I. NICULESCU
The Academy of Economic Studies
The Department of Economic Cybernetics

The Significance and Determination of the Elements of Quadrant IV of the Static Balance of Inter-Branch Connections

"The logic of any theoretical analysis is to try to describe something very complicated by something more simple".

W. W. Leontiev

1. An important place among the improved means with the aid of which the quantitative and qualitative transformations taking place in the national economy may be thoroughly analysed, is held by the method of analysis with the aid of the balance of inter-branch connections.

Through the multitude and variety of the statistical data comprised by it, the balance of inter-branch connections creates the possibility of a thorough study of many aspects linked with the structure of the economy, the efficiency of economic activities and the determination of the implications, on economy as a whole, of various measures in the field of economic policy. The static character of the balance of inter-branch connections is determined by the fact that the model, we refer to, excludes the time factor (characteristic of the dynamic models, namely they present the relations in the economy as they were photographed within the limits of a determined period (usually a year).

2. The static balance of inter-branch connections as it is elaborated everywhere within the balance between the sources of goods and services and their use in the economy as a whole-outlines the relations between the branches of productions (quadrant I), between them and the components of the final consumption (quadrant II) and between the primary factors and the branches of production (quadrant III).

By "connections" — in the sense of the balance — we thus mean the interdependences which are formed among the branches in the process of production and the distribution of the goods and material services. These

connections are presented in the table of the balance in the input-output form and their significance is characteristic of the quadrant in which they are placed:

Connections in quadrant I (x_{ij}; $i, j = 1, 2,...,n$; $n =$ the number of branches inscribed in the balance) are represented by the products and services of branch i, used in the production of branch j (technological connections).

Connections in quadrant II (x_{ik}; $k > n$; $n = n + 1,...,\omega$; $k =$ the component element of the final consumption) are represented by the products and services of branch i meant to satisfy the component k of the final consumption [1] (the connections between the branches of production and the elements of the final consumption).

Conection in quadrant III (x_{qj}; $q > n$; $q = n + 1,...\sigma$; $q =$ the primary factor component of the added value) are represented by the value of the primary factor q ensuring the carrying out of the process of production of branch j[2]. (The connections between the primary factors and the branches; of production). These relations are currently named "primary input".

3. Characteristic of all these three kinds of connections is the *sense* — the same — in which they have to be interpreted, regardless of the quadrant in which they are placed, namely *from the left to the right and upwards* (Fig. 1).

In other words, an element x of the balance represents — regardless of the quandrant in which it is placed — a connection which, from the point of view of the line on which the element is placed, constitutes an output, and, from the point of view of the columnn on which it is placed an input. This rule, which is characteristic of the way of presentation of the static balance of inter-branch connections, suggests the idea of completing quadrant IV [3] with values which should represent connections whose singnificance should result by following the same way of interpretation.

In other words, the value which has to be inscribed in quadrant IV at the intersection of line q (propre to the primary factor q in quadrant III),

---

1) The component k of the final consumption may be: "the consumption fund" of the population and of the society; "the development fund" — accumuulation, etc. in the form of stoks, investments, etc.; export. The number of the component elements of the final consumption is $(w - n)$.

2) The primary factor may be: "the primary incomes of the population" — in the form of wages, the incomes of the co-operative membres or other incomes of the population; "The primary incomes of the state and cooperative societies" — in the form of benefits or taxes on the circulation of goods; "liquidations" — considered also as primary input. The products imported and consumed in the process of production of branches are also considered as primary input. These products represent-from the point of view of the branches consuming them-consumptions of materials which have not resulted from a previous internal process of production and even if they are similar to the products of an interval branch (in the category of which they have been classified) do not form between the two branches a technological connection of the kind of that in quadrant I (x_{ij}). The number of the primary factors is $(\tau - n)$.

3) The literature of speciality admitts the particular importance of this quadrant and the possibility of its elaboration: yet — was not elaborated in any country. Generally, it is considered that this quadrant must reflect the aspect of the redistribution of the national income — a complex problem which implies the outlining of the phenomena in economy *in time*. It is possible that the problem to be proper to the dynamic balance: the static balance of inter-branch connections has its content and one cannot claim from it more than it allows.

