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MATERIAL PRODUCT IN THE USSR**

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ESTIMATION OF GROSS SOCIAL PRODUCT AND NET MATERIAL PRODUCT IN THE USSR

T. A. Khomenko

General overview

1. Gross social product and net material product (NMP) were the most important macroeconomic indicators used in the USSR for monitoring the economic growth. NMP was the core indicator among the control figures of the plans of development of the economy of the USSR. Gross social product represented the starting point of the estimation of NMP.

The counterparts of gross social product and NMP in the SNA are output and GDP. In fact, the name of GDP counterpart used in the USSR was “national income”. NMP is the term used at the international level to distinguish this indicator from national income in the SNA.

Generally speaking there is much in common in the estimates of NMP and GDP. The main differences originate from underlying conceptual framework; some differences are connected with peculiarities in organization of economy and statistics.

This paper contains the description of concepts, sources and methods used in the estimation of gross social product and NMP in the USSR and the union republics.

2. In accordance with the concepts of the Material Product System (MPS) product and income are produced in the sphere of material production. It covered production of material products: goods and material services, such as transportation and distribution of goods, repairs and the like. Provision of non-material services (such as housing, passenger transport, health care, education, science, general administration and the like) was treated as activities in the non-material sphere where only redistribution and final consumption of product and income takes place.

3. Net material product (NMP) represented the part of gross social product covering material products designed for final use. Similar to GDP it was computed by three methods:

- as sum of net product of industries (production method);
- as sum of primary incomes (distribution method);
- as sum of final use components (final use method).

4. The main classifications used in the estimates of NMP were the industrial classification of kinds of activities and the classification of economic units by type of ownership.

The industrial classification of kinds of activities distinguished the following industries of material production:

- industry;

- construction;
- agriculture;
- forestry;
- cargo transport;
- maintenance of roads;
- communication serving the sphere of material production;
- wholesale and retail trade;
- catering;
- material supply;
- procurement;
- information and computing services (commencing 1985);
- other branches of material production.

Industries allocated to the non-material sphere were as follows:

- health care;
- social security;
- physical culture and sports;
- education;
- passenger transport;
- communication serving households and the non-material sphere;
- housing services;
- public utilities and personal services;
- culture and art;
- science and scientific services;
- credit;
- insurance;
- general administration and defense;
- social organizations.

The classification of economic units by type of ownership distinguished the following types of units:

- public enterprises and organizations;
- cooperative enterprises (excluding collective farms);
- collective farms;
- personal plots of collective farmers;
- personal plots of other groups of population.

Public and collective enterprises including collective farms could be considered as subgroups of the sector of non-financial corporations while personal plots should be allocated to the household sector. Other SNA sectors could not be presented here as far as financial organizations (such as banks and insurance enterprises) as well as the general government and NPISH were considered as units of the non-material sphere.

When this classification referred to final use components the group “public enterprises and organizations” covered all public units belonging both to the material production

sphere and to the non-material sphere. NPISH were considered as insignificant so they were usually classified together with public enterprises and organizations.

5. Estimation of gross social product and NMP was carried out in current and constant prices.

Current prices which were used for estimation of gross output of industries can be considered as producer prices; they included taxes on products (for example, the most important turnover tax) and they excluded subsidies on products (payments to enterprises from the state budget due to price regulation).

Constant prices represented average prices of a base year. Prices of 1951, 1955, 1958, 1965, 1973, 1983 years were consecutively used as constant prices in the estimation of NMP. Change of the base year for NMP usually took place after such changes in the statistics of industry and construction. As a result, the base year used in these statistics usually differed from the base year used for estimating gross output and net product of the above industries in the framework of computing NMP in constant prices; it required corresponding revaluation of the primary data.

Valuation of NMP in constant prices was carried out by industries and by components of final use with the help of common methods: deflation, extrapolation and direct valuation. However, price indexes used for deflation purposes did not entirely correspond to international standards of price statistics.

6. Estimation of NMP of the USSR as a whole was organized by the USSR Central Statistical Office (CSO) at the beginning of 1920-ies in the framework of compilation of the Balance of the National Economy. First Balance of the National Economy was compiled for 1923/24 fiscal year and was published in 1926. It represented a set of very detailed tables and balances which can be considered as a forerunner of the SNA. They included, for example, resource and use tables, balance sheets, etc. Unfortunately later compilation of the Balance of the National Economy was considerably simplified, however, estimates of NMP were carried out on a regular basis. As a result, time series of NMP of the USSR cover the period from 1920-ies to 1991 but they have different level of disaggregation for different periods.

Estimates of NMP for the union republics were organized at the end of 1950-ies. At first they were carried out only by production method. Estimates of NMP by final use method started in the middle of 1960-ies and by distribution method which was considered as less important – at the end of 1980-ies. Time series of NMP by the union republics exist for the period from 1960 to 1990. Like the USSR time series they contain data on NMP both in current and constant prices as well as volume indices.

7. Estimates of NMP for the republics were based on the methodology developed by the CSO. The methodological materials provided to the republics included working sheets and handbooks with description of sources and methods of estimates. The initial estimates were carried out by the republican statistical offices (RSO) and submitted to the CSO. There they were checked, corrected and adjusted. Adjustments were necessary because a part of the necessary primary information was not available for the republics.

