again, it is indicative that the import requirement both from the North and the South would be higher according to the 1979 structure. The reason evidently is to be found in the fact that an incremental \$10,000 export according to 1979 structure corresponds to higher GDP increments than within the 1975 structure. These relationships reflect the quality changes in the commodity structure of the Southern exports during the observed time period.

The differences brought about in the market orientation of the South are reflected by the results. They show the progress made in South-South co-operation between 1979 and 1975. (See Table 7.) The imports additionally needed for the increased Northern exports contain more Southern contribution

Table 7. Total impacts of \$10,000 additional Southern exports directed to the North

Distribution of additional exports according to commodity and market relationships of the year	Additional exports			Additional imports due to additional exports			Additional GDP	
	Initial	Total	out of which to North South	Initial	Total	out of which from North South	Initial	Total
1975	10000	25869	20874 4995	6981	17419	12425 4995	28795	73727
			(80.7) (19.3)			(71.3) (28.7)		
1979	10000	28136	22263 5873	7337	19527	13654 5873	34017	89138
			(73.6) (26.4)			(69.9) (30.1)		

(30,1%) according to the 1979 trade structure than according to the 1975 trade structure (28,7%). The value of Southern additional imports from the South also increases and relatively more than does the value of additional northern imports (17.6% versus 9.9%).

The opposite version (cases III and IV) of the same exercise is when the hypothetical additional \$10,000 Southern exports are directed to the South. The results again reflect the high interdependency of the South with the North. But more interestingly, by the comparison with the above presented results it came to light that the total linkages of this "South-South co-operation" would create bigger total impacts both for the South and the North (net of the \$10,000) effects for the North than in the other scheme. These impacts grow when the 1979 structure is used for the calculations; which indicates first, that the North is also gaining by an increased Southern co-operation, and second, that more GDP increases are produced by this Southern co-operation scheme than by the Northern. This indicates that bigger output requirements are involved in the Southern co-operation. Third, the difference between the GDP impacts according to 1979 and 1975 is bigger if the South initially increases its Southern exports than if it increases its Northern exports by \$10,000.

These results reflect again the structural changes already mentioned. There is an additional indication involved, namely that a further intensification of the Southern orientation which follows the 1979 commodity (and bilateral) trade structure poses high requirements for the Southern production (supply) side, and more than the Northern orientation, which follows on more traditional patterns. (See Table 8.)

Table 8. Total impacts of \$10,000 additional Southern exports directed to the South

Distribution of additional exports according to commodity and market relationships of the year	Additional exports			Additional imports due to additional exports			Additional GDP	
	Initial	Total	out of which to North South	Initial	Total	out of which from North South	Initial	Total
1975	10000	26787	10910 15877 (40.7) (59.3)	7489	28681	12804 15877 (44.6) (55.4)	35552	87725
1979	10000	30369	13300 17069 (43.8) (56.2)	8008	31791	14722 17069 (46.3) (53.7)	41032	103926

Nevertheless, higher import requirements go along with the Southern scheme than with the Northern one. These even increase if 1979 structure was used instead of that for 1975. This direction of change reveals that the export structure of the intra-South trade changed on lines which involve a higher level of international division of labour. In the Southern scheme the level of additional Southern imports is higher than in the Northern scheme. Nevertheless the share of southern imports is slightly smaller according to the 1979 structure than to the 1975 trade structure.

This latter suggests that the composition of intra-Southern trade changed between 1975 and 1979 and the structural change was such which did not decrease the very high dependency of the South on the imports coming from the North - on the contrary.



b. Regional specialities of the impacts of an additional US\$10,000 exports

If the exports followed the southern (I) scheme (i.e., the initial \$10,000 were distributed to the South according to the 1975 distribution), the resulting induced trade effects for each region would be higher than if the (III) northern scheme had been followed. The only exception to this rule is the Near East, by its special market orientation and commodity structure. When the 1975 year's export structure was used in the calculations, the resulting linkage effects shows that rather high indirect exporting quantities were induced in the Southern scheme. Nevertheless the South-oriented exports induce quite high amounts of northern exports too. These, in most of the cases, almost attain the amounts of induced northern exports within the northern co-operation scheme.

This shows clearly the extremely high level of interdependency between the southern and the northern markets.

On the other hand, exports oriented to the north would have created induced South-South exports too.

Due mainly to the higher induced South-South than South-North effects, the total export impacts of the Southern co-operation scheme would have been bigger than the impacts of the northern scheme. (See Table 9.)

The very same relationships calculated by the 1979 trade structure already show rather important changes. The total induced exports of an equal amount of \$10,000 additional exports independently of the co-operation scheme are bigger according to the 1979 structure in the Latin American and Tropical African cases, lower in the Indian and South-East Asian cases. For the Near East the total induced effects are bigger in the 1979 structure if Southern co-operation scheme is followed.

