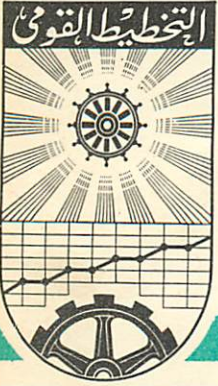


# الجمهورية العربية المتحدة



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THEORETICAL PROBLEMS OF INDUSTRIAL  
PLANNING

PART III

THE INSTRUMENTS OF INDUSTRIAL  
PLANNING

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# THEORETICAL PROBLEMS OF INDUSTRIAL PLANNING

## PART III

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## THE INSTRUMENTS OF INDUSTRIAL PLANNING

### 0. Introduction

Planning is, as mentioned earlier, no rigid system of ever constant activities; it is, however, a very lively matter changing according to objective conditions and concerns which are to be settled and mastered.

We have stressed several times that planning is by no means a desiring prognostication of planning authorities. National economic planning with all its parts must be a very real matter directed towards the reflection and fulfilment of the requirements of economic laws, and especially towards the fulfilment of the requirements of the law of planned and proportional development which arises in connection with socializing the reproduction process.

Between the applied system of planning, as described in the foregoing part of this submitted row, and instruments used are strong connections. This is so, since the applied system depends mainly upon the same factors it is done by instruments.

"No comprehensive plan of development can be drawn up in a vacuum. It must be an expression of the feasible and realistic objectives of a society, objectives that can be realized in the assigned period, starting from the initial situation of the base year (pre-plan-year), and within the social, political, administrative, and cultural setting of the country." <sup>1)</sup>

That is right, but we have to add that not only the pre-plan-period has to be taken into account, but also the forthcoming space of time must be



considered very thoroughly.

Form the tasks of planning resulting from these investigations and influenced by the applied system of planning which, in turn, depends highly upon "the social, political, administrative, and cultural setting of the country" concerned the instrumentarium of planning is decisively being influenced.

Summarizingly, we should repeat:

- 1) planning has to start with analysing national economic and socio-economic conditions given at present, reached level of economic development etc.,
- 2) the main trends of technical development have to be investigated;
- 3) the development of international economic relations, especially the degree of international economic collaboration, has to be analysed.

Proceeding from these analyses there can be determined:

- 1) the main aims of national economic development as a whole;
- 2) the development programmes of separate branches and districts;
- 3) the development program of separate enterprises according to their position within the framework of national economy,

But, simultaneously, and out of the mentioned analyses the way of how to realize the aims set can be fixed and has to be fixed. The results of those analyses will be different ones from time to time; and accordingly, the aims, to be fixed out of them, and the methods of how to reach them have to be different ones, too.



Thus, we can recognize the close correlation and interdependence between :

- political and socio-economic preconditions for planning,
- applied systems of planning, and
- implements for realizing planning.

In other words, the system of planning in the widest sense of the word, and including the used instrumentarium of planning, has always and everywhere to be accordant with objectively given economic conditions (socio-economic conditions) and political requirements.

That means, the system of planning cannot be an unchangeable and rigid one being good always and for any country, but it must be a flexible and changeable one becoming modified according to certain changes taking place within both the political and economic fields.

When talking now about systems of planning we bear in mind:

- the national economic plan itself,
- the proceeding of its elaboration, and
- the way of its execution and following up.

These three components, including the implements (technical implements) for materializing them, should be summed up as "the instrumentarium of planning."

### I. The Framework of National Economic Plans

The national economic plan is that instrument used by the state authority for fixing the necessary and objectively possible development of the social reproduction process as a whole and regarding its single parts



or spheres as well; for instance, the industrial plan which will be main subject of our following contemplations.

It goes without saying that it is completely impossible to reflect by means of the plan the multiplicity of all current political, social-economic, scientific, and natural processes happening within a national economy; by a national economic plan only the essential events can and should be reflected.

Within national economic plans, therefore, only the main problems of the social reproduction process are contained. In this sense, the national economic plan represents an approach of a national economy reducing the multiplicity of social reproduction processes to the most substantial processes.

Special tasks of separate branches and enterprises are to be planned - proceeding from the national economic plan - by means of so-called individual plans.

In spite of this "division of labour" between national economic plan and individual plans the complexity of the social reproduction process has to be watched over and the national economic plan has to be a real comprehensive one comprising all the single spheres of social reproduction and making them evident.

Therefore, the first viewpoint of subdividing national economic plans has to be:

|| subdivision according to the spheres of social reproduction;  
|| that means, according to production, distribution, circulation,  
|| and consumption .



There is no doubt, for the sake of planning national economy such a rough subdivision cannot be sufficient. Therefore, it can be observed in every planning practice that these single spheres of social reproduction are subdivided still furthermore.

Let us look, for instance, at the sphere of production. For being planned exactly it will be necessary to subdivide this sphere into the single branches of material production. Furthermore, the single factors originally determining the growth of national economy have to be made visible; especially, the occurring alterations of single elements of production must be made evident.

Therefore, the second viewpoint of subdividing national economic plans should be;

|| subdivision of the single spheres of  
|| social reproduction as to the branches  
|| and enterprises.

Hence, we can state, the principle of subdivision holds true for the national economic plan (as comprehensive plan) and for the individual or sectoral plans as well. This unitary system of subdivision is an essential precondition for the unitarity of the national economic plan and, especially, for its successful execution and following up.

The original construction of national economic plans in European socialist countries is almost the same all the time. The single paragraphs, however, are changing permanently. This so, because the national economic plan, as an instrument of state authority for managing national economy as a whole, has to contain all the tasks which are to be solved within a



certain space of time, or, exactly, within the plan-year in question. These tasks, however, are changing ones, and thus the single paragraphs of the national economic plan containing those changing tasks have to be changing ones, too. That is understood. New paragraphs are required by new tasks, or existing paragraphs have to become more emphasized because of these new tasks.

The third viewpoint of subdividing national economic plans is:

temporary subdivision of the comprehensive national economic plan and of sectoral plans as well.

Between the single parts of the plan there are close correlations. Preconditions for materializing tasks of the one are being shaped by one or some other parts. It is understood, therefore, that there must be a temporary adjustment between the single parts of national economic plans as well. 2)

The fourth viewpoint of subdividing national economic plans should be:

subdivision according to the regional structure of the country concerned.

That is necessary so as to adjust production, distribution, circulation, and consumption regionally and for ensuring the proportional and homogeneous development of all the single districts of a given country.