The enterprises in the USSR were classified by their subordination to different types of ministries. There were ministries of the union and republican levels and their enterprises were classified correspondingly. The reports of enterprises of the republican and municipal levels were available both for the CSO and the RSO. The reports of enterprises of the union level were submitted to their ministries and their information was available only for the CSO, however, very often without allocation to republics. Such allocation was carried out for each component of NMP at a most possible detailed level with the help of “top-down” method, that is proportionally to some appropriate distribution keys. The initial estimates of the republics were adjusted to take into account the data available only at the central level. The final results reconciled with the totals for the USSR were sent back to RSO. The share of such adjustments varied significantly for various components of NMP; for example, it was especially high for industries with a large number of enterprises subordinated to the Ministry of Defense.

8. Primary sources of information used for the estimates of gross social product and NMP were as follows:

- aggregated reports of enterprises and organizations submitted by ministries and local authorities;
- report of the Ministry of Finance on execution of the state budget;
- report of the State Bank;
- household budget sample surveys;
- administrative reports;
- censuses of livestock and perennial plants owned by households;
- household budget sample surveys;
- other sample surveys.

All enterprises and organization were covered by the system of compulsory reporting. Under these conditions sample surveys did not play significant role as a source of information for regular statistical observation.

The information from these primary sources was transformed into data of various areas of statistics (statistics of selected industries, labour statistics, finance statistics, capital investment statistics, etc.). These data were used either directly for the estimates of NMP or for compilation of a number of balances in the framework of the Balance of the National Economy, such as:

- balances of production and use of agricultural goods by type of producer units;
- the balance of money incomes and expenditures of population;
- balances of fixed assets.

These balances were specific for the statistics of the USSR and the union republics. They represented very important statistical tools used for the estimation of NMP.

Estimation of net material product by production method

9. In accordance with the production method NMP was derived as sum of net product of industries of the material production.

- 1) Gross social product (= total of gross output of industries)
- 2) Total of intermediate material consumption of industries
- 3) Net material product (= total of net product of industries) (1 - 2)

Net product of an industry was derived by deduction of intermediate material consumption from gross output.

Intermediate material consumption included input of material products and consumption of fixed assets. So unlike value added and GDP in the SNA net product of industries and NMP included intermediate consumption of non-material services and did not include consumption of fixed capital.

10. Allocation of activities to industries were carried out on the basis of data of establishments of enterprises. If an enterprise was engaged in various kinds of activities on a significant scale the data on these activities were shown separately in the reports and when estimating NMP they were allocated to corresponding industries. So, for example, gross output of agriculture included the production of agricultural products both by agricultural enterprises and by agricultural establishments of enterprises engaged in other activities (it was rather common practice in the USSR when large industrial enterprises organized production of agricultural goods to supply them to their canteens, kindergartens, sanatoria, etc.). So each industry consisted of relatively homogenous activities which corresponds to the SNA treatment.

Estimation of gross output of industries

Industry

11. Gross output of the industry covered output of various kinds of activities which corresponded on a whole to mining and quarrying, manufacturing, electricity, gas and water supply. These activities were subdivided in accordance with the adopted industrial classification by the following branches:

- fuel and power industry;
- metallurgical industry;
- chemical and oil-processing industry;
- machine-building and metal working;
- timber, wood-working, pulp and paper industry;
- construction materials industry;

- light industry;
- food industry;
- other branches.

12. Data on gross output were collected from enterprises where they were derived by direct valuation of output in wholesale prices of enterprises of two kinds: actual prices of the current year and prices of the base year adopted for the industry. All these prices were list prices, that is they used to be established for the whole country by the special body of the central government (Committee on Prices). The wholesale prices of enterprises did not include turnover tax.

13. The CSO and the RSO made some adjustments to data of enterprises. For example, change in work-in-progress in selected branches was added (if it was not included in output in the reports of enterprises).

The resulting data represented gross output of industry in the wholesale prices of enterprises. Data in prices of the base year adopted for industry needed revaluation in constant prices adopted for estimating NMP. For example, in the 1980-ies the base year for industry was 1982 and for NMP – 1983. The revaluation was carried out with the help of ratios between prices of these years.

14. The next step was to derive gross output in wholesale prices of industry, that is including turnover tax. Data on turnover tax were adjusted by the net payments from the state budget due to regulation of prices on selected agricultural and industrial products. The schemes of this regulation were as follows.

Agricultural goods to be used as raw materials for manufacturing (corn, wool, leather, etc.) were purchased by procurement enterprises at procurement prices and supplied to manufacturing enterprises at wholesale prices which were established at lower level in order to maintain retail prices on industrial goods at the low level. The balance between procurement prices and wholesale prices was reimbursed to procurement enterprises from the state budget. Agricultural goods which could not stand durable transportation and storage (livestock, milk, potatoes, vegetables, sugar beet, cotton) were purchased directly by manufacturing enterprises. In this case the similar balance of prices was reimbursed to these enterprises.

Another flow of payments from the state budget related to industrial goods supplied to agricultural enterprises (agricultural machines and equipment, motorcars, fuel, fertilizers, etc.). These goods were purchased by specialized enterprises allocated to the industry “material supply” at wholesale prices and they were delivered to agricultural enterprises at lower prices. The balance was reimbursed from the state budget to material supply enterprises.

