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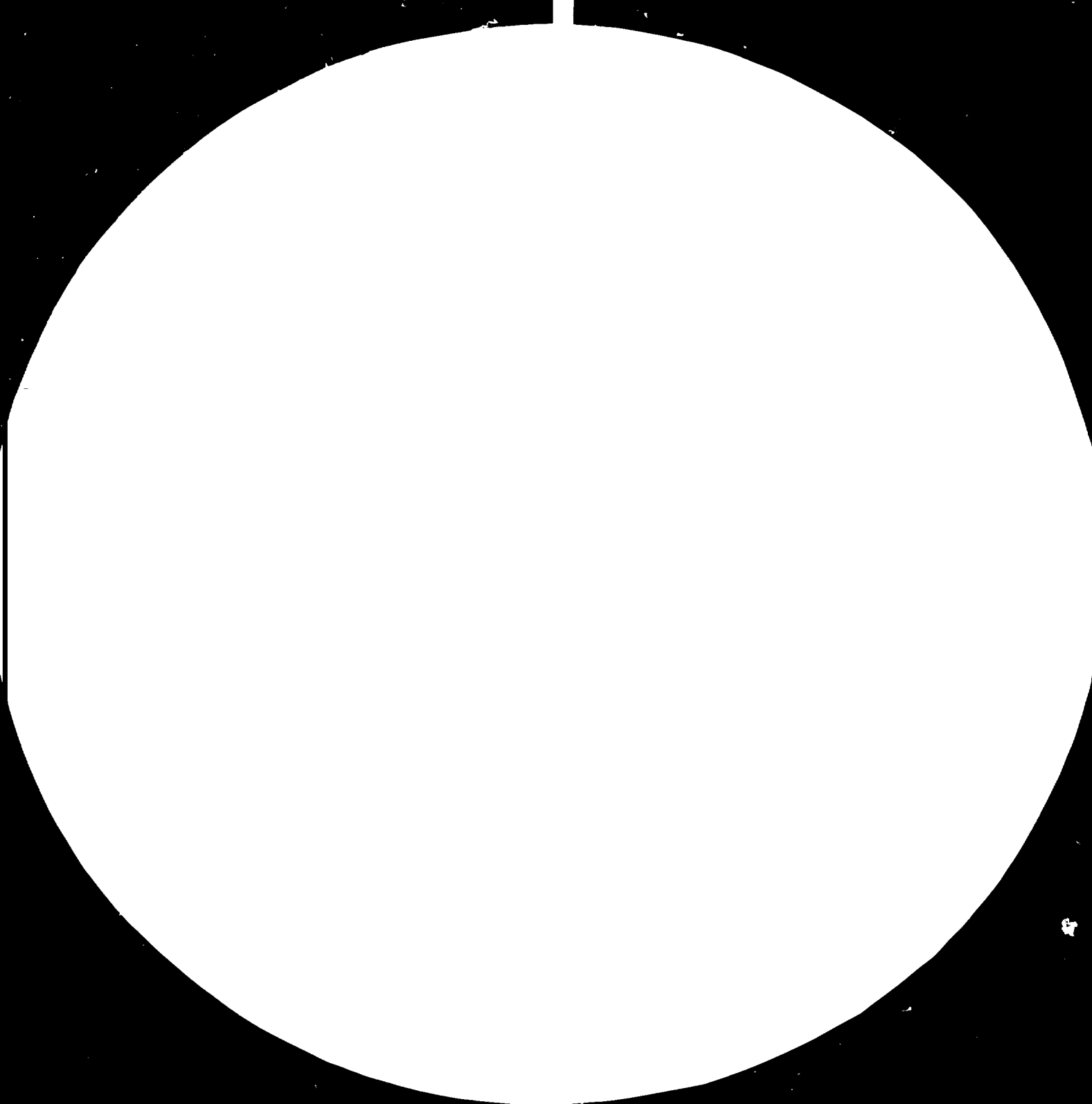

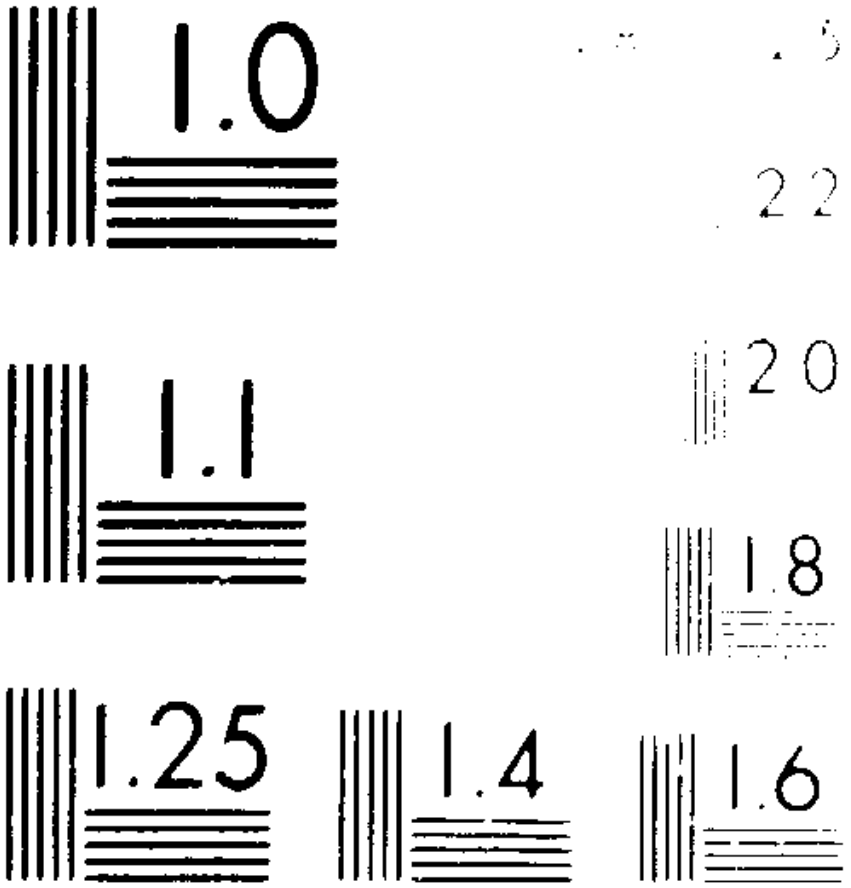
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THE IMPACT OF CO-OPERATION AMONG CMEA MEMBER COUNTRIES ON CAPITAL GOODS INDUSTRY DEVELOPMENT IN HUNGARY

Budapest

November, 1981

C o n t e n t s

Evolution and some basic results of capital goods development

Summary

In this study elaborated at the invitation of UNIDO the authors have the goal to present in quantitative and qualitative terms the economic policy directions, internal and external conditions, on the basis of which, in the past few decades, the structure of the Hungarian engineering industry - in accordance with the possibilities of this small country - has gradually transformed.

The results achieved by the Hungarian engineering industry after 1945 /the country's liberation/ can be seen clearly only if it is presented in broad lines what political and economic impact had been exercised by the previous decades. Prior to World War One the development of economy was set limits to by the frameworks of the Habsburg-Hungarian Monarchy. Hungary was a main agricultural supplier, and the development of industry - partly because of a domestic lack of capital - advanced at a snail's pace only. In this country primarily those engineering industry branches experienced a development which were in connection with agriculture, such as the manufacture of agricultural machinery, various machines and equipment for the milling industry and for the industries processing agricultural produces.

A whole range of big Hungarian enterprises came into being around that time with foreign /German, Swiss, French, British/ capital, and no flexible and wide-ranging network of small enterprises, characteristic of the developed industrial countries, was established in the engineering industry. In 1938 - that is to say, at the beginning of industrial upswing preceding World War Two - a total of just 48 thousand people were employed in the field of Hungarian machinery manufacture, consequently, the Hungarian People's Republic inherited from the capitalist

system an underdeveloped engineering industry. In World War T o even that engineering industry was destroyed: the total of wa damages exceeded by several times the national income achieve in the last year before the beginning of the World War.

In the post-war decades the previously backward Hungary could not only keep abreast with the extremely fast rate of economic development but, achieving an even faster rate, it could reduce the earlier extent of its backwardness. The process of nationalization, following the country's liberation, of the basic means of production of industry was essentially completed by 1950.

The economic structure of a country is an economic, historical and social category, a notion bringing to expression the internal proportions /macro- and microstructure/ of a constantly changing economy. The essence of the question practic l- ly is whether a given country, its leaders comprehend well what is to be done in the interest of shaping the structure of economy in an optimal direction.

In accordance with the world tendency of industrial deve - opment, the most important positive determinant in Hungary of the change of the structure of industry was a fast-rate increase of the engineering industry. The structural changes on the macro- and micro-level within the engineering industry acted towards the establishment of an engineering industry structure most complying with the country's potentials, in so much as instead of material-intensive branches it was the labour-intensive branches that advanced fastest. It is a peculiarity of the historical development of the Hungarian engineering industry that it specialized primarily in the production of capital goods, with the proportion of consumer durabl s having amounted to 4.8 per cent at the end of 1980.

Since the Hungarian engineering industry has specialized

in the manufacture of vehicles for different branches of transport, of various equipment for the post, of apparatuses and equipment for the infrastructure, including e.g. public health, with a view to both ensuring the market and meeting domestic demands it is greatly dependent on the international division of labour. Among all branches the share of exports is highest in the engineering industry. In 1980 some 44 per cent of all engineering industry products were sold abroad. On the basis of development policy targets, 1 per cent of growth of production of engineering industry is matched by 1.5 per cent of growth of engineering industry exports.

For the Hungarian economy - as a country not rich in raw materials and energy - it is a question of vital importance to carry on an extensive co-operation with the CMEA countries This is what provides a basis, for example, for the material and energy supply of the manufacture of capital goods, and fo ensuring outlet for a considerable part of the machines and equipment produced. In the development achieved, a determinin role has been played by economic co-operation within the framework of the CMEA, as the value of export products having their origin in engineering industry production has amounted to som 53 per cent of Hungary's total exports to the CMEA. In the CMEA countries' collaboration in the field of capital goods specia emphasis is due to international specialization and co-operation, on the basis of which the proportion of products supplied amounts to 36 per cent for metal-working machinery and equipment, to 81 per cent for hoists and means of conveyance, to 23-26 per cent for chemical, paper and building industry equipment, to 44 per cent for tractors and agricultural machines, to 60 per cent for vehicles. In total exports this comes clos to 44 per cent. Laying particular stress on a number of products in the engineering industry, we have organized large-se-

ries production of them relying on the CMEA co-operation. Suc is for example bus manufacture, the manufacture of vehicle rear axles, various telecommunication products, food industry and agricultural products, the manufacture of instruments, medica equipment, and so on.

In Hungary's international production, scientific and te h-nical relations - and within this also in the manufacturing branches of capital goods - a particularly important role is played by relations developed with the market economies and the developing countries, by industrial co-operation and join ventures. In the engineering industry turnover mutually conducted with the developing countries, in the exports and imports of profitable products featuring competitive technical standards, an ever more significant role is assigned to engineering industry co-operation.

In this study we want to bring to expression clearly tha in the Hungarian government's economic policy one of the main guidelines is to develop the engineering industry selectively to adjust its internal structure to the country's potentials. This is what is in evidence in the central development programmes, designed to ensure priority development first of all to the road vehicle industry, to computing industry, and to t electronics industry. In all these processes, manifest is a purposeful activity of Hungarian engineers, economists and businessmen, and the autonomous endeavours of enterprises fun - tioning within the framework of Hungarian economic management system.

THE IMPACT OF CO-OPERATION AMONG CMEA MEMBER COUNTRIES ON CAPITAL GOODS INDUSTRY DEVELOPMENT IN HUNGARY

1. Evolution of co-operation in capital goods industry among CMEA member countries and its role for the development of this sector in Hungary

1.1 Achievement of basic social and economic goals

In the first three decades of its socialist development Hungary has, on the basis of manifold international comparisons, achieved a medium level of development among the European countries and in relation to the developed world outside Europe. Being a country in the medium-positioned field is a significant result, taking into account Hungary's considerable backwardness prior to World War Two, which was inherited after the country's liberation and the victory of socialism.

The level of the per capita national income was quadrupled between 1950 and 1980, which marked passing from the state of underdevelopment to that of development. Industry became preponderant in the generation of the national income, the pattern of employment was transformed radically, there occurred a sudde

growth in the number of population employed in industry and services, the number of agricultural population decreased, a modification took place in the distribution between urban and rural inhabitants, urban settlements became preponderant.

In 1938 industry contributed to the generation of national income by 20 per cent, by 1980 this share exceeded 50 per cent. In 1938 300 thousand people were employed in industry, by 1980 industrial employment increased to 1 million 600 thousand people. The per capita national income was $ 124 in 1938, in 1980 it exceeded $ 2.000. In 1938 mechanical engineering accounted for 9.7 per cent of total industrial production, in 1980 23 per cent of total industrial production was made up of mechanical engineering products.

In 1938 industrial finished goods accounted for 28 per cent of total exports, in 1950 the corresponding share was as high as 85 per cent.

Prior to World War Two the Hungarian manufacturing industry was represented by some 200 companies, in 1938 about 40 major factories engaged in the manufacture of mechanical engineering products. Of them the Hungarian Railway Carriage and Machine Works manufactured vehicles, agricultural machines, Ganz diesel-system trains, motor trains, electricity meters, ships, Tungsram incandescent lamps. Over 50 per cent of the production of engineering industry was made up of agricultural vehicles, tractors, and other agricultural machines and equipment, on the other hand, modern electrical engineering was represented by just 15 per cent, and the motor industry by 5 per cent.

Coal production rose from 9.4 million tons in 1938 to 25.7 million tons in 1980, natural gas from 8 million cu.m to 6.127 million cu.m, electric power from 1.4 billion kw to 23.9 billion kw, steel production from 0.6 million tons to 3.7 million

tons, bauxite production from 0.5 million tons to 2.9 million tons, aluminium from 1 thousand tons to 73 thousand tons, cement from 0.3 million tons to 4.7 million tons.

The manufacture of radio receivers increased from zero to 281 thousand, that of television receivers came up to 420 thousand pieces, cotton fabric production grew from 146 million sq.m to 335 million sq.m, sugar production from 101 thousand tons to 468 thousand tons. Average wheat production increased from 1.37 tons to 3.55 tons per hectare, and maize production from 1.98 tons to 5.40 tons.

The per capita meat consumption rose from 33 kg in 1938 to 73 kg, and the number of those to whom health provision was extended grew from 31 per cent to 99 per cent. Nursery places having numbered 1.000 increased to 47.400.

The number of books published rose from 20 million to 70 million. The number of secondary school pupils increased from 52.000 to 375.000, that of university students from 12.000 to 133.000, of which the share of women grew from 15 per cent to 48 per cent.

This development was determined by the fundamental strategic objective of socialism: establishment of socialist relations of production, constant improvement of the standard of living of the population, enforcement of the socialist principles of distribution.

In the decade of the 1960s it became necessary to unfold more fully the previous tendencies of development. The economy's sources for extensive development became exhausted, solutions had to be sought for a progress in conditions of requirements for a higher level of development, it was in that period that the policy of détente unfolded, entailing a new chapter

of east-west economic relations.

In view of the results and experiences of previous corrections having gone into details, an essential improvement of the economic policy was realized in Hungary, with the goal of perfecting planned economy. And that goal was designed to be served by linking up the advantages of central planning with the beneficial effects of the market.

The transformation of the system of measures applied for the realization of the goals of economic policy has resulted in autonomy for the companies, in the necessity to take into account risks, in the possibility of making profits, in the establishment of a more flexible practice of planned economy. Foundations have been created for a system of measures which serves better an intensive development and a growth based on an increase in productivity and which creates particularly favourable conditions for technical and technological development.

For Hungary - which has a narrow domestic market, is not rich in natural resources, and features medium-standard qualitative indicators of production /productivity, technical level/ - it is made possible by an involvement in the international division of labour to realize production and specialization according to economical and up-to-date standards, through a continuous raising of the technical level.

In Hungary exports expressed in percentage of the ultimate consumptien achieve 54 per cent.

Our integration with the international division of labour is not a passive process but a consciously managed series of actions, which consider exports and imports as two connected sides of the integration with the international division of labour.

Hungary has achieved its results and wants to realize the

previously outlined goals and future tasks as a member of the CMEA. Our foreign trade turnover with the CMEA countries has increased from 1950 to the present day by more than 20 times. In the market that could be relied on in the phase of extensive development, special instruments prevailed, which were meant to provide for a trouble-free, systematic realization of transactions.

