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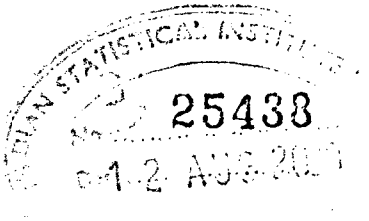

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PREFACE

The present volume is a collection of papers prepared by a number of visiting scientists from Socialist countries who worked in the Institute between 1954 and 1959.

Most of the visiting scientists came from the Soviet Union. Professor I. Y. Pisarev, Professor M. I. Rubinstein and Professor P. M. Moskvin—all from the USSR Academy of Sciences and Professor V. I. Maniakin of the Central Statistical Board visited the Institute in 1954-55. Professor Pisarev was head of the Statistics Section of the Academy of Sciences at the time and Professor Rubinstein and Professor Moskvin were in the Institute of Economics under the Academy. Dr. A. I. Ezhov, who visited the Institute in 1957-58, was the Deputy Chief of the Central Statistical Board of the USSR. Mr. A. P, Strukov, who came to the Institute in 1958-59 was in the National Income Section of the State Planning Commission, USSR.

Dr. J. Rudolph, Director of the Institute of Economic Planning and Professor of Economic Planning in the Hochschule für Ökonomie, German Democratic Republic and Professor Albin Orthaber, University of Ljubljana, Yugoslavia came to the Institute in 1957-58. Professor Oskar Lange, Chairman of the Economic Council of Poland came to the Institute a number of times; the particular paper included in this collection was prepared during his visit to the Institute in 1957-58.

CONTENTS

STATISTICS AND PLANNING

By I. Y. PISAREV

The Soviet Union has accumulated large experience in the field of statistics of socialist planned economy and culture. This experience, naturally, cannot be mechanically transplanted into Indian conditions, or as a matter of fact into the conditions of any other country. However, Soviet statistics might be of great interest, not only theoretically but also practically, to economists and statisticians of India.

In our rather brief essay we shall dwell on the interpretation of the mutual relations between planning of the national economy and socio-economic statistics.

In the following papers we shall give the interpretation of a number of other problems. But in order to make a fuller study of the experience of the USSR in the field of statistics, it would be necessary for Indian economists and statisticians to refer to a number of works on statistics recently published in the USSR. For this purpose. it would be desirable that the translation of some works dealing with statistics from Russian into English is undertaken.

In the Soviet Union, the means of production are socialised. They are owned by working masses in two forms: (1) property of the Socialist Government, (2) property of collective farms and other co-operative communities in all spheres of the national economy of the USSR. In the year 1950, socialist property comprised 99.4 per cent of all the means of production. The State property is the predominating form of property in the USSR; its portion amounts to nearly 91 per cent of all production funds. Public property in the means of production is the basis of the relations of production of socialism.

The socialist relations of production are characterised by (1) complete predominance of public property in the means of production; (2) liberation of the working masses from exploitation and establishing relations of friendly co-operation and mutual asistance; (3) distribution of products according to the interests of the working masses. Along with the growth and development of the socialist relations of production, new economic laws will arise and begin to function, while old economic laws lose their force and leave the stage.

It is known that each social and economic structure possesses its own basic economic law, determining all main aspects and all main processes of the development of social production. J. V Stalin gave the detailed formulation of the basic economic law of socialism. The essential features and requirements of the basic economic law of socialism are "the securing of the maximum satisfaction of the constantly rising material and cultural requirements of the whole of society through the continuous expansion and perfection of socialist production on the basis of higher techniques". (J. V. Stalin : Economic problems of socialism in the USSR).

It can be seen from this formula that the basic economic law determines the aim of socialist production and the means of its achievement.

The public property in the means of production gives rise to the objective necessity of the balanced, proportional development of the national economy. The socialisation of the means of production determines also the possibility of balanced development of the economic structure. Thus, the balanced proportional development of the national economy is the objective economic law of socialism.

Socialist planning is based on the combination of perspective plans conveying the principal line of economic development for five years, or for longer terms, and the current plans, presenting a concrete programme of work for shorter terms. Among the current plans there are annual plans. Current plans are worked out proceeding from perspective plans. A big part in planning is played by economic accounts and statistics, primarily because without their assistance it is impossible to study the state and development of the national economy and culture. In order to ensure a planned management of socialist economy it is necessary to have a unified system of the economic accounts of the national economy. Planned socialist construction is inconceivable without proper accounting and accounting is inconceivable without statistics. Proceeding from objective necessity, the Soviet Government has organised a uniform system of the economic accounts of the national economy. The main peculiarities and special features of the socialist economic accounts of the national economy are the following:

1. As under the conditions of the new relations of production all working masses, the whole people, are concerned with the achievement of production, and with the expansion of the national economy and culture, accounting becomes a national affair. All working people, therefore, assist their government in establishing exact and perfectly reliable economic accounts.

2. The second peculiarity of the socialist economic accounts, resulting from the socialisation of the means of production, is its universal, general character. In order to serve as a means of planning of national economy, the state accounting must necessarily comprise in reasonable forms, without any excesses, the whole national economy including all its branches, and covering the whole territory of the country.

3. The third peculiarity of the socialist accounting is its scientific, strictly objective character. National economic plans are scientific plans. They have a scientific basis on which the socialist accounting is organised. They follow the principles, of advanced economic theory. Socialist accounting is well-grounded and the strictest authenticity is its integral feature.

4. Finally, the fourth peculiarity of the socialist accounting is that it is organised by the socialist government as a uniform system, subordinate to the requirements and objects of the planning of the national economy. The uniform system of the socialist economic accounting consists of three parts: operative-technical accounts, bookkeeping and statistics. The components of the uniform system of the economic

accounts have their own specific objects, each of them performs its specific functions. Operative-technical accounting is connected with the calculation of individual facts as they are. For successful realisation of the directives of the national economic plan it is not sufficient to know only the general works quota. As planning of production has to be done at the enterprise level too, it is necessary to know concretely the peculiarities of each machine, unit of machines, department, shop etc. Without such concrete knowledge of the individual characteristics it is impossible to realise successfully the work quota (tasks) of the national economic planning in the very process of production.

