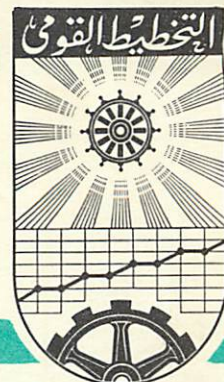


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THE ROLE OF INDUSTRY
IN
ECONOMIC DEVELOPMENT

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The Role of Industry
in
Economic Development.

It is industry that makes a country rich and powerful . This is so obvious that it may be rather senseless to discuss the mentioned point. However, though there is full agreement on the necessity of a rapid industrialization , I have the feeling that there are many ideas on this problem which differ from each other sometimes considerably. . . .

This note is not meant to compete with many good books which had been written in this field. It rather tries to give an outline and the background of some problems involved together with some details for illustration.

Any modern economy - both in terms of sociology and technology - is an industrial one. If planning as a socio-economic phenomenon is adopted it should concentrate on industrial development. Thus industrial planning being the most important part of national planning. This holds true, in particular, with respect to developing countries. Yet, we say that development is generally understood as the process of (initial) industrialization .

1. Industry and Productivity.

Productivity is the basic problem of economic progress. Productivity , however, is closely linked with mechanized production methods (apart from other factors). Such methods gave rise to industrial activities in economic history. They are spreading now over other sectors like e.g. construction and agriculture. At the same time industrial production methods are being improved themselves. Thus industrialization can be

conceived as a two fold tendency : establishment and expansion of industrial branches on the ~~one~~ hand and technological transformation of other types of economic activity on the other .

In any country industrialization of economic activities other than the traditional industrial ones has to be preceded by an industrialization in the narrow sense of the word. This so, because industrialization represents a tendency of furnishing the economy with productive equipment which comes from industry only. Developing countries, therefore, have to think , first , about a rapid development of industry . There must not be any doubt that it is finally a high rate of growth in productivity which will enable developing countries to avoid any further extending discrepancy between them and the industrialized countries.

It is worth while to discuss this point in detail because we all know very well the ~~alternative~~ labour intensive techniques versus capital intensive techniques. In terms of this note we may call this low productivity vs. high productivity . As the reader can easily see the author is in favour of high productivity which proves a synonym of capital intensives techniques.

Developing countries are much concerned with the strikingly increasing gap between industrializing and industrialized countries. One reason for that are the different rates of growth and the different levels of labour productivity.

Thus, the annual rates of growth of output per worker in manufacturing (which is a general indicator of labour productivity) marked from 1950-1960 .

in	Japan	12,2%	(18,1%	output)
	West Germany	5,1%	(10,1%	"
	Italy	7,6%	(9 %	")
	France	5,8%	(6,5%	")
	US	2,7%	(3,6%	")
	United Kingdom	2,3%	(3,5%	")

(World Economic Survey, 1961, UN, P. 65)

In most cases, a high rate in output per worker was linked to an accordingly high rate in total output.

It should be mentioned that the highest rates of growth in output per worker can be found in those countries which have an annual rate of growth of employment (in manufacturing) which out-paces any other western economy, namely Japan = 5,3% and West Germany = 4,7%. This seems to be an eloquent example about the importance of increase in productivity even if labour is more abundant.

In order to make our study complete some figures, we believe ,

should be given about productivity in socialist countries which as to, their starting points of economic development had been far less homogenous than those economies stated above.

During the period from 1950 to 1961 output per worker in industry increased as follows:

Bulgaria	191 %
Hungary	168 %
Germany	239 %
Poland	247 %
Roumania	233 %
USSR	207 %
Czechoslovakia	223 %

Obviously, a high rate of growth in productivity is a basic precondition for economic development in general and for industrial expansion in particular. It should be noted that this holds especially true in countries which started from a very low economic level after World War II (Poland, Bulgaria etc.) The latter embarked on a policy of intensive industrialization attaching top priorities to industrial activities conducive to a considerable increase in productivity. It is this general trend which enabled them to narrow the gap between themselves and the "classical" industrial economies.

