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The Federal Republic in the North-South Dialogue

Some Longer-Term Projections

by Lothar Hübl, Klaus-Peter Möller, Hanover *

For some time now the Federal Republic of Germany has been the largest exporter in the world, with a slight lead over the USA and some way ahead of Japan and the Soviet Union. It has therefore an important role to play in the North-South dialogue. The increasing mutual dependence of the Federal Republic and the developing countries is described by different scenarios in the following article.

In work carried out at the Institute for Applied System Research and Prognosis (ISP) in Hanover the so-called "Germany Model" ¹, which was evolved in 1975–1978, has been coupled with the "Mesarovic-Pestel World Model" ² in order to forecast reciprocal effects between the Federal Republic and the developing countries; model computations were carried out on this basis. The two models are "simulation models"; they are applied to an attempt to reproduce and simulate economic, technological and social interconnections.

The world model consists of a population model and an economic model; these are linked with four commodity models (for energy raw materials, foodstuffs, non-ferrous metals, and investment goods). The world is divided into 14 regions. The regions are interjoined by a world trade model harmonizing the respective export and import wishes of the individual regions by an iterative process.

The Federal Republic is one of the 14 regions of the world but it is given a much more refined treatment in a separate model. The model system for Germany comprises a 19-sector model of the economy, a population and education model, and a technology model. The driving force in the eco-

nomical model is the consumer demand of the population in conjunction with the public sector demand and the export and import data derived from the world model. The potential supply is computed from the sectoral capital stocks through a simple production function. The gap between supply and demand controls the investment activity which is thus determined by factors endogenous to the model system. The various production technologies are marked out in the technology model by means of specific input factors for labour, capital, energy and materials.

The module composition of the two models is shown in the following diagram:

The two model systems are linked through the foreign trade on the one hand and by the resource availability data on the other. The simulation process follows the following schema, presented here in a simplified form: The simulation starts from the world population model which extrapolates the population of all 14 regions of the world at the mortality and fertility rates corresponding to their specific age distribution. These population trends are the basis for a computation of the specific goods requirements of the regions. These requirements are juxtaposed with the regional outputs; the possible exports are determined at the same time. Any requirements which cannot be met by production inside the region are treated as desired imports. The import and export wishes of all 14 regions are adapted to each other in a world trade model which includes the state of the external relations (trade surpluses and deficits) and foreign credit balances and debt accumulations among the economic parameters taken into consideration. This world trade model

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¹ Cf. E. Pestel, L. Hübl, K.-P. Möller et al., *Das Deutschland-Modell (The Germany Model)*, Deutsche Verlagsanstalt Stuttgart 1978. The problems involved are discussed at length in this book.

² Cf. E. Pestel, L. Hübl, M. Mesarovic et al., *Anwendung des Mesarovic-Pestel-Weltmodells auf forschungs- und technologie-relevante Fragen aus der Sicht der Bundesrepublik Deutschland (Application of the Mesarovic-Pestel world model to questions of relevance to research and technology from the point of view of the Federal Republic of Germany)*, Final report to the Federal Ministry for Research and Technology, Hanover 1977.

SCENARIOS

also contains a development aid module which can amplify the import capabilities of a region by assumptions concerning external development aid.

Five major categories of goods (foodstuffs, energy raw materials, non-ferrous metals, investment goods, and others) are apportioned to the 19 sectors of the German model in the processing of the export and import data derived from the world model; in the case of the imports a further distinction is made between imports for final consumption and those for preceding stages.

Results of a Reference Scenario

The simulation of the future trend of some important socio-economic dimensions in the world must of course be ringed around by a number of premises. These sets of assumptions which are reached by evaluation of other enquiries and our own scrutinies and on the assumption that the trend of development will not be disturbed either by wars or by natural disasters we call a scenario. A reference scenario maps out a route for the future which looks plausible at present. It is impos-

sible to set out the details of the reference scenario within the confines of this article. A number of important findings will therefore be put forward immediately:

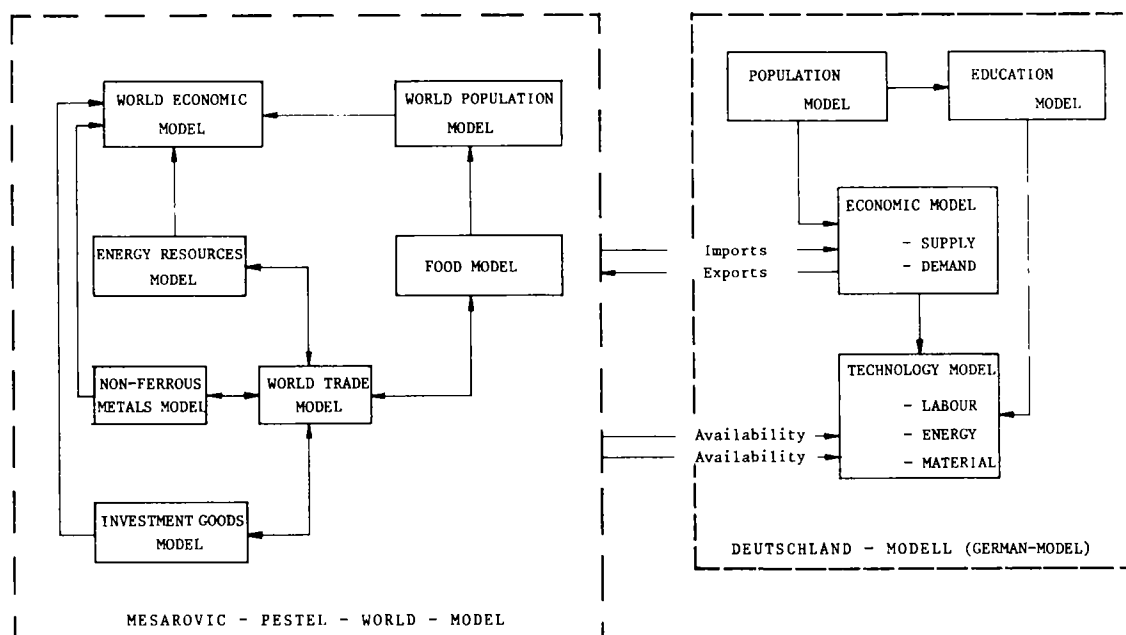
□ The population of the regions of Latin America, Central Africa and Southeast Asia will increase despite declining fertility, from about 1.7 bn now to about 3 bn in the year 2000, as emerges from the following table:

Table 1
Population Trend in the Developing Regions

Year	Latin America	Southeast Asia	Central Africa
1975	325	1,131	277
1980	371	1,278	312
1985	422	1,431	350
1990	476	1,591	389
1995	534	1,759	429
2000	593	1,932	473

□ Owing to the falling birth-rate in the industrialized regions the population of the regions of North America, Western Europe and Eastern Europe will increase only from about 1 bn to 1.1 bn in 2000.

Diagram 1
Schematic Layout of the World Model and the Germany Model



- REGIONS:
- | | |
|----------------------------------|---------------------------|
| 1. NORTH AMERICA | 9. SOUTH ASIA |
| 2. REST OF WESTERN EUROPE | 10. CHINA |
| 3. JAPAN | 11. GERMANY (F. R.) |
| 4. SOUTH AFRICA, AUSTRALIA, E.O. | 12. FRANCE |
| 5. EASTERN EUROPE | 13. GREAT BRITAIN |
| 6. LATIN AMERICA | 14. REST OF COMMON MARKET |
| 7. MIDDLE EAST, N. AFRICA | |
| 8. MAIN AFRICA | |

- SECTORS:
- | | |
|---------------------------|------------------------------|
| 1. AGRICULTURE | 11. METAL PROCESSING |
| 2. ENERGY | 12. VEHICLES |
| 3. MINING | 13. MECHANICAL ENGINEERING |
| 4. CONSTRUCTION MATERIALS | 14. CONSTRUCTION |
| 5. FOOD PROCESSING | 15. WHOLESALE & RETAIL |
| 6. TEXTILES | 16. TRANSPORT, COMMUNICATION |
| 7. CLOTHING | 17. DWELLINGS |
| 8. WOOD, PAPER, PRINTING | 18. GOVERNMENT |
| 9. CHEMICALS | 19. OTHER SERVICES |
| 10. METALLURGY | |

□ The real gross regional products will grow in the three developing regions at an average long-term trend-rate of a little under 5%. They will thus rise considerably faster than in the industrialized regions. The following table shows the expected gross regional products of the three developing regions between 1975 and 2000.

