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METHODS OF CONSTRUCTION OF THE NATIONAL PLAN

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1. Plan as the economic decision.

The economic plan is the decision of the economic authority /l=1,2...l'/ on: what /i=1,2...n/, how much /x/, where /r=1,2...r'/, when /t=1,2...t'/ and how /q=1,2...q'/ to produce and how to distribute /s=1,2...s'/ the results of the economic activity to satisfy the needs of the consumer /j=1,2...j'/. Such a definition of the plan can be presented in a following way:

$$ {}^{q\ r}_{l}X_{ij/t/} $$

In the above sense the plan is a set of the given quantities of the products which have different features. These features allow to distinguish several sets in the plan:

a/ the commodity structure of the plan /i=1,2...n/,

b/ the technology and technique of production /q=1,2...q'/,

c/ the geographical /territorial/ structure of the plan /r=1,2...r'/,

d/ the temporal structure of production /t=1,2...t'/,

e/ the structure of distributed product /s=1,2...s'/,

f/ the vertical structure of production /l=1,2...l'/, i.e. on which level the decision is taken,

The commodity structure of production depends on the structure of demand of final consumers /individual consumer, investor, foreign customer etc./ and on the technique of process of production:

$$ x_i = \sum_{0} a_{ij}x_j + \sum_{1} b_{ij}x_j + y_i $$

where:

x_i - global production,

a_{ij} - technical coefficient /material-intensity coefficient/,

b_{ij} - investment coefficient,

y_i - final production of commodity i,

$$y_i = e_i + h_i + g_i + m_i$$

e_i - foreign trade balance /exports - imports/,

h_i - individual consumption of commodity i,

g_i - collective consumption of commodity i,

m_i - non-productive investments and major repairs.

There may be so many plans as many commodities are produced in a given country. In practice the plans are much more aggregated /e.g. a plan of production of:agriculture, heavy and light industry, construction industry, plan of transports, plan of turnover etc./.

The technique of production is expressed in the structure of costs of production:

$$p_j = {}^{q}a_{ij}p_i + {}^{q}v_j + {}^{q}u_j + {}^{q}s_j$$

where:

${}^{q}a_{ij}$ - technical coefficient under the technique $q=1,2...q'$,

p_j - price of the product j,

${}^{q}v_j$ - cost of labour per unit,

${}^{q}u_j$ - cost of amortization per unit,

${}^{q}s_j$ - unit surplus /profit/.

The geographical structure of the plan shows the place of production of a given commodity i.e. a plant, a town, a district, a country, a group of countries etc. In practice only regional and central plans are constructed in the process of macro-economic planning. With the geographical structure of the plan the problem of costs of transport is connected. That is why the plan of transport plays an important role in the process of construction of the national plan.

The temporal structure of production is very important because of the existing inter-relations betweeh products /intermediate consum-

ption, problems of stocks and investment process/. Therefore one can distinguish perspective plans /10-20 years/, medium-term plans /3-7 years/, annual plans, monthly and weekly plans.

The vertical /subjective/ structure of the plan is linked with the hierarchical organisation of the national economy. It is the problem of centralization and de-centralization of the decision-making. From this point of view one can talk about:central plans, sectoral plans, enterprise plans etc.

The economic plan as a decision consists of the four elements: the aim, the means, the conditions of the activity and the criterion of choice. Sometimes [1] the fifth element is added: the order /i.e. the directive/ - only in the so called operational plans, where the directive is addressed to a given executor of the plan.

The aim of the economic activity is always a final production or /and/ the positive trade balance. Sometimes the targets are expressed in a more general form: maximization of the consumption, full employment of the means of production, increase of the standard of living of the population etc.

The targets can be achieved by implementation of the given means of production, such as: labour-force /L/, non-human resources - capital /M/, natural resources /N/. The negative balance of trade can also be treated as a mean of production because it is in fact a flow of products without implementation of the national resources.

The means of production can be translated into the aims only in given conditions of activity. Among these conditions we can distinguish the following norms: material intensity coefficients /a_{ij}/, labour-intensity coefficients /μ_{ij}/, amortization norms /$\frac{K}{T}$/, investment norms /b_{ij}/ and all kinds of domestic and foreign prices of products and resources.