Evolution of major indicators showing economic growth between the years 1970 and 1980 /for detailed figures see annexes 1 to 13/

Considering an average for the decade of the seventies, the rate of economic growth was fast. Gross national production increased by an average annual 8.2 per cent. In speeding up growth, total imports were a significant factor all the time, showing an annual average growth by 10.9 per cent. Exports expanded essentially in parallel with it, at an annual rate of 10.8 per cent. However, taking growth globally, a significant involvement of external resources became necessary.

Ultimate consumption also scored a growth, by an annual 7.5 per cent. The evolution of its rate was affected by and large identically by personal consumption and the expansion of accumulation.

The 7.1 per cent average annual growth of the national income between 1970 and 1980 was a period of fast growth of the Hungarian economy.

A 1 per cent growth of the gross national product was matched in the seventies by a 1.25 per cent increase in exports and one of 1.24 per cent in imports, which marked a broadening participation of the country in the international division of labour. In terms of percentage of the ultimate consumption, exports increased from 43.8 per cent in 1970 to 54.8 per cent.

In the years between 1970 and 1980 a remarkable change took

place in the investments of the socialist sector. The proportion of investments in agriculture and forest economy experienced an essential moderation. Among the material branches more was spent, regarding the proportions, on transport and telecommunication, trade, water management purposes, without a decrease in the share of industrial-purpose investments.

Socioeconomic advance continued in the decade of the seventies. In ten years the per capita consumption rose by 37.8 per cent and the per capita real income by 35.4 per cent. Per 1.000 heads of population the number of refrigerators increased from 103 in 1970 to 293 in 1980, washing machines from 179 to 300, passenger cars from 23 to 89, television sets from 171 to 258. The stock of savings deposits of the households rose from 42 billion forints to 145 billion forints. The number of pensioners rose from 1.300.000 in 1970 to 2.018.000. The monthly average of pensions increased from 1.136 forints to 3.215 forints. The amount paid out on pensions rose from 12.9 billion forints in 1970 to 56.0 billion forints in 1980. While in 1970 167.000 women were on the mothercraft allowance list, in 1980 their number was as high as 254.000. The number of physicians for 1.000 heads of population was 22.7 in 1970 and 28.8 in 1980.

In that period the sources of fast growth became exhausted, thus further development was, and is, possible according to an intensive type only, primarily by increasing economic efficiency.

In that decade, whereas a changeover to the intensive phase of development became necessary, further burdens devolved upon the Hungarian economy from the changes of world economy. The world market price explosion - the drastic price rises of oil and other raw materials - decreased significantly, through foreign trade, the value of the national income, causing not a marginal but a structural deficit of foreign trade balance. Simul-

taneously with that, foreign market restrictions also strengthened.

Hungary's membership in the CMEA, the power of the socialist economic community made it possible to tone down the effect of the price explosion, to delay a propagation of it through Hungarian economy. However, the protection provided can only be of a temporary nature. Lasting import price rises, losses sustained in the international turnover cannot either domestically be offset for a longer time by budget allotments /in the years 1974 to 1976 70 billion forints were assigned to that purpose/.

The Hungarian economy must adjust itself to the changed conditions. For a country so much dependent on the international division of labour the impact manifesting itself through foreign trade is a major mediator towards a rational management of economy.

In accordance with the plan the economic regulators should orient the actors of the producing sphere to centring their activity round a faster increase of efficiency, round bringing this country abreast with much more advanced economies. The chief instruments of this in Hungary are:

- the introduction of a competitive price system, enforcing profit interestedness, in which the profit to be realized through the competitive prices makes greater differentiation among the enterprises;
- the enforcement of the principle of normativity, pressing back and elimination of production-related withdrawals and supports other than through prices;
- joint enforcement of stability and flexibility /flexibility in prices, stability in the conditions of income regulation, in the formation of funds, in the control of wages and salaries, in credit terms/.

The regulatory system has the responsibility to inform the actors of economic life everywhere and in every moment on what they should do in the interest of a realization of the fundamental economic policy goals.

1.2 Development of the capital goods industry between 1970 and 1980, in the conditions of limited resources and of limited domestic market

In 1980 the engineering industry was responsible for 23 per cent of the gross output of industry. This was achieved with 32 per cent of those employed in industry and 18 per cent of the fixed assets of industry.

The engineering industry invested 34.7 billion forints in 1970 and 70.2 billion forints in 1980. In the years 1971-75 it accounted for a share of 16.1 per cent of all industrial investments and in the period 1976-80 for one of 18.3 per cent. Of the total investments in the engineering industry those for machines increased fastest.

While in 1970 the engineering industry generated a gross production value of 80.8 billion forints, in 1980 the corresponding value was already 138.2 billion forints. The average annual growth was 5.5 per cent, which was slightly higher than that for the whole of industry /5 per cent/.

In the first five years of the period the rate of growth of the engineering industry's production was faster, averaging an annual 7.8 per cent, while in the second five years the annual average was 3.3 per cent. The values in current prices show well that the value of mining and chemical products increased fast as a consequence of the 1973-77 price explosion, marking also an increase in their share in the gross production of industry, whereas the value of engineering products rose much slower, indicating a relative devaluation.

In 1980 the engineering industry employed 516.000 persons,

which was 18.000 less than in 1970. In the industries taking the lead, such as the telecommunication and vacuum engineering industry, the instrument industry, the manufacture of electrical machines and equipment, there was a growth in employment by some 30.000 persons in the decade at issue, in the other industries, on the other hand, there was a larger-scale decrease.

The gross production per employed in the engineering industry rose in value from 151.000 forints in 1970 to 268.000 forints, which corresponds to an average annual growth by 5.8 per cent and marks a faster increase than was characteristic for the whole of industry /5.3 per cent/.

The stock of fixed assets per employed increased at an annual rate of 8.6 per cent, slightly faster than for the whole of industry /8.3 per cent/. In 1980, of the gross value of machines and equipment in the engineering industry the fully automated machines accounted for a share of 13.6 per cent, the partially automated machines for one of 37 per cent, and the machines operating on the mechanical principle for one of 48.5 per cent.

In 1980 85 companies out of 315 engineering industry companies applied 900 licences with a cost of 480 million forints, which resulted in a production value of 19.6 billion forints, corresponding to 8.9 per cent of all engineering industry production. The main buyers and users of licences were the industries of means of transport, electrical machines and apparatuses, and telecommunication and vacuum engineering.

1.3 Change of the structure of capital goods industry, quantitative and qualitative changes

In the decade of the seventies an above-average rate of development was achieved in the engineering industry by the branches of the means of transport and of the electrical ma-

chines and apparatuses, with the fastest growth having achieved by the telecommunication industry.

The indicators in kind of the major products also indicate that a significant transformation took place in production in this decade. The annual output of buses rose from 6.000 to 12.400 pieces. Truck production went back from an annual 3.800 units to practically zero. The manufacture of railway goods waggons was practically also abandoned. The value of computing technical products, equipment increased in this decade by 35 times. The production of control and regulation equipment grew more than threefold and that of electric rotary machines increased by more than 2.5 times. The number of units of diesel-powered road vehicles rose from 1.470 to 3.750. Machine tool manufacture decreased in volume, but the production of programmable machine tools incorporating more sophisticated intellectual values scored an essential development in t is period. The production of semi-conductor devices increased more than fourfold.

It is a favourable change in the development of industry that the manufacture of automation devices has also become significant, we have become a follow-up employer of techniques.

The development of rapid rate was not followed in every instance by a modernization of technology. Product renewal advanced faster than bringing to date the technological processes of production.

The Hungarian engineering industry has the characteristic that it had expressly oriented to the production of capital goods only, and this tendency continued to strengthen in the decade of the 1970s. According to the intended purpose of manufactured products, 19.5 per cent of all manufactured products were capital goods in 1970. By 1980 this share had grown to 22.1 per cent. At the same time the share of consumer durables

decreased from 5.2 per cent to 4.8 per cent. The Hungarian engineering industry oriented to a lesser extent to the manufacture of apparatuses and equipment serving direct uses by the households. It rather specialized in the production of equipment for the infrastructure, transport and post, and sanitary appliances. The fundamental deviation in a comparison with the industrially advanced countries follows from the fact that Hungary has not made arrangements for the manufacture of passenger cars, hence some 90-95 per cent of engineering industry production serves with its industry- and infrastructure-related products the manufacture of capital goods.

1.4 Development and re-structuring of foreign trade and international specialization, including co-operation with developing countries

The engineering industry oriented to the production of capital goods is, also because of the above reasons, in strong reliance on the international division of labour, and the relatively narrow internal market requires it to market abroad a considerable proportion of its output. Of all branches it is in this industry that marketing abroad accounts for the highest share and this shows an increasing trend. In 1970 30 per cent, in 1975 37 per cent, and in 1980 as much as 44 per cent of engineering industry products were sold abroad. The export potential of the Hungarian engineering industry developed considerably in the seventies. 1 per cent increase in production compared with 1.5 per cent increase in engineering exports. The participation in the CMEA integration, the economic co-operation established with the various countries and matched by a collaboration in researches, planning, production and marketing promoted to achieve advantages following from mass production, savings following from specialization, and to result in rational costs of production.

Besides, the engineering branches achieved development in the fields where it was made possible - in addition to the available technical bases - by the special training of the labour, our educational, planning and research background, and our production traditions.

Taking into account the exports and imports of all manufactured products, in 1971 Hungary was in need of manufactured products imports. The surplus imports becoming necessary of manufactured products was made possible, in general, by surplus exports of agricultural produces, and in various years by an involvement of external funds. For this industrial-agrarian country it became possible in this way - thanks to the surplus imports of up-to-date manufactured goods - to maintain the process of economic growth.

A determining role was played in this by the co-operation within the framework of the CMEA: in the export turnover handled with the centrally planned countries the value of engineering production rose from 46 per cent in 1971 to 53.2 per cent in 1980 /in terms of money: from 28 billion forints to 73 billion forints/.

Our engineering exports going to the developing countries and to the market economy developed countries grew from 5.5 billion forints in 1971 to 23.6 billion forints in 1980, with their share rising in 10 years from 17.8 per cent to 23.3 per cent in total exports.

The value of engineering products sold in the market economy developed countries and in the developing countries more than quadrupled in 10 years. In this period the highest rate of growth was achieved by the engineering industry, on the other hand, its share in the export pattern, because of a start from a relatively low base, expanded to but a modest extent within the total turnover.

In the decade of the seventies significant structural changes could be observed, relying on observation data compiled on the basis of classification of manufactured products, in the export and import turnover of engineering products.

billion forints, free border

	Machines, mechanical equipment			Means of transport, telecommunication, instrument industry products		
	1971	1976	1980	1971	1976	1980
Exports	8.9	20.5	24.0	18.6	35.6	49.3
Imports	16.9	14.0	20.5	13.9	23.9	35.6
to/from centrally planned countries						
Exports	0.9	3.9	3.6	3.6	3.8	7.0
Imports	0.01	0.1	0.1	0.1	0.1	0.2
to/from developing countries						
Exports	0.8	2.1	4.9	2.0	4.7	8.1
Imports	8.1	16.3	20.6	5.7	9.7	14.5
to/from market economy developed countries						

In the decade at issue the exports of machines and mechanical equipment to the centrally planned countries trebled, although in the same group of products imports were still 100 per cent higher than exports in 1971. In 1980 the value of Hungarian exports was already 20 per cent higher than that of imports. The exports of machines common to all branches also more than doubled in 10 years: in this group of products the diesel engines for road vehicles accounted for a share of 1.5 per cent in 1971, whereas their exports in 1980 came up to 28 per cent of the total of this group of products.

There was a fast expansion in the exports of mining, metallurgical and building industry machines, having grown from 320 million forints to 1.550 million forints. In this period the exports of rolling mill equipment accounted for one third of the turnover in this group of products, though in 1971 still no delivery took place of them.

In the exports of chemical industry machines and equipment the value of lacquer and dye industry machines rose from 100 million forints in 1971 to 660 million forints, and the value of rubber and plastics processing machines increased from 55 million forints to 228 million forints. The exports of light industry machines also scored a fast growth, having increased by about two and a half times in 10 years. Within this group, the exports of spinning and weaving mill machines and equipment increased tenfold.

Among the food industry equipment a tenfold increase was achieved in this period in the exports of slaughter-house equipment and meat industry processing machines, furthermore of canning industry machines and equipment.

An over sextuple expansion occurred in the exports of tractors and agricultural machines, within which those of machines and equipment for animal raising purposes increased from 80 million forints to 1.800 million forints, and those of tractors and agricultural implement carrying machines rose from 112 million forints to 1.660 million forints.

The exports of means of transport to the centrally planned countries trebled and accounted in 1980 for 17.8 per cent of all engineering exports. The most important products responsible for the growth were road vehicles, diesel-powered buses, running gears for road vehicles, and floating cranes.

The intergovernmental agreements concluded with the centrally planned countries and including a five-year schedule

broken down year by year, and the export delivery commitments indicated in the quotas serve to determine the conditions of an expansion of turnover. The specific engineering industry quotas, delivery commitments are drawn up on the basis of the concluded specialization and co-operation agreements. The volume of turnover and the expansion of assortment that can be assessed beforehand make it possible for the manufacturers to realize, in view of the combined demand of the centrally planned countries, economic advantages following from a large-series production of individual manufactured goods.

Within imports from the centrally planned countries the value of machines and mechanical equipment rose from 16.9 billion forints in 1970 to 20.5 billion forints in 1980. Their share in comparison to total imports decreased considerably as the result of a fast growth of domestic production. On the other hand, a remarkable restructuring of the groups of products was also to be observed within the machine imports from the centrally planned countries. The imports of power machines common to all branches increased from 49 million forints in 1971 to 1.900 million forints, corresponding to an almost forty-fold growth. At the same time, our imports of boilers and heat power stations practically came to an end. The imports of air blowers suitable for heating and cooling increased tenfold /from 22 million forints to 217 million forints/, while those of transport means grew by 6.5 times.

A spectacular development occurred in the export and import turnover of the means of transport with the centrally planned countries. Between 1971 and 1980 Hungary's bus exports trebled, thanks to specialization agreements concluded with the centrally planned countries. The central programme of vehicle development - approved by the Government - made possible an expansion of bus manufacture commensurate with the demands and

a manufacture of subassemblies and co-operation in the road vehicle industry. Within the framework of the latter the Hungarian engineering industry specialized in the manufacture of running gears and certain sizes of diesel engines. Camion manufacture was introduced in Hungary, on the other hand, the production of trucks as end product was practically abandoned, and the different sizes of trucks are now bought from centrally planned countries. Also in truck manufacture we specialized in the production of subassemblies within the CMEA.

The central development programme for computing technique essentially created, likewise on the basis of international specialization and co-operation established within the CMEA, a domestic specialized manufacture, and it was on that basis that export and import turnover developed. It was made possible by the programme for computing technique that the exports to the centrally planned countries of equipment serving an automated control of various industrial equipment rose from 300 million forints in 1971 to 4.5 billion forints, which was a fifteenfold increase.

In the period between 1970 and 1980 a number of product groups played an important role in the development of Hungarian exports. Such were e.g. direct current machines, machine switching telephone exchanges, carrier frequency transmission technical equipment and other transmission technical devices, transistors, furthermore various products of laboratory equipment, optical information displays, and information printers. A similar process occurred in the product pattern of imports from the centrally planned countries: a significant increase took place in the shares accounted for by power machines, Otto vehicle engines, hot air blowers, equipment suitable for heating and cooling, means of conveyance, mechanical equipment serving mine sinking, deep-drilling equipment, earthwork machines and

surface treatment machines. It was already mentioned that our imports of passenger cars, motorcycles and road vehicles scored a fast growth, those of railway goods waggons rose in ten years from 112 million forints to 1.263 million forints, diesel locomotive imports quadrupled, those of wire and wireless telecommunication equipment were created during that period and achieved a value of 6.5 billion forints, the imports of TV picture tubes quadrupled, and those of digital computing, organizational technical and telemechanical units were likewise created during that period and achieved some 800 million forints by 1980.

The evolution of the exports and imports of engineering products in relation to the centrally planned countries is shaped to a considerable extent by the specialization and cooperation agreements established within the frameworks of the CMEA, permitting the establishment, thanks to the conclusion of bilateral and multilateral agreements, of a rational division of labour between the individual countries.