Table 9. Total induced exports due to an initial US\$10.000 exports if they are distributed according to the 1975 trade structure

Exporter	Co-operation scheme with initial US\$10.000 oriented to:	Northern induced exports	Southern exports	Total induced exports
Latin America	North	1563	1885	3448
	South	1631	3376	5007
Tropical Africa	North	417	223	640
	South	335	635	970
Near East	North	1515	779	2294
	South	986	600	1586
Indian Subcontinent	North	366	577	943
	South	118	1191	1309
South-East Asia	North	1579	1815	3394
	South	1480	2732	4212

The analysis of these changes is much facilitated if the changes are decomposed according to main markets. It can be shown, that the picture is not homogeneous any more as it seemed to be on a highly aggregated level. As expected, following the southern co-operation scheme all the regions gain more induced southern exports than northern exports. (The Near East is again the exception.) But in the cases of the more industrialized regions (Latin America and South-East Asia) the northern exports induced by the southern co-operation scheme turn out to be higher than the northern exports resulting from the northern co-operation scheme. Interestingly enough the southern exports induced by this northern co-operation are bigger than the very northern ones. (The Indian Subcontinent is joining the more industrialized regions in this aspect).

These results indicate several very important characteristics of - and differences between - the two co-operation schemes. The most important feature of the two schemes is that both have positive linkages in the opposite market too, i.e., the northern exports induces southern exports and vice

versa, showing the absolute interdependency of the two big world markets and their economies on regional levels too.

A very important feature of the South-South co-operation which started already in the past is that it seems to generate more linkages than the northern one (which followed more on traditional lines). (See Table 10.)

Table 10. Total induced exports due to an initial US\$10.000 exports if they are distributed according to the 1975 trade structure

Exporter	Co-operation scheme with initial US\$10.000 oriented to:	Northern induced exports	Southern exports	Total induced exports
Latin America	North	1363	2400	3763
	South	1394	3856	5250
Tropical Africa	North	722	283	1005
	South	690	779	1469
Near East	North	1379	641	2020
	South	1215	592	1807
Indian Subcontinent	North	310	545	855
	South	143	940	1083
South-East Asia	North	1149	2085	3234
	South	1380	2110	3490

It must be underlined that because of the tight structural linkages through the southern imports, the South-South co-operation generates so much imports from northern markets that these additional northern exports to the South turn out to be higher than the northern exports created by the very northern co-operation scheme (i.e., when the South is exporting the initial US\$10,000 to the North). A sign indicating once more the direct interest of the world in a more intensive South-South co-operation. As in our exercise this co-operation is strictly linked to a southern market enlargement (that

is, trade creation is part of the game), it also has been shown how decisive the expansion of the very southern market-size would be for the growth of the world economy too.

The events brought about between 1975 and 1979 in the trade structure of the South and reflected in our calculations partly re-enforce our former statements, partly reveal new elements of the relationships which existed in 1979.

A qualitative change can nevertheless be observed relative to the South-East Asian region if 1979 trade structure is used for the calculation instead of the 1975 trade matrix. \$10,000 additional exports oriented from South-East Asia to southern markets in the 1979 commodity and market distribution would yield much less induced southern and bit less northern exports than the very same additional exports do in the 1975 structure. In addition, the difference between the results of the two schemes proves to be small, showing that in the two markets the structure of exports of South-East Asia became quite close to each other.

The northern induced exports by both co-operation schemes would be lower according to the 1979 structure in the more industrialized regions (and in the northern scheme for Near East and Indian Sub-continent too).

In light of the working of the model, the results show that in the 1979 structure less northern but more southern exports would follow from an initial \$10,000 northern exports in Latin America in South East Asia than when 1975 structure is used to distribute the initial export increment, meaning rather basic changes in the export and import structures of the two regions.

It indicates that through the linkages the imports induced by the additional exports came in a bigger proportion from the South in 1979 than in 1975 and this logic is supported by an other result too. Northern exports created by the southern co-operation scheme also decrease if the 1979 structure is being used instead of the 1975 structure. All these results show that a South-South trade has entered into play, with much more strength. This partly also replaces the imports coming from the North which are payed for by southern exports to the North.

Much less South-East Asian exports are created in the framework of the southern co-operation scheme if the 1979 trade structure is used than if the 1975 trade structure is used. These induced Southern exports are hardly higher than the value reached by the northern co-operation scheme. This result is rather specific and needs to be analyzed in more detail. The model can capture at least a part of the induced GDP effects of increased exports through impacts on output and imports.

In the special case of South-East Asia, if in the calculations the incremental \$10,000 of exports are oriented to its northern markets according to the 1979 bilateral commodity structures, this requires only slightly more additional GDP than if the 1975 trade structure is used.