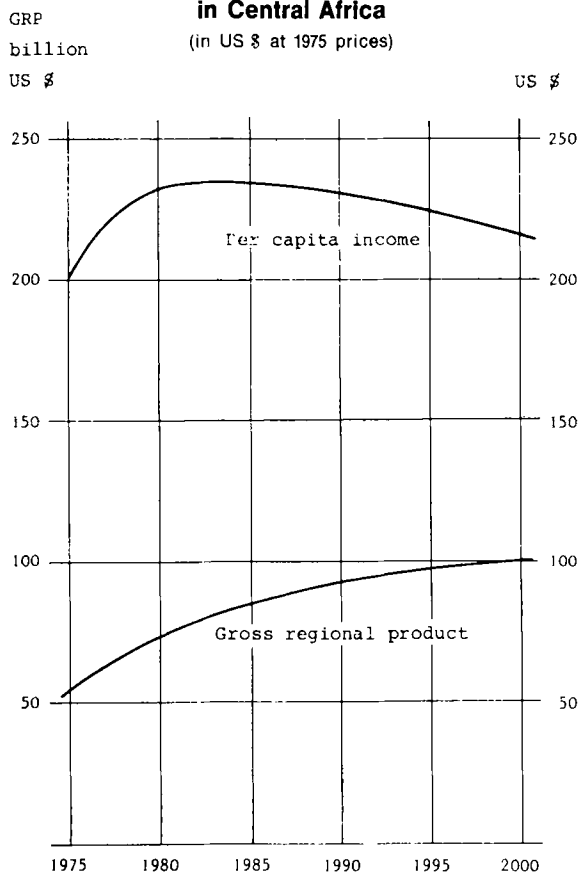
Table 2
Development of the Gross Regional Product in the Developing Regions
 (in bn US \$ at 1975 prices)

Year	Latin America	Southeast Asia	Central Africa
1975	277	328	55
1980	359	410	72
1985	449	485	83
1990	559	554	89
1995	714	630	96
2000	909	697	105

□ In consequence of the extremely strong population growth per-capita incomes will rise much more slowly in these regions than the regional product, so that all three regions will follow the development pattern depicted in diagram 2.

Diagram 2

Gross Regional Product and Per-Capita Income in Central Africa



The gap between the industrialized and developing regions, especially in per-capita incomes, will widen further in the future because in the industrialized regions the regional products and per-capita incomes will move almost parallel as a result of the low population growth.

A comparison of the food production potential and the growing population in the developing regions shows a steadily mounting surplus in Latin America, a deficitary situation in Central Africa and a disastrous imbalance between the indigenous production and requirements of food in Southeast Asia. In these circumstances the regions of Central Africa and Southeast Asia will be forced to increase their food imports continually.

Rising food imports will however greatly aggravate the existing trade deficits. A tenfold increase of the accumulated foreign indebtedness is forecast by the simulation for Central Africa and Southeast Asia, not exclusively as a result of increased food imports but also because of the need for energy raw material imports.

As the vital food and energy raw material imports preempt almost the whole of the import potential, the imports of requisite investment goods will stagnate except in Latin America.

The normal vicious circle of excess of births, shortage of food, imports of food and mounting foreign debts, which in turn impede the importation of investment goods, can obviously only be broken if either the growth of the population in these regions is drastically curbed or the food production potential can be raised sufficiently to lower the food imports. By these means alone could the developing countries be provided with the requisite investment potential which makes it possible to improve the deficient productivity in these parts of the world and to assure the population of an adequate per-capita income.

Scenario: Boost to Development Aid

While the reference scenario assumes that the development aid contributions of the industrialized regions will average 0.35% of their GNP, the developing countries have been aiming at much larger free aid transfers in the discussion on a New International Economic Order. One of the demands is that the aggregate GNP of all developing countries should reach about 25% of the gross world product in 2000. An attempt has been made to ascertain with the aid of the world model how large a transfer ratio is required to meet this demand, i.e. what share of the GNP must be assigned to development aid to achieve this object. The simulation shows that altogether 3% of the aggregate GNP of the industrialized countries

would have to be spent on development aid. It is exceedingly doubtful whether such a tenfold increase in development aid transfers compared with the present situation will ever be politically practicable. Were the development aid provided at present to be doubled, the developing countries' share of the gross world product would work out at no more than 15.2%. This would do very little to remedy the disproportion of per-capita incomes between industrialized and developing countries.

The consequences for the German economy of stepping up the development aid to 3% of GDP may be examined for three successive phases. The first phase, immediately after action has been taken, will witness a restructuring process within the sectors: the shift in ultimate consumption components will cause the classic consumer goods sectors to grow more slowly than the classic investment goods sectors (mechanical engineering, electrotechnical products, vehicles). The second phase will have marked effects on the external economy of the Federal Republic: the domestic consumer goods sectors will be pressed hard by increasing imports resulting from the build-up of production capacities in the developing countries, and there will be significant export losses in intermediate products because the developing countries will establish this sector of industry first; their demand for import goods will not yet rise significantly as a result of the effected transfers. In the third phase the exports of intermediate products to developing countries will fall off greatly since these countries will by now be able to meet their requirements themselves; exports of investment goods on the other hand will increase because the growing industrial capacities of the developing countries will cause the replacement and first-time demand for industrial plant and vehicles to rise. The Federal Republic will however be by-passed by most of the additional import demand of the developing countries as it accounts for a smaller part of the trade of

these countries than comparable industrialized countries³.