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[1] See:P.Sulmicki, Planowanie i zarządzanie gospodarcze /Economic planning and management/, Warszawa 1973, p.128-130.

The aims, means and conditions of the economic activity form a set of feasible solutions. In order to obtain the optimal solution one must possess a criterion of choice which is called sometimes a function of choice or objective function. Function of choice informs the producers about the social preferences concerning individual products and resources. In such a situation the plan is not a neutral one but it stimulates or restrains production of a given commodity.

The above mentioned elements are sufficient to make any decision. In the plan, in which the tasks for individual executors are expressed the fifth element must be included, i.e. an order /a directive/. Such a plan is constructed in the centrally planned economies.

There are, in general, two kinds of plans:

a/ plan of utilization of existing resources, and

b/ plan of increasing /enlarging/ the resources.

The plan of increasing the productive resources is constructed earlier than the plan of utilization of existing resources. In such a plan the problem of choice of investment projects arises. That is why this plan is called sometimes a strategic or investment plan. The economic authority must choose between a current consumption and a rate of growth of modernization of productive resources which can, in future, increase the efficiency of the whole national economy. It is also the problem of choice of technique of production which influences the implementation of labour-force etc.

The third problem which must be solved in a perspective plan it is the commodity structure of future production. The products of special interest of the economic authority are the so called strategic products such as: foodstuffs, means of transportation, natural resources, steel, energy, products which stimulate the technical progress /electronic equipment, atomic industry etc./ and products which are important from point of view of foreign trade.

The fourth problem is the allocation of production. The place of production is usually linked with the natural resources so the existing

resources must be a starting point when constructing the plan.

In the perspective plan the economic authority must choose between the uniform development of the whole economy and the concentration on given sectors or regions.

The plan of utilization of existing resources is one of the stages of realization of the perspective plan. In this plan the existing constraints are much more rigid than in a perspective plan. These constraints concern first of all the consuption which is expected, the technique of production which cannot be changed and resources which are given. There are no allocation decisions in such a plan. The sense of the plan is to maximize the consumption over the given limits, posseding given resources and having in mind the existing conditions of production. We shall concentrate on the methods of construction of such a plan.

2. Methods of planning.

By a method of planning we shall understand a way of transformation of information in the economic decision. From this point of view we can distinguish two general mathods of planning:

1/ method of complex solution,

2/ method of adjustment /coordination/ of partial solutions.

When adopting the method of complex solution a planner is obliged to construct a mathematical model for the whole national economy and to find the optimal solution /to indicate the magnitude of decisive variables/. In the model, linear or non-linear interrelations between the variables may be used. Such a method obviously needs the implementation of the electronic data processing. In practice this method cannot be adopted in the process of planning because of lack of information of certain phenomena in the national economy, lack of aggregated norms /prices/, too great number of balancing equations and technical difficulties in costructing and solving some equations.

Nevertheless this is the unique proper method of planning from logic point of view, because only by taking into consideration all the elements creating a decision the optimal solution may be obtained.

In practice of planning, the method of adjustment of partial solutions is adopted. This method cannot guarantee the optimal solution but it is the only method which is nowadays accessible. The sense of this method is to find solutions of different partial problems and to coordinate these solutions among them. This method is also called the iteration method or the method of succesive approximation.

There is a certain interactivity of plans concerning different spheres. It means that the plans are mutually conditional, the conditions of formation and realization of each of them depend on other plans. So the iteration procedure is needed - a course of succesive approximation, in which the plans drawn up during earlier phases of process of planning are useful in subsequent ones.

As the result of the iteration method one can obtain the plan which is internally consistent /balanced/ and feasible but it needs not to be the optimal one, though the planning authority tries to choose the best accessible solution.

There are many variants of the method of adjustment of partial solutions: balancing method, proportional method, extrapolation method, coefficient method etc. We shall concentrate on the complex solution method, on balancing method, on implementation of input-output analysis to planning and on the method of technical and economic coefficients.

3. Method of complex solution.

As an example of the model of the whole national economy we shall present the plan of utilization of existing resources which was elaborated by prof. P.Sulmicki.[2]

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[2] P.Sulmicki, Planowanie... op.cit. p.112-117.