This result suggests that the structure of northern trade went through only such type of changes for which the production structure was already "ready" to respond.

In fact, the proportion of intermediate products and of equipments (capital goods and consumer durables) in exports increased so much between the two years (from 24.5 to 41.6%) that the explanations why only slight GDP increments would follow from additional export in this new structure can be those presented above. On the other hand the share of agricultural products dropped very considerably and energy export also represented a smaller share in 1979 than did in 1975.

It should be noted that the higher shares in 1975 of agricultural and energy products in the total exports of South-East Asia went along with higher import shares of the same. As both declined, it indicates that more importance was given to the domestic market in 1979. It reflects also that more exports go at the price of growing import requirements.

The export share of agricultural products dropped much more in South-East Asia's southern exports than did in the northern exports of the region and the same holds for the energy exports. The case of intermediate products is special in that product group the South's participation increased. Therefore it can be understood that with the 1979 trade structure, first, the value of GDP induced by the southern co-operation scheme was less than that resulting

from the northern co-operation scheme, and second, that this values are considerably lower than those resulting from the calculations with the 1975 trade structure.

These results suggest the following conclusions: The trade structure of South-East Asia underwent a modification between 1975 and 1979. This modification was in line with the structure of the productive system of the whole domestic economy. Therefore one can say that the two spheres namely the supply side of the economy and the trade requirements of the international markets were already well adjusted. The economy so to say was ready to answer the requirements of the foreign trade with the South. It also is obvious that the northern trade structure imposes more additional output and import requirements as do the southern exports.

### 3.2 The GDP elasticities of total and Southern oriented exports of the developing regions

Another application of the model was offered by calculating the so-called elasticities. These were calculated for each exporter region relative to each of the bilateral partners using the 1975 and 1979 historical and the 1990 scenario trade matrices in turn.

Two different types of analyses had been carried out. Once, the partnerships were ranked according to the export elasticities related to the given bilateral relationships in a given year's trade structure. The changes in the ranks between 1979 and 1975 indicate intrinsic relationships caused by the modified bilateral export structure. When the same type of analysis is based on the ranking of the 1990 scenario relative to the 1979 ranking, a diagnosis of our scenario can be given.

Second, the numerical values and their respective changes have been analysed too. Rather interesting features of structural relationships can be revealed through the comparison of these values and their changes.

In the following some of the most interesting results of this second type of analysis will be presented.

GDP elasticities of total exports calculated on the basis of 1979 trade structures changed in four out of the five Southern regions compared to the elasticities calculated on the 1975 trade structure. (As the Near East kept its export structure basically unchanged, the elasticity of its overall exports was invariant.) The elasticities increased, and the rise was considered to be important in the case of Latin America, and the South-East Asian overall export elasticity dropped slightly as a result of the changes in the region's exports.

These changes are due, in general, both to the elasticity changes of the intra-Southern exports and to the exports oriented to the North. The elasticities increased markedly in both directions of the Latin American exports. The increase was important in Tropical Africa's Southern and in India's Northern exports, while a very considerable drop can be observed in case of the South-East Asian Southern export elasticities (see Table 11).

Table 11. GDP elasticities of the exports of developing regions calculated with the 1975 and 1979 export structures

Exporting Region	Total exports calculated with the export structures of		Southern exports		Northern exports	
	1975	1979	1975	1979	1975	1979
LA	0.82	0.98	0.90	1.08	0.79	0.95
TA	0.81	0.88	0.86	0.93	0.80	0.87
NE	0.78	0.78	0.81	0.93	0.77	0.75
IN	1.15	1.29	1.05	1.03	1.22	1.45
AS	0.78	0.77	0.82	0.76	0.77	0.78

In one case, i.e., in the southern exports of Latin America, the increase of the elasticity already involves a qualitative change: the value of the elasticity of exports is not only increasing but switching from being less than unity to bigger than 1. This result can be interpreted in a special way (see also p.9 of this study). Thus as opposed to the previous situation if a

unit of export growth demands more than a unit of production increase, this shows that the changes in output and import required for supplying the differential export already do not fit into the former economic conditions of the Latin American economy. Therefore they are more than proportionate. The reason for this can be found in the following way.

If e.g., more than 1 per cent production increase is needed for a 1 per cent increase of total exports, that shows that the production side was not ready to adopt quickly to this new requirements - there were no "free capacities" for doing it. This interpretation is rather indicative in cases when the elasticity becomes greater than 1 from being smaller than 1. It is then quite obvious that the composition of the incremental exports had changed strongly.