Within total engineering exports, the turnover of engineering products handled with the developing countries and the market economy developed countries rose from a share of 16.5 per cent in 1971 to one of 24 per cent in 1980. The value of engineering exports increased from 5.4 billion forints to 23.6 billion forints.

billion forints, free border

	1971	1976	1980
Engineering products			
Total exports	33.0	75.0	97.0
To developing countries	2.7	7.7	10.6
Percentage of total exports	8.1	10.3	13.6

To market economy developed countries	2.8	6.8	13.1
Percentage of total exports	8.4	9.1	13.4

In the first five years of the seventies the engineering exports going to the developing countries scored an extremely fast growth, having trebled in five years. In the years 1976-80 the intention and possibility of purchases of the countries not in possession of oil and of significant reserves of mining products for extraction and processing, furthermore of basic materials, moderated considerably. They were also seriously affected by the oil price explosion and its consequences. Competition became extremely keen in the developing countries having capital and wanting to pursue industrialization, since also the market economy developed countries tried to offset the unfavourable impacts having affected them mainly by sales of up-to-date engineering products.

Despite all this, the share of engineering products sold in the developing countries did not show any decline within total engineering exports. In various major product groups the turnover was dynamic even in that period: for example, the turnover of engineering products sold to the extracting industries and basic materials manufacturers grew from 15 million forints to 326 million forints. The exports of agricultural and food industry machines rose from 5.6 million forints to 306 million forints and those of the means of transport from 0.9 billion forints to 2.7 billion forints. The exports of electrical equipment and apparatuses increased eightfold, those of telecommunication equipment more than quadrupled. The exports of medical and therapeutical products increased from 168 million forints to 263 million forints. Instrument exports scored a treble growth in 10 years.

The engineering exports sold in the market economy developed countries showed a remarkable expansion: while in 1971 they accounted for a share of 11 per cent of all manufactured exports, in 1976 the share already amounted to 14 per cent and in 1980 to 16.8 per cent.

In consideration of international experiences, the expansion of total exports achieved in a number of product groups can be considered as outstanding. The exports of machines common to all branches increased by more than thirty times in the decade of the seventies, those of agricultural machines and equipment grew 18-fold, and those of medical and therapeutical equipment decupled. The exports of electrical equipment and telecommunication devices experienced a 400 per cent growth. Those of the means of transport having been significant also at the beginning of the decade sextupled in 10 years. The exports of control technical products - starting from a low level - could be increased more than fivefold.

1.5 Increase of economic efficiency in the capital goods industry

The engineering industry value added /GDP/ increased in 10 years by 2.3 times, with its average rate having been much faster than the rate of growth of gross production.

In the process of realization of the endeavour to improve efficiency, a priority role was played by the effort to come to a rational replacement of labour, and namely by mechanization of the hard work processes, a faster expansion of the proportion of semi- and fully automated machines and equipment, and employment of up-to-date manufacturing technologies resulting in labour saving. As a result of all this, the number of workers necessary for the generation of gross production of 1 million forints' worth decreased in the decade of the 70s from 6.6 to 3.7 in the engineering industry. At the same time,

the stock of fixed assets necessary for the generation of 1 million forints' worth of gross production value increased from 661 thousand forints to 1 million 111 thousand forints. The changeover to the phase of intensive-type development of economy, its process of realization was marked by the change having taken place in the engineering industry in the 70s. This tendency applied to the special branches belonging to the engineering industry. In the dynamically developing special branches this change took place faster than the average.

An improvement of the efficiency of engineering industry is indicated by the fact that the net income+/ originating in this industry rose from 21.8 billion forints achieved in the first year of the decade to 54.8 billion forints in the last year of the decade.

In the special branches of manufacture of means of transport, of telecommunication and vacuum engineering, and of instrument industry, the amount of net income almost trebled.

An improvement of efficiency is indicated by the change of net income and profit per 100 forints' worth of assets and wages paid out, respectively.

The net income earned on the assets used and on the wages paid out increased in the engineering industry between 1970 and 1980. The profit, especially that made on the wages used, also showed an increase. As a result of the implementation of development programmes supported by the Government, the indicators of the affected special branches, thus those of the manufacture of means of transport, telecommunication and vacuum engineering, and instrument industry, shaped more favourably than the average.

+/ net income = on the national economy level, the new value minus the wages

The efficiency of the engineering industry was much more favourable than that of the whole of industry. In the decade of the seventies this continued to improve in favour of the engineering industry. The indicators showing the efficiency of each of the special branches of engineering were more favourable than the average for the industry.

2. Institutional system of CMEA and its impact on the member countries' co-operation, with special regard to the development and production sharing of capital goods

The Council of Mutual Economic Assistance entered the fourth decade of its existence. It is an indisputable fact that the historically first international organization for economic and technical and scientific co-operation of the community of friendly countries building the socialist and communist society has stood the test of time. The activity carried on within the framework of CMEA has contributed considerably to the fact that in the past three decades the member countries' economy experienced a massive development, the economic potential of this group of countries has increased, their positions in world economy have become stronger.

The fundamental objectives of co-operation are contained in the Charter /1959/, in the "Basic Principles of International Socialist Division of Labour" /1962/, in the "Comprehensive Programme for the Further Extension and Improvement of Co-operation and the Development of Socialist Economic Integration by the CMEA Member-Countries" /1971/, and in other CMEA documents.

The CMEA is an open organization, which means that all those countries may join the CMEA which adopt the objectives and principles of CMEA and undertake the duties laid down in the Charter.

One of the most important basic principles of the functioning of CMEA is the observation of the state sovereignty and equal rights of the member states. In the organs of CMEA the passing of resolutions requires an understanding by all interested member countries. Concerning the CMEA countries these organs only adopt recommendations, which are in force for the given countries if they are confirmed on the government level. Higher CMEA organs can, on the other hand, pass obligatory resolutions

for the work of CMEA bodies functioning on a lower level. In the practice of the CMEA a system of mutual agreements is also in force, which agreements, in case of understanding, are put in writing by the heads of the interested bodies. The force of recommendations and agreements does not extend to the states which announce that they are not interested in the given question. This, however, does not exclude the joining of any state at a later date.

The representative bodies of the CMEA are: the Session, the Executive Committee, standing commissions, conferences. In support of the representative bodies of the CMEA, working parties and experts' meetings are operated. In the whole activity of the CMEA an important role is played by the Secretariat of the CMEA, which is headed by the secretary of the CMEA as a person of identical rank with the representative bodies.

The Session /known also by the names General Meeting, Council Meeting/ is the supreme directing body of the CMEA, in which government delegations appointed by the Governments of the CMEA member states participate, usually headed by the prime ministers of the individual countries. The Session considers the most important issues of international economic, scientific and technical co-operation; determines the main directions of activities for the CMEA bodies; identifies the short- and long-term objectives of co-operation; decides on calling into being new CMEA bodies; decides on the admission of new members and on the forms of participation of non-member-states; decides on any necessary modification of the Charter and other normative documents etc.

The Executive Committee is the executive body of the CMEA. It is the responsibility of the E.C. to direct operatively the work of multilateral co-operation carried on in the CMEA bodies, to control the implementation of the recommendations made

and the resolutions adopted; to prepare the session. In the Executive Committee the member states are represented by their deputy prime ministers responsible for international economic co-operation.

Within the framework of the CMEA three co-operation committees are operated: the Committee on Cooperation in Planning, the Committee on Scientific and Technical Cooperation, and the Committee on Cooperation in Material and Technical Supply. Within their scopes of activity, these committees concern themselves with issues covering practically the whole of the national economy. In the Committees on Cooperation the member countries are represented by the heads of the competent state offices, deputy prime ministers, ministers.

The CMEA Standing Commissions are concerned each with a specific branch or functional special domain of the national economy. At the meetings of the Standing Commissions each member state is represented by a government delegation, usually headed by the minister or deputy minister in charge of the branch or special domain at issue.

The Secretariat of the CMEA is composed of departments, which correspond to the arrangement by cooperation committees, standing commissions and conferences, and in addition to their economic, analyzing tasks they also see to the secretariat tasks of these bodies.

Currently the CMEA has three international scientific institutes: the Institute for Standardization, the International Institute of Economic Problems of the World Socialist System, and the International Scientific Research Institute for Issues of Management.

2.1 The basic method of economic co-operation

The basic method of economic co-operation among the CMEA member countries is co-operation in planning. In the CMEA countries' co-operation in planning manifest is an impact follow-

ing from the autonomous socialist proprietorship of the individual member countries, from the often deviating factors of interestedness.

The co-operation in national economic planning has become multifarious, featuring consultations on economic policy, co-operation in prognostication, co-ordination of long-term and five-year plans, exchange of experiences on methods of national economic planning and management etc. A particularly great role is played by the consultations on economic policy, within the framework of which the countries inform one another on the rate of development of national economies, on the fundamental trends and envisaged changes, on the ideas about the main areas and modes of international co-operation. Likewise important is for co-operation the co-ordination of long-term plans, on the basis of which agreements are established in the most important branches and topics on the large-scale co-operation influencing considerably development in a longer period and affecting fundamentally the structure of national economies.

Within the framework of the co-ordination of five-year plans the possibility is offered for the countries to ensure satisfaction, on the basis of mutual advantages and by means of mutual efforts, of their needs of raw materials and basic materials, machines and consumer articles. In this way, markets are created for placing their products.

Prior to the approval of their five-year plans, the countries mutually inform each other on a bilateral basis: regarding their major economic development directions they identify the set of problems expecting joint solution, point out the possibility of this and the different modes of it /specialization and co-operation in production, joint investment, scientific and technical co-operation, volumes and scheduling of mutual goods deliveries etc./.

The bilateral and multilateral international co-ordination of plans is concluded by the signing of bilateral intergovernmental protocols, which is done by the heads of the National Planning Offices. It is laid down in these protocols, for the whole of the five-year plan period and broken down by the year, what volumes and values are to be supplied by the individual countries to each other of such major products as fuels and raw materials, manufactured articles, agricultural produces etc. The co-ordination is also concerned with the harmonization of mutual goods deliveries. In addition, on the basis of the co-ordination of plans, the countries conclude agreements on co-operation of great significance. Such are e.g. those on the "Friendship" oil pipeline and "Alliance" gas pipeline important from a collective viewpoint, the Hungarian-Soviet agreements on respectively alumina and aluminium, and motor industry co-operation having significance from the viewpoint of the two affected countries, and so on. These co-ordinations of plans do not affect the entire scope of goods deliveries. They cover the commodities being of decisive significance for the national economies of the countries and from the viewpoint of mutual relations.

Following the co-ordination of five-year plans, the foreign trade organs of the countries conclude long-term, five-year agreements on mutual supplies of goods.

A deepening of integration is served by the so-called "target programmes" envisaged in the producing branches of the member countries and elaborated for co-operation tasks of great significance.

At the 32nd Session of the CMEA /1978/ three, and at the 33rd Session /1979/ two more target programmes were approved by the member states. They related to:

- the energy, fuel and raw material industries,

- the engineering industry,
- the development of agricultural and food industry co-operation,
- the development of communications and transport,
- the production of manufactured consumer articles.

The goal of target programmes is to satisfy better the needs of the countries, to utilize with joint efforts and rationally the natural resources of the countries, to pool the material, financial, intellectual and labour resources, to develop the priority branches, and to enhance their technical standard, on the basis of an effective international division of labour /specialization, co-operation/.

In the collaboration among the CMEA member countries a special emphasis is laid, in the domain of capital goods, on the other main method of collaboration: international specialization and co-operation.

In the CMEA countries specialization in production is generally understood as a process in which the resources of production are systematically concentrated on the manufacture of specific products /of identical nature technically and constructionwise/ and the individual countries /or their companies/ undertake specialization in them.

This process usually results in a lasting production sharing of finished products, which, thanks to economies of scale, ensures more economical conditions for meeting needs by up-to-date products. It may occur that specialization is not introduced for the manufacture of end products but for the production of major subassemblies or parts. In such cases these become independent domains of specialized production. Consequently, international specialization means the concentration in one or several countries of products of the same sort, with the purpose of satisfying the needs of the other interested countries, too. Among the countries stable economic relations get

thus established, on the basis of which production relations come into being between the countries or their companies.

In the past mainly agreements on specialization in end products have been brought into being in the CMEA. This process is being replaced more and more by a co-operation on specialization in parts and subassemblies, primarily for equipment and machine systems. This more advanced form of production co-opertion, in view of its spreading on a wider scale, is changing the foreign trade pattern of the individual countries.

In the specialization practice of the CMEA Standing Commission on Machine-building, the conclusion of agreements on specialization between companies has come to the fore in addition to the recommendations for specialization. The leading organs of the CMEA countries have recognized that unfolding direct relations among the interested companies, developing the activity of international specialization and co-operation not only on the intergovernmental level but also by the use of private law frameworks /in relation to sanctions, agreements on prices, terms of delivery, technical requirements etc./ - including an establishment of more direct ties between manufacturers and users and the requirement of taking responsibility - is a condition of the advance of international specialization.

The Hungarian economic management unambiguously gives preference to company relations. The Hungarian companies have the right to decide whether they want to participate in a specialization prepared on the intergovernmental level, and if so, they sign the contracts on specialization. The parties to a contract may be producing, trading and user enterprises and foreign trading companies jointly or separately.

Also in this form, the contracts on specialization - though laid down according to private law regulations - are framework

agreements, which do not replace commercial sales contracts for the products to be delivered on the basis of specialization.

The intra-CMEA production co-operation has a favourable impact also on the unfolding of trade with the market economy countries. Thanks to the production co-operation, the increase of the CMEA countries economic potential and particularly of their export potential creates favourable conditions for the development of foreign trade with the non-centrally planned third countries, for its growth in quantitative terms and for enhancing the qualitative standard of the products delivered. The systematic production co-operation among the CMEA countries enables the production of factory equipment, complex systems, for which a great demand can be reckoned with on the markets of the developing countries. No doubt, an increase in the productive capacity of the CMEA countries improves the possibilities of co-operation with companies of the non-centrally planned countries.

2.2 Scientific and technical co-operation

In the international co-operation proceeding in the field of capital goods, a very great role is played by both scientific and technical co-operation and co-operation on unification and standardization.

In the last ten years the scientific and technical co-operation of the CMEA member states - previously having been characterized almost exclusively by bilateral relations - has been featuring an endeavour to promote multilateral co-operation.

Scientific and technical co-operation is concentrated primarily on an implementation of the 18 large-scale target tasks envisaged in the Comprehensive Programme. In the course of their scientific and technical co-operation the organizations of the CMEA member states annually bring to conclusion some 300 works having significance of their own. A considerable part of the works completed relate to instruments, apparatuses, various

equipment and technologies, and the processing of specific materials.

At present close to three thousand scientific research institutes, organizations and companies concerned with designing and construction activities, and institutions of higher education are involved in the scientific and technical co-operation among the CMEA countries. Some 150-160 bilateral co-operation agreements are in force on the governmental and company levels, relating to over 2300 topics.

The CMEA member states' co-operation expanded in the field of education and development of scientific cadres, too. In the last ten years the friendly countries mutually received some 6000 aspirants to candidate's degree, and the number of those received for professional training amounted to 22.000.

The activity carried on at the different research places of the CMEA countries can be classified into basic researches, applied technical researches, and developments.

In the field of capital goods, machine manufacture, of fundamental significance is the co-operation relating to applied researches and developments.

The forms of co-operation can be grouped according to whether co-ordination, co-operation or joint activity takes place within their frameworks.

- In the case of co-ordination the technical researches /designing, construction, experimental works/ are carried out by the individual national organizations of the CMEA member countries, according to a programme multilaterally co-ordinated within the framework of the CMEA, on the basis of self-drawn-up plans of work, relying on their own material and intellectual resources.
- In the case of co-operation the technical researches are carried out on a shared basis laid down in relevant agreements,

on the basis of contracts concluded by the topic, and possibly by proportionate financing.

- In addition to co-ordination and co-operation, the different normative documents of the CMEA mention as a third form of collaboration, having most prospects, the operation of international scientific research collectives, institutes carrying out joint researches and functioning with a temporary or permanent character. In the course of the last 8 years the CMEA member countries brought into existence two international collectives of scientists, two international laboratories, a scientific producing association and four economic associations carrying out - in addition to economic co-operation - also technical researches, furthermore four international research institutes.

Unification and standardization /hereinafter: standardization/ is an integral part, an indispensable and effective means of the world's scientific, technical and economic development.

In consequence of an acceleration of scientific and technological revolution, of a broadening of world economic relations and of those among the CMEA countries, international standardization has gained in significance, the requirements set for it have changed. International standardization has become a decisive precondition of an expansion of production co-operation in all relations of collaboration. That is why the CMEA countries - besides having memberships in the world organizations and strictly complying with the standards there adopted - have decided to call into being the socialist community's own international standardization system. The main guiding lines of the system call for:

- a complex determination of the technical requirements set for the "specialized" products introduced in foreign trade /formulation of standards for products/;

- a unification of the terminology and of the methods of measurement and computation used in the technological activity;
- bringing closer to one another the different documentation systems current in the individual CMEA countries;
- the establishment of an automated information management system of standardization and metrology for the CMEA countries, etc.