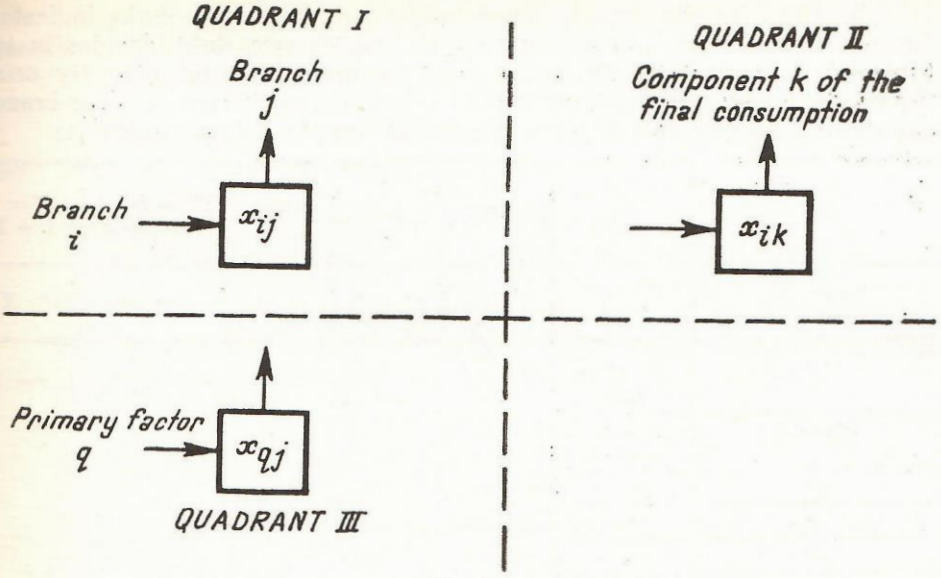

Fig. 1

with column k (reserved for the component k of the final consumption in quadrant II) must have the significance:

"the value of the primary factor q necessary in all branches of the national economy in view of achieving component k of the final consumption".

4. The following example will prove sufficient to outline the notions: we suppose that branch i is the "electric power" branch, branch j-the "ferrous rolled goods" branch, the primary factor q-"wages" and the component k of the final consumption — "the consumption fund". In this case, the significances of the above-mentioned connections will be:

in quadrant I, x_{ij} means the value of electric power consumed in the ferrous rolled goods branch in view of achieving its production;

in quandrant II, x_{ik} represents the value of electric power at the disposal of the consumption fund;

in quandrant III, x_{qj} contains the value of the wages necessary for achieving the production of the ferrous rolled goods branch and, finally,

in quadrant IV, x_{qk} represents the value of the necessary wages-in all branches of the national economy — in view of achieving the consumption fund from the internal production.

In conclusion, it results that quadrant IV of the static balance of inter-branch connections may be completed with values whose significance is imposed by the described model itself, values with a precisely established economic sense and which represent indicators of the national economy. It is probable that these indicators are characteristic of the model of the balance of inter-branch connections and they can be determined only within it and with its aid.

5. The data allowing the determination of the values of the indicators which should be inscribed in quadrant IV are the very data included in the three other quadrants of the balance of inter-branch connections. By using the elements for defining the matrical calculus, the balance of inter-branch connections represented in three quadrants has the following aspect:

W	L $(e \cdot w)$	D^w	N^w	E	$Y^w = D^w + N^w + E$	$X = L + Y^w$
$J^*(e^* \cdot W)$	$J^* \cdot e = e^* \cdot L$	$e^* \cdot D^w$	$e^* \cdot N^w$	$e^* \cdot E$	$e^* \cdot Y^w$	$e^* \cdot X$

Z	U $(Z.e)$
$I^*(e^* \cdot Z)$	$I^* \cdot e = e^* \cdot U$
M^*	$M^* \cdot e$
S^*	$S^* \cdot e$
P^*	$P^* \cdot e$
$V^*(M^* + S^* + P^* + I^*)$	$V^* \cdot e$
$X^*(J^* + V^*)$	$X^* \cdot e$