The second component of the system of economic accounts is book-keeping. Book-keeping reflects economic means and economic processes in their physical and monetary expression. Use of monetary index gives in particular the opportunity of reflecting all economic processes in their unity and mutual relations. For Soviet enterprises the following problems are of great importance : cost price of production, profitableness, productivity, the strictest regime of economy and economic calculation.

Socio-economic statistics is the third component of the uniform system of the national economic calculation. This generalises individual facts, utilises data of operative technical accounts, of book-keeping and of special statistical observation and accounts and gives the digital interpretation of the development of the national economy and culture as a whole and in separate parts, industries, and enterprises. Statistics occupies the most important position in the uniform system of the national economic accounting. It accounts for the fact that the Central Statistical Board attached to the Council of Ministers of the USSR, is the organ which directs the whole system of the socialist economic accounts in the country. The uniform system of socialist eco nomic accounts serves as an instrument in the hands of the Soviet Government with the help of which it controls social production, investigates operation and requirements of objective economic laws, finds out the level of the constantly rising material and cultural requirements of the whole society and the extent of their satisfaction through the continuous expansion and perfection of production on the basis of higher techniques. The mutual relations between planning, calculation and statistics may, very briefly, be characterised as follows:

(1) Statistics and economic accounts are primarily meant for efficient planing. The system of indices of the plan determines the basis of the system of indices of accounting and statistics. But it is necessary to keep in mind that the system of indices of statistics is always somewhat wider than the system of indices of the plan, because statistics comprises also such aspects of social life which cannot be planned directly.

(2) Economic accounts and statistics serve as (a) targets envisaged in the plan (b) means of substantiating the work quota of the plan (c) means of verification and control of the fulfilment of the plans in the process of this fulfilment (d) means of estimation of the plans from the point of view of their conformity with the requirements of the law of balanced (proportional) development of the national economy

(e) means of guarding the socialist property (f) means of conducting the regime of economy and economic calculations (g) means of bringing to light the resources of the national economy (h) means of raising the productivity of labour (i) means of control of measure of labour and consumption and (j) means of assistance to the development of socialist competition.

National economic plans in the USSR are of a directive character. After being approved by the Government, the plans acquire the force of a law (in the juridical sense) and are compulsory.

In the following treatment we are not going to mention specially, in every instance, that the statistical data are to be presented to the centre in their territorial, industrial and departmental aspects. Because, such differentiation of the calculative-statistical data is inherent in national economic planning, with the exception of "indivisible indices" relating to the national economy as a whole (total social product, national income etc.). Leaving aside particulars and details, it is possible to contemplate the following big subdivisions of State statistics in a socialist State like the USSR.

1. Statistics of population, as the basis of social life, of social production. Statistics of the achieved level of the consumption of material wealth and cultural advantages.

2. Statistics of the sphere of material production, dividing this sphere into production of means of production and production of means of consumption.

3. Statistics of the non-production sphere.

4. Statistics of the national economy as a whole, inter-industrial statistics.

Statistics of population (demographic) consider the facts concerning number, structure, distribution, the process of reproduction of the population, births, deaths, diseases etc. All these facts, naturally, cannot be objects for planning. But measures which are being contemplated in the national economic plans must necessarily proceed from the facts referring to the number, structure and distribution of the population. The achieved standard of the consumption of material wealth and cultural advantages is investigated in its varied aspects.

Statistics of the sphere of material production, as well as statistics of the non-production sphere, are divided in their turn into industries (branches) on the basis of the corresponding division in the national economic plan. Inter-industrial (branches) statistics comprises statistics of labour and cadres in the national economy, statistics of finance, investments, expenses of production and expenses of circulation, etc. Statistics of the national economy as a whole includes statistical (report) balance of the national economy, estimation of the social product, and national income.

Statistical indices of each branch of material production have their own special features as is shown in the appendix to our essay. But it will not be difficult to see that all of them have a common basis. There exist a number of necessary and most important indices which must be emphasised as basic and without which investigation

and planning of the sphere of material production is impossible. Among the basic indices will be found the following:

1. Basic means (basic funds) of the branch of material production. Basic means are estimated through book-keeping and are investigated statistically from the point of view of their material structure (machines, buildings, etc.) and from the point of view of their monetary estimation.

2. From all the components of the basic means of the branch, it is possible to single out "production basic means" in the proper meaning of the term, and also other non-production basic means. The peculiarity of the "production basic means" is that, they are utilised in the process of production and gradually transfer their cost to the output. Non-production basic funds (e.g., housing, municipal basic funds) are not used in the process of production and do not transfer their cost to the output. The ratio of "production basic means" to all basic means (in monetary terms) characterises the extent of using basic means in the process of production.

3. The knowledge of production funds gives the basis for estimation of the most important indices of the national economy—annual capacity of enterprises and industries. The annual capacity is calculated on the advanced progressive rates of utilising machinery, raw materials etc. in conformity with the fixed number of working days in a year and the specific duration of a working day (8 hours, and for some industries and some categories of workers less than 8 hours) as established by law and in strict conformity with all the requirements of labour protection.

4. The next most important index of statistics of the sphere of material production is the actual output—both gross and commodity. For commodities most important for national economy, it is provided in plans and consequently in statistics that the index should be calculated "naturally", but output as a whole may be estimated only monetarily. The index of actual output may be compared with the index of the annual capacity of each enterprise and industry (for such comparison the annual capacity must be estimated monetarily). This comparison characterises the rate of actual utilisation of the potential productive capacity of each enterprise and industry.

5. The index of output must be investigated statistically in connection with the indices of: (a) labour in an enterprise and in the industry; (b) expenditure of raw and auxiliary materials, fuel, electrical energy etc.; (c) wear and tear of equipment and other production funds. All these indices are among the most important indices of the sphere of material production. The population employed in the sphere of material production is the main productive force of the society. Statistics deals with the number and structure of productive and non-productive personnel, wages, and productivity of labour. On the other hand, statistics deals with the raw and auxiliary materials, fuel and electrical energy consumed in the process of production. Thus there opens the possibility of a statistical investigation of the cost price of the output (factory cost price) and, if the expenses of the realisation of output are

taken into account in full, the commercial cost price can be found out. The indices of productivity of labour and cost price, closely connected to each other, are the most important qualitative indicators of cost accounts in the Soviet national economy.