International standardization among the CMEA countries took place for a long time - similarly to the specialization of manufacture - by way of "recommendations". In the practice of co-operation a turning-point was marked by the entering into force of an intergovernmental agreement on the "CMEA Standard" /1975/. The "CMEA Standard" is a basic technical normative document for standardization, whose direct employment is obligatory for the signatories to the agreement in their scientific and technical and economic contracts. By the end of 1980 the elaboration of some 1.500 CMEA standards had been completed.

3. Basic results of co-operation in capital goods in Hungary

3.1 Centrally planned countries

3.1.1 International co-operation in production

From the viewpoint of the development and manufacture of capital goods, of primary importance are the cooperation deals of the engineering industry.

In the engineering industry the manufacture of a number of large-series products has been organized by means of co-operation:

- As a result of CMEA co-operation, with an annual output of 12.000 units Hungary's bus manufacture ranks today among the leaders in Europe. About 90 per cent of the Hungarian buses are sold in the CMEA countries.
- Outstanding results have been achieved in Hungary in the manufacture of vehicle rear axles, too. There is no factory in Europe which would turn out more than an annual amount of 20-30 thousand pieces; production in Hungary, on the other hand - as a result of specialization and co-operation agreements in the vehicle industry - exceeds today an annual amount of 100 thousand pieces.
- Well-known is the supply of Soviet Lada-brand passenger cars

within the framework of a multilateral division of labour. In the implementation of the programme forming the backbone of the centrally planned countries' passenger car manufacture Hungary also takes an active part, by the supply of instrument boards, car radios, door and steering-gear locks, windscreen wiper motors, ignition and other electrical equipment.

- In the field of telecommunication products the economies of scale established on the basis of orders from the Soviet Union and other centrally planned countries have made possible - particularly with regard to components and subassemblies - the introduction of the most advanced technologies in several domains. Currently the Hungarian production of telephone exchanges comes close to the annual outputs of Europe's largest companies active in the same line. Considerable results have been achieved in the joint development of microwave telecommunication networks, too. In the last 10 years the "Friendship" and other telecommunication systems have spread on a wide scale and proved good in the centrally planned countries.

In the 1980 exports of engineering product groups the products delivered on the basis of international specialization and co-operation agreements accounted for the following shares:

- metal working machines and equipment	36 %
- power engineering and electrotechnical equipment	39 %
- mining, metallurgical and oil industry equipment	20 %
- lifting devices and conveyors	81 %
- chemical, paper and building industry equipment	26 %
- tractors, agricultural machines	44 %
- vehicles	60 %

In 1980 the share of products in total exports supplied on the basis of specialization and co-operation agreements achieved 44 per cent.

Multilateral agreements have been established in relation to, and on their basis mutual turnover is going on of, motor and tractor industry machines, plastic and rubber industry processing equipment, machines of the unified computer system, ball bearings and bearing parts, radio parts and components, agricultural machines and tractors, building industry machines and equipment, cooling towers, manufacture of isotope products, mining machinery and equipment, technical equipment for trade, hydraulic equipment, trucks, container transport systems, garage industry equipment, refrigerators, food industry machines, light industry machines, railway goods waggons, vehicle industry main units and subassemblies, electric motors, turbogenerators, hydrogenerators, cable products, machinery for respectively laundries, printing trade, ready-to-wear industry, power engineering equipment, products of the machine tool industry, forging presses, lifting devices and conveyors, telecommunication equipment, voltmeters and measuring instruments, nuclear instruments.

The turnover of products manufactured under international co-operation and specialization schemes and handled on the basis of bilateral agreements is varying by country. It covers lots of models of computing technical equipment, medical instruments and apparatuses, cash registers, semiconductors, oil industry equipment and apparatuses, industrial fittings, road vehicle subassemblies, passenger car components, machine tools, chemical industry apparatuses, asphalt mixers, agricultural machines, therapeutical equipment, railway safety appliances, discrete semiconductors, integrated circuits, ignition motors, signal switches, mounting cranes, machines for plant protection, automation elements, heating equipment, rubber and plastic industry machines, computing technical devices, complete laboratories for agricultural and food industry purposes, building and road construction machines, colour TV sets, nuclear power

station equipment, weaving machines and finishing units, isotopes, technical equipment for trade, buses, air-conditioning equipment, electronic products, rotary capacitors, small machines for gardening, electronic measuring apparatuses, dampproof low-voltage apparatuses, mechanical balances, rotation cultivators.

The international specialization and co-operation in the field of capital goods carried on with our largest CMEA partners shows, by way of example, the following picture.

Within the framework of Hungarian-Soviet economic co-operation 36 agreements on co-operation and specialization are in force. Between 1976 and 1980 the Hungarian exports directed to the Soviet Union included specialized products with a share of about 33 per cent and Hungarian imports with one of 20 per cent.

In this relation the agreements on production specialization and co-operation mostly cover a period longer than five years. Outstanding are among them those on a division of labour relating to the motor industry - particularly bus manufacture -, ships and ship equipment, portal cranes and equipment making them complete, building industry machines, tractors and agricultural machines, rubber and plastic industry machines, telecommunication and computing technical equipment.

The Hungarian-Soviet production-related division of labour in the field of capital goods contributes considerably to permitting the employment of a selective industrial policy in this country. Mention should be made at the same time also of the other side - of very great significance for Hungary - of this process of division of labour, namely of the impact the machines and equipment supplied from the Soviet Union to Hungary have on the Hungarian economy. Soviet imports enable an almost complete covering of Hungarian demands for various equipment, thanks to which the Hungarian industry can concentrate resources

on the manufacture of other products. In this context above all the imports of passenger cars, building and road construction machines, sea-going vessels, several models of agricultural machines, and electronic components can be highlighted.

The co-operation carried on in the field of capital goods plays an outstanding role also in the division of labour between Hungary and Czechoslovakia.

On the basis of the commodity volumes handled in 1980, the agreements on production specialization and co-operation concluded on bilateral and multilateral basis were concentrated, from the viewpoint of Hungarian exports, on the following product groups: road vehicles and their main units and subassemblies, telecommunication and electronic products, instruments, automation and various process control devices, agricultural and food industry machines and equipment and their accessories.

Thanks to 20 bilateral contracts on production co-operation in the field of engineering industry, some 40 per cent of the mutual machine turnover was made up of specialized products.

Some traits of specialization and co-operation relations between Hungary and the GDR

Also in this relation it is more and more the products manufactured under specialization and co-operation schemes that are becoming the vehicle of mutual turnover. In 1980 specialized products accounted for a share of about 30 per cent of the total turnover and for one of almost 50 per cent in the turnover of engineering products.

Within the above, of outstanding importance are the agreements on specialization and co-operation relating to road vehicle manufacture, telecommunication and instrument industry on the side of specialized machine exports, whereas in specialized imports the agreements relating to the manufacture of

building and road construction machines, of agricultural machines, and of oil industry equipment are to be highlighted.

Co-operation between big producing plants has also been going on for several years and continues expanding. A few examples:

The GDR manufactures large series of the E-512 and E-516 combine harvesters and covers also the Hungarian needs of them. Hungary supplies for these combines the belt elevators and the engines. The agreement on research and development concluded with the GDR firm Fortschritt related to the development of adapters necessary for the GDR-made self-propelled corn and fodder harvesters. The co-operation on development carried on between MOM /Hungarian Optical Works/ and the Zeiss Works has resulted in, e.g., LEUKOMOM, which is currently one of the world's most advanced instruments for whiteness measurement.

3.1.2 International co-operation in scientific and technological fields

Hungary systematically concentrates the research and development activity primarily on the medium- and long-term research-intensive tasks, the solution of which is particularly important for the achievement of fundamental socioeconomic objectives and for which the country is in possession of suitable intellectual and material capability. These research and development tasks are identified by the national long-term plan for scientific research.

In addition to an application of the results of domestic scientific research, Hungary consciously makes use, for its socioeconomic development, of the scientific and technical knowledge attained in other countries. For the development of Hungarian industry and for the solution of the tasks of scientific research, of outstanding significance is the co-operation with the socialist countries. Several tasks of economic development have been solved here on the basis of achievements taken over from some of the centrally planned countries.

Soviet designs and equipment have been used for the construction of, among others, the Danube Iron Works, the Debrecen Roller Bearing Factory, the Székesfehérvár Light Metal Works, and lots of facilities for Hungary's chemical industry. Close scientific and technical co-operation has been established with the GDR in the field of chemical industry and agricultural machines manufacture, with Czechoslovakia in the development of power engineering, and with Poland in the domain of synthetic fibres manufacture.

- The Ganz Electric Works and the Leningrad Elektrosila Factory have achieved results in the development of various power current equipment, such as e.g. hydrogen-cooled turbogenerators and synchronous compensators;
- In co-operation with the Saransk Research Institute for Light Sources the Tungsram United Incandescent Lamp Factory has developed an automated standard lamp assembly line with a capacity of 3500 pieces per hour, and in progress is a joint elaboration of a fluorescent lamp assembly line with a capacity of 2500 pieces per hour;
- With the co-operation of the Soviet Union a VVER type experimental nuclear reactor has been constructed in Budapest, where joint researches are carried out by international research collectives of specialists of the CMEA countries;
- Jointly with Soviet organizations the Labor Instrument Industry Works has developed a family of complete agricultural laboratories, which are indispensable in modern agricultural production;
- Within the Hungarian-Polish scientific and technical co-operation results have been achieved in the Bizon-Gigant co-operation relating to the industry of agricultural machine and in the development of lucerne driers;
- In the co-operation with the GDR results have been produced

primarily in the research and development works relating to a perfection of various technological processes, a rationalization of production, material and energy saving, and an improvement of quality and exportability;

- In the Hungarian-Bulgarian scientific and technical co-operation success has been achieved in the development of various medicobiological devices and in the joint development of door phones.

In the interest of producing products on high technical standards, scientific and technical co-operation is linked with production co-operation /specialization and co-operation/. Thus in recent years such results have been produced in the field of the development and manufacture of computing technical devices, in the development of welding techniques and equipment, in the research and manufacture of medicobiological instruments and equipment etc. as have made possible a satisfaction of practical needs, a more efficient management of the national research and development capacity. A successful work has been carried on since 1972, by a collective of scientists, in the subject of reactor physical researches, for which the Central Research Institute for Physics is available in Hungary.

In the interest of gradually closing the gap between and equalizing the levels of economic development of the centrally planned countries, we have assisted in the past and will assist in the future, by handing over our scientific results and experiences, the centrally planned countries in need of such assistance. In Mongolia Hungarian specialists participate in the work of an International Geological Expedition; we have provided assistance for the establishment of a clothing factory and of a vaccines complex; for the setting up of a genetic, a radioelectronic and a lubricant testing laboratory, for the establishment of a milling industry and the training of specialists

for it. Hungarian specialists carried on geological surveying in the Republic of Cuba and provided assistance for the setting up of a Central Geological Documentation Department. In Vietnam a Hungarian team of bauxite prospecting specialists was on assignment, technical assistance was provided for the establishment of a spinning mill and for the modernization of agriculture, and assistance was rendered also for the development of the health network and supply.

3.2 Co-operation with developed market economy countries

The relations established with the developed countries play a significant role in Hungary's international production, scientific and technical relations, and are of particular significance in the manufacturing branches of capital goods. Industrial co-operation and joint venture are an important issue in east-west economic relations. In the engineering industry turnover established with the market economy developed countries a considerable role was played, in the exports of profit-earning products of competitive technical standard, by 81 engineering industry co-operation cases.

In the manufacture of capital goods an increasing significance is being gained in Hungary by the purchase of licences and know-how from other countries. This field of co-operation cannot be considered an independent one, as it is in close relation with production co-operation and scientific and technical co-operation. There is an increase year by year in the number of intellectual properties bought abroad: while in 1958 just a few licence and know-how purchases took place, today their number amounts to several hundred.

In the past decade the recognition has more and more caught on in Hungary's national economy that it is necessary to expand the trade in licence and know-how and to find ways and means for their fast and integral incorporation in the domestic in-

novation chain.x/

The licence policy serves for us the goal - and it may be conclusive for the developing countries, too - to close tha gap, in the fields of manufacture selected by us and namely through a dynamic trade in licence and know-how, between the levels of standard existing between our country and the market economy developed countries. The exchange of intellectual properties recently established on a value basis among the CMEA countries is also greatly in positive evidence in our country, particularly thanks to the Hungarian economic mechanism's having created a relevant interestedness for the economic units.

In the co-operation activity carried on with firms of market economy countries by Hungarian enterprises active in the manufacture of capital goods several examples can be made mention of where co-operation has made a considerable contribution to the company's product and production development and marketing activity and resulted in the development, in but a brief time, of competitive products readily selling on the market.

Some characteristic examples:

- In the development of the Hungarian machine tool industry, in the improvement of its product pattern, a considerable role is played by the co-operation cases established with various FRG companies /Gildemeister, Steineck, Kolb etc./ and with French, Austrian and Japanese firms. Highlighted is to be of these the co-operation between the Hungarian Machine Tool Industry Works and Gildemeister, relating to the joint manu-

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x/ What is understood by this is that a closest possible harmony is necessary in the development, manufacture and marketing /domestic sales and exports/ of new products. The economy's sensitivity to innovation can only be enhanced if in every link of the chain a conscious activity is going on in the interest of accelerating the introduction of the new product.

facture of various designs of NC lathes. It can be mentioned as an example of mutuality that Gildemeister will manufacture one of the NC lathe models on the basis of a design of the Hungarian Machine Tool Industry Works.

- In the manufacture of agricultural and food industry machines and equipment, too, mutuality has been characteristic of the co-operation cases. For example, as an offset to the Hungarian import of Claas combines corn adapters and driver's cabs have been developed in Hungary for the partner foreign firm. These co-operation deals have also promoted an introduction of the manufacture of up-to-date implements envisaged in the co-operation among the CMEA countries.

- Highly valuable are the co-operation deals which ensure in the field of various subassemblies and main units an enhancement of the technical standard of the Hungarian engineering industry. An outstanding co-operation is going on in this context between the Hungarian Fine Fittings Factory and the Swedish firm Mecman, relating to pneumatic devices and systems.

- Significant licence and know-how co-operation deals have been concluded in the field of road vehicle manufacture, having been the Hungarian engineering industry's largest development programme in the last 10-15 years, of which mention has already been made - as of an outstanding result - in the section dealing with the specialization and co-operation carried on with the CMEA countries. Such is the deal between IKARUS and the FRG firm MAN relating to the development and manufacture of bus engines, and the deal between Hungary's RÁBA and the American General Motors relating to bus running gears. In this branch a wide-ranging co-operation relating to subassemblies is also functioning, having been established likewise by respectively handing and taking over intellectual values. Such is e.g. the deal between the Hungarian factory

HAFE and the FRG factory ZF relating to the manufacture of speed-boxes.

- In the previous chapters mention has already been made of the relatively advanced state of development of the Hungarian medicotechnical manufacturing branch. A significant role is played also in this by licence and know-how relations, by the transfer and taking over of intellectual properties in reciprocal relation with both the centrally planned states and the market economy developed countries. The Hungarian companies Medicor, MOM, Labor MIM, Radelkisz have established lots of co-operation cases with FRG, French and US firms. Worthy of mention is in this context the Medicor-Siemens co-operation, which ensures the reciprocal availability of the two companies' external market services, including their service stations abroad.
- Such co-operation cases are also on the increase where - mainly under product sharing schemes - the co-operating partners' brands are used jointly /e.g. in the case of pneumatic devices for buses/, which contributes to enhancing their goodwill.

In the external economic policy of the Hungarian People's Republic the principle of mutuality is prevailing in every respect. This applies to production co-operation and scientific and technical relations just the same as to licence and know-how purchases. In the exchange of intellectual properties we are backed up, for assuring mutuality, by a background of several decades based on the wide intellectual potential of Hungarian science and technical knowledge. Here we think not only of such great inventors born and having worked in this country as Tivadar Puskás, György Jendrassik, Kálmán Kandó and others, but also of the research and development institutes having even recently achieved significant results in the development of new products and technologies in various fields. The Heller-Forgó air-conditioning technique for power plants, the Tatabánya Coal

Mines' patent for water purification and clarification and other techniques are known on the international scale. Because of the limited possibilities of the narrow domestic market, in several cases we sell our intellectual properties developed in specific branches of the Hungarian engineering industry to foreign firms in the form of licence and know-how.