On the other hand, interesting results but of opposite character were obtained relative to the South-East Asian region, where a slight overall drop of the GDP elasticity can be decomposed into an explicit drop of its Southern and into a slight increase of its Northern exports. Nevertheless, the value of both elasticities remain far below the unity and became very close to each other. This reflects that, according to the 1979 structure, the overall impacts on the national economy of a southern or of a northern oriented export policy were more or less the same. This happens in spite of the differences in the Northern versus Southern export structures and in spite of the 1979 export structure being different from that of 1975 in both big markets.

The comparison of these very aggregated regional results immediately allows for a distinction between and characterization of the two types of development paths.

1. The practically invariant GDP export elasticities calculated by the 1975 and 1979 trade structures suggest that the South-East Asian regional economy as a whole already in 1975 was adjusted to and prepared for an intensive export orientation and in its further development followed the already started major line.



The opposite holds for Latin America. Here the overall GDP elasticity of exports increase considerably and tends to attain unity by using the 1979 trade structure instead of that for 1975. This shows that the structural changes in Latin America were rather considerable. These results indicate that the opening up of the Latin American market is related to strong structural changes in the domestic economy and these occurred during the 1975-79 period. Thus Latin America is a latecomer in this sense relative to the South-East Asian region. The difference between the regional results reflect also the historical fact that in the South-East Asian economy the push of industrial structural change immediately was oriented to export markets. In Latin America the industrial development was mainly inward-looking and structural changes largely took place only in the after 1970-75 period. Additionally, the 1979 Southern trade structure made the elasticity value become greater than 1. These results indicate the highly different requirements of the two export markets in terms of structural adjustments.

2. Independently of the trade structure taken for the calculations, in Latin America Southern exports had higher GDP elasticity than the North. In fact, Latin America's exporters had to promote the exports of the so-called non-traditional exports, i.e., of manufactured goods in their South oriented (i.e., mainly intraregional) exports. As opposed to the above, the results for the South-East Asian region indicate a much higher level of correspondence between the requirements of the northern and southern exports by the 1979 structure. This result represents a qualitative change, as the calculations by the use of the trade structure of 1975 gave rather different elasticities for the two markets. The value of southern trade elasticity also decreased. Both results suggest that in South-East Asia no major dualism has existed as far as the two major markets and domestic economy are concerned.

#### Composition of GDP elasticities and what they show

##### a. The case of Latin America

The value of Latin America's overall GDP elasticity was less than 1 in the 1975 trade structure. Notwithstanding, if the composition of the overall elasticity is examined for this 1975 structure, one can see that there were certain - mainly import-activities-having elasticities greater than 1,

although the overall elasticity was below 1. The activities for which export-elasticities were higher than unity are the following: overall import elasticity of exports 1.15 (out of which 2.29 for energy imports), mining 1.04, investment 1.02.

The picture changes when the additional Southern exports are distributed according to the 1979 trade structure. Import requirements increase (mostly energy imports) while the elasticity of mining decreases below the value 1, while elasticities of all the other productive activities already exceed unity (except oil refining). The investment elasticity also increases.

What big changes in trade structure occurred between the two years? The composition of Southern exports modified considerably from the point of view of both commodity and market composition. (See Table 12.)

Table 12. Commodity and market composition of Southern exports in Latin America

Commodity group	Commodity composition of				Share of Southern exports	
	Total exports		Southern exports			
	in percentage					
	1975	1979	1975	1979	1975	1979
Agricultural products	43.5	49.5	25.5	30.3	15.93	13.96
Raw materials	8.7	6.7	1.6	2.7	5.59	9.68
Energy	34.0	23.0	43.2	17.7	29.06	16.93
Intermediate products	9.0	11.1	12.9	25.1	31.48	37.50
Consumer non-durables	2.0	2.5	4.7	6.8	42.99	42.01
Equipment	1.6	4.1	10.2	13.3	67.56	46.16
Consumer durables	1.2	3.2	2.0	4.2	35.14	25.58

Most striking changes can be found relative to the exports of energy and intermediate products. The share of energy exports decreased very considerably while that of the intermediate products more than doubled in the total Southern exports of Latin America. Meanwhile a greater part of the exports went to the North in 1979 than in 1975.