6. Among the main statistical indices for each enterprise and industry we would find financial indices characterising, in particular, results of the regime of economy and economic calculations.

7. As no enterprise and no industry is isolated, but is a part of the planned national economy, there exist balance indices, one of the main statistical indices. It is in balances that the economic relations of enterprises and branches of the national economy may be observed in their actual state, in the given period of time.

A similar (but not at all analogous) structure of the statistical indices is to be observed in the non-productive branches of the national economy: basic funds, annual capacity—potential and actual (e.g., annual number of seats in theatres, actual number of spectators for a year etc.), statistical characteristics of services to the population, labour and cadres in the non-productive branch, balance relations of the non-production branch with other branches of the national economy. There may be branch statistical indices as distinguished from inter-branch indices. For instance, the rate of smelting of pig iron is a branch index, as pig iron is produced only in one branch of material production. The output of cereals is also a branch index. Indices of labour, finance, investment, expenses of production and of circulation, as was mentioned before, are of the type of inter-branch indices of the national economy. As regards these indices, socio-economic statistics is faced with the problem of investigation of their interbranch structure formed by plan. Statistics must give answers to the questions regarding the distribution of labour in the national economy, the distribution of investment and finance, and the rate of expenses of production in various branches, etc.

Finally, statistics of the national economy, as a whole, unites all indices by means of evaluation of synthetic indices. Its main task is the evaluation of the report (statistical) on the balance of the national economy. (Balance of the national economy will be dealt with in a special paper).

The system of accounting statistical indices taken as a whole, in the unity of branch, interbranch and synthetic indices gives concrete digital characteristics of the development of the national economy and culture, of the whole process of socialist reproduction on an enlarged scale. But it is essential that this characteristic should be obtained with the minimum expenditure of means and energy, lest there should be any excess in accounting and statistics.

As an appendix we give a list of the most important indices of statistics which was compiled in conformity with the requirements of planning. The list is of an approximate, illustrative character. It is based, mainly, on "The reference book of social economic statistics" published in the USSR. The aim of our lecture will be achieved if it helps Indian statisticians in working out a system of statistical indices in conformity with the tasks of directing the national economy of India.

Appendix

The list of the most important indices of Soviet statistics.

I. *Population as the basis of social production.* Number of persons. Sex and age. Social structure and occupations. Nationality and mother tongue. Permanent and temporary residents. Urban and rural population. Territorial distribution of population. Reproduction, Births, Deaths, Family, Marriage, Divorces, Natural increase of the population.

Achieved level of satisfaction of material and cultural requirements of the whole society. Structure of consumption.

II. *Industry, as the leading branch of the national economy*

1. Material and technical basis of Industry. Basic production funds.
2. Productive capacities. Actually achieved average technical-economic rates of using industrial equipment.
3. Gross output, divided into gross output of production of means of production (group A) and production of means of consumption. (group B).
4. Commodity output.
5. Output in physical terms (for some most important items).
6. Balances of industrial output and raw and auxiliary materials, fuel, electrical energy etc., consumed in the process of production. Balance relations of industry and other branches of national economy.

III. *Agriculture*

1. Material and technical basis of agriculture. Basic production funds. Fleet of tractors, combines and other agricultural machinery. Repair of agricultural machinery. Mechanisation and electrification of agricultural processes.
2. Sown areas in different districts and zones, under different crops, separately for irrigated, virgin and fallow lands.
3. Expected and actual crops.
4. Commodity output of plant according to cultures.
5. Live-stock and reproduction of cattle (for different species) with emphasis on the pedigree cattle.
6. Productivity of cattle breeding.
7. Gross output of cattle breeding.
8. Commodity output of cattle breeding.
9. Forage balance for different districts and zones according to kinds of forage and species of cattle.

10. Mastering of the agro- and zoo-technical measures, accumulations of scientific achievements and advanced experiences in agriculture.
11. Forestry. Forest areas. Protective afforestation. Forest amelioration measures.
12. Mechanisation and electrification in forestry.
13. Balances of agricultural output and forestry (for some important kinds). Balance sheets of fuel, building materials and other industrial products consumed in agriculture and forestry. Balance relations of agriculture and forestry with other branches of the national economy.
14. Agricultural output per 100 hectares of arable and other useful lands (for different districts and zones).

IV. *Transport and Communication*

1. Material and technical basis of transport and communication. Basic production funds. Fleet of means of transportation (locomotives, cars, ships, planes etc.). Repairing of means of transportation. Technico-economic indicators of their work. Means of communication (post, telegraph, telephone, radio etc.). Technico-economic indicators of their work.
2. Transportation of cargoes by railways and water transport, by river, sea, auto and air transport (separately).
3. Transportation of passengers by separate means of transport.
4. Pipe-lines. Technico-economic indicators of their work and their results.
5. Balance relations of transport and communication with other branches of the national economy. Transportation balances for cargoes and passengers. Balances of fuel, electrical energy, building materials and other industrial products consumed by transport and communication.

V. *Investments*

1. Capacity, structure and main directions of investments.
2. Putting into operation of basic funds including putting into operation of surplus productive capacities.
3. Building and assembling, project and investigations, geological survey, topographic and geodesic work.
4. House building.
5. Balance relations with other branches of the national economy. Balance-sheets of material consumption in investments.

VI. *Progress of techniques and development in the national economy*

1. Accounts of mechanisation of labour intensive works.
2. Accounts of automatisation, of development of advanced technological processes and new techniques, new machinery.

VII. *Material and technical provision of the national economy*

1. Balance sheets of materials, equipment and industrial goods and foodstuffs supplied to the national economy.

VIII. *Commodity circulation*

1. Material and technical basis of commodity circulation. Network of warehouses, shops, canteens, restaurants etc. Capacity of the network of commodity circulation. Its technical equipment. Indicators of the work of commodity circulation.
2. Commodity provision for the retail commodity circulation. Market funds of consumer goods and foodstuffs.
3. Retail commodity circulation (including restaurants, canteens etc.) (for trade systems, for categories of goods). Purchases.
4. Balance of receipt and expenditure (monetary) of the population. Purchasing funds, Balance of consumption of industrial goods and foodstuffs.
5. Balance relations of trade with other branches of the national economy. Balance of the material consumption in the process of commodity circulation.