Our participation in the trade of intellectual properties is reciprocal also in the respect that to our partners being on an advanced technological level we provide market possibilities in the longer-run co-operation relating to licences and know-how. This brings immediate benefits to both parties, providing simultaneously for our partners the possibility to extend their export relations to new regions.

Currently Hungary already features the potentiality which permits for it to join organizationally, and meaningfully, in the international trade of licences. The country is a member of the Paris and Geneva conventions and other international agreements regulating the international turnover of licences. Hungary's National Office of Inventions relies on contacts and ways and means acknowledged internationally in creating the domestic conditions for the protection of intellectual properties and in rating the technical results achieved in this field. In compliance with the international practice, the sales of inventions, licences, know-how take place by the agency of companies in Hungary, too. Our country ensures legal security for the intellectual properties enjoying protection abroad and sees to observing the commercial regulation ensuing from the relevant international rules.

3.3 Co-operation with developing countries

We have shaped our economic and scientific and technical co-operation with the developing countries in compliance with the specific characteristics of the individual partner countries and with the Hungarian development objectives. This co-operation is based on mutual advantages and the equality of

partners but also contains elements of assistance rendered to the developing countries - such as duty concessions, sending of experts and vocational training within the framework of scientific and technical co-operation etc. - promoting thereby a development of their forces of production and the creation of economic independence.

In the relations established with the developing countries we consider scientific and technical co-operation as a priority instrument. We endeavour to hand over on an ever wider scale the achievements of Hungarian science and technology to the developing countries ready to take them over. The scientific and technical co-operation we carry on with the developing countries is realized partly on the basis of bilateral scientific and technical agreements or individual contracts, and partly within the framework of international organizations /UNIDO, UNESCO, IAEA, FAO, WHO, WMO etc./.

Hungary's bilateral scientific and technical co-operation with the developing countries, and within it the transfer of technology, is regulated, as a rule, by agreements concluded on the government level, whose number is at present 36. In addition, we have 39 bilateral cultural and scientific agreements which also feature lots of such elements as serve directly the research and development interests of the developing countries. These agreements usually envisage co-operation in the domains of science and technology, industry, agriculture, public education and public health, and include among others sending and exchange of specialists, transfer of documentation, of production and scientific experiences, covering also expert knowledge and technologies. This co-operation with the developing countries includes university, college and secondary education, the training of technicians and skilled workers and, to a lesser extent, also postgraduate development.

An important form within the framework of scientific and technical co-operation with the developing countries is the reception of scholarship holders.

Related to 1 million inhabitants, Hungary receives close to 200 scholarship holders from developing countries, which exceeds the international average. The developing countries mainly have demand for training in the engineering, medical and agricultural science fields. We are in a position to provide university education for students of developing countries in other disciplines, too.

Besides in higher education, Hungarian involvement is of significance also in postgraduate training and in the development of scientists. In the course of the last 10 years the institutes of the Hungarian Academy of Sciences received from developing countries more than 250 candidates[x/], where they carried on scientific research work and received high-level scientific extension training.

For the developing countries an important assistance is represented by the training organized in Hungary for technicians, skilled workers and other production specialists. More than 60 developing countries have so far availed themselves of the possibilities provided in Hungary for vocational training. Large numbers of scholarship holders are received particularly from Algeria, Bangladesh, Bolivia, Ecuador, Ghana, Guinea, Iraq, Jordan, Lebanon, Mongolia, Nigeria, Sudan, Syria, Tanzania, Vietnam, the People's Democratic Republic of Yemen, and the Yemen Arab Republic.

The number of Hungarian experts sent on assignments to the developing countries with purposes of providing assistance within the framework of bilateral and multilateral scientific and technical co-operation has increased year by year.

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x/ holder of a scientific degree

4. Expected impact of economic integration among CMEA countries on the Hungarian capital goods industry during the 1980s

4.1 Capital goods as a whole

For all CMEA countries, thus including also Hungary, economic co-operation with the other CMEA countries will continue to be of determinative significance during the 80s. On the other hand, slow economic development expected in world economy, and the expansion of the energy crisis brings more to the foreground, in a greater measure than hitherto, an exploitation of the countries' internal reserves.

Of a further unfolding of socialist economic integration, such advantages can be expected in the 80s for the Hungarian engineering industry as:

- turning greater attention on a wide scale of machine manufacture, in compliance with the requirements of intensive development, to the manufacture of modern means of production. This contributes also to enhancing the Hungarian engineering industry's competitiveness on the world market;
- permitting a further improvement of the product pattern of the engineering industry, a better exploitation of Hungarian potentialities, a concentration of labour force and resources;
- realization on a larger scale of a division of labour in the manufacture of main units, subassemblies, components, expansion of such specialization. This would improve the efficiency of machine manufacture.

The expected effect in the 80s of economic integration on the industry of Hungarian capital goods coincides with the guiding principles of the Hungarian economy's medium-term plan. For the engineering industry the achievement of the following goals are laid down in the plan:

- increase in the efficiency of production by strengthening export-oriented development, by a more efficacious practical application of advanced scientific and technical accomplish-

nents, by a faster modernization of the product pattern, and by enhancing international competitiveness. This calls for a quicker and more flexible self-accomodation to changing external economic conditions, for adjusting the production pattern and the product mix to market demand;

- achievement of a more favourable proportion in the development of the manufacture of semi-manufactures - components -, subassemblies and finished products;
- improvement of competitiveness in the engineering industry, which is to be realized by enterprises mainly through modernization and reconstruction of the existing plants.

The impact of CMEA co-operation will become manifest in the Hungarian capital goods industry above all in an increase of the efficiency of technical development, of the process of innovation. Until the price explosion of raw materials and energy, by its surplus exports the Hungarian engineering industry could set off a considerable part of its expenses on energy imports. By now, however, its performance has devalued automatically, since due to the considerably increased world market prices, it can now set off by its exports just half the imports of raw materials and energy. In addition to the rise of energy prices, this situation can also be accounted for by the fact that certain branches of the engineering industry could not keep abreast with world market requirements.

The Hungarian economy's VIth five-year plan relating to the years 1981-1985 envisages for engineering industry production an annual average increase by 5.6-5.9 per cent.

Taking into account the available material sources, the manufacturing traditions established in the domestic engineering industry, our positions achieved - and to be further extended - on the international market, in the development of the engineering industry's product pattern the following manufactur-

ing branches are granted priority in the course of the VIth five-year plan:

- development of the manufacture of various components, subassemblies, preliminary manufactures, forged products, castings and tools promoting the development of the engineering industry;
- specific domains of the electronics industry;
- manufacture of machines of greater importance for the food industry and agriculture;
- selected product groups of equipment for electric power production, distribution and uses;
- road vehicles and subassemblies;
- manufacture of specific machine tools.

For the realization of the objectives it is necessary to develop the sales methods, and to establish closer co-operation among the companies respectively engaging in research and development, production, and foreign trade. Licence and know-how purchases are to be increased further, and marketing activity needs improvement.

The increasing requirements of foreign trade in machines call for well-organized services, which the customer can fully rely on /service of customers, spare parts supply, accurate information, suitable references/.

4.2 Some selected capital goods sub-sectors

The expected impact of economic integration among the CMEA countries on the Hungarian capital goods industry during the 1980s will be not only of a general nature but will also be felt concretely in the various subsectors of the engineering industry.

The Hungarian bus manufacture developed within the framework of road vehicle manufacture is a most up-to-date branch within the CMEA, and ranks among the most advanced ones - by its magnitude and quality - on the European and international

scales. In the course of the next 10 years to come the bus manufacturing capacity having been established will be sustained dynamically, including the development of certain special models, which will add to our commodity supply for exports. In our days the Hungarian IKARUS bus is a widely known model doing good service in the towns and on the roads of the CMEA countries. It is the Hungarian national economy's interest to sustain and enhance the "rank" and to increase the exportability of this manufacture in the following years. With a view to this, an IKARUS bus for airport service has been developed, which integrates well with the service system of modern airplanes. This unique innovation features solution for the simultaneous transport of passenger and luggage directly to the airplane. And one more new feature in the system is a terminal building to be made up of modules.

Within the framework of road vehicle manufacture top priority is given to the manufacture of vehicle main units /rear axles, power-assisted steering units, various designs of passenger car fittings/. Relying on the currently existing manufacturing bases, a further development along two lines can be reckoned with:

- an expansion will be effected, relying on the manufacturing base for bus main units, in the production of rear-axles and power assisted steering units, to make them suitable for use in different domains of bus, truck and agricultural machines manufacture;
- relying on the manufacturing base already established for various fitting items of passenger cars, an expansion of international collaboration becomes possible which provides co-operation for the Hungarian national economy on a wider scale than previously /for Lada, Polski Fiat/.

The internationally acknowledged standard of Hungarian

road vehicle manufacture enables an expansion of co-operation carried on with the developed countries. For instance, joint manufacture based on the assembly of units of various origin is expanding with FRG, Swedish and US firms, e.g., Hungarian bodies are mounted on foreign chassis, or foreign engine blocks and transmissions are built in Hungarian bodies.

As for the product development of agricultural machines, its expansion is envisaged in connection with the specialization and co-operation having been established with the CMEA countries.

The manufacture of agricultural machines, particularly the mechanization of vegetable growing and processing, of poultry raising and processing, and the equipment for plant protection and fruit processing are technically up-to-date, and their further development is partly based on licence purchase. In the development of agricultural machines manufacture, of great significance is the utilization of advanced Hungarian agrotechnical knowledge, just as well as the concept unfolding about the agricultural machines system on the basis of the needs of Hungarian agriculture. On the other hand, our agricultural machines manufacture covers but a narrow scope, consequently it is ready for wide-ranging co-operation with the partner countries. In the following decade we are, therefore, interested in a wide-scale co-operation relating to subassemblies and components.

We envisage an expansion of specialization and co-operation established in machine tool manufacture with the CMEA countries, on both a bilateral and a multilateral basis. A significant progress is expected in the decade to come in the field of co-operation on subassemblies and in the joint development of machine-tool control systems. We contemplate, with regard to domestic developments, to promote them besides by relations

with the CMEA through co-operation and joint development with the market economy countries and through manufacturing co-operation connected with licence and know-how purchases.

The Hungarian machine-tool industry companies have several such machines and equipment as are acknowledged for their quality on the markets of both the centrally planned and the market economy countries. Beyond the conventional machine-tool industry products we have today considerable exports of NC machine-tools, too.

On the production development of power engineering machines and equipment likewise a significant impact will be made by an expansion of economic integration among the CMEA countries. This will be manifest above all in the manufacture and wide-ranging specialization of nuclear power station equipment. Since Hungary is interested in projects covering nuclear power station models developed in the Soviet Union, it is ready to launch the manufacture of such subassemblies as comply with the potentials of the Hungarian engineering industry. Such are e.g. the reloading equipment for fuel element cassettes, various secondary cycle equipment, special armatures, water treatment equipment and reactor repair machines. In addition it is to be noted that the Hungarian engineering industry is in possession of manufacturing capacities, meeting advanced European standards, for such conventional power engineering equipment as turbines, generators etc. Of such products it is ready, also further on, to expand export deliveries to both the market economy and the developing countries.

In the manufacture of watercraft and harbour equipment a further expanding co-operation with the other CMEA countries is to be expected. Connected with the opening of the "European waterway" the Hungarian engineering industry will develop the manufacture of floating structures, harbour equipment and the

related telecommunication devices, which are all products of its conventional line of manufacture. In this branch a well-developed product development and main unit co-operation is being carried on with the Soviet Union. Several models of floating and portal cranes have been developed jointly with the competent Soviet companies, and in the portal cranes we install Soviet engines. In this field we want to broaden relations with the developing countries, too, with regard to partly a co-operative manufacture of portal cranes and partly an increased involvement of our participation in the development of their harbours.

The manufacture of electrical machines and apparatuses is likewise an advanced conventional branch of the Hungarian engineering industry, meeting European standards. With the CMEA countries we have far-reaching specialization and co-operation relations, expected to expand further, particularly in the field of the manufacture of special motors, heavy-duty motors, generators. In this branch we endeavour to bring about co-operation on a much wider scale than hitherto.

Relying on the developed product and production standard of the branch of electrical machines manufacture, we want to expand our exports of transformers, up-to-date gas-insulated high-voltage distribution equipment, complete transmission line substations and distribution networks /including the line system/. With regard to the technological equipment of this subsector, we want to include in our commodity supply for exports the complete cable manufacturing lines and cable factories developed on the basis of specialization and co-operation with the CMEA countries.

In the course of the past 30 years the manufacture of industrial telecommunication equipment has likewise developed on the basis of international specialization and co-operation with

the CMEA countries. In this subsector an extensive research, development, manufacturing and marketing co-operation has come about with the institutes and companies of the CMEA countries. In the decade to come the production and export development based on socialist integration will be concentrated above all on the development of electronic and quasi-electronic telephone exchanges, complex VHF telecommunication networks, unified microwave systems. Relying on the economic integration established with the CMEA countries we expect in this subsector a wide-ranging co-operation and export expansion with the market economy and the developing countries. With a view to promoting this, we contemplate in our company relations an expansion of both licence and know-how purchases and of co-operation on components.

This subsector comprises the Hungarian engineering industry's traditionally developed branch of light source manufacture and the production of vacuum engineering machines developed on the basis of the former. Our specialization and co-operation relations having been established with our CMEA partners permit, on the basis of technical development co-operation works, an expansion of the manufacture and exports of high-capacity lines for the production of respectively standard lamps, black-and-white and colour TV picture tubes. Relying on the goodwill of the internationally known Hungarian company Tungsram and on specialization and co-operation with the CMEA countries we want to broaden relations with the market economy and the developing countries.

The instrument industry, including the manufacture of control technical and medicotechnical equipment is likewise a subsector of Hungarian engineering industry envisaged for priority development and enlargement. In this subsector, too, we want to develop further our manufacturing bases and exports relying

on the wide-ranging specialization and co-operation relations with the CMEA countries. On the basis of co-operation relations with the Soviet Union we are going to develop the exports of automation and telemechanical systems for gas and oil pipelines.

5. Potentials for expansion of co-operation between Hungary and developing countries in capital goods industry during the 80s

5.1 Co-operation possibilities for specific Hungarian machine manufacturing branches

Hungary wants to develop its co-operation with the developing countries in compliance with the individual countries' specific characteristics and with their economic development tasks, on the basis of mutual advantages.

With regard to the developing countries we expect an increase in mutual turnover up to 1990. On an annual average exports should increase by 13-15 per cent, exceeding considerably the rate of growth of overall exports. The vehicle of export growth should be machine exports, at an average annual rate of increase by 16-18 per cent. By 1990 more than 50 per cent of the exports to the developing countries will be made up of engineering industry products.

Taking into account the considerable differentiation of the developing world, we attach a fundamental economic policy interest to developing relations rapidly and efficiently with this group of countries. With regard to the developing countries, our involvement in the national economic programmes of the individual developing countries provides possibility for a development, for a dynamic expansion of world economic relations. We take care of adjusting our exports, our production pattern to the requirements presenting themselves.

In relation to the major engineering industry product groups we can give the following outline of international co-operation possibility, taking into account that the role of engineering industry is increasing in both exports and imports, and that it promotes for both parties an acceleration of technical development, an improvement of efficiency.

In machine tool manufacture there is possibility for a realization of co-operation on subassemblies, and in the case of manufactures connected with licence and know-how purchases, for the development of joint marketing with the licence transferer. We want to transfer to the developing countries the manufacture of conventional machine-tools, of various models of them, possibly on the basis of a buyback arrangement.

Of the machines and equipment for power engineering we can expand the delivery of conventional equipment /turbines, generators/ to the developing countries. We are in possession of considerable capacities for the supply of power station boilers and of machinery for water power stations.

In the field of agricultural machinesand food industry equipment we take into account the possibility for us to supply to, and commission in, the developing countries complete food industry equipment, animal keeping farms, slaughter-houses, agricultural plants, irrigation systems. Where it is possible, we rely on an involvement of local capacities and resources.

In relation to road vehicles there is possibility for the establishment of larger-scale co-operation with the developing countries, including the setting up of bus plants and an organization of transport systems and repair bases.

We are suppliers of watercraft and harbour equipment. We can expand the delivery of floating and portal cranes; with various developing countries the co-operative manufacture of portal cranes can also be organized, and we want to achieve a greater involvement in the development, and possibly complete construction, of harbours.

In the field of electrical machines and equipment we are today capable of supplying complete motor factories, of organizing in various developing countries the manufacture of up-to-date power-station cooling equipment /the Heller-Forgó de-

sign/, and we are ready to set up joint ventures for such purposes. The exports of light sources and of the manufacturing machinery for them can also be increased, and great possibilities are provided for the developing countries by enabling them to export complete luminous systems. We want to market in the developing countries electric household appliances - mainly ones manufactured under licence -, and possibly the establishment of manufacturing capacities can also be realized for such products.