With the observation that this model of the static balance of inter-branch connections does not emphasize the import products directly affected to the components of the final consumption and agreeing that the line vectors are noted with an asterisk (*) and the unit vector with "e", the significances of the matrices and vectors making up the three quadrants of the thus formed balance are the following:

W represents the matrix of intermediary consumptions of products and services from the internal production:

$$W = \| x_{ij}^w \| \qquad (i, j = 1, 2, ..., n)$$

L — the column vector of products from the internal production distributed to the intermediary consumption in view of carrying out the productions of branches:

$$L = \| L_i \| \qquad (i = 1, 2, ..., n)$$

$$L = W \cdot e \tag{1}$$

$$L_i = \sum_{j=1}^{n} x_{ij}^w \qquad \forall\, i \in (1, 2, ..., n); \tag{2}$$

J^* — the line vector of products from the internal production consumed in the process of production of branches:

$$J^* = \| J_j \| \qquad (j = 1, 2, ..., n)$$

$$J^* = e^* \cdot W \tag{3}$$

$$J_j = \sum_{i=1}^{n} x_{ij}^w \qquad \forall\, j \in (1, 2, ..., n); \tag{4}$$

D^w — the column vector of the development fund covered from the internal production of branches:

$$D^w = \| D_i^w \| \qquad (i = 1, 2, ..., n);$$

N^w — the column vector of the unproductive consumption fund covered from the internal production of branches:

$$N^w = \| N_i^w \| \qquad (i = 1, 2, ..., n);$$

E — the column vector of the exported products:

$$E = \| E_i \| \qquad (i = 1, 2, ..., n);$$

Y^w — the column vector of the final consumption covered from the internal production of branches:

$$Y^w = \| Y_i^w \| \qquad (i = 1, 2, ..., n)$$

$$Y^w = D^w + N^w + E \tag{5}$$

X — the column vector of the internal productions of branches:

$$X = \| X_i \| \qquad (i = 1, 2, ..., n) \tag{6}$$

$$X = L + Y^w$$

Z — the matrix of consumptions of import products:

$$Z = \| x_{ij}^z \| \qquad (i, j, = 1, 2, ..., n);$$

I^* — the line vector of any import products consumed in the process of production of branches:

$$I^* = \| I_j \| \qquad (j = 1, 2, ..., n);$$

$$I^* = e^* \cdot Z \tag{7}$$

$$I_j^* = \sum_{i=1}^{n} x_{ij}^z \qquad \forall j \in (1, 2, ..., n); \tag{8}$$

U — the column vector of the import products classified in the profile of the branches of the balance and consumed in the process of production of branches:

$$U = \| U_i \| \qquad (i = 1, 2, ..., n);$$

$$U = Z \cdot e \tag{9}$$

$$U_i = \sum_{j=1}^{n} x_{ij}^z \qquad \forall i \in (1, 2, ..., n); \tag{10}$$

M^* — the line vector of liquidations:

$$M^* = \| M_j \| \qquad (j = 1, 2, ..., n);$$

S^* — the line vector of the primary incomes of the population:

$$S^* = \| S_j \| \qquad (j = 1, 2, ..., n);$$

P^* — the line vector of the primary incomes of the state and co-operative societies:

$$P^* = \| P_j \| \qquad (j = 1, 2, ..., n);$$

V^* — the line vector of the added values:

$$V^* = \| V_j \| \qquad (j = 1, 2, ..., n)$$

$$V^* = M^* + S^* + P^* + I^* \tag{11}$$

X^* — the line vector of the internal productions of branches (X^* is the transposed vector X):

$$X^* = \| X_j \| \qquad (j = 1, 2, ..., n)$$

$$X^* = J^* + V^* \tag{12}$$

6. The notations used for the elements of quadrant IV and their significances are the following:

U^{Dw} — the column vector of import products (on branches in which they were classified), necessary to be consumed in the process of production for the achievement of the development fund from the internal production:

$$U^{Dw} = \| U_i^{Dw} \| \qquad (i = 1, 2, ..., n);$$

U^{Nw} — the column vector of import products (on branches in which they were classified) necessary to be consumed in the process of production for achieving the consumption fund from the internal production.