Decisive variables / Shadow prices	X	$\overset{o}{X}^{r1}$	X^{1r}	X^{r1}	Y^o	Constraints
p/x/	$-I + A$	-1	1		1	$-\underline{Y}$
p/x/	A^r	1		-1		$-\underline{X}^{r1}$
φ^{1r}			$-p^{1r}$	v^{r1}		$\leqslant -\underline{B}^r$
p/L/	λ					$\leqslant \overline{L}$
p/M/	μ					$\leqslant \overline{M}$
p/N/	ν					$\leqslant \overline{N}$
$\overline{x}^{1r}$			1			$\leqslant \overline{X}^{1r}$
$\underline{x}^{1r}$			-1			$\leqslant -\underline{X}^{1r}$
$\overline{u}^{r1}$				1		$\leqslant \overline{X}^{r1}$
$\underline{u}^{r1}$				-1		$\leqslant -\underline{X}^{r1}$
C/min/	0	0	0	0	p/x/	W/max/

The symbols which are used in the model are following /for the coumtry r=1/:

X - global production,

$\overset{o}{X}^{r1}$ - competitive imports /from the area $r \neq 1$/,

X^{1r} - total exports,

X^{r1} - total imports,

$\overset{o}{Y}$ - part of final production destined to distribution in the country r=1 /exceeding a given limit/,

$\underline{Y}$ - required /minimal/ level of final production,

$\underline{X}^{r1}$ - required /minimal/ level of imports,

$\underline{B}^{r}$ - required /minimal/ level of balance of trade-exchange /in foreign currency/,

$\overline{L}$ - accessible /maximal/ level of labour force,

$\overline{M}$ - accessible /maximal/ level of capital and stocks,

$\overline{N}$ - accessible /maximal/ level of natural resources,

$\overline{X}^{1r}$ - upper limit of exports,

$\underline{X}^{1r}$ - lower limit of exports,

$\overline{X}^{r1}$ - upper limit of imports,

$\underline{X}^{r1}$ - lower limit of imports,

p/x/ - shadow price of a product,

φ^{1r} - shadow price of foreign currency /rate of exchange/,

p/L/ - shadow price of labour - force /wage - rate/,

p/M/ - shadow price of capital and stocks /rate of profit/,

p/N/ - shadow price of natural resources,

$\overline{u}^{1r}$ - shadow price of upper limit of exports /export tax/,

$\underline{u}^{1r}$ - shadow price of lower limit of exports /export subsidy/,

$\overline{u}^{r1}$ - shadow price of upper limit of imports /import tariff/,

$\underline{u}^{r1}$ - shadow price of lower limit of imports /import subsidy/,

A - matrix of technical coefficients,

A^{r} - matrix of import-intensity coefficients,

p^{1r} - foreign prices obtained in exports,

p^{r1} - foreign prices paid in imports,

μ - matrix of capital-intensity coefficients,

λ - matrix of labour-intensity coefficients,

γ - matrix of natural resource-intensity coefficients,

W - value of residual final production,

C - costs of production.

In this plan of production and trade-exchange the aim is to achieve a given level of final production $\underline{Y}$ and a given level of positive balance of trade-exchange $\underline{B}^r$. The means of production are: L - labour-force, M - capital and stocks. The conditions of production are: technical norms of production / A, A^r, λ, μ, ν ,/ foreign and domestic prices /p^{1r}, p^{r1}, p/ and prices of resources / p/L/, p/M/, φ^{1r}, p/N/ /. The criterion of choice stimulates to maximize the final production over the given limits.

The interrelations in the model are of linear character. The first set of equations shows the distribution of global production:

/1/ $-X + AX - \overset{o}{X}^{r1} + X^{1r} + Y^o = -\underline{Y}$ or

/1a/ $AX - \overset{o}{X}^{r1} + X^{1r} + Y^o + \underline{Y} = X$

Knowing the restraints /$\underline{Y}$, X^{1r}/, technique of production /A/ and making the decision on competitive imports /$\overset{o}{X}^{r1}$/ and extra-production /i.e. exceeding given limits/ $-Y^o$, the planner can calculate a required level of global production /X/.