Another way of price regulation took place in case of TV and radio sets. The producer prices of these goods in addition to wholesale prices included the fee for their use to be paid by final purchasers (which could be considered as a tax on using selected goods). The enterprises producing these goods directed this fee to the state budget.

The total balance of all these flows was negative for the state budget, that is payments from the budget exceeded the payments to the budget. Net payments from the state budget due to price regulation grew constantly and by the end of 1980-ies they exceeded the value of turnover tax.

15. Data on turnover tax imposed on industrial products and on the payments to and from the state budget were received from the Ministry of Finance; they were available by products but for the country as a whole. All estimates of these flows were carried out by the CSO first for the country as a whole and then the results were allocated to republics in accordance with the output of corresponding products.

Valuation of turnover tax and payments to and from the state budget due to price regulation in constant prices was carried out with the help of extrapolation by volume indexes of output of corresponding goods.

16. The final figures of gross output of industry in current and constant prices were derived as follows:

gross output at wholesale prices of enterprises

plus: turnover tax

less: net payments from the state budget due to price regulation

equals: gross output in wholesale prices of industry.

Construction

17. Gross output of construction covered the value of construction and installation works, drilling, projecting and other works related to construction and major repairs carried out both by contractors and other producers at own account.

The main sources of information for estimates of gross output of construction were as follows:

- reports on capital investments of enterprises and organisations;
- reports of contractors on output and production costs;
- administrative reports on a number, space and prices of dwellings built by households at own account.

Data on capital investments in the reports of enterprises and organizations were valued at current prices and in prices of the base year adopted for construction.

18. The following adjustments were carried out to use these data for estimating gross output of construction:

- exclusion of expenses on purchases of machinery and equipment;
- exclusion of expenses on perennial plants;
- exclusion of other expenses not to be included in the output of construction (purchase of materials and supplies and training of personnel for the newly built enterprises, reimbursement to owners for pulling down buildings, structures and perennial plants at construction sites and the like);

- addition of changes in the work-in-progress related to all types of works carried out in the process of construction;

- addition of expenses on major repairs of buildings and structures.

Data in prices of the base year adopted for construction needed revaluation in constant prices adopted for estimating NMP. The revaluation was carried out with the help of price indexes.

19. Output of construction of dwellings by households at own account was estimated by valuation of the number of newly built houses and square meters of space of apartments at current and constant average prices per 1 house and 1 square meter. The value of major repairs of dwellings owned by households was estimated as a percentage of the value of their average annual stocks.

Agriculture

20. Gross output of agriculture included the following components:

- output of finished goods of plant growing and animal husbandry (including those consumed as intermediate input in the same producer unit);

- change in the work-in-progress in plant growing and animal husbandry;

- output of cultivating perennial plants (excluding forest plantations).

21. The output of finished goods of plant growing and animal husbandry was estimated on the basis of the system of balances of production and use of agricultural goods. The balances were compiled by groups of producers classified by type of ownership. The balances were compiled for about 100 groups of agricultural goods. Among the major groups were crops, potatoes, vegetables, melons, fruits and berries, grapes, sugar beet, meat, milk and dairy goods, eggs, wool. The scheme of these balances was as follows:

Balance of production and use of agricultural goods by type of producer units

Resources

- 1) Stocks at the beginning of the year
- 2) Output (5-1-3-4)
- 3) Purchases from other units
- 4) Transfers from other units
- 5) Total resources (5=12)

Uses

- 6) Sales
- 7) Transfers to other units
- 8) Intermediate input
- 9) Final consumption

- 10) Losses of stored goods
- 11) Stocks at the end of the year
- 12) Total uses (6+7+8+9+10+11)

The balances were compiled in physical and value terms in current prices.

At first marketable goods were valued at actual transaction prices. This part of uses covered sales to procurement and other enterprises, at city markets. Goods provided by agricultural enterprises to their employees as wage in kind were valued at cost or at procurement prices.

At the next stage valuation of non-marketable goods was carried out. They covered intermediate input (seeds, forage, goods for processing, etc.), final consumption by households owned personal plots, losses of stored goods and stocks. This part of uses of enterprises was valued at cost. The similar items in the balances for personal plots were valued at average prices of marketable goods of collective farms and personal plots.

At the next stage the resources and uses of goods acquired from other units were valued similar to valuation of marketable goods.

Finally the value of output of agricultural goods in each balance was derived as the sum of values of items of uses (including stocks at the end of the year) less the sum of values of goods acquired from other units and stocks at the beginning of the year. Total value of output of finished goods of plant growing and animal husbandry was derived as the sum of values of output of all balances.

Similar balances were compiled for livestock separately for the main herd (fixed assets) and young and fattening livestock (inventories). Main herd covered mature animals used for breeding, production of animal husbandry goods and as draught animals. Livestock classified as inventories included also small animals (like rabbits, poultry and bees) independently on their maturity. These balances allowed to estimate the output of livestock growing which represented the change in work-in-progress in the animal husbandry.

22. Valuation of output of finished goods at constant prices was carried out with the help of direct valuation of output in physical terms by group of products at average prices of the base year. These prices were derived by the CSO for the USSR as a whole and they were applied to republican estimates. The similar approach was used for output of livestock growing.