IX. *Municipal economy*

1. Housing funds. The characteristics.
2. Municipal enterprises of different kinds. Their capacity. Accounts of their utilisation.
3. Material balances of municipal economy.

X. *Expenses of production and expenses of circulation*

1. The cost price of the industrial output in different industries, as regards the kind of expenditure (with the emphasis on some main sorts of output).
2. Actual rate of reduction of the cost price of the comparable commodity output of industry.
3. The cost price of the commodity output of State farms.
4. The cost price of the work of Machine-Tractor Stations.
5. The cost price of transportation by rail, sea, river, plane, etc.
6. The cost of building and assembling, geological survey and other constructive work. Rate of the actual reduction of cost of this work.
7. Expenses of the official bodies in charge of (State) purchases.

8. Expenses of purchases, delivery to places of consumption, long term storage and wholesale realisation of agricultural produce.
9. Expenses of circulation of sales organisation, retail trade and organisations of public nutrition.

XI. *Socio-cultural arrangements*

1. Material basis in socio-cultural field. Network of pre-school establishments, schools, technical schools, higher education, libraries, theatres, clubs, cinemas, stadiums, other sporting establishments, houses of rest, sanatoriums, dispensaries, hospitals, polyclinics, other public health services and scientific research institutions. Characteristics of the network according to certain kinds of establishments. Capacity of the network of socio-cultural establishments.
2. Contingents served by each type of the network of socio-cultural establishments.
3. Characteristics of the work of different types of socio-cultural establishments.
4. Balance of material consumption in the fields of education, culture, art, science, public health.

XII. *Labour and cadres in the national economy*

1. Number and structure of workers, employees, junior assistants, engineers and technicians in productive and non-productive spheres, in various branches of the national economy.
2. Productivity of labour and wages.
3. Number, reception, graduation and distribution of the state schools of professional training. Network of schools for the state labour reserves.
4. Training of new skilled workers for most important occupations. Types of training. Training of mass cadres.
5. Balance of labour in the national economy. Balance of skilled workers and specialists with secondary and higher education in the national economy.

XIII. *Finance*

1. Balance sheets of fulfilment of state budget and of plans of other financial institutions.
2. Financial balances and accounts of the activity of ministries and departments.

XIV. *National economy as a whole*

National wealth and national property. Basic production and non-productive funds. Circulation funds. Reserves. Social output. Production goods. National Income. Distribution, redistribution and final utilisation of social output and national income. Characteristitcs of socialist reproduction on an enlarged scale as a whole.

16 June 1955.

THE MOST IMPORTANT CATEGORIES, CONCEPTS AND DEFINITIONS OF SOVIET STATE STATISTICS OF POPULATION AND INDUSTRY*

By I. Y. PISAREV

STATISTICS OF POPULATION, HEALTH, CULTURE AND PERSONAL CONSUMPTION

1. *Contents of statistics of population, health, culture and personal consumption*

The task of demographic statistics in the USSR is to study the size of population, its distribution over the territory of the country, its class and occupational composition, national structure and the structure of population according to sex, age, family status, literacy, and educational level. Demographic statistics also study all the processes of the change of population: reproduction of the population (birth rate and death-rate), marriages and divorces.

In connection with the all-round care for the citizens in the USSR, health statistics have naturally been developed on a very extensive scale. Health statistics in the USSR are grouped in the following basic divisions: (1) statistics of ambulatory-polyclinic and hospital institutions (ambulatories, polyclinics, dispensaries, hospitals, clinics, etc.), (2) statistics of maternity institutions and institutions of maternity and child care. (Maternity homes, crèches and children's homes, special consultations etc.), (3) statistics of sanatoria and rest houses (including one day rest homes and night sanatoria), (4) statistics of sanitary and antiepidemic institutions (sanitary-epidemiological stations, antiepidemic institutions, sanitary institutions dealing with food, communal housing, industry, schools etc.), (5) statistics of morbidity rate and illness rate, (6) statistics of temporary invalidity and social insurance, (7) statistics of social security and pensions, (8) statistics of physical development (physical culture and sport), (9) statistics of medical cadres.

Statistics of culture have also a number of branches, e.g., (1) school statistics, (2) statistics of vocational and special education, (3) statistics of pre-school and children's institutions, (4) library statistics, (5) statistics of clubs, (6) statistics of theatres, (7) statistics of cinemas, (8) statistics of printing presses, (9) statistics of science and scientific cadres.

The personal consumption of the working people is studied on the basis of mass data about commodity circulation furnished by different State shops and co-operative trade, on the basis of selective observation of collective farm market trade (bringing of goods to markets, prices) and special study of family budgets. Over 50 thousand families of workers, employees and collective farmers maintain day to day income-expenditure budgets during the whole year. The material

* Based on Dictionary-Reference Book on Social Economic Statistics of the Central Statistical Department-1948.

of this book-keeping is used for the study of the level of personal consumption and calculation of national economy.

2. *Territory* is the area of land and expanse of water, lying within state boundaries and also within administrative boundaries of region (province), district, town etc. The basic elements of statistical economic characteristics of territory are : size of area (in square kilometres, square miles etc.) enumeration of hills, rivers, lakes, list of administrative territorial units and populated points.

The territory of regions and districts is changed as a result of administrative economic division into districts which demands systematic accounting of these administrative territorial changes. Statistical economic indices are grouped within the limits of definite territories, i.e. according to the territories of republics, regions, districts.

3. *Density of population :* The indicator of the average density of population is calculated by dividing the number of inhabitants of a given territory by the size of its area, i.e. the indicator determines the number of inhabitants per square klm.

As the density of population in towns is higher than in the countryside, it is calculated separately for the rural population and for the whole population of the entire territory of State or region.