Productivity, therefore, is at stake both in the initial stages of development and later on in the permanent process of reequipping the production apparatus of any nation.

A very informative indicator of economic progress is the share in increase of industrial production which accrues from labour productivity. Hungary e.g. shows a steady increase of this share:

1959	=	35 %
1960	=	48 %
1961	=	67 %

(Source: Wirtschafts-wissens-schaft No. 4/63; p. 584, Berlin)

This tendency seems to be a general rule over a long period in both relatively less and more developed economies. Even countries with relative abundant manpower like e.g. Poland, Roumania etc. show a marked increase in the indicator under discussion.

Share of increase of productivity in growth of
industrial output (in %)

	1950-55	1966-60	1962
Bulgaria	52,2	21,1	72
Hungary	24,2	46,2	63
Germany	33,7	75,5	-
Poland	51,5	73,4	66
Roumania	53,3	67,5	-
USSR	66		
Czechoslovakia	61,3	62,4	52
Yugoslavia	23	48	-

It should be noted, however, that the ever growing weight of productivity in industrial production is both preceded and accompanied by

a high growth of labour productivity as such. This can clearly be seen from the following table:

Increase in (a) productivity (output per worker) and (b) production of industry
(1950=100)

	1958		1961		1962
	A	B	A	B	
Bulgaria	162	291	191	397	7,6
Hungary	133	232	168	265	5,7
Germany	188	241	239	292	8,4
Poland	192	278	247	338	4,1
Roumania	185	267	233	340	6,6
USSR	175	248	207	300	6,0
Czechoslovakia	183	228	223	282	-

From all these, though rough, figures two main conclusions can be drawn:

First, The process of economic development is based on a rapid growth of productivity from the very beginning.

The widening gap between many industrialized and industrializing countries calls for a faster increase in the latter in order to turn this widening discrepancy into its reverse.

Secondly, the increase in productivity as such should be faster than

the increase in industrial employment. Hence the economic possibility of a considerable further extension of employment in absolute terms because the economic surplus will be higher.

It should be a main concern of any development planner to provide for adequate measures and not to be induced to pay most attention to abundant manpower only. Otherwise, the respective countries which follow this line would run into terrible troubles in the long range.

Economic progress is a process of constantly re-equipping the national production potentiality which tends to become more costly though necessary all the time. Any choice of mainly labour-intensive techniques (i.e. low productivity), therefore, would mean a substantial waste of national resources.

Capital is usually regarded a scarce factor in developing countries. But capital, i.e. equipment etc. is required in ever growing quantities if a country intends to be up to date in the economic field. Capital can be derived, *ceteris paribus*, from the economic surplus only. The latter, in turn, is the result of a highly productive economy. Consequently, in order to gain a high investible economic surplus, one has to embark upon a policy preferring capital-intensive techniques.

Industrializing countries are in need of capital; they have therefore, to produce it partly by investing their limited resources in adequate techniques. Low productive techniques yield small output (in absolute terms) and consequently, a low economic surplus (in absolute terms, too) even if one should regard it appropriate to reduce wages drastically. Because this would not mean any increase in the economic surplus produced but rather

a different pattern of distribution in favour of the investible surplus. The main problem, however, is to produce more.

The more we manage to produce all the more we can allocate both for investment and consumption. Any use of the limited investable surplus for low productive techniques leads to a low output, low economic surplus and a low accumulative economy. This obviously, never can help bridge the gap between industrialized and industrializing countries.

As a result, a developing country proceeding in that way would not even gain the means to equip its economy according to the present international standards in technology. Moreover, in the meantime technico-economic progress is going on asking for even more capital investments which, naturally, would not be available either in developing economies. later on Thus, any preference to labour-intensive investments inevitably can not solve any basic economic problem but postpone and even aggregate it.