23. Change in work-in-progress in plant growing was derived as the balance of cost of winter crops at the end and at the beginning of the reporting year. It was estimated only for agricultural enterprises. Cost of winter crops at constant prices was derived with the help of extrapolation by quantity index of areas under these crops.

24. Output of cultivating perennial plants was valued at cost of planting and maintenance of perennial plants until they reached maturity. The sources of data were reports of agricultural enterprises and censuses of perennial plants owned by households.

Valuation at constant prices was carried out with the help of extrapolation by quantity index of area of plantations. Output of cultivating perennial plants owned by households was estimated first at constant prices using the same method. The result was inflated to derive output at current prices; the deflator was taken from the estimates of this item for collective farms.

Forestry

25. Forestry covered the activity dealt with the cultivated afforestation, the maintenance of natural forests and other works contributing to natural afforestation. Gross output of forestry was valued at cost including consumption of fixed assets. The sources of information for these estimates were reports of specialized forestry enterprises as well as data on forestry activities from reports of other enterprises, mostly collective farms.

Valuation at constant prices was carried out with the help of extrapolation by quantity index of area of forest plantations.

Cargo transport

26. The cargo transport covered all types of transport (railway, water, air, motor, pipeline, draught transport and rafting). It included all activities connected with transportation of cargoes by transport enterprises and similar services provided for sale by the subsidiary divisions of enterprises belonging to other industries. Passenger transport was allocated to the non-material sphere.

Gross output of the cargo transport was estimated as the sum of actual receipts for transportation of goods and mail, for loading and unloading goods, storage, etc.

The sources of information for this estimation were reports of transport enterprises on their incomes and outlays and reports of enterprises belonging to other industries on their subsidiary transportation activities. The data of these reports on most important incomes and outlays were shown separately by cargo and passenger transportation. However, some of them related to both kinds of transportation (for example, cost of maintenance of railways, waterways, vehicles, station buildings, etc.); in this case they were divided using arbitrarily derived coefficients.

Valuation of gross output of the cargo transport in constant prices was carried out by type of transport with the help of deflation by tariff indexes.

27. The data on railway transport were collected from departments of railways. If a railway went through territories of several republics, then output of the railway was distributed among these republics with the help of coefficients based on cargo turnover of the corresponding parts of the railway. These coefficients were computed by the CSO.

The data on water transport were collected from departments of ship lines. In some cases a department located at the territory of some republic could have ports at the territory of another republic. The output of this department was allocated to the republic where it was located, less the data related to the port on another territory. The latter were

submitted to the corresponding republic and included in its gross output of the water transport. Gross output on Central Asian ship line was estimated by Turkmenistan and it was distributed among Turkmenistan, Uzbekistan, Kazakhstan and Tajikistan using coefficients.

Gross output of air transport was estimated by the CSO and allocated to republics with the help of “top-down” method.

Maintenance of roads

28. Maintenance of roads covered activities on repairs and maintenance of motor ways and associated structures excluding city motor ways (the maintenance of the latter was classified in the industry “Public utilities and services”).

Gross output of the maintenance of roads was estimated at cost including consumption of fixed assets. The sources of data for this estimation were reports of the specialized enterprises on the costs of repairs and maintenance of roads and data on wear and tear of fixed assets of these enterprises and of roads from the balance of fixed assets.

Communication serving the sphere of material production

29. Communication included post, telegraph, telephone and wireless communications. The gross output of communication was estimated as the sum of receipts of enterprises from delivery of periodicals, parcels, sales of postage stamps, cards, etc.; for use of telephone and telegraph channels and for installation of telephones; receipts of broadcasting and television, etc.

These data were taken from the reports of the republican ministries of communications. The receipts from various communication services by type were divided between services provided to enterprises of the sphere of material production and services provided to units of the non-material sphere and to households. It was carried out by means of coefficients derived by the Ministry of Communications of the USSR for each republic on the basis of the special survey. Gross output included only services provided to enterprises of the sphere of material production. Services provided to units of the non-material sphere and households were considered as non-material services.

Valuation of gross output of communication in constant prices was carried out by type of services with the help of deflation by tariff indexes.

Trade, catering, procurement, material supply

30. These industries covered activities engaged in distribution of commodities. Each of them had its specific functions. Trade mostly dealt with consumer goods; it included retail trade and wholesale trade both internal and external. Catering which covered restaurants, cafes, canteens, etc. was often combined with trade. Procurement enterprises purchased agricultural goods from producers and supplied them to manufacturers. Material supply dealt with providing raw materials (excluding agricultural goods), fuel, energy, equipment, etc. to enterprises.

Gross output of all these industries (including catering) was estimated as a trade margin, that is the difference between the value of sold and purchased goods. For catering it meant that gross output (as well as intermediate input) did not include the value of goods used for cooking meals and of those sold without processing; it differed from the SNA approach. In some cases if the direct data on trade margins of enterprises were not available (for example, in reports of procurement enterprises) gross output was estimated as the sum of costs (other than purchases of goods for resale) and net profit.

The sources of information for estimating gross output were reports of enterprises engaged in these activities as well as reports of enterprises belonging to other industries on their subsidiary activity on distribution of goods. Trade margin obtained from reports of these enterprises was diminished by the payments of enterprises for transportation services in order to avoid double counting of output of transport.

Valuation of gross output of all these industries in constant prices was carried out with the help of extrapolation by volume indexes of turnover of corresponding goods.