These changes in export structure have further implications for economic structures. One of the major obvious linkages and multiplier effects can necessarily be revealed in the sectors where products and production are directly related to oil, and in other production activities linked to them indirectly. It should be kept in mind that Southern exports of Latin America in 1979 still meant practically intra-Latin American exports, which means that these linkages become weaker as a simultaneous result of the diminishing market-share and commodity share of energy: The second impact of primary importance is due to the share of intermediate products in total intraregional exports almost doubling, and also a greater part of total exported intermediate products was oriented to other Latin American countries. These changes in export structure were reflected in increased production and imports of inputs in the exporter countries (see Table 13). All these happen to be the largest ones in the region. Thus they are the countries which would represent what in the region is happening. The increased regional

Table 13. Elasticities with respect to additional southern exports of Latin America calculated by following the export structures of the years 1975 and 1979

	Total exports		Southern exports		Northern exports	
	1975	1979	1975	1979	1975	1975
Import total	0.978	1.068	1.146	1.269	0.923	1.010
out of which:						
energy	1.642	2.130	2.291	3.288	1.433	1.823
equipment	0.773	0.960	0.891	1.108	0.735	0.921
Agricultural VA	0.784	1.000	0.729	0.996	0.802	1.002
Manufacturing VA	0.771	1.017	0.913	1.242	0.725	0.957
Mining VA	1.002	0.466	1.038	0.008	0.991	0.588
GDP total	0.818	0.981	0.900	1.084	0.792	0.954

self-reliance, however still required big efforts. The logic of our argumentation seems to be justified if the same relationships are analysed not in the southern but relative to the northern trade of Latin America. No major structural changes occurred, energy and agricultural exports continued as the far most important items, and they even increase in flow terms in the Latin American bilateral exports to the US, which is their biggest and even growing market. As a result the GDP elasticities of exports to this market, though increased, remained the lowest. This shows that the economy was adjusted to its biggest markets requirements and even to modifications occurring in it.

At this point we come to the second subsystem of linkage effects: to that which is related to the export of equipment. The data show that structural change occurred with the increase of the proportion of equipment and durable consumer goods in total exports. These commodity groups cover the products of the so-called capital goods industry in the exports of Latin America. Thus the linkages related to an increase of the output of capital goods for export.

The markets for the export of these products is highly concentrated: the intraregional and the North American markets absorbed 77% of total equipment exports in 1979. The relative importance of the intraregional market shrank while that of North America increased very much. Nevertheless the share of equipment and durable consumer goods in the intraregional exports still is strikingly high. While in the total exports they represent 9.4%, their share is 19.5% in the intraregional and only 11.5% in the North American market (see Table 14).

An equally important factor could be the increase of the exports of light industrial products. The export of both big product groups obviously have rather strong effects on industrial production. If exports further were oriented towards the intraregional markets, the production and related activities have to be increased in the producer economies. (See Table 15.)

Table 14. The commodity distribution and market shares of the Latin American exports to the intraregional and North American markets

	Intraregional exports				Bilateral exports			
	Commodity composition (in percentage)		Marketshare of intraregional exports		Commodity composition (in percentage)		Marketshare of North America	
	1975	1979	1975	1979	1975	1979	1975	1979
Agricultural products	16.6	22.8	8.6	8.3	23.2	31.0	22.5	24.7
Raw materials	1.6	2.7	4.6	7.7	6.6	3.8	35.8	24.1
Energy	49.2	19.7	27.3	14.9	58.8	40.8	61.5	67.5
Intermediate products	14.2	27.1	28.5	32.0	5.7	9.2	21.8	23.7
Consumer non-durables	5.4	8.2	41.2	40.4	2.6	3.6	37.1	39.1
Equipment	10.7	16.4	58.9	39.6	1.7	6.2	17.9	37.4
Consumer durables	2.2	5.1	32.8	24.4	1.4	5.3	38.2	55.4
Total manufacturing	32.5	54.8	-	-	11.4	24.3	-	-

Table 15. Required increase of industrial production as a result of increased exports (elasticities) in Latin America

	Total exports		Intraregional exports		North American exports	
	1975	1979	1975	1979	1975	1979
Light industry	0.716	1.022	0.903	1.458	0.418	0.903
Capital goods	0.775	1.051	0.848	1.247	0.488	0.956
Total of GDP	0.818	0.981	0.858	1.094	0.647	0.924

These relationships reveal the linkages of structural changes and cast light on the extreme complexity of problems involved in these changes, even if the level of the analysis is rather highly aggregated.

As a result of our South-South co-operation scenario, the GDP elasticities would further increase. This result follows from our scenario where the increase of the share of intraregional exports and a slight promotion of the exports of manufactured goods in it also has been visualized. The elasticity increase is caused firstly by the exports to Africa, then by Latin America's exports to the Near East. These nevertheless would only represent smaller markets; except for equipment, where the market share would be rather considerable (Africa's share is 7.2% and that of the Near East is 5.1%). This is one of the important changes visualized by the scenario in the comparison to the 1979 historical structure (when 2.7 and 2.0% of total equipment exports were oriented to these two markets). In the scenario it was the intraregional export which was considered as being of the major importance for the development of the whole of the region. (See Table 16.) As can be observed, according to this South-South scenario the only considerable structural change

Table 16. Commodity composition and share of intraregional exports in Latin America, 1979 and South-South scenario, (in percentage)