Mention should be made of another problem related to this issue. Technico-economic progress implies by definition highly and adequately trained manpower. How can this be achieved with prevailing labour-intensive techniques? Even training abroad, excellent as it may be, could not be continued at home for lack of well equipped factories. However, it is practical experience in operating modern machines and running up-to-date plants which makes manpower really qualified ones and who are, in addition to this, fit and elastic enough to keep up with technical progress in any field.

Summarizing we may say that any concentration on labour-intensive techniques actually means:

(i) to use the national economic surplus in order to produce less than it would be possible if a policy were adopted which is in full line with the objective trends in technology and economy. But this, obviously, is uneconomical, waste of national resources;

(ii) to postpone the necessarily expensive investments in modern techniques until they have become even more expensive .

At that time the discrepancy between means and ends would be greater than it is now;

(iii), to remain backward in the field of training and re-training practically manpower for lack of modern equipments. This holds true also for any research and development activity in the according fields.

2. Industry and General Structural
Changes .

Industrialization is a permanent process which implies

- (i) an increasing share of industry in national production;
- (ii) industrialization of economic activities others than the classical industrial ones and ;
- (iii) structural changes inside industry.

It is the share of industry in national production (and / or national income and employment as well) which economists use to classify countries as advanced, less developed, industrial ones etc. We need not discuss at length this problem because economists are in full agreement that industry should prevail. Consequently, it has to grow faster as against other sectors of the economy. This is of particular significance in such cases where the industrial share in the national product is low. As a substitute for a detailed discussion let us quote some data.

Share of industry (incl. construction)
in total national output (excl. services)
1950 - 1960

US	75 %
UK	77,8 %
Italy	58,3 %
Denmark	58,1 %

(World Economic survey U.N. 1961 P. 61)

Share of industry (incl. construction)
in national income (excl. services) in current
Prices.

	<u>1950</u>	<u>1961</u>
Bulgaria	43,4 %	53,7 %
Hungary	58,6 %	67,6 %
Germany	53,3 %	69,9 %
Czechoslovakia	70,0 %	72,0 %

The second point, industrialization of economic activities outside industry, is no urgent problem in the early stages of development since the existence of a solid industrial basis is the prerequisite of it. First comes industry; industrialization will spread over other sectors of the economy later on.

It may be quite interesting, however, to learn how far this process has already developed in some industrially more advanced countries.

The East German construction sector is undergoing a process of mechanization which so far resulted in a percentage of 48,3 being carried out by means of modern assembling methods (for which standardized building elements are used). In residential building only, this share marks 70,8 % (all data for 1962) out of total production in this field. Agriculture, being relatively well mechanized, now faces the problem of full mechanization. Crop harvesting of cereals is fully mechanized on 50,7% of the respective cultivated area (i.e. cutting and threshing are executed by machines in the fields). Crop harvesting of sugar beets—a very labour-intensive

operation-is now completely mechanized on 72% of total sugar beet acreage.

The third point of our definition of industrialization-intra-industrial structural changes proves the main problem in development policies. This holds true in both the initial and the subsequent stages of economic growth. Such changes are going on continuously every-where. Our approach must be, therefore, a rather dynamic one.

No country can go into industrialization straight away because structural changes are different at the various stages of development. Priorities attached to certain industrial activities (branches) in one period have to be transferred to others during the next one. Moreover, industrialization is a long-term problem. It requires adequate allocation of national resources as well as accordingly long-term planning. These tasks are mostly undertaken by the governments, i.e. responsibility is a national one. The approach, therefore, must be a national one, too. Any mistake in our planning means mis-allocation of national resources and loss of time. Its correction needs, in turn, even more public funds and more time.

It is our job now to study this issue of intra-industry structural changes with special reference to general trends underlying the process of specific national industrialization. We shall start our discussion with the main factors affecting the structural set-up of industry as the dominating sector of the national economy.

- (i) Any nation, and emerging new nations in particular, faces the problem of modelling its own national economy. Planning, consequently, has to outline (and, later on, to help implement) a comprehensive national pattern of development. All economic activities have to be fit together,

first, with respect to national resources and needs. In other words: industrialization-based on planning-must finally result in an overall initiating and rational utilization of the economic, social, political and cultural potentialities of the country so as to form an economic entity of the nation.