Information and computing services

31. This industry appeared relatively recently (in the 1985) as a result of technical progress in the field of processing of information. Gross output of this industry was equal to sales of such services. The information for its estimation was obtained from the reports of information and computing centres and similar enterprises.

Other branches of material production

32. This industry included activities of publishing agencies, film studios, production of handicraft and artisan goods, collection and primary processing of waste and scrap, procurement of forest goods, fishing and hunting.

Gross output of publishing agencies was estimated as the value of printed matters on the basis of reports of relevant trade associations. Valuation in constant prices was carried out with the help of extrapolation by the volume index of retail turnover of books and magazines.

Gross output of film studios was estimated as the sum of costs of film production including consumption of fixed assets and net profit from sales of films. The source of information were reports of film studios.

Gross output of production of handicraft and artisan goods was estimated on the basis of data of household budget surveys.

Gross output of collection and processing of metal scrap was estimated as trade margin while for other waste it was taken equal to sales. The source of information were reports of relevant enterprises.

Gross output of procurement of forest goods, fishing and hunting included procurement of firewood, peat, wild plants, mushrooms, berries and fruits, fish and game by households for sale and for own consumption. The data on procurement and disposals of these goods in physical terms were estimated on the basis of household budget surveys; then they were valued at procurement prices. Valuation in constant prices was carried out

with the help of direct valuation of goods in physical terms at average prices of the base year computed for the country as a whole.

External trade

33. Output of external trade was treated in the NMP estimates with the help of a special procedure adopted due to peculiarities in organisation of economy, price formation in general and in external trade, in particular, as well as in establishing exchange rates. The external trade was entirely controlled by the government. Only a limited number of specialized enterprises subordinated to the Ministry of Foreign Trade were engaged in this activity. All receipts from the external trade were transferred to the state budget. The government established prices on exported and imported goods and two levels of these prices existed. Exports consisted mostly of means of production (raw materials and other goods for productive purposes); the prices on them were established at relatively low level. Imports consisted primarily of consumer goods; the prices of their domestic sales were established at relatively high level. The exchange rate was established also by the government and it did not reflect actual ratios between prices.

Under these conditions the traditional procedure of estimation of the output of the external trade and net exports was considered as inadequate and it was transformed as follows:

$$T = (I_d - I_w) + (E_w - E_d) = (I_d - E_d) + (E_w - I_w) = (I_d - E_d) + B_w$$

where I_d and E_d - the value of imports and exports in domestic prices;

I_w and E_w - the value of imports and exports in world prices converted to the national currency by official exchange rates;

B_w - net exports in world prices converted to the national currency by official exchange rates.

This method was based on the concept which implied that $I_w = E_w$. As far as they were not equal the adjustment on the net exports was needed.

Net exports was converted to the national currency (B_d) with the help of coefficients characterizing the effectiveness of external trade transactions as follows:

$$\text{If } E_w > I_w, \text{ then } B_d = (E_w - I_w) \times E_d / E_w;$$

$$\text{If } I_w > E_w, \text{ then } B_d = (I_w - E_w) \times I_d / I_w.$$

So the final algorithm of computation of gross output of the external trade was as follows:

$$T = (I_d - E_d) + B_d$$

34. Gross output of the external trade was shown as a separate item (called "receipts from external trade") in the structure of gross social product and NMP. It was estimated

by the CSO in current and constant prices. The allocation to republics was carried out proportionally to the totals of net products of all industries.

Net exports was shown as a component of resources in the balance of production, distribution and use of gross social product (a counterpart of the goods and services account in the SNA).

35. The example of estimation of gross output of the external trade:

1) MPS approach

Exports in domestic prices (Ed) - 1000 roubles
 Exports in world prices converted
 to the national currency by official
 exchange rates (Ew) - 1200 roubles
 Imports in world prices converted
 to the national currency by official
 exchange rates (Iw) - 1100 roubles
 Imports in domestic prices (Id) - 1500 roubles

$$T = (1500 - 1000) + (1200 - 1100) \times 1000/1200 = 500 + 100 \times 0.83 = 583$$

$$B_d = (1200 - 1100) \times 1000/1200 = 83$$

$$I_d - E_d = T - B_d \quad 1500 - 1000 = 583 - 83$$

2) SNA approach

$$T = (1500 - 1100) + (1200 - 1000) = 600$$

$$B_w = 1200 - 1100 = 100$$

$$I_d - E_d = T - B_w \quad 1500 - 1000 = 600 - 100$$

Estimation of intermediate material consumption

36. Intermediate material consumption in all industries consisted of material input (goods and material services) and consumption of fixed assets.

37. Material input included the following items:

- raw materials and goods embodied in the final product;
- materials, instruments, implements, spare parts, devices used in the production process and not included in fixed assets;
- working clothes and footwear, special meals consumed by employees;
- reimbursement of expenditure by employees on necessary tools, clothes, etc.;
- semi-manufactured goods;
- fuel and energy of all kinds;

- payments for cargo transportation services provided by other enterprises and cost of transportation of goods within enterprises;
- payments for services of communication and computing centres;
- cost of packing materials;
- losses of output and intermediate goods within the established limits;
- fodder and seeds including those produced within the same enterprise.

Material input of goods and services purchased from other enterprises was valued at purchaser prices, that is including transport and wholesale trade margins for goods. Goods and services from own production were valued at cost.