	Share of intra- regional exports		Commodity composition of interregional exports		total exports	
	1979	1990	1979	1990	1979	1990
Agricultural products	8.3	12.6	22.8	21.8	45.4	43.0
Raw materials	7.7	12.3	2.7	2.7	5.9	5.5
Energy	14.9	18.0	19.7	15.5	21.9	21.4
Intermediate products	32.0	40.5	27.1	22.7	14.0	13.9
Consumer non- durables	40.4	56.9	8.2	8.6	3.4	3.7
Equipment	39.6	63.3	14.4	20.4	6.0	8.1
Consumer durables	24.4	47.3	5.1	8.2	3.4	4.3

related to intraregional exports is happening relative to equipment. According to the scenario these exports would be concentrated in the intraregional market: 63% of total equipment exports would find markets within Latin America itself.

The requirements linked to an increase of exports in the given model structure vary according to bilateral trade partners. The higher the elasticities calculated the further away from the base production structure would be the new export structure. That is the reason why the elasticities calculated for the Latin American scenario export to Africa and the Near East are very much above the average. They also exceed the elasticities which result from the calculations made with the 1979 export structure. (See Table 17.) (As it was mentioned above the South-South scenario pushed strongly forward the Latin American export of equipment relative to the African and Near Eastern markets.)

Table 17. Regional elasticities due to bilateral export increases of Latin America according to the structures of 1979 and of 1990 scenarios.

	I m p o r t i n g   R e g i o n s							
	Intraregional		Tropical Africa		Near East		Total World	
	1979	1990	1979	1990	1979	1990	1979	1990
Elasticities of								
Imports	1.33	1.44	1.15	1.40	1.10	1.23	1.60	1.11
Agriculture	1.96	1.09	0.55	0.97	1.47	1.42	1.00	1.02
Mining	0.04	0.13	0.98	0.63	-	-	0.47	0.47
Light Industry	1.45	1.79	0.90	1.72	1.31	1.58	1.02	1.12
Basic Products								
Industry	1.32	1.55	1.05	1.63	1.29	1.50	1.06	1.13
Capital Goods								
Industry	1.21	1.60	0.94	1.79	1.37	1.60	1.02	1.11
Oil Refining	1.07	1.14	1.28	1.33	0.72	0.88	0.88	0.91
Manufacturing								
Total	1.27	1.54	0.96	1.63	1.29	1.49	1.02	1.08

b. The case of South-East Asia

Comparing results for South-East Asia and Latin America, a clear picture on the marked differences in their development characteristics can be seen.  
8/

South-East Asia is the only region where the GDP elasticities of exports has been far below 1 with the structure of 1975. It also is the only region where, in spite of the structural change brought about between 1975 and 1979, there was no increase in the value of elasticities. On the contrary, the value of elasticity decreases in the region. This statement holds also for the elasticity of the imports. Nevertheless, the export elasticities of manufacturing production increase slightly, but the increase is much more for the Northern than in the Southern exports (see Table 18).

Table 18. Commodity and market composition of the Southern exports in South-East Asia

	Commodity composition of							
	Total exports		Northern exports		Southern exports		Share of Southern exports in total	
	1975	1979	1975	1979	1975	1979	1975	1979
Agricultural products	28.1	18.6	26.0	18.2	33.5	19.9	32.2	29.3
Raw materials	3.2	2.3	3.8	2.8	1.5	1.0	12.7	11.9
Energy	26.6	20.9	26.5	21.8	26.9	18.3	27.2	24.0
Intermediate products	12.4	21.0	11.3	17.9	15.4	29.2	33.2	38.1
Consumer non-durables	15.9	13.1	19.1	15.7	7.1	6.1	12.0	12.7
Equipment	7.7	11.8	6.5	10.1	10.9	16.1	38.1	37.5
Consumer durables	6.1	12.4	6.6	13.5	4.7	9.4	20.6	20.7

8/ Nevertheless the aggregation at the regional level hide certain very important features of these paths. For instance the whole problematic of national-domestic market and their sizes drop out.



Table 16 shows that the export commodity composition of 1979 changed so that import substitution already could be felt (energy and equipment). It also can be seen that within manufacturing the different industrial branches are not equally affected by the increase of exports in the 1979 structure, and that it makes a difference if the exports are northern or southern oriented.

The export share of the northern markets for intermediate products became smaller in 1979 than it was in 1975, net the export elasticity of this sector increased. This suggests that the product composition of the incremental Northern exports of South East Asia changed and was different in 1979 than in 1975;

The proportion of intermediate products in the total exports also increased. Nevertheless it is important to take into consideration that out of the Northern regions it was only the West European market share increased slightly while the shares of both the big North American and of the Japanese market decreased in the South East Asian export of intermediate products.