- (ii) Industrialization must be brought into line with modern production techniques and technologies. This has its effects not only on productivity as discussed in section 1 of the present note, but also on the choice of industrial activities (branches) resp. to which top priority has to be attached.
- (iii) All national economies constitute a world-wide economic mechanism. They are interrelated on many lines: trade, production etc.. They must manage their respective national industrialization with due regard of the two types of international division of labour, i.e. the traditional capitalist system and the emerging international economic system of socialist countries which in 1962 produced 37% of total world out-put in industry. Thus, in designing the national pattern of industrialization we must coordinate it with trends on the international scale. Any national industry conceived as a comprehensive and well-balanced system of division of labour must find its adequate international position. This highly influences the problem of industrial structure. Naturally, the various branches are affected in different ways.

We have arrived, substantially, at three main aspects for designing an industrial pattern in planning: the national economic, the technological (technical) and the international economic one. All three are so much integrated that it is extremely difficult to study them separately.

Industrial planning and hence drafting the mentioned structural pattern is a problem of production activities (or branches) and not, primarily, of single projects resp. factories. We have to plan, therefore, which products or groups of products have to be produced (and how this should be managed ~~technologically~~) in order to meet present and future demand. This production approach results from the fact that industry is a set of heterogenous branches (activities) which have different weights in the national economy. It is up to the planner to single out these differences in weight, so as to fix the different rates of growth of output in the many branches. Because the average rate of increase in industrial production gives the general trend only, it is the result of the various specific branch-rates rather than the starting point for their calculation. Consequently, priorities are necessary to mark the order and the proportionality among different branches of industry. Industry as a whole is pushed ahead by putting differential emphasis on the various branches. This actually means to pick out the leading branches which determine the character of industrial production either in general or, perhaps, in different periods only.

Machinery, equipment as well as intermediate goods are needed in rapidly growing quantities everywhere. They, obviously, must be made available by both local production and imports, the percentage of either source varying from time to time and from country to country. To do

without national production of such means of production would, however, inevitably imply that the national economic growth is becoming.

- (i) more and dependent upon imports and that
- (ii) the own possibilities of exports could not keep step with import needs, because the necessary diversification of exports mainly depends on an adequate extension of investment goods production. Highly exchangeable goods are just coming from this sort of industrial activity.

Consequently, every country must have a national production of machinery, equipment and intermediate goods. For developing economies this point is of particular importance. It will contribute significantly to further economic independence. Yet we may say that the extension of these industrial activities serves as one indicator of sovereignty in the economic field.

It had been said earlier that, apparently, machinery etc. is required in growing quantities. We should not forget, however, that this is equally true with respect to the number of different kinds of machines etc. which is increasing tremendously. Our general conclusion therefore has to be somewhat amplified to the effect that each country should develop a production of investment and intermediate goods to an extent which meets partly local demand as well as export needs in exchange, mainly, for such investment and intermediate goods which are not produced locally (resp. in quantities only below local demand). If we have in mind certain machines or intermediate goods, separately, it may happen that some are locally produced according to total demand whilst others are completely imported. But on average an extended production in this field is regarded vital for

both local use and export.

If planning would not embark on this line international economic relations would not be less disturbed than they are now. Investment goods producing countries would remain such, thus underdevelopment in other countries being frozen. Moreover, as producer goods are needed more and more industrial economies would become even more superior.

After this verbal discussion it is necessary to study our problems quantitatively. UN has made an attempt to summarize recent industrial trends all over the world. The results suit very well our discussion. Output of means of production as against consumer goods has grown more rapidly in both capitalist and socialist countries as the following tables reveal:

Annual Rates of Growth of Manufacturing Output
by Major Groups, 1950-1960.