$$U^{Nw} = \| U_i^{Nw} \| \qquad (i = 1, 2, ..., n);$$

U^E — the column vector of import products (on branches in which they were classified) necessary to be consumed in the process of production for achieving the entire export:

$$U^E = \| U_i^E \| \qquad (i = 1, 2, ..., n).$$

The sum vector bordering, on the right, quadrant IV must identify in its first n elements vector U, because the totality of products imported and consumed in the process of production must be retrieved in the components of the final consumption [1]). Thus, it is necessary that there should exist the relation:

$$U^{Dw} + U^{Nw} + U^E = U \tag{13}$$

which should verify the balance of quadrant IV from the point of view of the outputs of the import products used in the process of production.

---

[1]) As the function of the processes of production, is, finally, that of achieving the satisfaction of the final consumption, vector U represents, from this point of view, the vector of the cumulated content of import products in the final consumption. Of course, the import we are referring to is the import of products classified in the category of internal branches and consumed in the process of production.

The totality — on the column of the components of vectors U^{Dw}, U^{Nw} and U^E,

$$e^* \cdot U^{Dw} = I^{Dw}$$

$$e^* \cdot U^{Nw} = I^{Nw}$$

$$e^* \cdot U^E = I^E$$

noted I^{Dw}, I^{Nw}, I^E represent the imports of products (of any kind) necessary to be consumed in the process of production for the achievement from the internal production of the development fund (I^{Dw}), the consumption fund (I^{Nw}) and, respectively of export (I^E).

The relations

$$I^{Dw} + I^{Nw} + I^E = I^* \cdot e = e^* \cdot U \tag{14}$$

are obvious.

Further, the notations and significances of the elements of quadrant IV are:

M^{Dw}, M^{Nw}, M^E — the liquidation expenses (in all branches of production) necessary for the achievement from the internal production of the development fund (M^{Dw}) and of the consumption fund (M^{Nw}), respectively of export (M^E). This said, the total content of liquidation in the development fund, the consumption fund and export is expressed by relation

$$M^{Dw} + M^{Nw} + M^E = M^* \cdot e; \tag{15}$$

S^{Dw}, S^{Nw}, S^E — the wage expenses (the primary incomes of the population) necessary (in all branches of production) for the achievement from the internal production of the development fund (S^{Dw}) and of the consumption fund (S^{Nw}, respectively of export (S^E). The cumulated content of primary incomes of the population in the development fund, the consumption fund and export is given by relation

$$S^{Dw} + S^{Nw} + S^E = S^* \cdot e \tag{16}$$

P^{Dw}, P^{Nw}, P^E — the plusproduct (the incomes of the state and co-operative societies) achieved due to the deliveries from the internal production to the development fund (P^{Dw}), the consumption fund (P^{Nw}), export (P^E). The cumulated content of the incomes of the state and co-operative societies in the development fund, the consumption fund and export is

$$P^{Dw} + P^{Nw} + P^E = P^* \cdot e \tag{17}$$

The balance of quadrant IV must be ensured, from the point of view of inputs, by the existence of relations:

$$I^{Dw} + M^{Dw} + S^{Dw} + P^{Dw} = e^* \cdot D^W \tag{18}$$

$$I^{Nw} + M^{Nw} + S^{Nw} + P^{Nw} = e^* \cdot N^W \tag{19}$$

$$I^E + M^E + S^E + P^E = e^* \cdot E \tag{20}$$

and, the general equilibrium, by relations

$$e^* \cdot D^W + e^* \cdot N^W + e^* \cdot E = I^* \cdot e + M^* \cdot e + S^* \cdot e + P^* \cdot e =$$
$$e^* \; Y^W = V^* \cdot e \tag{21}$$

7. The determination of the previously defined indicators comprised in quadrant IV of the static balance of inter-branch connections is possible by using the following elements resulting from the mathematical processing of the data inscribed in the first three quadrants of the balance:

A^W — the matrix of the coefficients of the direct expenses of products and material services from the internal production [1]):

$$A^W = \| a_{ij}^w \| \qquad (i, \; j = 1, 2, ..., n) \tag{22}$$

$$A^W = W \cdot (\hat{X})^{-1}$$

$$a_{ij}^w = \frac{x_{ij}^w}{X_j} \tag{23}$$

$(E - A^W)^{-1}$ — the matrix of the coefficients of total expenses [2]) of products and material services from the internal production:

$$(E - A^W)^{-1} = \| A_{ij}^w \| \qquad (i, \; j, = 1, 2, ..., n)$$

A^z — the matrix of the coefficients of direct expenses of import products

$$A^z = \| a_{ij}^z \| \qquad (i, \; j = 1, \; 2, ..., n) \tag{24}$$

$$A^z = Z \cdot (\hat{X})^{-1};$$

$$a_{ij}^z = \frac{x_{ij}^z}{X_j}; \tag{25}$$

i^* — the line vector of the coefficients of direct expenses of import products consumed in the process of production of branches:

$$i^* = \| i_j \| \qquad (j = 1, \; 2, ..., n);$$
$$i^* = I^* \cdot (\hat{X})^{-1}; \tag{26}$$

$$i_j = \frac{I_j}{X_j}; \tag{27}$$

$$i_j = \sum_{i=1}^{n} a_{ij}^z \qquad \forall \, j \in (1, \; 2, ..., n) \; ; \tag{28}$$

---

[1]) $\hat{X}$ — the diagonal matrix formed with the elements of vector X.

[2]) The coefficient of total expenses A_{ij} expresses the necessary total of production which must be achieved in branch i and which this branch should put at the disposal of the entire national economy, for branch j to be able to deliver at the final consumption products at the value of a monetary unit (one leu).

m^*, s^*, p^* — the line vectors of the coefficients of direct expenses of liquidation (m^*), primary incomes of the population (s^*), primary incomes of the state and co-operative societies (p^*).

$$m^* = \| m_j \|; \quad s^* = \| s_j \|; \quad p^* = \| p_j \| \qquad (j = 1, 2, ..., n)$$

$$m^* = M^* \cdot (\hat{X})^{-1}; \tag{29}$$

$$s^* = S^* \cdot (\hat{X})^{-1}; \tag{30}$$

$$p^* = P^* (\hat{X})^{-1}; \tag{31}$$

$$m_j = \frac{M_j}{X_j} \tag{32}$$

$$s_j = \frac{S_j}{X_j} \tag{33}$$

$$p_j = \frac{P_j}{X_j} \tag{34}$$

F^z — the matrix of the coefficients of total expenses of import products (in the unit of the final consumption achieved from the internal production) [1]

$$F^z = \| F^z_{ij} \| \qquad (i, j = 1, 2, ..., n)$$

$$F^z = A^z \cdot (E - A^w)^{-1} \tag{35}$$

$(F^m)^*$, $(F^S)^*$, $(F^P)^*$ — the line vectors of the coefficients of total expenses of liquidation $(F^m)^*$, primary incomes of the population (F^s),* primary incomes of the state and co-operative societies $(F^p)^*$, (in the unit of final consumption achieved from the internal production)

$$(F^m)^* = \| F^m_j \|; \quad (F^s)^* = \| F^s_i \|; \quad (F^p)^* = \| F^p_j \| \qquad (j = 1, 2, ..., n)$$

$$(F^m)^* = m^* \cdot (E - A^w)^{-1} \tag{36}$$

$$(F^S)^* = S^* \cdot (E - A^w)^{-1} \tag{37}$$

$$(F^p)^* = p^* \cdot (E - A^w)^{-1} \tag{38}$$

8. The elements of quadrant IV are calculated through the following formulae:

$$U^{Dw} = F^z \cdot D^w \tag{39}$$

$$U^{Nw} = F^z \cdot N^w \tag{40}$$

$$U^E = F^z \cdot E \tag{41}$$

---

[1]) The coefficient of the total expenses of import products F^z_{ij}, expresses the necessary import products, classified in the category of branch i and consumed in the process of production (by all branches of the national economy) for branch j to be able to deliver at the final consumption products at the value of a monetary unit (one leu).