The impact of a massive increase in development aid on the economic development of the Federal Republic could thus be summed up as follows:

- Shifts in the internal structure towards the sectors which supply investment goods,
- Stronger pressure of imports on the consumer and intermediate goods areas,
- Additional exports in the investment goods area after a time lag of 6–10 years.

Scenario: Higher Raw Material Prices

Another often discussed possibility the effects of which can be examined by means of the model is that of increased prices for raw materials which are supplied mainly by the developing regions.

An agreement on raw materials was proposed at the Nairobi World Trade Conference in 1976 with the object of bringing stability to the raw materials of the producer countries and safeguarding the supplies of the raw material-buying countries. This so-called Integrated Programme for Commodities was at first to extend to the 18 commodities listed in the following table:

Group 1

Foodstuffs: Bananas, sugar, beef, oilseeds and vegetable oils, tea, cocoa, coffee;

Group 2

Agrarian Non-Food Raw Materials: Cotton, jute, sisal, rubber, tropical timbers;

Group 3

Mineral Raw Materials: Phosphates, bauxite, manganese, tin, copper, iron ore.

³ The following figures show the share of the developing countries in the total export trade of the mentioned countries: Germany 10.7%, France 17.2%, Great Britain 19.6%, USA 23.2%, Japan 39.6%.

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A mere glance at the list shows it to consist of raw materials which are almost all in plentiful supply at the time, although the industrialized regions could be hit hard were they in short supply, and which can be replaced fairly easily by substitutes so that they do not lend themselves readily to OPEC-like cartelization.

For the simulation of the effects of increases in the prices of these raw materials it was assumed that no substitution effects or problems would arise from the establishment of a cartel by their producers. For the sake of simplicity it was assumed that the prices of all 18 listed commodities would double.

The simulation shows in this case that the industrialized regions of North America and Australia/South Africa profit from the increase of prices. The effect on the three developing regions of Latin America, Central Africa and Southeast Asia is a rise of the gross regional product in 2000 varying between 10 % for Southeast Asia and 20 % for Central Africa.

As for the Federal Republic, the effects differ but little from the case of the reference scenario. The impact on the GNP is slight but negative.

Leaving aside the fact that it would be hardly practicable to double the prices of the 18 commodities of the so-called Nairobi list, the positive effects on the developing countries seem to be slight. It has also to be borne in mind that such big price increases would engender substantial substitution effects, in particular for the agricultural products.

Scenario: Segregation of the Developing Countries

Yet another scenario which has been examined is the possibility of the developing countries deciding on a policy of shutting themselves off from the rest of the world. This would enable the developing countries to turn their backs on the past strategy of copying the industrialized countries and aiming at the standards of Western civilization. The trade flows between the industrialized and developing regions would be reduced to a trickle.

Such drastic measures do not of course remain without effect. In spite of the relatively modest share of world trade handled by the three developing regions (17 %), it cannot be ruled out that the world trade would contract by as much as 30 % or more compared with the reference scenario in consequence of secondary effects of the trade stagnation cutting down also the trade between the industrialized regions.

In the developing regions the income levels would be greatly impaired by the severance of trade flows. Latin America would be affected least: its gross regional product in 2000 would be only 22 % lower than in the reference case. In Southeast Asia the income level would be 28 % down and in Central Africa nearly 50 % lower than in the reference case.

In the first phase of this self-segregation the industrialized countries hit most would be those which conduct a high share of their total trade with developing countries: Japan, France and Great Britain. The Federal Republic and the USA would become more greatly involved in the second phase when the falling-off of trade begins to affect the import opportunities in other industrialized regions and repercussive processes are set off. Accordingly, the regional product of the three first mentioned regions will in 2000 be 20 % lower on average than in the reference case while the Federal Republic will get away with a reduction of 14 %.

Résumé of the Model Simulation

Needless to say, model computations of the kind presented here cannot possibly mirror the multitude of political issues in dispute with the developing regions in the North-South dialogue. But they offer the advantage that by reducing their complexity to a few stable structures they allow possible future developments to be surveyed unhampered by the many political taboos which often preclude an insight into the dimensions of the problems.

Summing up, it may be noted therefore that the situation of the developing countries would not be materially improved either by doubling the present development aid or by doubling the prices of the raw materials which they supply. To bring about a material change of the present conditions the development aid would have to be raised to levels approaching politically impracticable dimensions.

Total self-segregation by the developing regions on the other hand would hit the industrialized countries very hard, even though the consequences of raw material shortages have been ignored in the simulation.

As a way out of the impasse remains the hope for a stabilization of the population in the developing regions. Together with increased development aid and improved raw material prices this would check a further worsening of the incomes disparities between industrialized and developing countries.