	Manu- facturing Total.	Chemicals	Basic Metals.	Metal. Products	Food etc.	Clothing + footwear.
Japan	18,1	18	15,1	26,7	11,2	12,5
West Germany	10,1	12	8,9	13,1	7,9	9
UK	3,5	6	3,3	4,3	2,7	1,8
US	3,6	6,5	0,1	5,1	2,3	3,4

(World Economic Survey, UN, 1961, P. 67).

Annual Rates of Growth of Industrial Output,
Produced and Consumer Goods
(preceeding year =100)

	1959			1960			1961		
	Industry Total (a)	Producer goods. (b)	Consumer (c)	(a)	(b)	(c)	(a)	(b)	(c)
Hungary	110,8	112,7	107,8	113,4	114,3	109,5	112	112	110
Poland	109,2	113,2	104,8	111,1	113,5	108,3	110,5	111,9	108,1
USSR	111,4	112,2	110,3	109,9	110,9	107,1	109,2	110	106,6

(ibidem. P.P. 177/178).

Though both tables are not indentical in classification and definitions, the general trends is obvious:

Δ 'Producer goods' $>$ Δ 'total output' $>$ Δ 'Consumer goods'

Naturally, this leads to an increasing share of producer goods in aggregate industrial (manufacturing) output. Furthermore, this trend is the sine qua non for an expansion of consumption. In all countries quoted above per capital consumption in absolute terms is higher than in almost all developing economies. Hence the unique phenomenon: if high absolute consumption per capita is being attained this is accompanied by a decreasing share of consumer goods production in total industrial output.

Per capita consumption is partly a synonym for high per capita income which can be observed to be the most out-standing target in the majority of less developed countries. This goal consequently, can be reached if the planners provide for a more rapid increase of output of machines, equipment etc.

Thus, if industry is to play its genuine rôle in development, its structure has to be changed successively in favour of producer goods. The "World Economic Survey 1961" of UN gives a concise formula for that:

"The basis of economic growth is man's increasing ability to transform natural resources into useful products, and industrialization represents the highest stage of development of this process. " (P. 61).

This transformation, however, requires tools, i.e. machines, How could somebody advise developing countries not to embark on a policy which is in accordance with these modern trends? Why should such economies be excluded from this highest stage of economic growth? Because these countries are poor they cannot, we believe, afford to spend their small economic surplus on techniques which by no means can be regarded as elements of a highly productive and hence highly accumulative industrial basis.

3. Branch Composition of Industry.

Some economists and politicians are usually rather afraid of the conclusion we have arrived at in the previous section. This is mostly so because they weigh the economic potentiality of highly industrialized countries against that of their homelands. We admit, that the results are somewhat discouraging at the first sight. It is our intension, therefore, to

discuss this issue soberly with the view to reduce it to its proper dimensions .

A comprehensive national economy needs almost all products of industry. But, normally, no country can manage to produce all herself. This is now-a-day beyond the national potentialities with, perhaps, only one or two exceptions. This makes clear that the designing of the industrial structure in development planning comes into the picture as the problem of balancing of the two main sources of industrial products: local production and imports. We are, of course, discussing this problem from the point of view development planning in the long range. Operative foreign trade matters in this particular field will be dropped.

The basic question of this section runs as follows: which industrial activities (branches) should a national economy consist of? Apparently, this is the question about the main targets of a development plan about allocation of investments. Due to the character and time limitation of the present note we shall endeavour to outline, at least, a few main structural elements of an up-to-date industry which has to be set up step by step. It is up to the national planners, of course, to map out the full structure.

The industrial structure has to be discussed at different levels, e.g. by major groups, groups, products and articles if we wish to use the concepts of the International Standard Industrial Classification (ISIC). The structure which we have in mind in this note is limited to major groups and groups (or branches). These are real elements of the national pattern of industry; and it is a problem of long-term investment allocation as well. Because the mentioned aggregate industrial activities

require specific machinery, equipment and skills which can be created only during a long period of time. Consequently, they cannot easily or, perhaps, not at all be transformed into other activities. They, represent the skeleton of the national economy (industry). On the other hand, products and articles are subject to short term fluctuations in demand etc. If the basic structure of an industry as a whole is up to the standards and trends which we are discussing, short-term adjustments as regards individual commodities represent no serious problems because they need no specific basic equipment (= investment) which would necessarily imply major structural changes. Thus; choosing the most important branches in designing the national economy we simultaneously shall provide for an adequate flexibility of the production apparatus in order to meet short-term fluctuations that will occur.