With regard to electronic and precision engineering products co-operation on components may be expanded. In addition we have made arrangements for the supply of complete medical systems: we are capable of delivering hospitals, ambulatory clinics. We are also capable of supplying complete VHF networks, unified microwave systems, studio engineering equipment, consumer electronic products, and the manufacturing lines for them. In many developing countries lots of complete lamp factories supplied by us are in operation, and meeting expected demands is possible in this decade, too. In control technics we want to achieve progress in the development and supply of gas and oil industry automation equipment.

Consideration may be given, furthermore, to supplies of bauxite, alumina and aluminium industry facilities and of power station equipment, and we can undertake the turnkey delivery of factories to manufacture cables, aerial lines, insulated cables and other lines.

We can supply also in the future fruit and vegetable processing plants, complete mills and slaughter-houses, ready-to-wear plants, various small plants, lime processing works, pottery plants, machine tool factories, metal ware plants.

A considerable expansion of the exports to the developing countries of means of production, of engineering industry prod-

ucts, supposes, in turn, an expansion of product purchases from there. The raw materials and agricultural produces imported from the developing countries have played, even up to now, an important role in satisfying Hungarian needs /of e.g. crude oil, raw phosphate, iron ore, copper, tin, crude rubber, raw cotton, cotton yarn, wool, raw hide, fodders of vegetal and animal origin, coffee, cacao, tropical fruits etc./. In the decade up to 1990 we will increase at an above-average rate our procurements of such products.

We envisage buying in this decade increasing amounts of machines, complete equipment, instruments, components from the developing countries.

According to preliminary calculations we shall account for a fast expansion of imports of manufactured consumer articles from the developing countries, partly thanks to our intention to redeploy the manufacture of various products to those countries. Our purchases of agricultural produces, foodstuffs will also increase dynamically, taking into account the positive changes to be expected by the end of the eighties in Hungarian economic and social conditions.

5.2 Contribution of Hungarian export-oriented product systems to the establishment and development of an infrastructural base in the developing countries

Demands for systems-based exports are increasing dynamically on the world market. This is a concomitant of fast scientific and technological development, in the course of which more and more sophisticated production-technological, telecommunication, health and other equipment complexes are brought into existence, with a view to realizing higher-standard, faster and more economical production and services.

The developing countries' economic structure now being in a phase of shaping in many domains calls for such functional

complex systems comprising products of several industries and requiring infrastructural organizational and other activities connected with the given sphere of service - e.g. education, public health - as differ in nature from the organizational system of the market economy developed countries. In contrast to a system of health provision based on private institutions, a different requirement is set e.g. for the solution of health provision, health equipment in a town district of a developing country.

The production and functional systems become in fact an integral part of an importer country within a short time if in the longer term the supply of the systems with raw materials, components, intellectual knowledge can be solved mostly from indigenous resources. Thus it is also an interest of the developing countries to import production and functional systems on a medium or slightly higher level of technological development.

The long-term co-operation among the centrally planned countries includes such projects of greater significance for which the individual countries do not provide single machines and equipment but technological service systems. Hungary's CMEA-oriented equipment exports also partly consist of food industry complex equipment, closed-system animal raising plants, hospitals, medicotechnical facilities.

In recent years practical conditions have come about in several domains of Hungarian economy for the exports of complex systems /health, agriculture and food economy, telecommunication, education, management of waters, power engineering/. From the viewpoint of our economic co-operation with the developing countries we consider the exports of complex systems as of outstanding significance, naturally taking account of the developing countries' development priorities, their basic

supply problems. Hungary has experiences in complex systems exports directed to the developing countries. In Algeria Hungary co-operates in the development of poultry raising, cattle fattening, game economy and fodder production. The establishment of slaughter-houses and meat plants forms part of this programme, just as well as the delivery of bread factories and canning factories, in addition to which our collaboration can be extended to fruit, vegetable and milk processing. In Iraq our date processing equipment, mills and canning factories can already be considered as standard facilities; an expansion of our exports primarily depends on the local possibilities. In Tunesia Hungarian specialists participate in the elaboration of development plans ranging from soil preparation to processing. By deliveries of agricultural and food industry equipment to Nigeria, we have met in the last five years orders of considerable magnitude.

Hungary's food industry systems exports include lots of possibilities for the developing countries. We are in a position to supply animal raising plants, slaughter-houses, meat plants, mills, canning factories, development schemes for agricultural areas, plant growing systems /for sugar-beet, maize, vegetables/ and so on, connected to which a turnover of agricultural machine systems can also be established.

The health systems are currently among the best-developed ones of the export-oriented systems. The major subsystems of the health system are ones exportable on their own. Such are e.g. the regional health provision system, the ambulance service, the regional blood supply and haematological network, the pulmonary screening network, systems for education on health. Two thirds of the complete health equipment have so far gone to the CMEA markets and one third to the developing countries. Two important accessories of complete health equipment exports

to the developing countries are sales of pharmaceuticals and the continuous training of medical personnel with the responsibility of seeing to the functioning, operation of the health institutions and equipment. We can assist training by an adaptation to the developing countries of the experiences and methods well proved in our domestic reference bases, naturally made complete with exports of a considerable part of the technical equipment.

The so far most wide-spread form of Hungarian exports of health systems to the developing countries is the supply of complete hospitals, drug packaging plants and ambulatory clinics and the training of specialists.

In recent years, in addition to the exports of complete hospitals and health systems, more and more requirements have arisen on the part of the developing countries for the development and equipment of health networks.

The successful operation of all sorts of systems exports is conditioned on the training of a suitable staff of specialists, which is made possible by a flexible shaping of the educational system complying with the requirements.

The Hungarian exports of educational systems are generally connected with the international education development programmes drawn up or given preference to by UNESCO and designed for the main education development areas of the individual countries. Within the framework of Peru's education development programmes Hungarian companies saw to the equipment of 200 secondary schools and 20 universities. The Peruvian party took care of constructing the infrastructural facilities, whereas we supplied target modules and laboratories. We concluded agreements on large-scale deliveries with Brazil, too, where we supplied complete units for some 80 technical and medical universities. Besides we carried out the construction, or equip-

ment, of a technical vocational school in Iran and of two higher-level schools in Algeria.

Another domain for our infrastructural systems exports is the sale of telecommunication systems. The requirements of the countries importing telecommunication systems are determined by their levels of development, the telecommunication system they are in possession of, and the degree of development of the related infrastructure. The exports of telecommunication systems have so far consisted of transmission technical systems. In conjunction with other centrally planned countries we have participated in the establishment of railway safety lines, we have supplied complete microwave systems. The industrial organizational background of the Hungarian telecommunication systems exports meets the basic requirements, our major telecommunication products - various models of telephone exchanges, wire and wireless transmission technical equipment, VHF two-way sets - hold their own on the world market, and organized in systems incorporating a high intellectual content they can be utilized for meeting sophisticated tasks.

One of the most successful branches of infrastructural export systems, and having most promising prospects, is that of electric power systems. Electric power supply is a very important condition for the development of industrial and agricultural production. The demand for electric power is increasing at a particularly fast rate in the industrializing countries, since the extracting industry, metallurgy, heavy industry, chemical industry and engineering industry are rather energy-intensive branches.

Hungary has capacities for export deliveries of substation equipment, which we have already supplied on a turnkey basis to various developing countries /Kuwait, Libya, Iraq, Algeria, Morocco/, and in addition we have supplied transformers and

other electrical equipment. The products of reliable and good quality provide a favourable reference.

Of power station main equipment items we have sold to developing countries non-series equipment, generators, and we are in a position to meet more such demands of developing countries. Exports of complete heat power stations are also possible, with a suitably co-ordinated activity of the manufacturers and the designing, engineering offices. Our domestic manufacture of power engineering equipment having a history of several decades provides a good basis for larger-scale exports of electric power systems. In the course of the development of the domestic industrial background we engage, primarily in consideration of the developing countries' requirements, in the establishment of production capacities.

In the decade of the eighties the expansion of the exports of complete systems, equipment may become a vehicle of the export dynamism of capital goods. In the interest of establishing this activity at an accelerated rate and of realizing such exports to the developing countries, we have developed an integral system of domestic intersectoral co-operation, we have carried out developments in consideration of the possibilities of the various systems exports, we have brought into existence reference bases and extended vocational training, and we have developed an efficient general contracting system. All these make possible for the Hungarian export-oriented product systems to make a considerable contribution in this decade to the establishment of the developing countries' infrastructural base and also to promote a rapid growth of the production and exports of Hungarian capital goods.

5.3 Methods, possibilities serving an expansion of co-operation in engineering industry with the developing countries

The development of long-term co-operation to be established

with the developing countries is one of the cardinal tasks of Hungarian economy. A dynamic increase of the exports of capital goods, engineering industry products sets new requirements for trade relations, which calls for a further development of the existing trading methods, according to the following:

- In this decade part of the industrial capacities will be sloughed off in Hungary - with their simultaneous redeployment to the developing countries - if in the longer term the products at issue can be safely and economically procured from the developing region. A redeployment of capacities may take place in this decade with regard to various light industry products and also to metal ware and machines of lower sophistication. This facility requires the establishment of such new organizational forms as permit linking exports and imports. Reckoning with suitable supplies on the part of the developing countries, longer-run Hungarian purchases would be possible /on the basis of long-term agreements/ of semi-finished and finished clothing items, raw materials, food industry materials, finished products, in exchange for exports of mainly Hungarian engineering industry products, capital goods.

- Co-operation relations with the developing countries are highly suitable for expansion; we have achieved favourable results in the last decade. In Iraq we have set up a bus assembly plant, in India we have made arrangements for the joint manufacture of water power plant units, and the manufacture of various models of bicycles has also been introduced. In relation to the aluminium industry we have endeavoured to establish co-operation relations in the manufacture of microwave equipment and in the production of geodesic instruments. From the technical aspect, Hungary's production potentials would permit a wider-scale development of co-operation relations with the developing countries. The relevant co-opera-

tion agreements could relate to the agricultural machines industry - with special regard to a modernization of agricultural production in the African countries -, to electronics, and to the manufacture of refrigerators, air conditioning equipment and parts of them. The establishment of co-operation relations is possible in the developing countries where it is permitted by the level of development of the indigenous industry.

- In the relations to be established with the developing countries an important role is to be played by jointly owned interests. At the beginning of the decade 17 jointly owned ventures with Hungarian interests were operated in the developing countries, 5 of which were producing enterprises. With our interests are in coincidence the developing countries' endeavours to establish a larger number of joint ventures mainly in the production sphere. Exports of Hungarian capital goods can also be involved in the deals on the establishment of joint ventures, and namely in cases when economical solutions are in view, taking into account the qualifications of the local labour.

- Of outstanding significance is the assignment of specialists to the developing countries within the framework of scientific and technical co-operation. In the future we want to develop this activity and make it complete with the organization of vocational training in the developing countries. In the countries where a system of planning for the development of the national economy has already been established, we want to develop direct co-operation with the planning agencies, with a view to providing assistance for a better foundation of the economic development plans, for the elaboration of joint programmes. The developing countries are then expected to elaborate accordingly their long-term programmes for scientific and technical co-operation.

- In the supply of capital goods for the developing countries an important factor may be the use of equipment, machines, and possibly complete systems under a scheme of leasing. By the second half of the eighties this form may have become an important factor of co-operation, in view of which we are shaping accordingly the necessary conditions.

6. Major problems faced by Hungary in developing co-operation with the CMEA countries in capital goods industry, ways and means used for solving them, and lessons and experiences to be drawn from the co-operation for developing countries

In the previous chapters of this study reference has already been made to one of the most important goals of international economic co-operation with the CMEA countries in capital goods industry, which is, namely, achievement and assurance of a high-standard engineering technology. In the CMEA region this means a particularly great task, since earlier these countries had, in general, but underdeveloped engineering industries,[x/] implying unequal conditions for becoming able in a historically brief period to meet competition with the technical and technological standard of the market economy developed countries.

In the following an enumeration will be given of the problems with which Hungary has met in the course of its co-operation with the CMEA countries in the field of capital goods industry:

- the modernity and quality of machines and equipment manufactured in the member countries has not increased in the necessary measure; the efficiency of machine exports and imports has become problematic;
- in the engineering industry branches most of the CMEA countries have so far pursued an extensive-type economic development, having led to duplications in manufacture;
- as is known, this method of economic development - whose initial advantages are incontestable, particularly for underdeveloped countries and ones having achieved a medium degree of development - affects disadvantageously an enforcement of the categories of economic efficiency.

By analyzing these problems experiences show that the meth

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x/ Excepting Czechoslovakia and the GDR

ods and practice of CMEA co-operation affect with apparent slowness the development of skills at innovation. Therefore up-to-date products and production processes gain ground slowly, and so become replaced the obsolete ones in production. In the phase of fast extensive industrial development a process just contrary to a growth of the number of modern, specialized autonomous companies could be witnessed: the big companies dominating the manufacture of individual products or product groups incorporated one after the other the small enterprises having co-operated with them as subdeliverers. The growth in number of the big ones was warranted by existing "diseases" /weakness of the co-operating partners' capacity for deliveries, looseness in meeting contracts etc./. The problem is that the harmful effect of remedying acted deeper and longer than the benevolent effect.

It is a circumstance worthy of note that in the process of industrialization in our country - just as well as in other CMEA countries - the type of introvert company aiming at an ever closer production process has become rather predominant. In consequence of this, the production structure and the stock of fixed assets and of labour put up a fair "resistance" to any expansion of specialization and co-operation.

In the present-day modern machine manufacture the up-to-dateness of the finished product and of the structure of technology is determined to a considerable extent by the degree of specialization of the manufacture of subassemblies, main units, components and parts. In the last 20-25 years the Hungarian engineering industry has achieved certain relevant results just on the basis of co-operation with the CMEA countries, and namely in the manufacture of roller bearings and in that of RÁBA rear axles already mentioned. Such examples, however, are few in number.

The present-day standard of technology is characterized

on the one hand by a relatively cheap mass production by specialized plants and, on the other, by the use in a certain percentage of various main units, parts and components mostly standardized also internationally. In the socialist economic integration it must, consequently, be achieved that excellent quality, reliability, competitiveness be ensured through co-operation of plants specialized in the manufacture of respectively main units, parts and components, thanks to a consciously coordinated activity of the CMEA countries.

The high technical standard of present-day modern machine manufacture and telecommunication is based on an extensive diversification of end product manufacture. These branches have, essentially, developed into machine-building and assembling industries, where the company bringing out the finished products avails itself of the technical expertise, capacity and products of other, specialized companies.

It is an essential question whether in concrete cases it can be managed to realize economic advantages through larger-scale mass-production. The simultaneous requirement of stability and flexibility is undoubtedly one of the important and characteristic problems of international specialization and co-operation. The requirement of stability lies in the desirability to have agreements on specialization in force for 5 to 10 years, which is advantageous for the exporters. All this, however, advances a region's technical development only if in the case of concrete products modernity can be kept abreast with, just the same as requirements for quality steadily increase on the world market. This in turn calls for flexibility.

With the present-day and future dimensions of Hungary's internal market, only an increased integration with world economy, and within it above all with the CMEA co-operation, can serve as a suitable economic background for a better unfolding

of our machine manufacture. The systematic development of Hungary's national economy envisages in the longer term the establishment in the capital goods industry of production capacities featuring high technical standard matched by flexibility and also a development of the structure of engineering industry, which calls for setting up, gradually but in a greater measure, specialized companies.

Analyzing the system of conditions of co-operation it can be stated that in the longer-run CMEA co-operation it is expedient to identify the modalities for specialization and co-operation which guarantee market security but do not give absolute priority to stability, but on the contrary, enforce the instruments of flexibility in the phase of development to follow.

With regard to Hungarian relations it can be stated of the plans of scientific and technical co-operation that the number of results achieved on the basis of division of labour and suitable for practical utilization still remains inferior to the possibilities provided by the scientific and technical potential. In comparison to the envisaged terms the works are often protracted and remain on the level - incidentally also important and useful - of an exchange of information and experience. The insufficient concentration of scientific and technical co-operation, the lack of properly close relations with production co-operation, the underdevelopment of certain conditions of contracted co-operation based on direct relations between the co-operating organizations are all such factors as represent further difficulties in the field of co-operation in capital goods.