Summarizing, we should state:

the framework of national economic plans has to be an unitary one from top to bottom. National economic plans have to be subdivided unitarily and under four points of view:



- 1- according to spheres of reproduction,
- 2- in favour of temporary adjustments,
- 3- according to branches and enterprises, and
- 4- for the sake of ensuring proportional development of a national economy from the regional point of view.

By this system of subdivision it shall be ensured :

- 1- to control the fixing of economic main tasks and its fulfilment, therefore, these main tasks must be made visible and, simultaneously, the responsibility has to be laid down;
- 2- to make possible an exact co-ordination of all the parts of national economic plans for guaranting proportional development of national economy as a whole and its single spheres as well, and that as to quality, and time;
- 3- to make possible an economic adjustment between collaborating countries.

## 2. The System of Balances and Indicators

The fixing of planned development of national economy is made by means of indicators. By these indicators aims bound to be reached during the planned period are fixed .

On the other hand, these indicators make possible by using balances, to co-ordinate the tasks of single spheres of national economy and to control the fulfilment of these tasks.

The single parts of national economic plans are closely connected by the system of balances and indicators which forms -in a certain sense- the skeleton of the national economic plan

The scientifically- based system of balances and indicators has:



- 1) to show accordance between plan and economic main tasks,
- 2) to comprise the social reproduction process comprehensively.
- 3) to make possible the predetermination of the future development of the national economy; and that, from the point of view of national economic quantities and proportions.

The system of balances and indicators cannot be a rigid one. It must be changing in accordance with:

I. The applied system of planning at all.

What does that mean ? - As mentioned earlier 3) there are two theoretically possible systems of planning and managing national economy: the centralized system of planning and the pure market system of planning. As mentioned furthermore, practically used systems of planning and management of national economy are moving in between these two marginal points. Whilst in former times almost all the European socialist countries were tending towards the fully centralized system, today a general movement towards the market system can be observed.

The more, now, a national economy is tending towards the market system, the less economic indicators are needed by the central planning authority so as to control the observance of plan tasks.

But it is not only a matter of numbers. The quality of used indicators depends mainly on the applied system. In case of decentralized planning (trend towards market system) the number of needed indicators is a small one.



the quality however, must be a considerably increasing one as compared to a more centralized system where a lot of indicators is being used so as to give the tasks from the central planning authority directly down to the productive unit. The same holds true for the sake of controlling. The indicators setting targets or plan tasks have to be accompanied or completed by indicators able to control the fulfilment of the tasks set.

This is so, because within a fully centralized economy there is no place for more or less automatically effecting levers. By the strong system of setting tasks the effectiveness of real economic indicators is being abandoned. Hence, we need an administrative system of controlling indicators, too. The more, however, we dispense with administrative indicators, the more scope will be given to really economic levers.

Because of the mentioned trend in European socialist countries a decrease of used indicators can be observed. Generally, there is a movement towards two main indicators:

- a) commodity or market production (so as to control the quantitative side of production and the observance of material or physical proportions)
- b) profit (for controlling the qualitative side of production, development of labour production, etc.)

It goes without saying that the number of used indicators must be a different one and that the mentioned trend holds true for the central level only. In case of lower levels of



planning, however, the number of used indicators will still be bigger now and in future, too. It depends on the possibility to replace administrative indicators by means of economic levers and material incentives.

There is no doubt, therefore, that operative planning will mainly be carried out by means of indicators now and in future. Thus, the number of indicators used within enterprises and between enterprises and superordinated organizations will always be a relatively big one as compared to those used at the central level; and that for the sake of planning and following up as well.

2. The system of used indicators must be a changing one according to the usefulness of indicators concerned.

Let us explain this fact by an example. For a fairly long time gross production was valid as one of the most important indicators for planning and following up production. This was so, because the main task - in a certain period of our building up process - consisted in increasing the volume of production generally, i.e., assortment etc.

During this period the axiom was valid to produce a high quantity, for the requirements were - owing to outcomes of World War II and the separation of Germany - on a high level. On the other hand, it became necessary to mobilize production.

Under these conditions the indicator gross production could be the right measurment for controlling the fulfilment of production programmes. But later on, when the main task



was not longer consisting in mobilizing generally, when it became necessary to produce on a high level of quality and with due regard to the assortment of products produced, when it became urgently necessary to produce with due regard to cost of production (prime cost), and with due regard to returns realized by the enterprise, too, the indicator of gross production could not be looked upon as the most useful one .

This depends upon the contents of the conception of gross production <sup>4)</sup> which is including the totality of produced ready-made articles, the intermediate goods produced within the planning period, and the stock changings in ready - made articles and intermediate goods as well .

But in case of controlling national economic efficiency of enterprises it cannot be of interest what is being produced by the enterprise anyhow; the controlling authority is, however, interested in knowing, what has really been produced by the enterprise and what is able to cover social requirements.

Thus, the indicator gross production has been replaced by the indicator commodity or market production. <sup>5)</sup>

This newly applied indicator is able to show:

- whether the enterprise fulfills its production program generally,
- whether it is producing according to planned assortments, and
- whether the enterprise is producing according to planned prime cost or not .



3. The system of indicators and balances as well must be a changing one also in accordance with newly attained knowledge concerning, for instance, improvements of balances and indicators.

For explaining, two examples; again :

Firstly, concerning balances: formerly, only two-sided balances had been used confronting demand and supply, sources and appliance, etc, but without considering the fact : where do they come from and where do they go? Quite recently, however, interlacing balances (input - output tables) have been developed confronting demand and supply, etc, too, but showing simultaneously existing interlacings between enterprise and enterprise, branch and branch a.s.o. That is to say, by means of interlacing balances the flow of materials can be made evident facilitating in such a way the process of following up .

Secondly, regarding indicators : in many cases there are different methods for ascertaining indicators. Look, for instance, at the indicator: "Labour productivity ." There are, as known, at least three methods for calculating .<sup>6)</sup> We have to look for the most useful one and to apply it. According to our present knowledge the best seems to be represented by the time - summing method. In former times the indicator labour productivity was only ascertained by means of the natural method or on basis of value terms.

Concerning indicators used in industrial planning two kinds have to be distinguished:

- I) indicators expressing size of production, elements of production, and results of production ; to this group there are belonging, for instance, such indicators as:



volume of production, number of manpower, means of production consumed, fixed capital at all, net product, used materials, etc.,

- 2) indicators expressing certain relations which are existing within reproduction process. So, for instance, the indicator "Rate of fixed capital" relating the physical result of production to one value unit of fixed capital. 7)

While by indicators interdependence and results of the reproduction process are to be reflected, balances are expected to express these events existing within the process of distribution and circulation.