3.1 Raw Materials .

Processing (i.e. manufacturing) industries are growing fast. An increasing share of industrial output, therefore, is attributed to them. This leads to a high demand of raw materials. In order to avoid more dependence upon imports of raw materials the latter should be extracted resp. produced to a large extent locally. This extent is characterized by the national resource endowments (quantitatively and qualitatively as well).

As raw materials are required in large quantities transportation is very costly both in absolute and relative (per unit) terms. This expensiveness also includes expenses for investment and maintenance of transport lines and equipment. There are exceptions, of course, to be considered. Even high transportation costs can be neglected if a specific raw

Net product (value added) per employed in East
German industry, 1960 .

(in national currency units)

Basic industries	13200
(electricity, mining, metallurgy, chemicals, construction materials)	
dto, excl. chemical industry	8900
Chemical industry	20300
Metal processing	12500
Light industries	12800
Food-stuffs industries	65600

(Statistical Year-book of GDR, 1960/61, Berlin)

These figures are self-explanatory.

High productivity is always the inverse of high capital intensity which involves serious investment problems. Comparative studies, are, therefore, necessary to estimate the specific investment requirements (i.e. per unit of production) for certain products which can technologically be substituted by chemicals. One of the most promising tendencies is the gradual and partial substitution of metals by adequate types of plastics. In preparing their long-term plans the socialist countries have been encouraged to promote chemical industry because it is, relatively speaking, an "investment saving" activity. A specific volume (in m³)

of output has the following investment requirements:

Output	Plastics	Steel	Aluminium
Investment:	1	3	5

Nevertheless, investments in chemical industry remain still high in absolute terms. They can be kept, however, minimal by an appropriate intra-branch structure of chemical production. The capital-output ratio tends to suggest an efficient solution in this case. Resorting again to data from the German planning authorities we find considerable deviations from the average fixed capital-output ratio in the various sub-branches of chemical production. Here are the figures of some selected sub-branches:

Fixed capital-output ratios (1960)

Chemical industry	0,974
Basic chemicals	1,398
Oil processing	1,066
Plastics for production	0,478
" consumption	0,369
Artificial fibres	0,903
Pharmazeuticals	0,365

Fixed-capital output ratios of the last four sub-branches should planners induce to care for a set of chemical activities in development so as to take the full advantage of chemical industry. Because this industry seems to be very expensive in the primary sub-branches, but it pays well in the

subsequent stages. By the way, this is an important point for development planning namely, not to think preferably of individual projects and their (individual) profitability but rather to think in terms of branches (incl. sub-branches) and their specific role in industrial development .

It should be noted that the development of chemical industries fits well the idea of priority to non-consumer goods. About 84% of total chemical output in Germany e.g. can be classified as producer goods. Thus the high rates of growth of this sort of production in almost all capitalist and socialist countries (Cf. General Statistics of OEDC, July 1963, P.P. 4,12) proves an important point in modern industrial development .

3.3 Engineering Industries

Referring to what has been said earlier about the growing quantities of equipment needed in industrial development we may start our discussion of engineering with a short comment on international trends in this field.

It is learned from statistics that both expansion of production and foreign trade results to a considerable extent from the engineering branches. Such countries which have to offer a diversified assortment in these fields are better off. They are less subject to fluctuations on the international markets but rather active themselves. Moreover, it is engineering where, from the technological and technical point of view, an extremely rapid diversification and specialisation can be observed. In this area, it is believed, developing economies can find a suitable place among other more advanced countries, and they can find it easily. In the long range,

it will become almost not managable to pay for increasing imports of equipment etc. by raw material or consumer goods exports preferably.