There are obvious differences in the impacts of Southern and Northern orientation in exports as well as the impacts of the following structures of 1975 or 1979 also are different (see Table 17). When exports to the South are distributed according to the 1979 structure the elasticities of the light industry and capital goods industry increase relative to the results of the calculations made on the basis of 1975 structure.

The same is the result when in the calculations the exports are North oriented, with an additional branch showing increased elasticity: e.g. the basic product industry.

It is supposed that the more traditional markets can be supplied by export goods under less pressing production conditions. Given that the commodity composition of export to these traditional markets follows on more traditional lines. Thus the increasing North American and West European and decreasing Japanese market could also be an explanation for the extra-efforts needed for increasing equipment exports.

From the results of Table 18 it is quite obvious that except for the exports of the intermediate products, the market orientation of South East Asia was concentrated on the North and not on the South. That overall GDP elasticities were low and even slightly decreasing indicates how strongly the regional production structure adjusted to export requirements.

This statement seems to be supported by the fact that the "traditional" Japanese bilateral trade has had the lowest GDP export elasticity (0.699 in 1979) and the newer markets had higher GDP elasticities (and relative to 1975 even increasing ones). This partly is due to the increased share of intermediate product exports and partly to the equipment exports. In these markets South East Asia had an increased share (both in North America and Western Europe).

The calculations with the scenario trade structure are consistent with the previously presented results (see Table 19). As in the scenario it was supposed that South-East Asia would strongly concentrate on Southern exports, accordingly it was supposed that this region would be a major Southern supplier of equipment under a Southern co-operation scheme. Therefore, in the majority of the cases its exports go to the South. Almost the same holds for intermediate products. As a result, the GDP elasticities have increased in the bilateral exports to Southern regions (LA, TA and NE) in our scenario results (see tables 20 and 21). These exports in 1979 represented only marginal markets but quite important ones in the scenario structure. (In the case of Tropical Africa the GDP elasticity of exports exceeds unity, by which it becomes questionable to increase exports to this region.)

Still, the overall picture indicates that the South-East Asian region is capable of responding to major market disturbances. This is expressed by the results of the elasticity calculations too.

c. Indian Subcontinent

In the methodological interpretation of the elasticities calculated with our model structure it has been stressed that both absolute level and the time behaviour of the value of the elasticity are rather indicative as regards the working of the economy under investigation. The Indian Sub-continent (IN) was put in the list of the individually analyzed region, as this region represents a rather special development path.

IN is the only region where the GDP elasticities of exports proved to be mainly above or in some cases very close to 1 already in the calculations with the 1975 structure of trade. As one can see from the results, the changes brought about in the bilateral trade structures between 1975 and 1979 contributed to a general increase in the absolute value of elasticities. (See Table 22.)

The main reasons why the export elasticities are higher in a 1979 trade structure is that in the major export markets of the region, namely in the North American, Western European and Japanese markets, a rather strong increase of the elasticity can be observed. Some slight increases happen to occur in the Latin American, Near Eastern and South-East Asian bilateral relationships too.

On the other hand, considerably decreasing elasticities can be observed in the intraregional and Tropical African bilateral trade. Two types of structural changes can be revealed between 1975 and 1979 which are the explanation for the changing elasticity values.

Table 19. Commodity and market composition of the trade in the South-South scenario for South-East Asia

	Commodity composition of						Share of Southern exports in total	
	Total exports		Northern exports		Southern exports		1979	1990
	1979	1990	1979	1990	1979	1990	1979	1990
Agricultural products	18.6	17.5	18.2	18.4	19.9	16.3	29.3	39.7
Raw materials	2.3	2.1	2.8	2.9	1.0	1.0	11.9	19.8
Energy	20.9	19.5	21.8	24.6	18.3	12.7	24.0	27.6
Intermediate products	21.0	21.5	17.9	16.0	29.2	29.0	38.1	57.2
Consumer non-durables	13.1	11.8	15.7	16.1	6.1	6.0	12.7	21.7
Equipment	11.8	13.7	10.1	8.4	16.1	21.0	37.5	65.0
Consumer durables	12.4	13.8	13.5	13.6	9.4	14.0	20.7	43.2

Table 20. Sectorial elasticities with respect to additional exports of South-East Asia

	Following the export structure of					
	Southern exports			Total exports		
	1975	1979	1990	1975	1979	19799
Agricultural VA	0.768	0.740	0.723	0.689	0.662	0.658
Mining VA	1.438	1.044	0.806	1.374	1.133	1.083
Manufacturing VA	0.742	0.760	0.870	0.751	0.803	0.833
GDP total	0.818	0.760	0.802	0.782	0.774	0.789
Import total	0.987	0.814	0.880	0.942	0.889	0.912
out of which:						
energy	1.342	0.694	0.853	1.367	1.118	1.168
equipment	0.809	0.675	0.805	0.790	0.776	0.815