In the course of the international harmonization of development policy concepts, a high-level CMEA co-ordination is expected to identify for the future the areas, where a deeper-going international specialization of production offers itself

in the co-operation in a way that falls in line for each participating country with its economic potential and its ideas about structural development.

x x x

The road covered by Hungary in socialist development is inseparable from the results achieved in a diversified co-operation with the other centrally planned countries having identical social and political systems. The path of this development provides valuable lessons for the developing countries, too. Of these we are going to highlight those which are directly or indirectly in connection with the production of capital goods, with the relevant international co-operation, and with the favourable results of the latter.

a/ After World War Two, for a fast social and economic development Hungary was in need of a change in the qualitative standard of human knowledge and experience, of the skills of manpower. A fundamental role was played in this by an actual revolution of education initiated and carried through in socialist Hungary. The level of qualifications of the manpower employed in economy experienced a rapid and large-scale increase. The development of the education of human productive forces is the basis of a progress of economy.

b/ The integration of production and trade having been established in the CMEA has played an outstanding role in the fast economic growth of the individual centrally planned countries, in the favourable transformation of their social and economic structure. The Soviet Union takes the first place in Europe and the second place on the global scale with regard to to the production volume of the engineering industry, and it is in a position to launch the manufacture of any machine, means of conveyance, instrument and the like for any branch of its economy.

The established forms of production co-operation, the main area of which has been the engineering industry, have permitted for the centrally planned countries to realize the following advantages:

- An intersectoral division of labour fundamentally makes possible an exploitation of absolute advantages and of static comparative advantages. In this form, the relation among the participating countries is extremely loose, in the mutual trade the finished products manufactured in the various branches are involved in an exchange.
- An intrasectoral specialization is based on advantages following from the economy of scale, i.e. manufacture in large series, and on advantages following from production traditions and from special knowledge getting realized in production and product development. In comparison to the previous form, an increase in the size of production enhances the significance of the advantages that can be realized and broadens the scope of mutual trade which, in addition to finished products, already comprises in a considerable measure components and subassemblies manufactured in identical branches. The production and supply of components and subassemblies enhances the parties' reliance on one another and strengthens the integration of production.
- In the case of production technological co-operation the involved parties carry out jointly researches, development and production but usually appear separately on third markets. In addition to the dynamic, comparative advantages those of adaptation and, last but not least, of co-operation also become manifest here.

- In the case of co-operation relation combined with joint activity on third markets, production and research based on co-operation is, further, made complete by co-operation in the field of marketing and services. Thanks to this, the involved parties also come by mutual tertiary advantages besides the ones previously enumerated.

- With joint exports of complex systems the systems operator enjoys, beyond the above, the advantages of complexity. A highly increased possibility is offered here for the exploitation of dynamic comparative advantages, of advantages of co-operation and of adaptation and, last but not least, of tertiary market advantages.

  In the co-operation system of the CMEA all these forms are existant, and it has been the application of these, in observing the principle of mutual dependence, that has made possible a realization of mutual advantages.

c/ Instead of the earlier unilateral dependence, international relations transmit elements of mutual economic dependence in ever wider zones, within an ever wider geographical range of effect. The development of the socialist world system, the economic integration of the countries comprised by it, exercises a fundamental impact, both directly and indirectly, on this process, on the possibility of social and economic development on the basis of mutual advantages, among countries having come to different levels of economic development.

d/ The developments of the seventies indicate that in the case of export-oriented industrialization the rate of growth accelerates, the macroeconomic efficiency of unit investments is higher, payment restrictions are weaker, and international creditworthiness increases. Real economic processes have not borne evidence to the supposition that an involvement in the

international division of labour might imply structural backwardness.

e/ For the realization of an export-oriented industrial development policy, including an expansion of the manufacture of capital goods, it is necessary to develop a corresponding set of instruments:

- the protectionist customs and trade policy serving an exclusion of foreign competition needs to be transformed;
- the role of the banking system gains in significance; it is expedient to use differentiated exchange rates. The system of export incentives is to be adjusted accordingly;
- in using foreign capital it is expedient to employ the practice of controlled co-operation, mainly in the technology-development-intensive industrial branches and in the export-oriented industrial branches;
- the tasks connected with a long-range co-ordination of industrial development come to the fore.

f/ The role of industrial division of labour played with an ever more determinative character in the expansion of world trade, the decline of specific transport costs, decreases considerably the role of physical geographical factors in the selection of partners. The acceleration of time alters, transforms the bond of historically established relations. This makes possible also for the developing countries to establish their relations in consideration of the peculiarities of partner selection ensuing from the dimensions of their own national economies and by taking account of the available resources. The viewpoint of economicalness requires concentration on definite relations; as a result of the concentration the markets where a greater volume of turnover can be achieved gain in significance. The exploitation, the utilization of this possibility is given for the countries participating

in the CMEA, just as well as for all developing countries.

g/ In opposition to the practice of previous years, in the future it will not be left exclusively to the national or regional market to act as fostress for the exacting new industries, but as early as in the initial phase of development an increased role will be played by world economic factors. An orientation to world economy is by no means contrary to the requirements of regional co-operation, in fact, the results there achieved can be put to account in deepening regional co-operation delimited by objective factors. For the development, or for an acceleration of the development, of an industry manufacturing capital goods external resources may also be used, this, however, absolutely requires an adjustment to world market conditions, a following of the main tendencies of development, a matching of the internal scale of values of the national economy by the impacts of world economy.

h/ The unfolding of an indigenous machine manufacture in the developing countries relies heavily on the degree by which the transfer of technology taking place within the framework of international corporations of market economy countries makes dependent the affiliated companies operating in the developing countries on the parent company's development, research and expertise capacities, with even the locally owned companies becoming dependent on the foreign technology. The spreading of international monopoly corporations in the developing countries particularly raises /has raised/ limits to the development possibilities of local privately owned industries and impedes /has impeded/ an improvement of their competitiveness on the world market.

Basic characteristics of the Hungarian People's Republic

Geography, population

Territory /1 per cent of Europe/, 93 thousand sq.km
Location: Central Europe
Capital: Budapest, 2.081.700 inhabitants
Population: 10.713.000 /1980/
Density of population: 115 people per 1 sq.km
Average annual growth of population: 0.4 per cent, related to 1960 = 100

Social and economic indicators

The per capita GNP was in 1980 219 per cent of the corresponding value in 1970. Average annual growth between 1970 and 1980: 8.2 per cent

Pattern of uses of GNP in 1980:
- Consumption: 69.9 %, in percentage of domestic uses
- Accumulation: 30.1 %
- Import surplus in percentage of GNP: 1 %

Pattern of uses of the national income in 1980:
- Consumption: 75.9 %, in percentage of domestic uses
- Accumulation: 24 %
- Import surplus in percentage of the national income: 2.7

Agricultural average yields /tons per hectare/, 1980:
- wheat 3.55
- maize 5.40
- meat consumption /including fish/ per head of population: 73 kg

Number of active earners: 5.050 thousand
Electric power production /kwh/ per capita: 228.7
Number of physicians per 10.000 inhabitants: 299

Foreign trade index
Total amount of imports /1950 = 100/
in 1980: 2097 %
Total amount of exports /1950 = 100/
in 1980: 1913 %
Commodity pattern of foreign trade in 1980, percentage breakdown:

	Imports	Exports
Energy sources, electric power	14.8	4.1
Materials, semi-finished products, parts	49.2	31.2
Machines, means of transport, capital goods	19.3	26.2
Manufactured consumer articles	8.3	16.1
Food industry materials, live animals, foodstuffs	8.4	22.4

L I T E R A T U R E

1. Magyar statisztikai zsebkönyv, 1971-1980 /Pocket-Book of Hungarian Statistics/, Központi Statisztikai Hivatal, Budapest. 1971-1980.
2. Ipari zsebkönyv, 1971-1980 /Pocket-Book on Industry/, Központi Statisztikai Hivatal, Budapest, 1971-1980.
3. Bognár József: Világgazdasági korszakváltás /Beginning of a New Era in World Economy/, Közgazdasági és Jogi Könyvkiadó, Budapest. 1980.
4. Dr. Szekér Gyula: Iparpolitikánk és a világgazdasági változások /Our Industrial Policy and World Economic Changes/, Társadalmi Szemle, No. 2, 1980.
5. Dr. Faluvégi Lajos: Állami pénzügyek, gazdaságirányitás /State Finances, Economic Management/, Közgazdasági és Jogi Könyvkiadó, Budapest. 1979.
6. Fáy József - Nyers Rezső: Szakositás és kooperáció a magyar gazdaságban és a KGST-ban /Specialization and Co-operation in Hungarian Economy and in the CMEA/, Külgazdaság, No. 1, 1981.
7. Nyitrai Ferencné: Népgazdaságunk fejlettsége nemzetközi tükörben ... /Development of Our National Economy from the International Aspect .../, Központi Statisztikai Hivatal, Budapest. 1978.
8. Dr. Szőnyi Péter: A versenyképesség javitásának feltétele /Condition of Improving Competitiveness/, Népszabadság, February 13, 1980.
9. Dr. Szőnyi Péter: A KGST-országok közötti szakositás és tudományos-müszaki együttmüködés egyes kérdései /Some Issues of Specialization and Scientific and Technical Co-operation Among the CMEA Countries/, Budapest. 1974.
10. Friss István: Gazdasági törvények, tervezés, irányitás /Laws of Economy, Planning, Management/, Kossuth Könyvkiadó, 1967.

11. Kádár Béla: Szerkezeti változások a világgazdaságban /Structural Changes in World Economy/, Közgazdasági és Jogi Könyvkiadó, Budapest. 1981.

12. Berend Iván: Fejlesztési, beruházási politika ... /Development, Investment Policy .../, Közgazdasági és Jogi Könyvkiadó, Budapest. 1978.

13. Szocialista integráció a beruházások területén. Cikkgyüjtemény. /Socialist Integration in the Field of Investments. Collection of Articles./, Müszaki Könyvkiadó, Budapest. 1976.

14. Káldyné Esze Magdolna: Nemzetközi kooperáció - nemzetközi vállalkozások /International Co-operation - International Ventures/, Közgazdasági és Jogi Könyvkiadó, Budapest. 1980.

15. Mádi Csaba: Licenc és know-how, a szellemi termékek nemzetközi forgalma /Licence and Know-how, International Turnover of Intellectual Properties/, Közgazdasági és Jogi Könyvkiadó, Budapest. 1976.

16. Rába András: Ipari kooperáció magyar és nyugati vállalatok között /Industrial Co-operation Between Hungarian and Western Companies/, Külgazdaság, No. 7/1980.

17. Nemzeti tapasztalatok a tudománynak és technikának a fő társadalmi-gazdasági fejlesztési problémákra történő alkalmazásában. /Beterjesztette a Magyar Népköztársaság Kormánya. Az Egyesült Nemzetek Konferenciája a tudomány és technika a fejlődés szolgálatában, Bécs, 1979/ /National experiences in applying science and technology to major socioeconomic development problems. Submitted by the Government of the Hungarian People's Republic. UN Conference on Science and Technology for Development, Vienna, 1979/

18. Távközlő rendszerek külföldi értékesitése export fővállalkozásban /Sales Abroad of Telecommunication Systems under Export-Related General Contracting/, Hiradástechnika, Vol. XXX., No. 9.

table 1

	Persons employed in 1000			Gross production thousand million Ft			Gross production per employed		person
	1970.	1975.	1980.	1970..	1975.	1980.	1970.	1975.	198
Machine industry	533,8	539,9	516,7	80,8	118,8	138,2	151,4	220,0	267,5
out of this: machinery industry	189,0	142,5	128,7	21,3	28,6	30,1	112,7	200,7	233,5
industry for vehicles of transport	108,4	106,5	104,3	21,5	33,0	39,1	198,3	309,8	374,9
electrical engineering	57,2	60,7	63,4	10,8	16,3	20,4	188,8	268,3	321,
telecommunication and vacuum engineering	84,3	97,3	102,1	8,1	17,6	21,6	96,1	180,9	211,5
precision engineering	52,5	57,9	58,9	5,6	9,7	12,0	106,6	167,5	203,
iron and metal mass products	81,3	74,6	59,1	14,5	13,6	15,0	178,3	182,3	203,
Total industry	1.673,1	1.708,4	1.614,5	371,7	440,1	601,0	222,2	257,6	372,3

table 2

Structure of industry

at current prices

	Proportion of the branches in the gross production			Proportion in persons employed			Proportion in fixed assets		
	1970.	1975.	1980.	1970.	1975.	1980.	1970.	1975.	1980.
Mining	5,3	4,2	6,2	8,4	7,3	7,1	12,8	9,3	8,1
Electric energy industry	3,0	3,1	4,3	2,0	2,2	2,2	14,3	15,0	14,7
Metallurgy	11,0	10,2	10,2	5,9	5,9	6,0	12,8	11,0	9,6
Machine industry	25,2	27,3	23,0	31,0	31,6	32,0	17,8	17,3	18,5
out of this:									
Machinery industry	6,6	6,4	5,0	8,8	8,5	8,0	4,9	4,0	4,4
Industry for vehicles of transport	6,4	7,5	6,5	6,3	6,2	6,5	5,6	5,4	5,6
Electrical engineering	3,3	3,7	3,4	3,2	3,4	3,9	2,0	2,0	2,3
Telecommunication and computer industry	3,0	4,3	3,6	4,9	5,7	6,3	2,0	2,6	3,0
Precision engineering	2,0	2,2	2,0	3,0	3,4	3,6	1,0	1,3	1,5
Iron and metal mass products	3,9	3,2	2,5	4,8	4,4	3,7	2,3	2,0	1,7
Building material industry	3,3	3,1	3,3	4,7	4,7	4,9	5,5	7,0	6,9
Chemical industry	12,0	14,4	19,3	6,3	6,8	6,9	13,1	15,8	16,3
Light industry	18,1	17,2	14,0	27,3	26,2	25,3	11,4	12,1	12,0
Food processing industry	20,1	18,5	18,3	10,4	11,2	12,2	11,1	11,2	12,8
Total industry	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

table 3

Production of selected industial products

	1970.	1975.	1980.
Lathes /number/	3.210	3.005	1.777
Milling machines /number/	985	491	216
Drilling machines /number/	4.834	3.664	3.499
Diesel motors /number/	967	504	462
" /million Watt/	181	82	99
Diesel motors for road transport /thousands/	17	24	26
" /million Watt/	1.478	3.094	3.752
Railway Diesel-motor wagons /number/	50	36	17
Railway freight wagons /number/	499	479	30
Railway passenger carriages /number/	584	201	104
Lorries /number/	3.815	2.533	265
Buses /number/	5.983	10.739	12.406
Bicycles /thousands/	275	254	364
Electric supply meters /thousands/	347	467	615
Incandescent lamps /millions/	149	305	406
Fluorescent tubes /thousands/	7.939	10.960	14.102
Electric rotors /thousands/	1.271	2.365	2.829
Electric lines and cables /million running meters/	66	80	82
Semi conductors /millions/	27	64	102
Equipment and instruments for management technique /million Forints/	459	894	620
Control gear and regulator for control engineering /million Forints/	457	1.280	1.398
Computer - technique products /million Forints/	128	2.852	4.546

table 4

	Gross production indices			Annual average growth	
	1970.	1975.	1979.	1971-75.	1976-80.
Machine industry	171,1	117,5	94,8	7,8	3,3
out of this:					
machinery industry	141,2	107,9	93,8	5,5	1,5
industry for vehicles of transport	182,3	114,9	96,3	9,7	2,8
electrical engineering	189,0	123,8	92,2	8,8	4,4
telecommunication and computer industry	266,8	146,6	100,9	12,9	7,8
precision engineering	212,4	139,9	98,6	8,7	6,9
Iron and metal mass products	103,3	92,6	86,6	2,2	-1,5
Total industry	161,7	118,4	98,3	6,4	3,4
	Number of employed in branches				
Machine industry	96,8	95,7	97,1	0,28	-0,88
out of this:					
machinery industry	86,2	90,4	97,8	-5,59	-2,00
industry for vehicles of transport	96,2	97,9	96,8	-0,39	-0,41
electrical engineering	110,8	104,4	97,2	1,19	0,86
telecommunication and computer industry	121,1	104,9	96,9	2,80	0,95
precision engineering	112,3	101,5	97,4	1,93	0,30
iron and metal mass products	72,7	79,2	96,3	-1,69	-4,61
Total industry	95,5	94,5	97,2	0,21	-1,10
	Productivity in branches /on ground of production to one person employed/				
Machine industry	176,8	122,8	97,6	7,1	4,2
out of this:					
machinery industry	163,8	119,4	95,9	3,0	3,5
industry for vehicles of transport	189,5	117,4	99,5	12,6	3,2
electrical engineering	170,5	118,6	94,8	6,3	3,6
telecommunication and computer industry	224,3	128,8	104,1	8,5	6,6
precision engineering	189,1	137,8	101,2	7,1	6,5
Iron and metal mass products	142,1	116,9	89,9	3,5	3,2
Total industry	169,3	125,2	101,1	5,1	4,6

table 5

Structure of output in state industry

Branches according to the character of product	1970.	1975.	1980.	Structural changes 1971-75.	1976-80.
Energy bearers	19,1	17,7	16,4	0,93	0,93
Industrial materials and semi-products.	35,2	35,0	35,3	0,99	1,01
Building materials	4,9	4,8	4,4	0,98	0,94
Investment goods	19,5	20,4	22,1	1,05	1,08
machinery equipments	7,7	7,3	7,1	0,95	0,97
vehicles	6,5	6,9	7,8	1,06	1,13
Industrial consumer's goods	13,3	13,4	12,6	1,01	0,94
durables	5,2	5,1	4,8	0,98	0,94
clothing	4,5	4,7	4,1	1,04	0,87
Processed foods, beverages	8,0	8,1	8,5	1,01	1,05
Total state industry	100,0	100,0	100,0	1,00	1,00