Therefore, we have to distinguish between :

- 1) Balances containing results of production and their distribution
- 2) balances of foreign trade activities
- 3) balances of receipts and expenditures

From another point of view we have to distinguish between:

- 1) planning balance - sheets (serving so as to set tasks).
- 2) reporting or controlling balance - sheets  
(so as to control the fulfilment of the tasks set)

From a third point of view we have to classify used balance-sheets:

- 1) according to analysing separate processes  
(analysis and balancing of production process, of distribution, of commodity and money circulation, of consumption);  
and
- 2) according to combining separate processes  
(so as to make clear the interlacing between separate processes)



From a last point of view we have to distinguish between:

- 1) physical balances  
(balance - sheets of materials),
- 2) balances of manpower,
- 3) financial balances.

Let us go a little bit deeper into the matter of balance-sheets.

The basic scheme of physical balances, for instance, looks (in a simplified way) as follows:

Sources	Appliance
1 - Results of market production	1 - Material Consumption
2 - Imports	2 - Means for sustaining and expanding fixed capital
	3 - Increase in stocks
	4 - Individual and social consumption
	5 - Exports
Total sources	Total uses

Such a physical balance-sheet, for instance, is represented by



# BALANCE-SHEET OF FORMATION AND DISTRIBUTION OF GROSS PRODUCTION

(in case of national gross production)

Sources	Appliance
Domestic production (classified according to spheres and branches)	Investment production requirements (energy, auxiliaries, raw-materials, semifabricated goods)
- Lessee	Increase in working capital
+ Reduction of State stocks	Increase in state stocks
+ Import	Individual consumption of population
	Social Consumption
	Export
Available Gross Production	Distributed Gross Production

Beside this balance - sheet and proceeding from the fact that the proportion between means of production and means of consumption must be observed very exactly the following table must be established :



Ascertainment of Actual Domestic Use in means  
of Production and Means of Consumption

Purpose x) of use	Domestic Production - losses	Foreign Trade Imp. EX. Bal.	Stocks	available
	-in value terms -			
MP (total)				
IP (total)				
IP (MP)				
IP (MC)				
M (total)				
M (MP)				
M (MC)				
MC				

GNP

X) Explanations

MP = Means of production

IP = Instruments of production

IP (MP) = Instruments of production used so as to  
produce means of production

IP (MC) = Instruments of production used so as to produce  
means of consumption

M = raw-materials and semi - fabricated goods

M (MP) = raw-materials and semi -fabricated goods so as  
to produce means of production

M (MC) = raw - materials and semi - fabricated goods  
so as to produce means of consumption

MC = means of consumption



Furthermore, we have to control the development of the proportion between compensating fund and net product. Therefore, our gross national product has to be subdivided and classified from this point of view

Accordingly, we have to elaborate the following balance-sheet

GROSS NATIONAL PRODUCT

(with respect to compensating fund and net product)

Branch	Compensation	fund	Net Product
	Depreciations	Production Requirements	
I. Industry	-used up fixed capital -	- used up materials and intermediate goods -	-paid wages, salaries, and earned profits -
I. Basic Industr.			
II. Power			
I2. Mining			
:			
2. Metal-Working			
2I. Heavy eng.			
:			
3. Light industry			
3I. Wood War			
32. Textiles			
:			
:			
II. Handicraft			
III. Agriculture			
IV. Traffic			
V. Trade			
VI. Sundry			
Total			



So as to ascertain the absolute size of compensation fund all the products forming it have to be subdivided with respect to their role in the process of production. That is to say:

Instruments of production:

to that there are belonging also construction and assembling activities serving so as to coordinate the single implements production productive organism or so as to maintain the ability of functioning of them;

Auxiliaries:

i.e. above all, products reaching ever more importance with growing appliance of chemical processings; products being useful to the chemical working up and out of raw-materials and semi-fabricated goods, for instance, sulphuric acid, caustic soda, a.o.;

Energy:

products by means of which -directly or indirectly - mechanisms are put into operation, chemical processes are caused, and light and warmth are produced;

Raw-materials and semi-fabricated goods:

organic or inorganic substances out of which instruments of production, auxiliaries, energy, and means of consumption are to be produced ;



Transporting performances:                      changes of places of means of production and means of consumption

Concerning compensating fund the following should be mentioned. The development of the compensating fund related to the development of the gross production is effected by two diametrically opposed tendencies:

- 1) the development of productive techniques (mechanization and automation as well as growing application of chemical processings, electrification and utilization of atomic power) leads to relatively growing shares of implements of production, of auxiliaries, and energy in the compensating fund,
- 2) the rising economy regarding the appliance of instruments of production, the use of energy, auxiliaries, raw-materials and semi-fabricated goods as well as the more rational organization of transporting activities leads, on the other hand, to a relatively decreasing share.

The column "net product" of the before mentioned balance-sheet must be transferred to another, more specified, balance-sheet. This so, because the net product or the national income represents the starting-point for planning economic development. The compensating fund serves so as to replace used up materials and machines (instruments of production) shaping in such a way the former and physical conditions of production. The net product, however, is supposed to be source for expanding social reproduction.



BALANCE of NATIONAL INCOME

Formation	Distribution
National income produced	A. <u>Accumulation</u>
-Losses	Investment for the productive sphere
-Damage of productive fixed and floating capital	Increase in floating capital
-Balance of foreign trade	Increase in state stocks
	3. <u>Consumption</u>
	Cons. of individual producers
	Expenditures for social consumption
	Exp. for persons unfit for work
	Exp. for workers temporary out of work
	Exp. of persons receiving capital income
	Exp. for state tasks (incl. defence)
	Exp. of social organizations
	Exp. of the banking system
Total	Total

From this primary balances the balances of commodity and money circulation must be derived.

For ensuring the proportionality of reproduction process the



following three conditions of equilibrium must be existing or even shaped within a certain space of time, for instance, one year:

- 1) the whole commodity turnover within national economy must be equal to the total of purchasing fund,
- 2) the structure of supply (regarding the whole commodity turnover) must be equal to the structure of demand (regarding the total of purchasing fund),
- 3) within each national economic sphere and within each branch there must be an equilibrium between receipts (revenues) and reduction of cash holdings, on the one hand, and between expenditures and increase in cash holdings, on the other.

For making these proportions or for controlling their observance respectively it is necessary:

- 1) to ascertain the volume of the aggregate commodity turnover and its structure as well,
- 2) to analyse receipts and expenditures of branches and spheres as well as distribution and redistribution of money connected with them,
- 3) to determine the volume of the separate purchasing funds and their commodity structure as well.