If there are large expanses of water within the State territory, their area is not taken into account when the density of population is calculated.

4. *Present population :* Present or actual population is considered to be the number of persons living, upto and including a definite date (viz., the day of the census), in a given locality, independent of the duration of stay of these persons in that locality and independent of their future stay in the same locality. If at the time of census a given person stays actually in the populated point, he is included in the present population.

5. *Constant population :* To constant population belong all the people living constantly in a given locality regardless of the fact whether these people are actually staying in that locality at the time of census or not.

In general, the number of constant population is obtained by excluding the persons temporarily residing from the number of present population calculated at the time of census and by adding to it, the number of temporarily absent persons.

6. *Temporarily resident population :* To the temporarily resident population belong those who constantly live in another locality but who at the time of census reside in the territory of a given town soviet, settlement soviet, or village soviet.

7. *Absent population :* All the persons who usually live in a given locality but at the time of census were out of that locality are considered as persons temporarily absent at the time of census.

In the instructions for the census of 1939 the directions were given that persons who moved to another place to live constantly, persons who serve in the Soviet Army and Navy, students living in the place of their study as well as all those who left more than six months before the day of census, are not to be included in the census papers of their former residence. All these persons were included in the census papers of their new residence.

8. *The social structure of the population :* For the study of the class composition of population at the time of the All Union Census of 1939, the census paper included the following question, 'to which social group a questioned person considers himself as belonging to, from among the following groups: workers, employees, collective farmers, co-operative handicraftsmen, individual farmers, handicraftsmen not belonging to co-operatives, people of free professions or ministers of religious worship and non-working elements'.

It should be borne in mind that a person's present work or his present place of work cannot always be regarded as the only criteria for considering him as belonging to this or that social group.

Collective farmers temporarily engaged at the time of census in industry, construction, timber cutting etc., but permanently working in collective farms were considered to be collective farmers. Members of a collective farm who permanently work in industry, construction, institutions, but worked before in the collective farm or take part in the collective farm work at the time of their vacation or during holidays, were considered as workers or employees. These people were not marked in the census papers as 'member of collective farm'.

Members of an artel of all kinds of producers, fishermen's co-operatives and co-operatives of invalids were considered as co-operative handicraftsmen.

Persons who were not members of collective farms and were occupied with individual farming were considered as belonging to the social group of individual farmers, provided that farming was their main occupation. Second-hand dealers, persons who lived on other forms of unearned incomes and also those persons who could not point out the sources of the means of their subsistence were considered as non-working elements.

For determining the class composition of the population, it is necessary to take into consideration not only the persons actually working but all their dependents, both adults and children. Thus children and other dependents of workers are considered as belonging to the category of workers; children and other dependents of collective farmers are considered as belonging to the group of collective farmers; children and other dependents of employees are considered as belonging to the group of employees etc.

9. *Statistics of birth, mortality, marriage and divorce :* The primary material for the study of these facts is the recording of every birth, death, marriage and divorce in corresponding registers. Civil marriages are registered in towns by the Town

(District) Registry Bureaus (Bureau Z.A.G.S.) and in villages and workmen's settlements by secretaries of Village and Settlement Soviets. Acts of marriage are registered in two copies. The second copy is used by the organs of the Central Statistics Office for statistical examination.

The cause of death is registered in the Z.A.G.S. bureaus at the time of registration of the death cases on the basis of medical certificate about the death. The death certificates are given by medical institutions and doctors who treated the dead. As a rule, all the towns and a large number of rural populated points are provided with medical centres for registration. In the country-side wherever there is no doctor the cause of death as well as the fact of death is registered according to the testimony of two witnesses confirming the fact of death.

10. *Statistics of the movement of population :* The movement of the population in the USSR is connected with the planned development of the national economy.

The basic source materials for accounting of mechanical movement of population are coupons of address lists made for the following groups of moving (arriving and leaving) population : (a) for all persons arriving for permanent residence or departing for permanent residence, (b) for all persons arriving and departing for work, independent of the period and character of work (constant, seasonal etc.), (c) for study (except persons arriving for short-term courses—upto $1\frac{1}{2}$ months), (d) for all persons arriving on a long-term (over $1\frac{1}{2}$ months) mission and coming back from it, and (e) for all members of families arriving to live together with and leaving the persons mentioned above. Persons not mentioned in the above groups and registered on address lists without coupons are not included in the accounting of mechanical moving. The following categories of arriving and departing persons belong to these groups : arriving in country houses, rest-houses, sanatoria, for usual vacations, because of illness, for holidays, as excursionists, tourists, on official mission (upto $1\frac{1}{2}$ months), for meetings of congresses, conferences, persons who change residence in the same settlement and also regular (everyday and periodical) moving of population.

11. *Urban settlement :* To the urban settlement belong towns, workmen's settlements and settlements of town type. By decisions of governments of Union Republics, in addition to the towns, a considerable number of settlements whose area and population is not large and whose population is mainly engaged in extra-farming vocations have been included in the urban settlements. Such are factory settlements, settlements near railway stations, health resort settlements etc. Every urban settlement is governed by its Settlement or Town Soviet of Working People's Deputies. A town is considered to be an independent settlement from the standpoint of territory and declared as a town by the legislative act of the Government. From the economic view-point the most characteristic feature of towns is the concentration of a considerable mass of population in it and predominance of persons in the population whose main occupation is not farming.

The town as a whole, as a complex of productive forces concentrated in its territory is studied by means of the so-called passport system of town.

Rural settlements in contrast to urban settlements are governed by Village Soviets of Working People's Deputies. The territory of Village Soviets may consist of one, two or several populated points. The population in the territory of all Village Soviets is considered as belonging to the category of rural population.

12. *Territorial composition of towns and workmen's settlements :* The majority of towns and workmen's settlements of the Soviet Union consist of some populated points—the main town and separately located settlements, governed by the common Town or Settlement Soviets. In the population census of 1939 both the main populated locality and all the populated points governed by a common Town Soviet were considered as belonging to the population of a given town or workmen's settlement. There are a number of big towns to the Town Soviets to which some Village Soviets are subordinated. In these cases the population of these Village Soviets is not included in the population of towns and is considered as belonging to the category of rural population.