The data on the value of material input were taken from reports of enterprises on cost of production. Some of the cost items could be directly classified as intermediate input while others should be extracted from the aggregate items; it was carried out with the help of coefficients specified for each industry.

38. The reports on the costs of construction works did not cover all producer units engaged in construction. The ratios of material input to the value of output by type of construction works available from these reports were applied to gross output to obtain the total intermediate material input in construction.

For agricultural enterprises the total intermediate input was estimated on the basis of the data of their reports. The data on intermediate input of agricultural goods (mostly fodder and seeds) both purchased and produced within the same agricultural producer unit were taken from the balances of resources and uses of agricultural products. The intermediate input of industrial goods was derived as the balance between the total intermediate input and intermediate input of agricultural goods. For personal plots of collective farmers intermediate input of industrial goods was estimated on the basis of household budget surveys. For other groups of population such data were not available. They were estimated using the ratio of the intermediate input of industrial goods to output for the plots of collective farmers.

In forestry intermediate material consumption was estimated as the balance between gross product and net product. The latter was calculated as the sum of primary incomes of enterprises engaged in forestry; these data were taken from their reports on outlays financed from the state budget.

Material input in catering excluded purchases of foodstuff for cooking and processing.

Material input in trade, procurement and material supply excluded the payments for transportation services.

39. Valuation of material input in constant prices in industry was carried out with the help of deflation using price indexes for material input. These indexes were calculated on the basis of reports on costs of selected enterprises and data on effect of changes in prices and tariffs on the value of costs; then these indexes were applied to all enterprises of corresponding sub-industries.

Valuation of material input in constant prices in construction was carried out with the help of deflation using price indexes for construction materials. Wholesale price indexes for material input in construction carried out by enterprises were calculated by the CSO.

Retail price indexes for material input in construction carried out by households at own account were calculated by the RSO.

Valuation of material input in constant prices in agriculture was carried out by groups of goods and types of producer units with the help of direct valuation; the same prices were used by all republics. For agricultural goods average prices of output were used; they were calculated by the CSO for the country as a whole on the basis of the balances of resources and uses of agricultural goods. Prices for industrial goods were also calculated by the CSO.

Price deflators for valuating in constant prices material input of the forestry, transport, communication, wholesale and retail trade, catering, procurement and material supply, publishing agencies were calculated by the CSO.

Material input of film studios and procurement of scrap and waste at constant prices was taken equal to data in current prices.

40. Consumption of fixed assets included wear and tear of fixed assets plus the depreciated value of scrapped fixed assets in the sphere of material production. The data on consumption of fixed assets for all industries were taken from the balances of fixed assets which were compiled by the RSO and then adjusted by the CSO to reconcile with the similar balance for the USSR.

Estimation of net material product by the final use method

41. In accordance with the final use method NMP was derived as follows:

- 1) Personal consumption by households
- 2) Material costs in the organizations and institutions of the non-material sphere providing services:
 - to households
 - to the society as a whole
- 3) Final material consumption (1 + 2)
- 4) Accumulation of fixed assets:
 - in the sphere of material production
 - in the non-material sphere
- 5) Change in inventories and other expenses
- 6) Accumulation and other expenses (4 + 5)
- 7) Losses
- 8) Net exports of goods and material services
- 9) Net material product (3 + 6 + 7 + 8)

42. The main deviations of components of final use of NMP from their counterparts in SNA are as follows.

Final material consumption included consumption of fixed assets by households and by institutions of the non-material sphere. It excluded final consumption of non-material services by households and intermediate consumption of non-material services by institutions of the non-material sphere.

Accumulation and other expenses included accumulation of fixed assets (net fixed capital formation) and change in inventories; acquisitions of armament were also covered here. So unlike its SNA counterpart (gross capital formation) it excluded consumption of fixed capital and included acquisitions of armament which could be treated as means of destruction.

There is no such a component in the final use of GDP as losses.

Net exports did not include non-material services while in the SNA they were covered by this indicator.

43. Personal consumption of households covered material products (consumer goods and material services) acquired by households from their personal incomes and received in kind. It included the following items:

- purchases of consumer goods and material services from retail trade enterprises, at city markets, from individuals;
- receipts of goods as wages in kind;
- goods produced by households for own final consumption;
- payments for electricity, gas and water supply for domestic purposes;
- payments for services of laundries and film processing studios (which were treated as material services);
- wear and tear of dwellings.

44. Consumption of goods (durable and non-durable) was taken equal to their acquisitions excluding agricultural goods produced by households for their own final consumption and received as wages in kind. For agricultural goods actual consumption was taken into account; increase in stocks of these goods was accounted as change in inventories.

The value of purchases of consumer goods in retail trade enterprises and at the markets was derived by deducting from the total purchases the value of goods used by households as intermediate input. The data on total purchases by households were taken from the balance of money incomes and expenditures of population; they were based on the data of the State Bank on the cash turnover. Reports of trade enterprises were the source of information on purchases of selected goods used as intermediate input. They included, for example, fertilizers, tools and other industrial goods, seeds, forage, livestock, construction materials, goods for capital repairs of dwellings owned by households.

Purchases of consumer goods from individuals were estimated using the data of household budget surveys.