$$U = F^z \cdot Y^w \tag{42}$$

$$M^{Dw} = (F^m)^* \cdot D^w \tag{43}$$

$$M^{Nw} = (F^m)^* \cdot N^w \tag{44}$$

$$M^E = (F^m)^* \cdot E \tag{45}$$

.....

$$M^* \cdot e = (F^m)^* \cdot Y^w \tag{46}$$

$$S^{Dw} = (F^s)^* \cdot D^w \tag{47}$$

$$S^{Nw} = (F^s)^* \cdot N^w \tag{48}$$

$$S^E = (F^s)^* \cdot E \tag{49}$$

.....

$$S^* \cdot e = (F^s)^* \cdot Y^w \tag{50}$$

$$P^{Dw} = (F^p)^* \cdot D^w \tag{51}$$

$$P^{Nw} = (F^p)^* \cdot N^w \tag{52}$$

$$P^E = (F^p)^* \cdot E \tag{53}$$

.....

$$P^* \cdot e = (F^p)^* \cdot Y^w \tag{54}$$

9. Being in possession of the elements of quadrant IV, calculated as at point 8, the complete picture (on four quadrants) of the static balance of inter-branch connections can be formed:

W	L	D^w	N^w	E	Y^w	X
J^*	$J^* \cdot e = e^* \cdot L$	$e^* \cdot D^w$	$e^* \cdot N^w$	$e^* \cdot E$	$e^* \cdot Y^w$	$e^* \cdot X$
Z	U	U^{Dw}	U^{Nw}	U^E	U	
I^*	$I^* \cdot e = e^* \cdot U$	I^{Dw}	I^{Nw}	I^E	$I^* \cdot e = e^* \cdot U$	
M^*	$M^* \cdot e$	M^{Dw}	M^{Nw}	M^E	$M^* \cdot e$	
S^*	$S^* \cdot e$	S^{Dw}	S^{Nw}	S^E	$S^* \cdot e$	
P^*	$P^* \cdot e$	P^{Dw}	P^{Nw}	P^E	$P^* \cdot e$	
V^*	$V^* \cdot e$	$e^* \cdot D^w$	$e^* \cdot N^w$	$e^* \cdot E$	$V^* \cdot e$	
X^*	$X^* \cdot e$					

10. To follow more easily the ideas expounded, we bring an example of calculus of the indicators of quadrant IV for a conventional balance in which the economy is divided into three branches of production.

10. 1. The static balance of inter-branch connections organized on three quadrants:

				L	D^W	N^W	E	Y^W	X
	125	115	130	370	95	25	75	195	565
W	190	80	180	450	95	85	50	230	680
	65	195	10	270	—	310	150	460	730
J^*	380	390	320	1090	190	420	275	885	1975
	5	35	10	50					
Z	10	20	20	50	U				
	25	5	50	80					
I^*	40	60	80	180	$I^* \cdot e$				
M^*	15	20	40	75	$M^* \cdot e$				
S^*	70	90	190	350	$S^* \cdot e$				
P^*	60	120	100	280	$P^* \cdot e$				
V^*	185	290	410	885	$V^* \cdot e$				
X^*	565	680	730	1975	$X^* \cdot e$				

10.2. The elements necessary for calculating the indicators which must be inscribed in quadrant IV and which are determined with the aid of the data contained in quadrants I, II and III:

$$A^W = \begin{array}{|c|c|c|} \hline 0.221238 & 0.169117 & 0.178082 \\ \hline 0.336283 & 0.117647 & 0.246575 \\ \hline 0.115044 & 0.286764 & 0.013698 \\ \hline \end{array}$$

$$(E - A^W)^{-1} = \begin{array}{|c|c|c|} \hline 1.518550 & 0.413781 & 0.377627 \\ \hline 0.683805 & 1.419883 & 0.478433 \\ \hline 0.375938 & 0.461087 & 1.197034 \\ \hline \end{array}$$