The administrative boundary of a town is usually broader than a town limit. In most cases a town outgrows the bounds of the old town limit owing to the construction of industrial enterprises and house-building. Therefore, in statistical work it is not the town limit but the administrative boundary of a town that is taken into consideration.

13. *Administrative statistics :* The territorial structure of republics, regions, territories, districts, towns and village Soviets as well as their administrative boundaries are changed as a result of administrative economic division into district, reorganisation of some forms of administrative territorial units into others, formation of new administrative divisions, springing up of new towns and populated points.

Statistics of a number of administrative-territorial units and statistics of all the administrative territorial changes constitute a branch named administrative statistics.

Current accounting of administrative-territorial changes is especially necessary for economic statistics which study production—economic indicators connected with administrative territorial units.

14. *Morbidity statistics :* Morbidity is the most important indicator of the sanitary and general health conditions of the population. This study is twofold: the illness rate which is determined by the number of new cases and the morbidity rate which comprises the total number of diseases, both old and new, which are prevalent among the population during a given period. The illness rate is mainly characterised by the admittance data of medical institutions, while the morbidity rate, i.e. the existence of various chronic diseases (tuberculosis, rickets, goitre etc.) is mainly revealed through medical examinations and inspections of different groups of population—examination of school boys and girls, examination of workers, labour examination etc.

While studying the illness rate the extent of its spread is determined and intensive indices (number of patients per 1000) and extensive indices (i.e., relative proportion of certain diseases to the total number of patients) are calculated.

15. *Statistics of highly infectious diseases :* Accounting of highly infectious diseases is of very great importance for timely antiepidemic measures to prevent their spreading. Therefore these diseases are accounted on the basis of special urgent notifications about a contagious patient. The notifications are made by medical workers (doctors, middle medical personnel) who discover the highly infectious disease, and are sent to district (town) health section not later than 24 hours after the diagnosis. The following diseases come under this catagosy : typhoid, paratyphoid, dysentery, toxic dyspepsia, typhus, relapsing fever, measles, scarlatina, diphtheria, hooping-cough, anthrax, glanders, cerebral meningitis, poliomyelitis, epidemic encephalitis, tick, spring- summer encephalitis, rabbit-fever, natural smallpox, hydrophobia, tuberculosis. On the basis of the urgent notifications received during a month, the district (town) health sections draw up a report about the highly infectious diseases.

16. *Statistics of non-epidemic diseases :* A group of the so-called most important non-epidemic diseases are systematically registered and taken under control : active tuberculosis, new active forms of syphilis, gonorrhoea, soft chancre, trachoma of the first, second and third stages and contagious skin diseases. The accounting of these diseases is carried out on the basis of compulsory notifications written by the treating doctor at the time of the first treatment undergone by a patient in a given calendar year. These notifications are sent for processing (through the district health section) to the regional health section which, after a thorough examination by a special institution, draws up monthly reports about the spread of the most important non-epidemic diseases. Notifications are examined in order to pick out duplicates, to check filled up documents and to find out the correctness of the diagnosis.

Accounting of cancer and other malignant tumors is carried out through special dispensaries and institutes.

Physical development is one of the most important indicators of the sanitary and general health conditions of the population. Examination of the physical well-being of the population is carried out either through a complex examination of individual groups or more often by the utilisation of operative materials of practical health institutions (maternity hospitals, crèches, consultation offices, school consulting rooms, material of medical inspection of workers, rooms for controlled physical culture).

The basic indicators for defining physical development are growth, weight and chest measurements.

The processing of data is carried out within homogeneous groups (sex, age, occupation etc.,) and in every one of such groups there should be not less than 100

people. In the processing of data the results of the measurement are put down in the form of tables and the basic average quantities are calculated from the distribution of the observations obtained.

17. *General school-education :* It should be remembered that in the USSR General Education is universal and compulsory i.e., every school-going age child must and does go to school.

The planning and statistics of general education are carried out on the basis of the following minimum of indicators : (1) total number of schools and the number of schools by types, elementary schools, seven-year schools, secondary schools, (2) the number of classes by groups 1–4, 4–7, 8–10, (3) the number of pupils by types of schools and groups of classes, (4) the number of pupils finishing 7th, 10th or 11th classes, (5) admittance to the 1st, 5th and 8th classes, (6) transferability to 5th and 8th classes.

Statistics of industry

1. *Contents of statistics of industry.* The most important task of industrial statistics is the control over the fulfilment of the plan. The production of goods is a basic indicator in the plan of the national economy. The plan determines for every branch of industry, the production of definite kinds of goods in definite quantities. Therefore the task of industrial statistics is to control the fulfilment of the plan of the production of output. Industrial statistics must show to what extent the plan is fulfilled by individual enterprises, branches and industry as a whole; how much, what kind of and what quality of industrial output was received by the national economy. At the same time it must disclose the main causes and facts which exert both negative and positive influence on production, reveal reserves not taken into account by the plan, but the utilisation of which would later on make for an increase in output. Since it is the labour power that plays a decisive role in the process of production, the study of the problems of labour in industry, the quantity and structure of labour power, its movement, utilisation of working time, labour productivity and wages becomes one of the most important tasks of industrial statistics. Not less important is the study of the basic funds, their structure, dynamics, renovation and their going out of use. Two more elements are studied in detail—production equipment (working machines) and power-equipment (power-apparatus) : their stock, structure, capacity and utilisation.

The material supply of industrial enterprises is a basic object for studying industrial statistics. Without the material supply of industrial enterprises as well as without basic funds, the production process cannot be carried out. Here great attention is devoted to the study not only of volume, structure and sources of receipts but of the utilisation of the main elements—raw materials and fuel—to determine advanced progressive norms of expenditure and discover inner resources.

Industrial statistics also studies the cost price of the industrial output.

Industrial statistics should not only determine to what extent the plan of lowering cost price is fulfilled but also find out, through analysis, the causes and factors by which a given extent of fulfilment of the plan is conditioned.