As it was mentioned earlier money circulation is nothing but the reflection of physical processes. The flow of materials, or commodities at all, leads to money circulation. It is understood, therefore, that there must be equality between the total of commodity circulation and the total of money circulation; and that not only on the whole. That is to say,



there has also to be a structural equilibrium between groups of the fund of commodities and concerned parts of the monetary fund.

For instance, there has to be an equilibrium between purchasing fund of industrial enterprises at all and materials or commodities necessary so as to materialize enterprises' production process in general. Furthermore, there has to be a specialized equilibrium between purchasing funds of separate enterprises and special groups of materials or commodities used by those enterprises in particular.

The same holds true, of course, for all branches and spheres of social reproduction process.

So as to materialize this necessary equilibrium a series of balance - sheets has to be established which is expected to show the balance between purchasing fund and commodity fund in question.

According to our topic we intend to take out of the totality of these balance-sheets those dealing with receipts and expenditures of productive enterprises.



BALANCE OF MONETARY RECEIPTS AND EXPENDITURES OF  
PRODUCTIVE ENTERPRISES

Receipts	Expenditures
Receipts resulting from commodity turnover	Investment
Receipts from subsidies	Payments for deliveries of energy, fuels, auxiliaries, raw-materials, semi-fabricated goods, payments for traffic performances
Refunding of negative foreign trade price differences 8)	Payment of wages
Pensions, sick benefits, reliefs	Taxes and duties
Additional means of investment	Premiums of social insurances
Investment credits	Premiums of other insurances
Acceptance of state participation 9)	Interest on credits
Acceptance of strange capital 10)	Interest on state participation and strange capital 4) 10)
Payments of insurance	Repayment of investment credits
Decrease in deposits	Payment of net profit
Increase in banking credits	Income of social organizations, of members of co-operatives, and of private owners of enterprises
Decrease in commercial credits	Repayment of working capital
Increase in commercial credits	Payment of positive foreign trade price differences 8)
Decrease in cash -holdings	Fees
	Increase in deposits



cont.

Receipts	Expenditures
	<div>Decrease in banking credits</div> <div>Increase in commercial credits</div> <div>Decrease in commercial credits</div> <div>Increase in cash-holdings</div>
Total Receipts	Total Expenditures

### 3. Interlacing Balances

Nowadays, in most of the socialist countries efforts are being made so as to connect the single balance-sheets withing a so-called national economic interlacing balance. Commonly, such an interlacing balance is known as input - output table.

But an interlacing balance is more than a simple connection of nowadays existing and being used balance-sheets.

Interlacing balances are not only two-sided, but two-dimensional balance-sheets. Supply and demand (sources and uses) are not only simply confronted, but closely implicated with each other. In this way, it has become possible to make evident the aggregate national economic and mutual implication of single (separate) enterprises (branches) and of their produced goods as well.

By means of interlacing balances necessary changes can accordingly be made obvious resulting as consequences from changings of the one or the other element of social production.



This is important in a twofold way:

- 1) under the point of view of drafting plans;  
when fixing certain final tasks (gross national product, gross production of branches and enterprises, liabilities in export, etc.) interim tasks resulting from that can be precalculated with mathematical exactness.
- 2) in case of plan deviations within the one or the other branch (enterprise, or as to single products) necessary and following changes can mathematically be ascertained without bigger difficulties and without any time lag.

Besides all this it is worth while mentioning that the expediency of interlacing balances is not only resulting from the problem of proportional development between industrial branches and spheres of social reproduction, but also gets importance for the sake of judging social efficiency of certain economic measures and for controlling social reproduction process. The latter is being reached by using practically an unitary system from the lowest stage of production up to the central level of national economy.

When looking at used - or at least prepared - systems of interlacing balances in European socialist countries, we have to distinguish between:

- 1) the national economic interlacing balance and
- 2) Interlacing balances of industrial branches.



The national economic interlacing balance is such a balance showing in a chess-board-like method the appliance of all goods, produced within the national economy and imported as well, within the single stages of production and for accumulation, consumption, and export respectively, and making possible, thereby, comprehensive planning and following up of all national economic proportions related to physical funds of national economy. The national economic interlacing balance is comprising production and utilization of physical funds of national economy entirely. II)

Interlacing balances of industrial branches, commonly called "partly interlacing balances", are expected to reflect the relations between aggregate production and total use of goods within one partial system of the national economic process of production and the relations of this system to other partial systems (from the point of view of purchase and sale).

Thus, the system of partly interlacing balances is comprising:

- 1) interlacing balances of enterprises;
- 2) interlacing balances of associations of nationally-owned enterprises (organizations); here, again, we have to distinguish between :
  - a) interlacing balances established under the point of view of administrative subordination and comprising all the subordinated and collaborating enterprises of a certain association (organization ) of enterprises,
  - b) interlacing balances of single groups of goods;



3. interlacing balances of central planning authorities, and here, again,
  - a) regarding administrative subordination,
  - b) interlacing balances of several groups of goods.

The system of partly interlacing balances serves so as to plan production unitarily and is proceeding from the ascertainment of total production and total use of materials as well and within certain spheres of responsibility.

Accordingly, we have a pyramid-like system of interlacing balances starting with interlacing balances of enterprises and ending in the interlacing balance of national gross production. In such a way, interlacing balances are fulfilling two main tasks:

- 1) by means of them existing relationships within national economy and between industrial branches are to be made evident
- 2) they are to be used for the sake of optimizing social reproduction process.

As mentioned before, the chess-board-like method is being applied for establishing interlacing balances ; and that in the following way: 12)

The aggregate national economy is subdivided into a certain number of branches or sectors . The degree of subdivision depends upon

- a) the reached level of economic development and
- b) upon the aims which shall be attained with the analysis.



Generally speaking, one can say, every national economy can be divided into "n" branches or sectors; the total output <sup>13)</sup> of each sector shall be denoted "X"; that is to say, the output of the first branch will be  $X_1$ , that of the second one  $X_2$ , a.s.o. ; now we have to observe the fact that the total output of one branch is to be delivered to all the other branches of industry; beside all these parts of total output delivered to other branches or sectors there are still parts not being used for the sake of domestic production immediately or at all, but determined to be used for the sake of forming reserves, for expanding production (new investment), for export and consumption, etc;

Thus, we can say:

- $X_i$  stands for the total output of any branch or sector;
- $X_{ij}$  stands for the delivery of any branch to any other branch, and
- $y_i$  stands for the net or final output of any branch or, in other words, for the external use of gross production of any branch.