Table 21. Manufacturing elasticities of the South East Asian exports

	Northern exports			Southern exports		
	1975	1979	1990	1975	1979	1990
Manuf. total	0.755	0.819	0.850	0.742	0.760	0.870
out of which:						
Agrofood	0.817	0.735	0.737	0.937	0.742	0.728
Light industry	0.811	0.889	0.858	0.615	0.752	0.895
Basic products	0.642	0.795	0.788	0.665	0.623	0.890
Capital goods						
industry	0.600	0.748	0.714	0.683	0.874	0.964
Oil refining	1.192	1.059	1.144	1.244	0.951	0.798

Table 22. GDP elasticities of bilateral trade

India exports to	1975	1979
LA	0.92	0.92
TA	1.21	0.97
NE	1.02	1.11
IN	1.32	0.91
AS	0.87	1.00
NA	1.68	2.04
WE	1.13	1.65
JP	0.66	1.01
World	1.15	1.29
North	1.22	1.45
South	1.05	1.03

The commodity composition of the Northern exports changed in favour of durable and nondurable consumer goods and of equipments. Meanwhile the northern market share in the exports of these products also increased very much.

The commodity composition of the exports to the IN intraregional and the Tropical African markets went through a change of a quite different character.

As far as the African exports are concerned, the share of agricultural products increased very strongly (from a 28.6% share in total exports in 1975 to 62.7% in 1979) and this change occurred at the cost of manufactured products, the share of which decreased necessarily by 1979 in this bilateral trade.

In the intraregional market on the other hand the basic and considerable changes were related to equipment exports (the share of which increased from 8.6% to 19.3% by 1979) and to the role of energy in the intraregional export decreasing from 6.1% of total intraregional trade in 1975 to 0.2% in the 1979 intraregional exports.

The structural changes in these two latter bilateral trade relationships contributed to the overall decrease of the GDP elasticities; from values much above to 1 they decreased to values below 1. This tendency of changes in the commodity structure of the IN was accompanied by a rather important decrease in the elasticities of all groups of imports and elasticity of the oil refining industries were also decreasing considerably. (In the other manufacturing sectors, the elasticities also were lower according to the 1979 structure.)

IN's African export structure in 1979 apparently suited better the Indian export production structure than did the structure of 1975. Nevertheless, it has to be underlined that these exports were marginal in their volume not only in international but also in domestic terms. Even the totality of the IN exports in 1979 has the smallest among all the Southern regions.

IN specialized in agricultural exports and exports of intermediate goods. (Its Northern exports contain less agro and more intermediate products, while its Southern exports have more agro-products.) While the share was still low,

one could observe a tendency of increase the weights of these two commodity groups between 1979 and 1975. These two groups of products were already in 1975 mainly oriented to markets of developed economies - basically to Western Europe. This orientation towards the North became even more emphasized by 1979.

In the scenario it was supposed that the share of manufactured products should increase through an increased orientation towards the (other) southern regions. As a result of this very considerable change in the bilateral trade structure of the region the calculated bilateral GDP elasticities all are higher than the elasticities based on the 1979 trade structure.

As the big change in commodity structure in the scenario affected trade with the South, the considerable increases of elasticities occur with the Southern bilateral regional exports. Among the southern regions Latin America and the Near East are the major markets for IN.

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These results and their analysis already revealed the great regional differences prevailing in structure and their changes in time. The consequences of hypothetical scenarios - as it could be shown by a few examples - are also very important as they vary very much according to region.

All this suggests that there is a need for a more elaborate and detailed analysis of the problem.

This is what we consider as our main objective in the near future.

Annex Table 1. Initial trade matrix of the South-South Scenario  
and results of the iterations (all values in million US\$)

	Change in trade flows			In percent of base year				
1. Iteration	N	S	W	N	S	W		
	N	0	0	0	N	0.0	0.0	0.0
	S	-863	3802	2939	S	-0.62	+4.26	+0.69
	W	-803	3802	2939	W	-0.06	+10.6	+0.17
2. Iteration	N	S	W	N	S	W		
	N	0	+1852	+1852	N	0.0	+0.69	+0.14
	S	-299	+4348	+4049	S	-0.09	+4.87	+0.95
	W	-299	+6100	+5901	W	-0.02	+1.73	+0.34
3. Iteration	N	S	W	N	S	W		
	N	+1159	+2496	+3655	N	+0.11	+0.93	+0.28
	S	+ 219	+4927	+5146	S	+0.07	+5.52	+1.21
	W	+1378	+7423	+8801	W	+0.10	+2.08	+0.51