2. *Industrial enterprises as units of observation :* An industrial enterprise is an economic unit, organised for turning out industrial output. It is a basic link in the management of industry, and is the primary economic unit which bears the responsibility for fulfilment of the plan. As a rule industrial enterprises work on the principles of economic accounting; they own definite independent property, enjoy independence in operating and bear the responsibility for obligations undertaken by them. They are provided with circulation funds, have pay-accounts and loan-accounts in banks, and keep complete accounts.

An enterprise, besides its main task of producing industrial output, performs some other functions. A part of these functions (for example, capital construction, supply of raw materials and fuel, transport etc.) has for its object provision of conditions for continuous production of a certain volume, definite kind and quality of output. Other functions are connected only indirectly with industrial production, for example, household-communal economy, subsidiary agriculture etc. Thus, an industrial enterprise carries out industrial (turning out of output) and non-industrial (capital construction etc.) productive activity. Industrial productive activity is called the basic activity; while studying the work of industry as a whole, as a branch of the national economy, an enterprise is taken as the basic unit of observation. The enterprise is considered to be independent only when it is administratively isolated from other enterprises, this isolation being conditioned by production-technical unity of all its components.

3. *Division of industry into economic groups A and B :* Industry is divided into two big subdivisions : Subdivision A—the production of the means of production and subdivision B—the production of the means of consumption. Branches of industry belonging to group A are the branches producing the elements of basic funds (machinery construction etc.) and circulation funds (production of electrical energy, extraction of coal etc.). Branches of industry producing consumer goods for the population belong to group B. Branches may be considered as belonging to group A or to group B either according to the basic (predominant) destination of output or the actual utilisation of output. In the first case, the coal industry, for example will be included as a whole in group A since the predominant part of coal goes for productive consumption (industry, transport etc.); in the second case, it will be considered as belonging partially to group A and partially to group B (consumption of coal by the population for heating). In planning and accounting of the national economy the first method is mainly used.

4. *Classification of the branches of industry :* The industries can be classified into two groups as shown in the following table.

(Group A—the production of the means of production
Group B—the production of consumer goods.)

branches of industry	group
I. *production of electrical energy and thermal energy :*	
1. electric power stations	
a) hydro-electric power stations ..	A
b) thermal electric power stations ..	A
c) wind electric power stations ..	A
2. electric networks and electric power sub-stations ..	A
3. independent (district) boiler-houses ..	A
4. heating networks ..	A
II. *fuel :*	
1. coal:	
a) extraction of coal ..	A
b) concentration of coal ..	A
c) production of coal briquettes ..	A
2. oil:	
a) oil-extracting ..	A
b) oil-refining ..	A
3. peat:	
a) peat-extracting ..	A
b) production of peat briquettes ..	A
4. shales (extraction) ..	A
5. extraction of natural gas (combustible)	A
6. coke chemical ..	A
7. production of synthetic oil fuel ..	A
8. production of gas ..	A
9. production of other kinds of fuel ..	A
III. *extraction of ores of ferrous metals and ferrous metal industry:*	
1. extraction of ores of ferrous metals:	
a) iron ore ..	A
b) manganese ore ..	A
2. ferrous metal industry:	
a) ferrous metal industry without production of electro-ferro-alloys and without second processing of ferrous metals ..	A
b) production of electro-ferro-alloys ..	A
c) second processing of ferrous metals	A
IV. *extraction of ores of non-ferrous metals and non-ferrous metal industry.*	
1. extraction of non-ferrous metals ..	A
2. non-ferrous metal industry without secondary processing of non-ferrous metals ..	A
3. secondary processing of non-ferrous metals ..	A
V. *machine building and metal working :*	
(i) machinery construction* :	
1. production of boiler-house equipment and primary engines ..	A
2. production of electric power equipment ..	A
3. machine-tool production ..	A
4. production of equipment for metallurgical, mining, fuel and chemical industry	A
5. production of equipment for timber, woodworking and paper industry ..	A
6. production of equipment for light industry ..	A
7. production of equipment for food industry ..	A
8. production of equipment for printing and publishing industry ..	A
9. production of equipment for construction work and road building work ..	A
10. production of lift-transport equipment	A
11. agricultural machinery production ..	A
12. tractor production ..	A
13. railroad machinery production ..	A†
14. production of motorcars and trolley buses ..	A‡
15. ship-building ..	A
16. production of equipment of means of communication ..	A
17. production of pump and compressor equipment ..	A
18. production of control-measuring instruments and measuring apparatus and instruments ..	A

* Output of consumers' goods, produced together with main output is regarded as belonging to group B.

† Production of passenger and tramcars and cars of metro belongs to group B.

‡ Production of automobiles, buses and trolley buses belongs to group B.

branches of industry	group
19. production of instruments for metal-working and wood-working industry ..	A
20. production of ball (roller) bearings ..	A
21. production of carts ..	A
22. production of fire-prevention equipment ..	A
23. production of equipment of safety engineering ..	A
24. production of other machines and equipment for production purposes ..	A
25. production of machines and equipment for cultural and municipal services ..	B
26. production of medical equipment ..	B
27. production of calculating machines and typewriters ..	B
28. production of other machines and equipment for non-production purposes	B
(*ii*) production of metal articles:	
1. production of cable ..	A
2. production of metal goods for communal economy ..	A
3. production of other metal goods for production purposes ..	A
4. production of metal goods of consumption ..	B
5. production of iron welding constructions ..	A
(*iii*) production of repair works:	
1. specialised enterprises for repairs of industry and construction equipment	A
2. specialised works for repairs of rolling stock and communication equipment..	A
3. divisional repair shops of railways ..	A
4. repairs of shops ..	A
5. repairs of motor transport ..	A
6. repairs of tractors and agricultural machines ..	A
7. repairs of trams, cars of metro and trolley-buses, specialised enterprises for repairs of buses, taxi and motor cars ..	B
8. repairs of various production equipment ..	A
9. forges ..	A
10. repairs of various non-production equipment and metal goods of consumption ..	B
VI. *mining chemical and chemical industry :*	
1. mining chemical (without salt industry)	
a) extraction of apatite, phosphorite and potassium raw materials ..	A
b) extraction of chemical mineral raw materials ..	A
2. basic chemistry ..	A
3. aniline dye industry ..	A
4. production of synthetic plastic ..	A*
5. production of artificial fibre ..	A
6. production of synthetic rubber ..	A
7. production of other synthetic organic products ..	A
8. chemical pharmaceutical ..	A
9. photo chemical ..	B§
10. timber chemistry and production of vegetable extracts	
a) distillation of wood ..	A
b) hydrolysis of wood ..	A
c) production of essential oils, tannic extracts, gutta percha and other vegetable resins and extracts ..	A
11. lacquer and paint industry ..	A
VII. *rubber and asbestos :*	
1. production of rubber and asbestos goods (except rubber foot-wear and other rubber goods of consumption) ..	A
2. production of rubber foot-wear ..	B
3. production of rubber toys and other rubber goods of consumption ..	B
VIII. *extraction of non-metallic minerals and production of mica, abrasive and graphite goods :*	
1. extraction of non-metallic minerals ..	A
2. production of mica, abrasive and coal graphite goods ..	A
IX. *production of building materials (including extraction of materials for construction):*	
1. cement ..	A