$$A^z = \begin{array}{|c|c|c|}\hline 0.008849 & 0.051470 & 0.013698 \\ \hline 0.017699 & 0.029411 & 0.027397 \\ \hline 0.044247 & 0.007352 & 0.068493 \\ \hline \end{array}$$

$$i^\bullet = \begin{array}{|c|c|c|}\hline 0.070796 & 0.088235 & 0.109589 \\ \hline \end{array}$$

$$m^\bullet = \begin{array}{|c|c|c|}\hline 0.026548 & 0.029411 & 0.054794 \\ \hline \end{array}$$

$$s^\bullet = \begin{array}{|c|c|c|}\hline 0.123893 & 0.132352 & 0.260273 \\ \hline \end{array}$$

$$p^\bullet = \begin{array}{|c|c|c|}\hline 0.106194 & 0.176470 & 0.136986 \\ \hline \end{array}$$

$$F^z = \begin{array}{|c|c|c|}\hline 0.053781 & 0.083057 & 0.044361 \\ \hline 0.057286 & 0.061715 & 0.053549 \\ \hline 0.097967 & 0.060327 & 0.102213 \\ \hline \end{array}$$

$$(F^m)^\bullet = \begin{array}{|c|c|c|}\hline 0.081024 & 0.078009 & 0.089686 \\ \hline \end{array}$$

$$(F^s)^\bullet = \begin{array}{|c|c|c|}\hline 0.376485 & 0.359196 & 0.421661 \\ \hline \end{array}$$

$$(F^p)^\bullet = \begin{array}{|c|c|c|}\hline 0.333429 & 0.357669 & 0.288506 \\ \hline \end{array}$$

10.3. The determination of the indicators of quadrant IV.

$$U^{Dw} = F^z \cdot D^w = \begin{array}{|c|}\hline 13.00 \\ \hline 11.31 \\ \hline 15.04 \\ \hline \end{array}$$

$$U^{Nw} = F^z \cdot N^w = \begin{array}{|c|}\hline 22.16 \\ \hline 23.28 \\ \hline 39.26 \\ \hline \end{array}$$

$$U^E = F^z \cdot E = \begin{array}{|c|}\hline 14.84 \\ \hline 15.41 \\ \hline 25.70 \\ \hline \end{array}$$

$$U = F^z \cdot Y^w = \begin{array}{|c|}\hline 50 \\ \hline 50 \\ \hline 80 \\ \hline \end{array}$$

$$M^{Dw} = (F^m)^* \cdot D^w = \boxed{15.11}$$

$$M^{Nw} = (F^m)^* \cdot N^w = \boxed{36.46}$$

$$M^E = (F^m)^* \cdot E = \boxed{23.43}$$

$$M^* \cdot e = (F^m)^* \cdot Y^w = \boxed{75.00}$$

$$S^{Dw} = (F^s)^* \cdot D^w = \boxed{69.88}$$

$$S^{Nw} = (F^s)^* \cdot N^w = \boxed{170.67}$$

$$S^E = (F^s)^* \cdot E = \boxed{109.45}$$

$$S^* \cdot e = (F^s)^* \cdot Y^w = \boxed{350.00}$$

$$P^{Dw} = (F^p)^* \cdot D^w = \boxed{65.66}$$

$$P^{Nw} = (F^p)^* \cdot N^w = \boxed{128.17}$$

$$P^E = (F^p)^* \cdot E = \boxed{86.17}$$

$$P^* \cdot e = (F^p)^* \cdot Y^w = \boxed{280.00}$$

10.4. The static balance of inter-branch connections, completed (with four quadrants) appears in the form:

				L	D^w	N^w	E	Y^w	X
	125	115	130	370	95	25	75	195	565
W	190	80	180	450	95	85	50	230	680
	65	195	10	270	—	310	150	460	730
J^*	380	390	320	1090	190	420	275	885	1975
	5	35	10	50	13,00	22,16	14,84	50	
Z	10	20	20	50	11,31	23,28	15,41	50	
	25	5	50	80	15,04	39,26	25,70	80	
I^*	40	60	80	180	39,35	84,70	55,95	180	
M^*	15	20	40	75	15,11	36,46	23,43	75	
S^*	70	90	190	350	69,88	170,67	109,45	350	
P^*	60	120	100	280	65,66	128,17	86,17	280	
V^*	185	290	410	885	190	420	275	885	
X^*	565	680	730	1975					