The second set of equations shows the structure and constraints in imports /in physical units/:

/2/ $A^rX + \overset{o}{X}^{r1} - X^{r1} = -\underline{X}^{r1}$ or

/2a/ $A^rX + \overset{o}{X}^{r1} + \underline{X}^{r1} = X^{r1}$

The third set of equations shows the trade balance of the country r=1 in foreign currency:

/3/ $-p^{1r}X^{1r} + p^{r1}X^{r1} \leqslant -\underline{B}^r$ or

/3a/ $p^{1r}X^{1r} - p^{r1}X^{r1} \geqslant \underline{B}^r$

In the fourth, fifth and sixth sets of equations, the distribution of: labour-force, assets and natural resources is shown.

The next four sets of equations show the limits in the foreign trade which might be imposed by the central economic authority or which may result of previous foreign commitments.

The above presented model shows the stimulating role of the plan in increasing the efficiency of productive resources. There are upper limits concerning resources and lower limits concerning products. By

of these limits the planner can stimulate the executive units to decrease the technical norms /$A, A^r, \lambda, \mu, \gamma$/.

Solving the dual program, the optimal level of different parameters /price of product, rate of exchange, wage-rate, rate of profit, price of raw materials and norms adjusting the prices of exported and imported goods - subsidies, bounties, tariffs, taxes etc./ can be calculated. Obviously, the economic authority must make the initial decision concerning or the desired level of salaries, or prices, or the rate of profit.

On the macro-level, all the above mentioned figures are expressed in the form of matrices or vectors with enormous number of elements what causes some additional technical problems and is the important information barrier.

The construction and finding a solution of such a model in a very detailed form exceeds the actual possibilities of any country in the world. Nevertheless similar models in more aggregated or less detailed form can be used in the planning process, especially on lower levels.

4. Method of adjustment of partial solutions.

4.1. Balancing method.

One of the most frequently used variants of the method of partial /fractional/ adjustments is the so called "balancing method" /balancing calculus/. The name of this variant is not very exact one because there are also balances constructed in the coplex method. Nevertheless, in the theory of planning in centrally planned economies, such a notion is used, so for our purposes we shall also call this variant - a balancing method.

The aim of implementation of the balancing method is to obtain the plan embracing the whole national economy and all kinds of economic activities in a country. Such a plan should be equilibrated, i.e.

it should assure satisfaction of all the demands, both in general and in partial scale. It should also be internally consistent - it should not include any tasks which are contradictory and it should include means which can guarantee a realization of these tasks.

The activity aimed at mutual adjustments of economic decisions /i.e. construction of internally consistent plan/ is called a planning coordination. There are four kinds of such coordination:

1/ vertical coordination - when the economic units are subordinated one to another,

2/ horizontal coordination - when the economic units are hierarchically independent,

3/ territorial coordination - when the regional plans are adjusted,

4/ temporal coordination - when the plans of different periods are adjusted.

The coordination of plans should be a continuous process. The balancing method is utilized in practice only for periods not longer than 5 years because the estimation of future needs is very difficult, so the exact equilibration of possibilities and demands is impossible in long term.

The balances constructed when adopting the balancing method concern the economic activities in the whole national economy or only in some part of it. That is why we can distinguish, in general, balances elaborated in the scale of:

a/ the whole national economy,

b/ a sector of production,

c/ an economic unit /plant, enterprise etc./,

d/ a region of the country.

The balances constructed in macro scale must have an aggregated character and though they are equilibrated in general magnitudes it is indispensable to check whether exists a partial equilibrium in every field of activity. In practice, the macro-balances are constructed for products of special importance: raw materials, some foodstuffs etc.

On each level two kinds of balances are constructed:

a/ commodity balances of production,

b/ synthetic balances.

There are following commodity balances of production which are constructed in the process of planning:

- balances of materials or products concerning the production of individual commodities or groups of commodities,
- balances of production in particular sectors of national economy,
- macro-economic balances of production of chosen commodities or groups of commodities.

The example of the balance of a given material is shown in tab. 1.

Tab. 1.

Balance of material "A".

Supply	Demand
1. Stocks at the begining of the planning period.	1. Production requirements: a/ current production, b/ investments.
2. Input as a result of planned production.	2. Demand on the domestic market.
3. Imports.	3. Exports.
4. Inputs from other sources: a/ interior reserves, b/ state reserves.	4. Increase of reserves.
	5. Other requirements.
	6. Stocks at the end of the planning period.