The following may be looked upon as an example:

- $X_I$  is the total output of sector I,
- $X_{I2}$  is that part of sector I's total output delivered to sector 2, and
- $y_I$  is the net product of sector I used for being exported, consumed, a.s.o. ;

(by means of  $x_{ij}$  the inter branch - inter sectoral - exchange is being denoted, by  $x_{ii}$  the so-called intra branch - intra sectoral -exchange)



Brought, now, into a mathematical shape that will look like :

$$X_I = x_{I1} + x_{I2} + x_{I3} + \dots + x_{In} + y_I$$

$$X_2 = x_{21} + x_{22} + x_{23} + \dots + x_{2n} + y_2$$

.

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.

.

$$X_n = x_{n1} + x_{n2} + x_{n3} + \dots + x_{nn} + y_n$$

by all the  $x_{ij}$  i.e. , by

$$\begin{vmatrix} x_{I1} & x_{I2} & x_{I3} & \dots & x_{In} \\ x_{21} & x_{22} & x_{23} & \dots & x_{2n} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ x_{n1} & x_{n2} & x_{n3} & \dots & x_{nn} \end{vmatrix}$$

the matrix of inter sectoral exchange is being formed showing the degree of interdependence between single sectors of industrial production.

It goes without saying that the single "x" (and X or y as well) can be expressed either by physical terms (tons, kg, meters, etc) or by value terms (actually used prices, fixed prices, a.s.o. ). When choosing



the one or the other kind of measurement, however, we have to take into consideration the kind of goods or the scope of industry (national economy) which shall become analysed. There is no doubt, it would be possible to sum up goods of the same kind and expressed by means of the same unit of measurement. It would, however, be completely impossible to sum up different goods of different sectors which usually are expressed by different units of measurement. That is understood! Therefore, and in the last case we have to use value terms or price expressions.

Anyhow, we can state (according to the mathematical shape, mentioned before) that the total output of sectors can be expressed by the following equation:

$$(I) \quad X_i = \sum_{j=1}^n x_{ij} + y_i \quad (i = 1, 2, 3 \dots n)$$

By the aggregate system of equations (I)

$$(2) \quad \sum_{j=1}^n X_j = \sum_{j=1}^n \left( \sum_{i=1}^n x_{ij} + y_i \right) = X$$

the gross national product is determined.

On the other hand, however, by the single elements  $x_{ij}$  elements of cost of the single sectors are represented; and that, elements of costs of material.

By means of a formula or equation, again, we can state:

$$C_i = x_{1i} + x_{2i} + \dots + x_{ni}$$



For attaining, however, the cost of production we have to add to the costs of material

- the costs of used up outfits(depreciations) and
- paid wages and salaries.

Let us denote depreciations as " $x_o$ " and paid wages and salaries as " $x_v$ " then the total of cost of production will amount to:

$$P C_i = x_{ii} + x_{2i} + \dots + x_{ni} + x_{oi} + x_{vi}$$

That can be transferred into our mathematical shape and we will receive:

$$X_I = x_{I1} + x_{I2} + \dots + x_{In} + y_I$$

$$X_2 = x_{21} + x_{22} + \dots + x_{2n} + y_2$$

⋮

$$X_n = x_{n1} + x_{n2} + \dots + x_{nn} + y_n$$

$$X_o = x_{o1} + x_{o2} + \dots + x_{on}$$

$$X_{ov} = x_{v1} + x_{v2} + \dots + x_{vn}$$



There is :

$$X_o = \sum_{j=1}^n x_{oj}$$

the equation expressing the total of depreciations and

$$X_v = \sum_{j=1}^n x_{vj}$$

that expressing the balance of labour force employed within the productive sector of national economy (labour forces employed outside the productive sector would be "y<sub>v</sub>")

Proceeding from the fact ( or at least from the assumption) that our used system of equations ( or our used matrix, respectively ) is being established by means of value terms we are able now to sum up the items of the single columns . By doing so we will get:

$$P_{C_i} = \sum_{j=1}^n x_{ji} + x_{oi} + x_{vi} ;$$

there stands :

$$\sum_{j=1}^n x_{ji}$$

for the costs of materials used up within sector "i" ,

$$x_{vi}$$

for the wages and salaries paid by sector "i" and

$$x_{oi}$$

for used up instruments of production (machines, houses, etc.)



As we stated earlier the total output of sector "i" amounts to  $X_i$ . Therefore, the difference between  $P_i C_i$  and  $X_i$  must be the profit of sector "i", and when denoting the total of cost "input" we can state now that input + profit = output, or, the other way round,

$$X_i - C_i = m_i \quad (\text{"m" means profit}).$$

Our theoretical and mathematical shape should, therefore, be extended to :

$X_1$	$X_{11}$	$X_{12}$	....	$X_{1n}$	$Y_1$
$X_2$	$X_{21}$	$X_{22}$	....	$X_{2n}$	$Y_2$
$\vdots$	$\vdots$	$\vdots$		$\vdots$	$\vdots$
$X_n$	$X_{n1}$	$X_{n2}$	....	$X_{nn}$	$Y_n$
$X_0$	$X_{01}$	$X_{02}$	....	$X_{0n}$	X
$X_v$	$X_{v1}$	$X_{v2}$	...	$X_{vn}$	
$M$	$m_1$	$m_2$		$m_n$	
$X$	$X_1$	$X_2$		$X_n$	



Now let us have a look at interlacing balances used in the GDR and in most of the European socialist countries.

You will find there nearly the same construction which just even now has been explained from the theoretical point of view.

	$I^I$	$II^I$	$III^I$	$IV^I$	$V^I$
$I^I$	$II^I$	$III^I$	$IV^I$	$V^I$	$VI^I$
$II^I$	$III^I$	$IV^I$	$V^I$	$VI^I$	$VII^I$
$III^I$	$IV^I$	$V^I$	$VI^I$	$VII^I$	$VIII^I$
$IV^I$	$V^I$	$VI^I$	$VII^I$	$VIII^I$	$IX^I$
$V^I$	$VI^I$	$VII^I$	$VIII^I$	$IX^I$	$X^I$
$VI^I$	$VII^I$	$VIII^I$	$IX^I$	$X^I$	$XI^I$
$VII^I$	$VIII^I$	$IX^I$	$X^I$	$XI^I$	$XII^I$
$VIII^I$	$IX^I$	$X^I$	$XI^I$	$XII^I$	
$IX^I$	$X^I$	$XI^I$	$XII^I$		
$X^I$	$XI^I$	$XII^I$			
$XI^I$	$XII^I$				
$XII^I$					



USE							
SOURCES		1	2	3	4	5	6
		POWER	MINING	METALLURGY	CHEMICAL INDUSTRY	CONSTR. MAT. IND.	HEAVY ENGINEERING
		1	2	3	4	5	6
		1	2	3	4	5	6
		1	2	3	4	5	6
POWER	1						
MINING	2						
METALLURGY	3						
CHEMICAL IND.	4						
		1	2	3	4	5	6
TRADE	26						
SUNDRY BRANCHES	27						
TOTAL USED MAT.	28						
DEPRECIATIONS	29						
WAGES	30						
SURPLUS	31						
NET PRODUCT	32						
GROSS PRODUCT	33						
INCREAS. STOCKS	34						
IMPORT	35						
TOTAL SOURCES	36						

1. SQUARE

2. SQUARE

3. SQUARE

26	TRADE
27	SUNDRY BRANCHES
28	TOTAL USED MAT.
29	USED FIXED CAPITAL
30	INVESTMENT
31	INCREAS. STOCKS
32	CONSUMPTION
33	EXPORT
34	TOTAL APPROPRIAT.