However, this is not the only reason for a development of national engineering. There are some decisive internal factors which favour this type of industrial activity. In section I it has been pointed out that the limited resources of capital in developing countries prove an argument for choosing capital intensive techniques. We should like to elaborate on this idea now.

Industrial development requires large investment of machines and other equipment as well as of buildings. Consequently, we have to consider it as a problem of supply of investment goods, i.e. in physical terms. This should be clearly understood because in practical planning we often see that most attention is paid to the financial problems of investment. The mentioned physical character of investment, appharently, being left to, say, " non-planners " or " non-economists ".

The economic surplus which is the main source of investment is usually expressed in value (money) terms because it is an aggregate indicator. This sum must be equal to the volume of investment goods (equipment and buildings) for implementing the targets of the plan. If, therefore, comprehensive planning is adopted, adequate measures must be taken to supply these goods physically. This can be done by quantititative planning techniques only. In other words planners have to care for a proportionality between the financial and material funds.

When calculating the physical funds which are necessary for the investment plan we directly arrive at the problem of the relationship

between the structure of local production and that of the required material funds. Total requirements in most cases exceed local supply, the residual, therefore, normally is covered by loans and credits from abroad. But this is not the problem of the present section. What seems to be more pressing in developing economies is the discrepancy between the major (and minor) structural elements of material investment needs and production. Proportionally, expansion of investments tends to increase the dependence of foreign supply of investment goods. No trend of an adequate growth of a certain local output of investment goods can be seen in developing economies. Sometimes no investment goods are made at all domestically nor are according targets set in the long-range development plans.

For illustration of the implications let us try to make a very simple scheme. Supposed the total output is divided into three main groups of commodities, namely.

- a) Raw materials and semi-fabricated goods (= intermediate goods, int. g.)
- b) Machinery and equipment (= investment goods, inv. g.)
- c) Consumer goods (= c. g.)

Then we have:

$$\text{Production} = \text{int. g.} + \text{inv. g.} + \text{c. g.}$$

This is total sources (provide no foreign trade takes place) in terms of physical structural elements of output. In figures we have to write, e.g. $100 = 40 + 5 + 55$.

For replacement of used value materials and intermediate goods we need 20, for increase in stocks 5. 15 are in excess. For investments, however, the plan requires, say, 25 units. Consumer goods demand amounts to 50 which means a surplus of 5. A comparison of both the actual physical and the planned structure of output indicates the problem clearly:

	Output = intermediate goods+investment g. + Consumer goods				
Actual	100	=	40	+	55
Planned	100	=	25	+	50
<hr/>					
Balance			+ 15	-	20
				+	5

Twenty units of investment goods must be procured if the investment plan is prior to any other need. In exchange for that we have a total surplus of 20 consisting of 15 intermediate goods (raw materials) and 5 consumer goods.

So far, things are alright. The structure of the national product come be transformed into that one which is physically adequate to the plan. But the troubles begin just at this point. Nowadays, any exchange of raw materials and, partly, of consumer goods against investment goods means a real loss of material production and income (for easiness of discussion it is assumed that these goods do find a market abroad). This is due to the well-known trends of prices going in diverging directions at the expense of raw materials exporting countries.

Thus, in our example the export of raw materials would fetch, perhaps, only 14 and the export of 5 consumer goods 5. Total exports of 20, therefore, earn a total of only 19. These 19 units are available

for imports of equipment (investment goods). They can be used, due to increased prices for an import of only say, 18 real units which is 2 units short of the investment plan.