The example of the macro-economic balance of production is shown in the Tab. 2.

Tab. 2.

Macro-economic balance of the commodity "B".

Input /Supply/	Output /Demand/
1. Domestic production.	1. Intermediate /productive/ consumption.
2. Decrease of stocks.	2. Increase of stocks.
3. Imports.	3. Consumption
	a/ individual,
	b/ collective.
	4. Investments.
	5. Exports.

The balances of materials and commodities guarantee the interior consistency of a given part of the national plan /i.e. they assure the equilibrium between the needs of certain groups of the society with the possibilities of production/. They must be however coordinated with the financial incomes of economic units, non-productive institutions and individual consumers. This coordination is accomplished by means of synthetic balances in which financial equilibrium is expressed. The commodity plan of production is confronted with the purchasing power of consumers. As the result of such a confrontation there may appear a necessity to verify some decisions in the plan. Sometimes the planner is obliged to change the structure of production, of supply on domestic market, to verify the policy of credits granted to or received from abroad or to make a decision concerning adjustments of domestic prices. In principle, the regulation of prices in socialist economies is not an instrument of equilibration of demand and supply. Nevertheless, in some cases, the adjustment of level of some domestic prices might be unavoidable. One must

remember however that every regulation of prices should be linked with changes of incomes of population in order to keep the desired rate of growth of real incomes of the society.

On the micro-level the synthetic plan is called a financial plan of the enterprise. It includes: a profit-and-lost account, plan of financing of fixed capital and plan of financing of circulating assets.

On the macro-level there are following synthetic balances: balance of creation and distribution of national product, balance of foreign trade, balance of incomes and expenditures of population and financial balance of state. We can say that the macro-economic synthetic balances are:

a/ the reflection of the principal proportions of economic development,

b/ the instrument of economic equilibrium,

c/ the information about the interrelations between the proportions of development and the standard of livimg of the population.

An example of the financial balance of state is presented in the Tab.3.

Tab. 3.

The financial balance of state.

Incomes	Expenditures
1/ Financial accumulation of enterprises. 2/ Amortization in enterprises 3/ Income of the budget of state 4/ Pension fund. 5/ Profits of insurance and financial institutions. 6/ Increase of amount of money in disposal of population. 7/ Repayment of credits by private sector and the population. 8/ Other incomes.	1/ Current expenditures a/ from the budget, b/ from the pension fund, c/ from specialized funds, d/ credits granted to private sector and to the population. 2/ Expenditures for accumulation a/ investments, b/ repairs, c/ increase of stocks.

The financial balance of state shows the primary and secondary distribution of national income. It combines the productive and non-productive activity of the society. The sources of incomes of the budget of state, state-owned enterprises and banks are shown in this balance. That is why it enables to control the general equilibrium in domestic market.

The above described balancing method of planning does not assure a full accordance between real and financial expression of targets and means in the plan neither in the scale of the whole national economy nor in the scale of sectors of production, nor in the micro-scale. It is a result of different sources of information which are utilized in the process of eleboration of different balances. The difficulties in the procedure of planning are due to the fact that the system of planning information does not work sufficiently and the forcasted data are not of good quality.

The complex coordination of all the components of the national plan can be achieved only by construction of a great number of partial /fractional/ balances. This procedure is labour- and time-intensive. Even a small alteration in one of partial balances necessitates mostly the changes in other ones in order to achieve the desired concordance. A great number of variables and their variety make in practice impossible the simultaneous and effective coordination.

Improvement of the coordination of partial plans can be expected when the input-outout analysis is applied in broader scale in the process of plan-elaboration.

4.2. Input-Output Method.

Balances of inter-industry flows are the models showing the national economy divided into industries /sectors/ producing particular products. Some part of the production is utilized inside a given sector, the other part is delivered for productive purposes of other

sectors, the rest is destined for final customers /individual and collective consumer, investor and foreign partner/. Most frequently used input-output models are short-term balances /1-2 years/. The technical coefficients applied in such analysis are constant and investment coefficients are excluded.

The advantage of the input-output analysis is that it enables to shorten the time which is indispensable to construct the partial balances. Instead of great number of fractional balances a synthetic model of all the processes connected with creation and distribution of global and final production is elaborated. It is worth to emphasize that this method enables the application of electronic data processing in a large scale and thus the results can be obtained very quickly. The model of the national economy when applying the input-output analysis is presented in Tab.4.