There is , at first, horizontally and vertically as well to be seen almost the same subdivision. Regarding the columns I up to 28 even the same subdivision can be observed.

This subdivision is taken in accordance with the classification of industry being valid in all European socialist countries according to an agreement concluded between all countries belonging to the Council of Mutual Economic Aid (CMEA) for making uniform technical planning implements. It does not need saying that countries which embarked upon a policy of international coordination and specialization of their production must have adequate tools to do so.

Within our interlacing scheme the first square (in between the columns I up to 28 and the lines I up to 28) is identical with the table of elements ( $x_{II}$  up to  $x_{In}$  and  $x_{II}$  up to  $x_{nI}$ ) and is expressing, therefore, the total of material costs coming into being within the productive sphere of our national economy.

As we mentioned earlier, to the cost of material there must be added the cost of used up fixed capital (within our theoretical scheme the elements  $x_{oI}$  up to  $x_{on}$  or the total  $X_o$ ) and paid wages and salaries (the single elements of  $x_v$ ). Both of these things you will find again within our practically used interlacing balance. line No. 29 , depreciations and all the single elements  $29_1$  ,  $29_2$  etc, are equal to our theoretical elements  $x_{oI}$  ,  $x_{o2}$  , etc. line No. 30 , wages ( and salaries or course) is equal to all the single elements of  $x_v$  ( $x_{vI}$  ,  $x_{v2}$  , etc.) of our theoretical shape.



Generally speaking, by the vertical construction of an interlacing balance the value composition of national gross production is made evident horizontally subdivided according to all the existing branches. Practically, this can be reached by interting all the single deliveries of separate branches (or enterprises, regions, countries, etc; it depends upon the point of view drawing up interlacing balances ) to separate branches (or again enterprises, regions, countries, etc.)

The second square of our interlacing balance, i.e., the lines 29,30, and 31 comprises the value added <sup>I4)</sup> plus depreciations, and is identical with the elements  $x_{oI}$  up to  $x_{on}$ ,  $x_{vI}$  up to  $x_{vn}$ , and  $m_I$  up to  $m_n$  of our theoretical scheme. The third square, finally, comprises all our theoretical  $y$ 's and represents, therefore, the final or external use of produced goods.

#### 4. The Pratical use of Interlacing Balances

For explaining the practical use of interlacing balances we have to start with introducing two new notions.

- 1) the notion of technical coefficients and
- 2) the notion of cost coefficients.

To start with the technical coefficient. It indicated how many units of a certain good are needed so as to produce one unit of another good. Commonly, this coefficient is termed " $a$ ".

Let us take an example. For producing one ton of steel we are in need of a certain quantity of iron ore. The expression of the relationship between steel and iron ore is called technical coefficient; by means of symbols:



$$\alpha(\text{iron ore / steel}) = \frac{\text{quantity of iron ore}}{\text{tons of steel}} ;$$

or, when replacing the single elements for producing steel by  $q$  and the quantity of produced steel by  $Q$  we receive :

$$\alpha = \frac{q}{Q} .$$

Generally speaking, the technical coefficient can be expressed by :

$$(a) \quad \alpha_{ij} = \frac{q_{ij}}{Q_j}$$

or, in words, for producing one unit of  $Q_j$  we are in need of  $\alpha_{ij}$  quantities of  $Q_{ij}$ , or, in other words, again, for producing a certain quantity of  $Q_j$  we are in need of  $Q_j$  times  $\alpha_{ij}$   $Q_{ij}$ 's; expressed by a formula :

$$q_{ij} = \alpha_{ij} \cdot Q_j$$

From this it appears that our equation (I) can be written in the following form:

$$(3) \quad Q_i = \sum_{j=1}^n \alpha_{ij} Q_j + q_i$$

$x_i$  is replaced by  $Q_i$  so as to make clear that we bear in mind quantities (the same holds true for the small  $x$ ;  $x_{ij}$ , therefore, is equal to  $q_{ij}$ ), and  $x_{ij}$  is replaced by the function  $\alpha_{ij} Q_j$ .

Proceeding from (3) we can say :



$$(4) \quad q_i = q_i - \sum_{j=1}^n a_{ij} q_j$$

The fullfledged system of equations would be:

$$\begin{aligned} q_1 &= q_1 - a_{11} q_1 - a_{12} q_2 - \dots - a_{1n} q_n \\ q_2 &= q_2 - a_{21} q_1 - a_{22} q_2 - \dots - a_{2n} q_n \\ q_3 &= q_3 - a_{31} q_1 - a_{32} q_2 - \dots - a_{3n} q_n \\ q_n &= q_n - a_{n1} q_1 - a_{n2} q_2 - \dots - a_{nn} q_n \end{aligned}$$

Out of these equations we can recognize that  $q_1 = a_{11} q_1$ ,  $q_2 = a_{22} q_2$ , etc., can be concluded and we will receive (and written in the right order):

$$\begin{aligned} q_1 &= (1 - a_{11}) q_1 - a_{12} q_2 - a_{13} q_3 - \dots - a_{1n} q_n \\ q_2 &= -a_{21} q_1 + (1 - a_{22}) q_2 - a_{23} q_3 - \dots - a_{2n} q_n \\ q_3 &= -a_{31} q_1 - a_{32} q_2 + (1 - a_{33}) q_3 - \dots - a_{3n} q_n \\ &\vdots \\ q_n &= -a_{n1} q_1 - a_{n2} q_2 - a_{n3} q_3 - \dots + (1 - a_{nn}) q_n \end{aligned}$$



Taken for granted all the single  $q_i$  we have received by that the possibility to calculate all the single  $Q_i$ ; and that, by the right side of our formed system of equations a matrix is given :

$$M = \begin{pmatrix} (I - \alpha_{11}) - \alpha_{12} - \alpha_{13} - \dots - \alpha_{1n} \\ - \alpha_{21} + (I - \alpha_{22}) - \alpha_{23} - \dots - \alpha_{2n} \\ - \alpha_{31} - \alpha_{32} + (I - \alpha_{33}) - \dots - \alpha_{3n} \\ \vdots \\ - \alpha_{n1} - \alpha_{n2} - \alpha_{n3} - \dots + (I - \alpha_{nn}) \end{pmatrix}$$

which can be solved in the known way.