Investments are the key problem in development planning. This is true of both volume of investment and its physical structure. If total investment requirements are given priority some foreign sources have to be used because of the limited local potentiality to accumulate. But what interests us is the structural problem. Our simple example reveals that a heavy restraint on development is coming from an inadequate material structure of production. Apparently, the investment targets provide for a higher sum than the related material fund which had been produced locally. This holds true of all developing countries. Naturally, a considerable part of output of intermediate (raw materials) and consumer goods has to be exported in exchange to investment goods. This is to adapt the physical structure of national output to the structure of total uses in accordance with the investment and consumption plans. Consequently if the structure of output is not being changed gradually, national development will permanently be dependent on imports of expensive machinery to almost 100 per cent. Moreover, this import depends, in turn, upon exports of raw materials and consumer goods. These commodities do not fetch reasonable prices on the world markets, and consumer durables e.g. face very competitive markets in industrial countries. The increasing needs for investment goods, therefore, can be met to the extent the prevailing other branches of production earn the necessary amount of hard currency. These earnings are limited. So are, in the long range, loans and credits from abroad if a country does not wish to be extremely indebted.

A weak economy, therefore, is not merely characterized by a

low accumulative power (i.e. small economic surplus) but rather by a crippled structure of output with predominantly non-investment goods. The very essence of this brief discussion is that the undoubtedly ever growing demand of investment goods should lead to a remarkable expansion of a national production in this field. This is to avoid any further weakening of the position of developing countries. Apart from this, a national production of equipment would increase productivity which is extremely necessary in order to decrease costs with the view to have a better competitive position on the world markets.

In more concrete terms this actually suggests to have a national engineering industries. And any development plan should envisage definite measures in this particular field. Thus, the process of industrialization will be executed, though partly, on an own material basis. And it is to this extent that the national economic surplus will be produced in that physical form in which it can be invested directly. Industrialization and investment, therefore, prove primarily a material (Production) problem.

Engineering requires, of course, specific skills, capacities etc. which can be developed over a long period only. Furthermore, engineering is subject to a rapid process of specialization which gives rise to new sub-branches. Our conclusion that any economy has to have an engineering holds generally true. However, which parts (sub-branches) of it serve best a national economy at the different plan periods must be found by detailed planning. A manageable approach may be, perhaps, the following.

The national planning should start with choosing the main branches of the entire economy. These top-priority-branches would form the very central part of the economy around which other complementary activities will be grouped. In addition to this, the chosen leading branches constitute

a certain trend of specialization of the national economy. These branches must be taken from the group of producer goods, otherwise we would encounter the problems discussed before. Consequently, planning activities should be concentrated on this central part of the national economy. This would imply that the bulk of investments be allocated for them. Scattering of investment, which is minimizing its effect could be largely avoided.

Proceeding that way, requirements of equipment etc. then tend to become relatively homogeneous and they will amount to a certain size which makes a national production of relevant machines etc. feasible. If, e.g., oil processing belongs to the small group of top-priority-branches, an adequate national production of certain types or parts of chemical equipment should be initiated.

The development of a national engineering would start from a limited number of specific activities in this field and spread gradually over other, complementary, engineering branches. The latter, actually, have to produce certain inputs of the national machine-building branches like e.g. castings, forgings, dies, bolts, electric motors etc. Consequently, a whole bunch of sub-branches will come into the picture ranging from certain final goods to a number of intermediate goods. This is under control of the plan, both demand and supply. And the market problem, therefore, is primarily a problem of quantitative planning of the material relations between a specific set of interconnected industrial activities.

Concluding, we should like to give some figures about this problem. Bulgaria and Roumania formerly backward economies followed a

policy of promoting engineering industries during the last decade. This was (and is) a basic principle of their industrialization. It resulted in a growing share of metal-processing in total industrial production. The rate of growth of this share was higher than that in the more industrialized socialist countries (Czechoslovakia, East Germany) which actually means that the gap between more and less developed economies was narrowed.

Percentage of metal-processing in total industrial output.

	1950	1958	1962
Bulgaria	8,4	13,2	19,3
Roumania	13,3	21,8	26,0
Germany	24,0	29,9	34,2
Czechoslovakia	20,8	32,7	31,9

(Einheit, No 9/63, P. 24, Berlin)

At the same time, total industrial output in Bulgaria and Roumania marked higher rates than in the other socialist economies (Cf. P. 6) .