Tab. 4.

Input-output model of national economy.

Branch i /supplier/ \ Branch j /buyer/	Inter-sectoral flows	Foreign trade	Final production	Total
1	$X_{11} \dots X_{1n}$	$X_1^{1r} \dots -X_1^{r1}$	Y_1	X_1
.				
.				
n	$X_{n1} \dots X_{nn}$	$X_n^{1r} \dots -X_n^{r1}$	Y_n	X_n
Non-competitive imports	$\hat{X}_{11}^{r1} \dots \hat{X}_{1n}^{r1}$		Y_1^{r1}	$\hat{X}_1^{r1}$
	$\hat{X}_{c1}^{r1} \dots \hat{X}_{cn}^{r1}$		Y_c^{r1}	$\hat{X}_c^{r1}$
Labour costs	$V_1 \dots V_n$			V
Amortization	$U_1 \dots U_n$			U
Surplus	$S_1 \dots S_n$			S
Total	$X_1 \dots X_n$	$X_i^{1r} \dots -X_i^{r1}$		X

Symbols:

X - global product,

X_{ij} - quantity of product "i" utilized by sector "j",

X_i^{1r} - exports of product "i" from region r=1 to region r≠1,

X_i^{r1} - competitive imports of product "i" from region r≠1 to region r=1,

$\hat{X}_{ij}^{r1}$ - matrix of non-competitive imports destined for productive purposes,

Y_i - final production,

Y_i^{r1} - non-competitive imports- not included in costs of production,

$\hat{X}_i^{r1}$ - total non-competitive imports,

V_j - labour costs in production of commodity "j",

U_j - amortization in production of commodity "j",

S_j - gross surplus in production of commodity "j".

Input-output analysis enables to present the creation and distribution of any of the products and their inter-relations resulting from the fact that they are materials to each other. The model shows also the foreign trade-exchange and the equity between gross incomes created in the process of production and the value of final production. Using the interdependances presented in Tab. 4 we can construct the equation of so called input-output equilibrium:[3]

$$\sum_{j=1}^{n} X_{ij} + /X_i^{1r} - X_i^{r1}/ + Y_i = \sum_{i=1}^{n} X_{ij} + \sum_{i=1}^{n} \hat{X}_{ij}^{r1} + V_j + U_j + S_j$$

The left side of this equation is the sum of rows in the model and presents the distribution of global product. The right side is the sum of columns. The global product is presented as the sum of costs of production /costs of materials, labour costs, amortization and surplus of economic units/.

The application of input-output analysis demands a well-organized apparatus of collecting and processing the information.

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[3] See: O.Lange, Wstęp do ekonometrii /Introduction to Econometrics/, Warszawa 1958, p.210-228.

One of the most difficult problems to solve is the question of aggregation of data. We can say that the useful degree of aggregation for the macro-economic planning is from 20 to 30 industries and from 15 to 25 branches in an industry.

When using the input-output method it is necessary to possess information on the industry structure of the particular component parts of the distributed national income /individual and collective consumption, investments, increases in stocks and reserves and foreign trade turnover/ as well as on the planning matrix of the coefficients of inter-industry relations.

Having such information concerning the final year of the plan it is easy to determine the proportions of production using the known relationship:

$$/1 - A/X_i = Y_i$$

Sometimes however is more convenient to use the formula:

$$/1 - A/^{-1} Y_i = X_i$$

in order to determine the structure of global production /X/ which is necessary to obtain the needed structure of final production /Y/. Utilization of convert matrix of coefficients $/1 - A/^{-1}$ enables very quick elaboration of several variants of the plan from which the optimal one can be chosen.

Further step in improving the vertical and horizontal coordination of partial plans is the application of the so called real-financial balance /in physical and monetary terms/. Such a balance does not contain all the imputs and outputs in physical terms but is more developed in the part of flows of final products in monetary terms. It enables the coordination of all the synthetic balances elaborated on the central level. As the result we can obtain the system of interior consistency in which any alteration desires almost automatically the change in other parts of the balance. The technique of elaboration of this model is much more complicated than of the "normal" input-output table. A simplified example of such a model is presented in tab.5.