Let us now turn to the cost coefficient. We mentioned earlier that the technical coefficient indicates the quantities of a certain good, needed so as to produce one unit of another good, expressed in physical terms. The cost coefficient indicates the same, but expressed in value terms. Returning to our first example (iron ore and steel) we may say : the cost coefficient indicates the value (price) of iron ore necessary for producing a certain quantity of steel expressed by means of one currency unit; in form of an equation this would be :

$$(b) \quad a_{ij} = \frac{x_{ij}}{x_j}$$

There is identity between the quotients (a) and (b), only the means of expression are others.



Analogously, we can say, therefore, if there holds

$$a_{ij} = \frac{x_{ij}}{x_j},$$

then there must be :

$$x_{ij} = a_{ij} \cdot x_j,$$

and, accordingly, also the total equation

$$x_i = \sum_{j=1}^n a_{ij} x_j + y_0$$

holds true, and also:

$$y_i = x_i - \sum_{j=1}^n a_{ij} x_j.$$

And concluding the elements belonging together the following system of equations can be developed:

$$y_1 = (1 - a_{11}) x_1 - a_{12} x_2 - a_{13} x_3 - \dots - a_{1n} x_n$$

$$y_2 = -a_{21} x_1 + (1 - a_{22}) x_2 - a_{23} x_3 - \dots - a_{2n} x_n$$

$$y_3 = -a_{31} x_1 - a_{32} x_2 + (1 - a_{33}) x_3 - \dots - a_{3n} x_n$$

.

.

.

$$y_n = -a_{n1} x_1 - a_{n2} x_2 - a_{n3} x_3 - \dots + (1 - a_{nn}) x_n$$

From the a -factors of this system of equations our new



matrix is to be formed looking like:

$$M = \begin{pmatrix} (I - a_{11}) - a_{12} - a_{13} - \dots - a_{1n} \\ - a_{21} + (I - a_{22}) - a_{23} - \dots - a_{2n} \\ - a_{31} - a_{32} + (I - a_{33}) - \dots - a_{3n} \\ \vdots \\ - a_{n1} - a_{n2} - a_{n3} - \dots + (I - a_{nn}) \end{pmatrix}$$

which can be solved again in the known way. Provided, the net output of the single branches ( $y_i$ ) is given we are enabled now to calculate by means of

$$M^{-1} \cdot y = X$$

the total output of all the branches expressed, of course, in value terms.

Let this be proved by a simplified example. We should proceed from the following facts.

Out of the GDR's industry we would like to consider the interlacing of mining, metallurgy, and chemical industry.



In 1962 it was like : x)

	Mining	Metallurgy	Chem. Ind	External	Total
Mining	2.342	0.00019	0.155	0.3757	2.872
Metallurgy	0.239	4.047	0.036	0.680	5.002
Chem. Ind.	0.295	0.141	10.884	0.856	12.176

x) in milliards of marks

According to the plan for 1963 the external use (external from the point of view of our mentioned three branches) shall increase to :

- mining : 0.421 Mrds. of Marks
- metallurgy : 0.682 Mrds. of Marks
- chemical ind. : 0.875 Mrds. of Marks

It will be the task of our planning authority to calculate the necessary total output of all the separate branches.

How to proceed ? - First of all; the cost coefficient "a" must be found out; according to (b) The cost coefficient will be:

$$a_{11} = \frac{x_{11}}{x_1} = \frac{2.342}{2.872} = 0.815$$

$$a_{12} = \frac{x_{12}}{x_2} = \frac{0.00019}{5.002} = 0.0000379$$

$$a_{13} = \frac{x_{13}}{x_3} = \frac{0.155}{12.176} = 0.0127$$



$$a_{21} = \frac{x_{21}}{x_1} = \frac{0.239}{2.872} = 0.083$$

$$a_{22} = \frac{x_{22}}{x_2} = \frac{4.047}{5.002} = 0.809$$

$$a_{23} = \frac{x_{23}}{x_3} = \frac{0.036}{12.176} = 0.00295$$

$$a_{31} = \frac{x_{31}}{x_1} = \frac{0.295}{2.872} = 0.1027$$

$$a_{32} = \frac{x_{32}}{x_2} = \frac{0.141}{5.002} = 0.028$$

$$a_{33} = \frac{x_{33}}{x_3} = \frac{10.885}{12.176} = 0.893$$

After inserting all these "a" into our matrix "M" we will get:

$$M = \begin{pmatrix} (1 - 0.815) - 0.0000379 & - 0.0127 \\ - 0.083 & + (1 - 0.809) - 0.00295 \\ - 0.1027 & - 0.028 & + (1 - 0.893) \end{pmatrix}$$

or:

$$M = \begin{pmatrix} 0.185 & - 0.0000379 & - 0.0127 \\ - 0.083 & + 0.191 & - 0.00295 \\ - 0.1027 & - 0.028 & + 0.107 \end{pmatrix}$$

By the newly planned external use we will get a vector matrix :

$$M = \begin{pmatrix} 0.421 \\ 0.682 \\ 0.875 \end{pmatrix}$$



And now we have according to  $M^{-1} \cdot y = X$ ,  
to inverse our matrix "M"

Since we have a relatively simple example, the steps could be like the following :

1. step

the value of the corresponding determinant must be calculated:

$$D = \begin{vmatrix} 0.185 & -0.0000379 & -0.0127 \\ -0.083 & +0.191 & -0.00295 \\ -0.1027 & -0.028 & +0.107 \end{vmatrix} = 0.003487$$

2. step

the algebraic complements must be formed :

$$A_{11} = 0.019824 ; A_{21} = 0.0003596 ; A_{31} = 0.0024258 ;$$

$$A_{12} = 0.009184 ; A_{22} = 0.018491 ; A_{32} = 0.0015998 ;$$

$$A_{13} = 0.021940 ; A_{32} = 0.005184 ; A_{33} = 0.035332 ;$$

3. step

forming the inversed matrix  $M^{-1}$  the single complements must be divided by the calculated determinant D ; the results will be :

$$M^{-1} = \begin{vmatrix} 5.683 & 0.103 & 0.695 \\ 2.633 & 5.301 & 0.458 \\ 6.290 & 1.486 & 10.129 \end{vmatrix}$$