Receipts of agricultural goods as wages in kind and consumption from own production were taken from balances of production and use of agricultural goods.

Payments for electricity, gas and water supply as well as payments for services of laundries and film processing studios were taken from the balance of money incomes and expenditures of population.

Wear and tear of dwellings were taken from the balance of fixed assets.

Practically all this information was available for the RSO and they estimated almost all these items excluding consumption of goods received by servicemen as wages in kind. Such data were estimated by the CSO and allocated to republics using the “top-down” method.

45. Valuation of personal consumption of households in constant prices was carried out by two methods:

- deflation by price indexes of retail trade turnover and by tariffs for material services;
- direct valuation of agricultural goods at average prices of the base year computed by the CSO for the country as a whole.

46. Estimates of material costs in the non-material sphere were carried out by groups of organizations and institutions providing services:

- to households in such areas as housing, public utilities, passenger transport, communication serving households and the non-material sphere, health care, social security, physical culture and sports, education, culture and art;
- to the society as a whole in the field of science, credit, insurance, general administration and defense.

The costs of units of the non-material sphere were subdivided by industries and by sources of financing (the state budget, funds of trade unions, funds of enterprises).

Material costs included such items as:

- purchases of stationery, foodstuff, medical goods, bed linen, working clothes, etc.;
- payments for electricity, gas and water supply;
- payments for material services (transportation of cargoes, information and computing services, repairs, services of laundries);
- part of the aggregate items, such as expenditures on maintenance and current repairs of buildings and equipment at own account, on staff training, on research work;
- wear and tear of fixed assets.

47. Sources of information for the estimates of material costs in the non-material sphere were as follows:

- reports of the Ministry of Finance on execution of the state and republican budgets (for budgetary institutions);
- reports of the State Bank and insurance enterprises;
- reports on the execution of the budgets of trade unions;
- reports on use of profits of enterprises referring to maintaining their own social and cultural subdivisions (sanatoria, hospitals, rest and sports centers, clubs, housing, etc.).

Some of these reports contained information which did not allow to derive material costs directly. In such cases ratios of material costs to total costs were used which were taken from more detailed reports of units belonging to corresponding industries. For

example, such ratios for housing services were available only for dwellings owned by the local governments; they were applied to housing services provided by enterprises belonging to various industries to their employees. For units engaged in health care and education these ratios were obtained from the estimates carried out for budgetary institutions.

The estimates of material costs of passenger transport and communication serving households and the non-material sphere were similar to those for cargo transport and communication serving the enterprises of the sphere of material production.

Wear and tear of fixed assets were taken from the balance of fixed assets.

48. The estimates of material costs in the non-material sphere were carried out both by the CSO and RSO. Share of data estimated only at the central level differed by industries. It was substantially higher for industries providing services to society as a whole.

49. Accumulation of fixed assets referred to the increase in the value of fixed assets used both in the sphere of material production and in the non-material sphere. They covered buildings (including dwellings) and structures, machines and equipment (including vehicles), perennial plants and livestock used for breeding, production of animal husbandry goods and as draught animals.

Accumulation of fixed assets (excluding livestock) was estimated on the net basis as follows:

fixed assets put into operation
plus the value of finished capital repairs of fixed assets
minus wear and tear of fixed assets
minus depreciated value of scrapped fixed assets.

These data were taken from the balance of fixed assets. The estimates were carried out by spheres of economy, by industries and by type of ownership.

Valuation in constant prices of fixed assets put into operation and of the value of finished capital repairs was carried out with the help of deflators derived on the basis of price indexes for construction works and for output of machine-building. The deflators for the republics were calculated by the CSO. Wear and tear of fixed assets and depreciated value of scrapped fixed assets were valued in constant prices only when change of depreciation rates took place in accordance with the government decision.

50. Accumulation of livestock was estimated as the balance between the value of stocks at the end and at the beginning of the year. These data were taken from the balances of livestock. They were valued in constant prices by direct valuation.

51. Change in inventories was estimated for the following groups:

- materials and supplies, work-in-progress, finished goods and goods for resale at enterprises classified by industries (excluding agricultural goods and work-in-progress in agricultural enterprises);

- agricultural goods stored by their producers (agricultural enterprises and households) by type of ownership;
- work-in-progress in agriculture (for agricultural enterprises by type of ownership);
- unfinished construction and capital repairs of buildings and structures (for enterprises by type of ownership);
- work-in-progress in forestry;
- strategic reserves held by the government.

52. Change in inventories (with some exceptions mentioned below) were estimated as the balance between the value of stocks at the end and at the beginning of the year. Change in unfinished construction was estimated as follows: capital investment, less fixed assets put into operation, less the written off value of unfinished construction. Change in unfinished capital repairs was estimated in the similar way: total expenses on capital repairs less finished repairs. Work-in-progress in forestry was estimated as output at cost less sales of timber generated in the process of maintenance of forests.

53. Sources of information for these estimates were as follows:

- data of finance statistics based on balance sheets of enterprises;
- balances of production and use of agricultural goods;
- balances of livestock;
- reports of enterprises on capital investment and capital repairs;
- balances of fixed assets;
- data of the state budget on financing the Department of the State Material Reserves.