Tab. 5

Model of Real and Financial Inter-Flows.

Incomes \ Expenditures		Number of row	I.Material production: Socialized economy	I.Material production: Non-soc. economy	II.Foreign trade: Exports of goods	II.Foreign trade: Compens. operat.	III.Non-productive service: Socialized ec.	III.Non-productive service: Non-soc economy	IV.Budget of State	V. Households	VI.Finan. of gross accumul.: In soc economy	VI.Finan. of gross accumul.: In non-soc.ec.	VII.Distribut.of amortiz.: In soc. economy	VII.Distribut.of amortiz.: In nonc soc. ec	VII.Distrib. of other f.: In soc. economy	VII.Distrib. of other f.: In non-soc. ec	IX.Changes in commitments	X.Changes in assets of banks	XI.Errors and ommissions	XII. Total /I-XI/
Number of column		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
I.Material production	Socialized econ.	1																		
	Non-soc.economy	2																		
II.Foreign trade	Imports of goods and ...	3																		
	Compensatory operations	4																		
III. Non-productive services	Socialized ec	5																		
	Non-soc. econ.	6																		
IV.Budget of state		7																		
V. Households		8																		
VI.Creation of investment and rotary funds	In socialized economy	9																		
	In non-socialized economy	10																		
VII.Creation of amortization fund	In socialized economy	11																		
	In non-socialized economy	12																		
VIII.Creation of other funds	In socialized economy	13																		
	In non-socialized economy	14																		
IX.Changes in dues		15																		
X. Changes in liabilities of the banks	Increase of emmission	16																		
	Increase of bank deposits	17																		
XI.Errors and ommissions		18																		
XII. Total /I - XI/		19																		

4.3. Method of technical and economic coefficients.

Calculation of quantitative relations between a supplier and a buyer is not organized only in order to construct an input-output table but also to obtain some fractional interdependances which could be used in process of planning. This simplified method /frequently used in the initial stage of planning/ is called a normative method or the method of technical and economic coefficients.

In this method certain ratios, norms or coefficients are calculated and utilized in the calculus of the most important data in the draft plan, both on the supply and demand sides. These norms can be computed on the basis of past conditions, forecasted changes of the situation or on the basis of technical requirements /desired norms/. They become then the criterion of coordination of the plan, i.e. the complex and partial plans should be equilibrated under the assumption of existance of these norms in reality.

The norms utilized in the process of planning can be divided into following groups:

a/ intensity coefficients /labour-, asset-, material-intensity norms etc./,

b/ efficiency norms /of investments, of foreign trade etc./,

c/ quality norms /of products and services/,

d/ coefficients of consumption per head /of foodstuffs, of different products and services etc./,

e/ coefficients of financial expenditures of the population /income and price elasticities of demand, rate of savings, structure of expenditures etc./.

Obviously the list of coefficients may be enlarged when needed. The coefficients may be of static or dynamic character. The dynamic norms are used in medium-term planning, They may vary under the influence of the following phenomena:

- changes in the material consumption of the products of particular industries required for producing a unit of product in other industries,

- changes in the structure of production in particular industries,
- changes in the scale of production in particular industries,
- substitution of some products for others,
- changes in prices of materials used in production as well as changes in prices of produced commodities.

The planning authority has available a number of methods of estimating changes in the coefficients. Among them the most frequently used in practice are: the method of extrapolation of trends and the method of estimates by experts.

The coefficients may have more or less obligatory character for the executive units. So called "directive indices" are of very rigorous obligation during the elaboration of the plan. So called "indicative indices" do not possess such a rigorous character. In practice of modern planning we may observe the process of diminishing number of directive coefficients. The role of directive norms is now played by the so called synthetic coefficients as: rate of profit, rate of rentability, increase of added value etc.

The method of technical and economic coefficients is very simple and easy to adopt but it can be used only in order to work-out the draft plan in the initial stage of planning. The necessity of balancing the resources, the products and services in the whole national economy demands the application of more sophisticated methods which guarantee higher precision in planning.

Having presented in this brief study some methods of planning I wanted to emphasize their usefulness for the practice of planning and to indicate what conditions should be fulfilled in the country which endeavour to introduce or to perform the macro-economic planning.