4. step

We have to calculate :

$$M^{-1} \cdot y = X ;$$

accordingly ,

$$X = \begin{vmatrix} 5.683 & 0.103 & 0.695 \\ 2.633 & 5.301 & 0.458 \\ 6.290 & 1.486 & 10.129 \end{vmatrix} \cdot \begin{vmatrix} 0.421 \\ 0.682 \\ 0.875 \end{vmatrix}$$

Thus, we will get :

$$X_1 = 2.392 + 0.070 + 0.608 = 3.07$$

$$X_2 = 1.108 + 3.615 + 0.401 = 5.12$$

$$X_3 = 2.648 + 1.014 + 8.864 = 12.53$$

According to our results the new interlacing table would be in 1963 (assumed that cost coefficients have not been changed:)

	Mining	Metallurgy	Chem.Ind.	Ext.	Total
Mining	0.815 · 3.07	0.0000379 · 5.12	0.0127 · 12.53	0.421	3.07
Metallurgy	0.083 · 3.07	0.809 · 5.12	0.00295 · 12.53	0.682	5.12
Chem. Ind	0.1027 · 3.07	0.028 · 5.12	0.893 · 12.53	0.875	12.53



or:	Mining	Metallurgy	Chem.Ind.	Ext.	Total
Mining	2.500	0.000194	0.159	0.421	3.07
Metallurgy	0.255	4.142	0.036	0.682	5.12
Chem. Ind.	0.315	0.143	11.189	0.875	12.53

The actual figures (from the Statistical Yearbook) were in 1963: <sup>15)</sup>

	Mining	Metallurgy	Chem.Ind.	Ext.	Total
Mining	2.397	0.000144	0.161	0.421	2.979
Metallurgy	0.225	4.132	0.034	0.682	5.072
Chem. Ind.	0.301	0.149	11.656	0.875	12.981

Comparing these figures with those published in the Statistical Yearbook of the GDR <sup>15)</sup> we will find that GDR'S mining reached 2.979 of milliards of marks (we have calculated 3.0) metallurgy 5.07 (5.1) and chemical industry 12.9 (12.5) in 1963 .

In general, the differences between actual figures and those being calculated are not worth being mentioned; with the exception of chemical industry.

What could be the reason for this remarkable deviation ?

In developed countries there is a movement on the way to replace traditional raw - materials by artificial ones ; for instance, iron parts of machines, motor cars, etc., by plastics, ceramics by plastics, a.s.o. That effects, of course, chemical production; on the other hand, however, the technical or cost coefficient is also influenced by this movement; and thus we are able to take this fact into consideration.



When looking at our Statistical Yearbook the cost coefficient of (delivered and worked up ) chemical goods has particularly been changed in case of chemical industry itself (within one year only ) from 0.89 to 0.90; further, in case of ship building industry from 0.0001 to 0.0002, textile industry from 0.0046 to 0.0052, leather, shoes, and hides industry from 0.042 to 0.054, cellulose and paper industry from 0.037 to 0.054 ;  
a.s.o.

There is no need for explaining this trend which is not a mere contingency, but a lawful economic development.

Anyhow, the usefulness of interlacing balances and of mathematical methods, made possible by them, could be made evident, I think . And that has been the aim of our example which, of course, was a more than simplified one, although based on practical figures and, therefore, real values. Without any trouble we would be able to transform the example into a bigger shape. Here, we used only three branches. We can, of course, replace these three branches by all the existing branches; i.e., we would be able to form a matrix, proceeding from our used interlacing balance, containing all the existing industrial branches .

It goes without saying that such a matrix cannot be calculated manually. In such a case we need computers. But that is another question, not to be dealt with here and now.



Footnotes

- 1) F.A. Abdel Rahman, Comprehensive Economic Planning in the UAR, Memo No. 238, p. 6
- 2) For this, the following example; it is planned to establish, starting in the middle of the current plan-year, within one enterprise a new productive unit. Preconditions for doing so are:
  - up to the middle of the year the necessary equipments must be available, i.e., produced and distributed; furthermore, the money must be available so as to buy them;
  - material and, perhaps, additionally used workers must be available so as to set the new equipment into operation;
  - preconditions within the enterprise must be shaped regarding capacity adjustments; and that in a twofold way:
    - a) so as to provide the new productive unit with intermediate goods (or raw materials respectively), and
    - b) to ensure the further working up of goods produced within the newly established productive unit;
  - the total increase in production must be taken into consideration and its sale has contractually to be ensured. According to the size of the new establishment a certain national economic chainreaction can be the outcome.
- 3) c.f.H; Linsel / K. Sack, The system of Planning, forthcoming Memo.
- 4) c.f.K. K.Sack / H. Linsel, Special Conceptions of Socialist Economy, Memo No. 518, p.18, and Planning of Production in Socialist Industry, Memo No. 598, p. 23.



- 5) c.f.k. Sack/ H.Linsel; Special Conceptions of Socialist Economy, Memo No 518, p. 18, and Planning of production in Socialist Industry, Memo No 597 p. 24.
- 6) c.f.k.Sack/ H.Linsel , Contents and Measuring of Labour productivity in Socialist Industry, Memo No 595, p. 17.
- 7) c.f.H.Linsel/K.Sack , Special Conceptions of Socialist Economy, Memo No 519, p. 46.
- 8) Between prices of domestic markets and those being valid on foreign markets there can be a gap. In case of a negative gap (i.e., domestic prices are higher than foreign prices) foreign trade would be a disadvantageous one for enterprises. By means of mentioned refundings those disadvantages shall be compensated. Under inverted conditions, i.e., in case foreign prices should be higher than domestic prices, what would be in unjustified favour of enterprises, those positive differences have to be paid for the benefit of the state which also is responsible for the compensation of negative gaps. By and large and considering foreign trade as a whole these positive and negative gaps are more or less balancing ones.
- 9) In case of semi - state enterprises.
- 10) In case of private enterprises.
- 11) c.f. Wirtschafts-wissenschaft, No 12 - 1962, p. 1790,  
Tasks and Construction of Interlacing Balances for National Economic Branches, German, by H. Knop and R. Rieplow.
- 12) I would like to explain the structure and the possible use of interlacing balances by means of the example of the interlacing balance of national gross production. The system is always the same; no matter what level of planning is concerned. Only the subdivision, of course, has to be a changing one depending upon the size or scope of economy which shall be analysed .
- 13) For a certain and planned space of time, of course!
- 14) Value added, i.e., cost of labour forces and earned profit.
- 15) Statistisches Jahrbuch der DDR 1964, p. 140.