11. The elements of quadrant IV of the static balance of inter-branch connections calculated by the expounded method is a step forward in the application of the model of balance in economic analysis. The indicators, which must be included in quadrant IV of the balance besides offering the possibility for its complete presentation, represent elements — characteristic of the balance — emphasizing connections existing in the national economy which so far were not revealed by any of the systems for obtaining the synthetic indicators of the economy.

REFERENCES

1. MĂNESCU MANEA: *Calculul economic.* (Economic Computation). Editura Academiei R.S. România, Bucharest, 1964.
2. DOBRESCU EMILIAN: *Ritmul creşterii economice* (The Rhythm of Economic Growth). Editura politică, Bucharest, 1968.
3. EFIMOV A. N., BERRI L. I.,: *Metode de planificare a proporţiilor dintre ramuri.* (Methods for Planning the Proportions among Branches). (Russian), Moscow, 1965.

4. EIDELMAN M.: *Probleme privind estimarea producției în cadrul balanței legăturilor dintre ramuri.* (Problems Concerning the Estimation of Production within the Balance of Inter-Branch Connections). Buletinul documentar statistic, no. 12, 1964.
5. KOSTOV V.V.: *Balanța legăturilor dintre ramuri* (The Balance of Inter-Branch Connections). (Russian), Moscow, 1966.
6. NEMCINOV V. S.: *Metode și modele economico-matematice.* (Economic-Mathematic Methods and Models). (Russian), Moscow, 1965.
7. ISAMU YAMADA: *Theory and Application of Interindustry Analysis,* Kinskunia Bookstore Co. LTD. Tokyo, 1961.
8. SEKULIC MIJO: *Metode bilansiranja strukturnik proporcija u planu priverednog razkoja.* Medusektorski modeli, Beograd, 1965.
9. LEONTIEV W. W.: *Input-Output Economics.* New-York, 1966.

SIGNIFICATION ET DETERMINATION DES ELEMENTS DU IV-E CADRAN DU MODELE STATIQUE ENTREE-SORTIE

La détermination du IV-e cadran du modèle entrée sortie constitue un problème de grande actualité, dont se préoccupent fortement les spécialistes. Cet ouvrage offre la solution pour compléter le modèle statistique entrée-sortie à indicateurs propres—par définition—du IV-e cadran de ce modèle. La méthode de calcul de ces indicateurs—autrement importants dans l'analyse économique — ne présente pas de difficultés pratiques, étant capable de mettre en évidence des solutions déterminées avec précision au degré de précision de tous les éléments constitutifs des cadrans du modèle. Ces cadrans sont complétés avec des données obtenues à la suite des enregistrements statistiques.

Les indicateurs du IV-e cadran ainsi calculés complètent le fonds des indicateurs synthétiques de l'économie nationale, contribuant à la réalisation de certaines analyses économiques aussi complètes que possible.

ЗНАЧЕНИЕ И ОПРЕДЕЛЕНИЕ ЭЛЕМЕНТОВ КВАДРАНТА IV СТАТИЧЕСКОГО БАЛАНСА МЕЖОТРАСЛЕВЫХ СВЯЗЕЙ

Определение элементов квадранта IV баланса межотраслевых связей представляет собой очень актуальный вопрос, находящийся в центре внимания специалистов по вопросам баланса межотраслевых связей. В настоящей статье дается решение дополнения статического баланса межотраслевых связей показателями, которые свойственны — согласно определению — квадранту IV этого баланса. Метод расчета указанных показателей, имеющих большое значение в экономическом анализе, не представляет практических трудностей и делает возможным выявление строго определенных решений со степенью точности всех составных элементов квадрантов баланса, которые дополняются данными, вытекающими из статистических записей.

Показатели квадранта IV, рассчитанные таким образом, дополняют фонд сводных показателей народного хозяйства, способствуя проведению наиболее полных экономических анализов.