Table 6

Intersectoral relations in the socialist industry /in percentage/

Output sectors	Input sectors: Non-industrial sectors	out of this: Productive sectors	Wholesale and retail trade	Foreign trade
1970.				
Heavy industry	66,5	7,6	9,5	22,7
out of this:				
Machine industry	75,5	6,5	10,1	30,3
Chemical industry	74,2	5,1	8,7	21,3
Light industry	73,8	2,6	36,2	19,8
Other industry	74,8	5,9	40,5	5,8
Food processing industry	82,1	10,6	49,6	17,3
Total industry	71,1	7,3	22,9	20,7
1975.				
Heavy industry	67,9	6,9	8,9	25,8
out of this:				
Machine industry	75,6	5,8	8,5	37,5
Chemical industry	76,5	3,9	11,2	18,5
Light industry	73,2	3,4	35,1	21,9
Other industry	72,9	5,9	39,5	9,7
Food processing industry	81,7	7,0	51,6	19,2
Total industry	71,7	6,0	21,9	23,6
1980.				
Heavy industry	67,7	6,8	8,2	34,2
out of this:				
Machine industry	76,7	5,5	8,4	41,0
Chemical industry	79,8	4,3	8,1	19,1
Light industry	74,6	3,4	34,7	22,4
other industry	65,9	7,2	25,6	9,6
Food processing industry	82,9	6,1	54,0	19,3
Total industry	71,5	6,2	20,8	22,8

table 7

Proportion of foreign trade in the whole realization

	1970.	1975.	1980.
Heavy industry	22,7	25,8	24,2
out of this:			
Machinery industry	22,1	28,9	32,9
Industry for vehicles of transport	40,3	48,4	53,8
Electrical engineering	16,3	21,2	24,6
Telecommunication engineering	45,9	54,2	55,2
Precision engineering	43,9	46,4	49,4
Iron and metal mass products		20,5	19,0
Total machine industry	30,3	37,4	41,0
Light industry	19,8	22,0	22,4
Food processing industry	17,3	18,8	19,2
Mining	17,2	8,0	5,8
Electric energy industry	0,1	0,2	0,5
Metallurgy	25,5	25,1	21,9
Total industry	20,7	23,6	22,8

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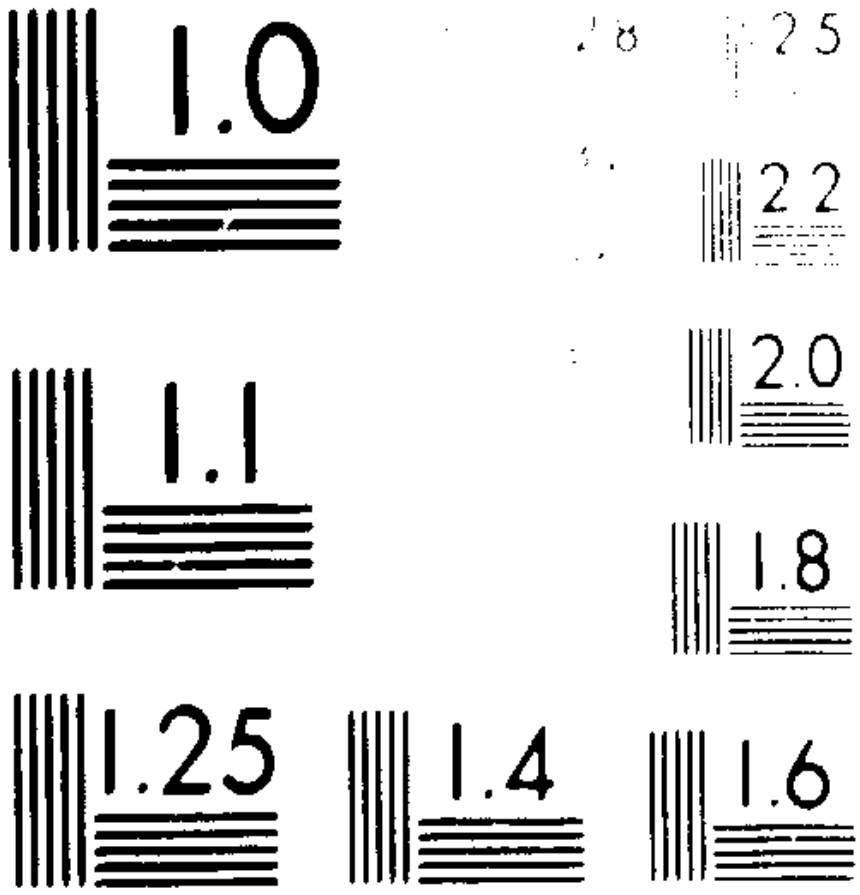
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table 8

Trade of industrial goods /according to ITJ/

Direct exports to socialist countries

	Million Forints, free border			Division %		
	1971.	1976.	1980.	1971.	1976.	1980.
Machine units for general use	177,3	330,3	391,7	0,28	0,31	0,28
Machines general	3317,8	7609,8	7744,2	5,56	7,14	5,61
Machines for mining, metallurgy, building industry	319,3	2089,3	1548,4	0,53	1,95	1,36
Lathes, milling machines Cutting machinies, cable machines, machines for telecommunication and vacuum engineering	2068,8	3717,6	4668,9	3,46	3,49	3,38
Equipment for the chemical industry	684,8	1205,1	1188,0	1,14	1,13	0,86
Machines for the light industry	433,1	926,3	1064,0	0,72	0,86	0,76
Machines for food processing	1037,8	1380,3	2382,4	1,73	1,29	1,72
Tractors and agricultural machines	843,0	3271,0	5023,1	1,41	3,07	3,64
Total machinery industry	8848,9	20529,8	24010,7	14,80	19,20	17,40
Vehicles	9328,9	21506,9	24531,9	3,24	2,20	2,17
Electric rotors Electric equipment and instruments for industry and household Instruments for telecommunication	1935,9	2347,1	3003,9	3,24	2,20	2,17
Semi-conductors and products of vacuum engineering	4022,1	6110,0	11006,2	6,74	5,73	7,98
Medical instruments and optical products	1306,9	2276,5	2723,6	2,19	2,13	1,99
Tools	1738,5	2299,5	3522,6	2,91	2,15	2,55
Equipment and instruments for management technique	308,4	3256,6	4541,1	0,51	3,05	3,29
Vehicles, electric and telecommunication instruments and tools together	18640,7	35604,2	49323,3	31,20	33,40	35,78
Products of machine industry total	27481,6	56134,0	73334,0	46,10	52,70	53,20
TOTAL INDUSTRY	59666,6	106447,0	137826,9	100	100	100

table 9

Direct exports to developed countries

	Million Forints, free border			Division %		
	1971.	1976.	1980.	1971.	1976.	1980.
Machine units for general use	93,6	107,2	358,8	0,36	0,21	0,46
Machines general	66,1	603,2	1911,5	0,25	1,23	2,45
Machines for mining, metallurgy, building industry	163,4	134,8	488,7	0,64	0,27	0,62
Lathes, milling machines Cutting machinies, cable machines, machines for telecommunication and vacuum engineering	309,1	493,9	1076,5	1,21	1,01	1,38
Equipment for the chemical industry	79,8	34,2	143,2	0,31	0,07	0,18
Machines for the light industry	22,9	56,3	135,7	0,08	0,11	0,17
Machines for food processing	12,0	39,8	46,0	0,04	0,08	0,05
Tractors and agricultural machines	50,6	606,5	790,8	0,19	1,24	1,01
Total machinery industry	797,5	2075,9	4950,2	3,13	4,24	6,36
Vehicles	369,3	627,1	2536,2	1,44	1,28	3,26
Electric rotors Electric equipment and instruments for industry and household	590,7	1485,7	2217,7	2,31	3,04	2,85
Instruments for telecommunication Semi-conductors and products of vacuum engineering	838,5	2060,7	2400,5	3,29	4,21	3,08
Medical instruments and optical products	66,3	254,4	556,4	0,26	0,52	0,71
Tools	62,2	156,0	80,1	0,24	0,31	0,10
Equipment and instruments for management technique	58,4	163,1	307,6	0,22	0,33	0,39
Vehicles, electric and telecommunication instruments and tools together	1985,4	4747,0	8098,5	1,28	9,71	10,40
Products of machine industry total	2782,9	6822,9	13048,7	10,92	13,96	16,78
TOTAL INDUSTRY	25472,6	48859,3	77734,1	100	100	100

table 1o

Direct exports to developing countries

	Million Forints, free border			Division %		
	1971.	1976.	1980.	1971.	1976.	1980.
Machine units for general use	27,0	40,4	58,3	0,41	0,27	0,24
Machines general	678,6	1884,5	1865,6	10,51	12,75	7,90
Machines for mining, metallurgy, building industry	15,1	160,0	326,3	0,23	1,08	1,38
Lathes, milling machines Cutting machinies, cable machines, machines for telecommunication and vacuum engineering	85,2	767,5	609,7	1,31	5,19	2,58
Equipment for the chemical industry	12,7	92,5	50 1	0,19	0,62	0,21
Machines for the light industry	66,2	248,4	68,5	1,02	1,68	0,29
Machines for food processing	14,8	657,0	243,2	0,22	4,44	1,03
Tractors and agricultural machines	5,6	92,8	362,4	0,08	0,62	1,53
Total machinery industry	905,2	3943,1	3584,1	14,00	26,69	15,18
Vehicles	897,2	1395,0	2666,4	13,90	9,44	11,29
Electric rotors Electric equipment and instruments for industry and household	202,6	777,3	1763,8	3,13	5,26	7,47
Instruments for telecommunication Semi-conductors and products of vacuum engineering	360,5	859,4	1320,8	5,58	5,81	5,59
Medical instruments and optical products	167,6	289,6	763,0	2,59	1,96	3,23
Tools	128,9	344,7	499,1	1,99	2,33	2,11
Equipment and instruments for management technique	18,3	120,5	7,1	0,28	0,81	0,03
Vehicles, electric and telecommunication instruments and tools together	1775,1	3786,5	7020,2	27,50	25,63	29,73
Products of machine industry total	2680,3	7729,6	10604,3	41,50	52,32	44,91
TOTAL INDUSTRY	[illegible]	14774,0	23610,1	100	100	100

table 11

Direct imports from socialist countries

	Million Forints, free border			Division %		
	1971.	1976.	1980.	1971.	1976.	1980.
Machine units for general use	309,6	594,3	469,1	0,43	0,49	0,31
Machines general	6525,2	10438,7	9040,2	9,26	8,76	6,14
Machines for mining, metallurgy, building industry	2439,4	3012,4	3212,2	3,46	2,52	2,18
Lathes, milling machines Cutting machinies, cable machines, machines for telecommunication and vacuum engineering	813,5	1631,7	1698,5	1,15	1,37	1,15
Equipment for the chemical industry	749,3	838,0	400,2	1,06	0,70	0,27
Machines for the light industry	1104,0	1363,2	1173,7	1,56	1,14	0,79
Machines for food processing	327,9	647,3	658,6	0,46	0,54	0,44
Tractors and agricultural machines	4611,9	4877,0	3854,1	6,54	4,09	2,61
Total machinery industry	16880,8	14007,7	20506,6	23,97	11,76	13,93
Vehicles	9682,6	15951,1	20331,3	13,75	13,39	13,89
Electric rotors Electric equipment and instruments for industry and household	1097,6	2212,7	2601,9	1,55	1,85	1,76
Instruments for telecommunication Semi-conductors and products of vacuum engineering	1086,7	2001,9	8504,8	1,54	1,68	5,77
Medical instruments and optical products	1010,7	1522,7	1434,7	1,43	1,27	0,97
Tools	660,7	693,8	1097,9	0,93	0,80	0,76
Equipment and instruments for management technique	358,3	1224,2	1653,2	0,50	1,02	1,12
Vehicles, electric and telecommunication instruments and tools together	13896,6	23876,4	35623,8	19,74	20,05	24,20
Products of machine industry total	30777,4	37884,1	56130,4	43,71	31,81	38,13
TOTAL INDUSTRY	70411,3	119072,9	147197,6	100	100	100

table 12

Direct imports from developed countries

	Million Forints, free border			Division %		
	1971.	1976.	1980.	1971.	1976.	1980.
Machine units for general use	331,6	627,5	828,5	0,73	0,79	0,73
Machines general	1264,7	2046,6	3567,6	2,81	2,59	3,16
Machines for mining, metallurgy, building industry	1595,7	3432,7	4346,7	3,54	4,34	3,84
Lathes, milling machines Cutting machinies, cable machines, machines for telecommunication and vacuum engineering	559,2	1862,2	2774,2	1,24	2,35	2,46
Equipment for the chemical industry	1332,5	3124,5	1846,6	2,96	3,95	1,64
Machines for the light industry	1557,8	2457,4	2791,8	3,46	3,11	2,47
Machines for food processing	418,8	636,1	1977,5	0,93	0,80	1,75
Tractors and agricultural machines	1088,4	2111,4	2443,3	2,41	2,67	2,17
Total machinery industry	8148,7	16298,4	20576,2	18,11	20,63	18,27
Vehicles	1725,3	2628,0	3600,1	3,83	3,32	3,19
Electric rotors Electric equipment and instruments for industry and household	515,6	1465,6	2129,9	1,14	1,85	1,89
Instruments for telecommunication Semi-conductors and products of vacuum engineering	1064,0	2029,5	3207,8	2,36	2,56	2,84
Medical instruments and optical products	729,8	1258,1	2035,2	1,62	1,59	1,80
Tools	607,9	976,1	1561,7	1,35	1,23	1,38
Equipment and instruments for management technique	1029,1	1337,4	1959,7	2,28	1,69	1,74
Vehicles, electric and telecommunication instruments and tools together	5671,7	9694,7	14494,4	12,60	12,27	12,87
Products of machine industry total	13820,4	25993,1	35070,6	30,71	32,90	31,15
TOTAL INDUSTRY	44994,7	78999,8	112590,2	100	100	100

table 13

Direct imports from developing countries

	Million Forints, free border			Division %		
	1971.	1976.	1980.	1971.	1976.	1980.
Machine units for general use	-	-	-	-	-	-
Machines general	-	2,5	64,4	0,0	0,20	0,53
Machines for mining, metallurgy, building industry	4,1	24,4	28,3	0,7	0,23	0,23
Lathes, milling machines Cutting machinies, cable machines, machines for telecommunication and vacuum engineering	-	-	0,2	-	-	-
Equipment for the chemical industry	-	-	1,0	-	-	-
Machines for the light industry	-	3,8	-	-	0,30	-
Machines for food processing	0,2	1,9	19,6	-	0,10	0,16
Tractors and agricultural machines	-	-	14,4	-	-	0,12
Total machinery industry	4,3	32,6	127,9	-	0,03	1,07
Vehicles	104,5	17,7	19,3	2,01	0,17	0,16
Electric rotors Electric equipment and instruments for industry and household	21,6	47,3	31,0	0,41	0,46	0,13
Instruments for telecommunication Semi-conductors and products of vacuum engineering	0,6	43,9	79,4	0,01	0,43	0,66
Medical instruments and optical products	4,4	32,4	36,8	0,08	0,31	0,30
Tools	-	4,8	0,2	-	0,04	0,03
Equipment and instruments for management technique	-	1,3	-	-	0,01	-
Vehicles, electric and telecommunication instruments and tools together	131,1	147,4	166,7	2,51	1,44	1,40
Products of machine industry total	135,5	180,0	294,6	2,59	1,76	2,47
TOTAL INDUSTRY	5215,7	1082,7	11935,2	100	100	100