54. Valuation in constant prices was carried out by deflation for the most of groups of inventories excluding agricultural goods for which direct valuation was used. Price indexes for deflating the value of inventories held by enterprises price indexes were calculated using the data on price changes on selected goods based on the government decisions. In order to derive change in unfinished construction and capital repairs in constant prices components of their estimation in current prices were valued separately in constant prices. For this purpose the same deflators for the corresponding items were used as in case of the valuation of accumulation of fixed assets.

55. Other expenses referred to acquisitions of military equipment and armaments from enterprises. These data were derived from the report on execution of the state budget. They were valued at constant prices by deflation using the price indexes for output of corresponding industries. These estimates were carried out by the CSO and allocated to republics proportionally to NMP (together with change in strategic reserves).

56. Losses included the following items:

- written off value of unfinished construction;
- losses of livestock from the main herd;

- losses of perennial plants from natural disasters;
- losses of agricultural goods stored by their producers;
- depreciated value of scrapped fixed assets in the non-material sphere;
- losses from discounting the out-of-date goods by trade enterprises.

The sources of information for estimating losses were statistics on capital investment, balances of agricultural goods and livestock, balances of fixed assets, finance statistics.

57. Net exports represented the balance of exports and imports of goods and material services. The source of information was the data of external trade statistics.

Estimation of net material product by distribution method

58. In accordance with the distribution method NMP represented the sum of primary incomes received by economic units (households and enterprises) from their participation in production. NMP by this method was derived as follows:

- 1) Wages and salaries
- 2) Income from personal plots
- 3) Income from individual labour activity
- 4) Primary incomes of households (1 + 2 + 3)

- 5) Turnover tax (less net payments from the state budget due to price regulation)
- 6) Receipts from external trade
- 7) Social contributions of enterprises of the sphere of material production
- 8) Net profit of enterprises of the sphere of material production
- 9) Allowances to various funds (budgetary and non-budgetary)
- 10) Payments of enterprises of the sphere of material production for non-material services and other non-material expenses
- 11) Primary incomes of enterprises (5 + 6 + 7 + 8 + 9 + 10)

- 12) Net material product (1 + 11)

59. Unlike the SNA approach all components of primary incomes were supposed to be obtained from some sources of primary information (while in the SNA operating surplus is derived as the balancing item). However, in practice “payments for non-material services and other non-material expenses” could not be derived directly from the reports of enterprises and represented in fact a balancing item.

The main deviations from the SNA treatment (besides the above mentioned coverage only of the sphere of material production) were as follows:

- treatment of social contributions as primary incomes of enterprises (however, it does not affect the total NMP);
- inclusion of elements of intermediate consumption (non-material services);

- exclusion of consumption of fixed capital.

60. Wages and salaries included the following items:

- payments in cash and in kind (basic, supplementary and premiums) for the work actually done or the hours worked as well as for absence from the work according to the labour legislation (annual leave, performance of social duties, etc.);

- the value of goods and services provided by employers free of charge to selected categories of employees in accordance with the labour legislation (housing, public utilities, food, uniforms which could be used outside the work); if they were provided at the discounted cost the difference between the total and discounted cost was included;

- business traveling allowances.

Wages and salaries were mostly a part of production cost; however, some payments included in wages and salaries were made from profit of enterprises (for example, selected premiums). All these payments were taken into account before taxes.

Wages and salaries did not include tips which were considered as transfers between households.

Data on wages and salaries were obtained from the labour statistics where they were classified by the spheres and branches of the economy.

61. Income from personal plots was estimated as net product received from participation of households in such kind of activities as farming, construction at own account, scrapping, procurement of forest goods (berries, mushrooms, woods, etc.), fishing and hunting.

The individual labour activities covered production of goods by craftsmen and artisans who were not members of cooperatives. Income from these activities was also estimated as net product.

These data were taken from the estimates of NMP by the production method.

62. Turnover tax and receipts from external trade were considered as taxes on products while net payments from the state budget due to price regulation – as subsidies on products. These items were taken from the estimates of NMP by production method.

63. Social contributions included contributions of enterprises of the sphere of material production to the State Social Insurance Fund and to the Central Fund of Social Insurance and Social Security for Collective Farmers. The total sums of social contributions obtained from the reports on the execution of the budgets of these funds were divided between the spheres and branches of the economy proportionally to the distribution of wages and salaries.

64. Net profits of enterprises from the production were estimated as the receipts from sales of output less production cost and turnover tax. When they were included into primary income of enterprises they were diminished by premiums paid out to employees from profits and by depreciated value of scrapped fixed assets.

Profits of public enterprises and collective farms were obtained from their reports while for cooperative enterprises they were calculated using the reported data on sales and wages and estimated value of intermediate material consumption.

65. The rest of primary incomes of enterprises represented components of production cost in the business accounting.

Allowances to various funds included contributions to the state budget for geological and prospecting works, for road construction, contributions to various industrial funds. These data were obtained from the finance statistics.

Payments of enterprises of the sphere of material production for non-material services included rental payments for buildings and equipment, payments for services of passenger transport, of legal, educational and research institutions, of public utilities and the like.

Other non-material expenses included some other components of production cost, such as expenses on training staff, selected tax payments, etc.

Reports of enterprises on production cost were not detailed enough to obtain direct information on payments of enterprises for non-material services and other non-material expenses; these items were derived as residuals as follows: NMP by production method, less primary incomes of households, less other components of primary incomes of enterprises.