* Consumption goods from plastic materials belong to group B.

§ Production of cinema film belongs to group A.

branches of industry	group
2. production of lime, gypsum (alabaster) and other astringent materials ..	A
3. production of refractories ..	A
4. production of acid proof goods ..	A
5. production of building bricks ..	A
6. production of substitutes of brick ..	A
7. production of ceramic decorative materials ..	A
8. production of thermoinsulation materials ..	A
9. production of tile, slate and asbestos veneer ..	A
10. production of soft roofing ..	A
11. extraction of minerals for building and silicate ceramic industry ..	A
12. production of concrete and ferro-concrete building details ..	A
13. production of gypseous building details	A
14. other branches of production of building materials ..	A
X. *glass and china faience industry:*	
1. glass industry.	
a) production of window glass and technical glass ..	A
b) production of electric-technical glass ..	A
c) production of glass for economic and living needs and glass things..	B
2. china faience industry.	
a) production of building and technical china and faience ..	A
b) production of electro technical china ..	A
c) production of china and faience for economic and living needs ..	B
d) production of earthenware for economic and living needs ..	B
XI. *forest exploitation and wood working industry:*	
1. forest exploitation ..	A
2. wood working industry (including match industry)	
a) saw industry ..	A
b) plywood industry ..	A
c) furniture industry ..	A
3. production of new furniture ..	B
4. repairs and restoration of furniture ..	B
a) production of wooden package ..	A
b) production of wooden parts of sledge construction ..	A
c) production of prefabricated houses	A
d) production of building details from wood ..	A
e) production of other articles from wood for production purpose ..	A
f) production of antiseptics for wood	A
g) production of wooden house utensils and other goods of consumption	B
h) match industry	B
XII. *paper industry:*	
XIII. *textile (including knitted goods and felting industry):*	
1. cotton cleaning ..	A
2. primary processing of flax ..	A
3. primary processing of other bast crops	A
4. wool washing ..	A
5. silk winding ..	A
6. cotton industry ..	A
a) production of cotton ware except technical ware ..	B
b) production of cotton technical textiles and ware ..	A
c) independent spinning, spinning-weaving and weaving mills ..	A
7. linen industry:	
a) production of linen-wares (except technical wares) .	B
b) production of linen technical and packing textiles and wares ..	A
c) independent flax spinning mills ..	A
8. wool industry:	
a) production of woollen wares (except technical wares) ..	B
b) production of woollen technical textiles and wares ..	A
c) independent spinning weaving mills	A
9. silk:	
a) production of silk goods except technical goods ..	B
b) production of silk technical textiles	A
c) independent silk twisting, silk spinning and silk weaving mills	A
10. jute industry ..	A
11. knitted goods:	
a) production of knitted wear ..	B
b) repairs of knitted wear ..	B
12. production of lace ..	B

branches of industry	group
13. felting industry	B*
XIV. *sewing:*	
a) production of sewing wares	B
b) repairs and restoration of sewing wares	B
XV. *leather, fur and shoe industry:*	
1. production of leather	A
2. production of artificial leather	A
3. harness saddle production	A
4. production of travelling and haberdashery wares from leather	B
5. fur industry	A†
6. shoe industry:	
a) production of new foot-wear	B
b) repairs and restoration of foot-wear	B
XVI. *industry of fats and soap perfumery industry:*	
1. industry of fats	A‡
2. soap and perfumery, cosmetic industry	B
XVII. *food industry:*	
1. meat industry	B
2. fishing industry:	
a) catch of fish	A
b) fish working	B
3. fruit and vegetables	B
4. butter manufacturing and cheese making	B
5. production of other dairy produce	B
6. oil manufacturing	B
7. margarine	B
8. flour grinding and groats industry:	
a) flour grinding	A§
b) groats	B
9. macaroni	B
10. baking of bread	B
11. starch and treacle	A
12. sugar	B
13. confectionery	B
14. canning industry	B
15. tea industry:	
a) fermentation of tea	A
b) weighing of tea	B
16. spirit	A
17. vodka	B
18. wine making	B
19. brewing	B
20. yeast	A
21. production of nonalcoholic drinks	B
22. bottling of natural mineral waters	B
23. tobacco makhorka industry.	
a) fermentation	A
b) production of tobacco makhorka goods	B
24. vitamin industry	B
25. salt industry	A
26. refrigerators	B
27. other branches of food industry	B
XVIII. *printing and publishing industry and production of various goods of culture:*	
1. printing and publishing industry	B
2. cinema coyping works	B
3. production of musical instruments	B
4. production of drawing articles, stationery and visual aids	B
5. production of art goods and toys	B
XIX. *other branches of industry:*	
1. production of combined fodder	A
2. water lines	B
3. other branches of industry	B

* Production of felt for building technical purposes, in harness, saddle production etc., belongs to group A.

† Fitting of furriery, sewing and repairs of clothes made from sheep skin, sewing of fur clothes belong to group B, sewing of fur clothes with textile cover belong to sewing production.

‡ Production of candles belongs to group B.

§ Mills of collective farms, producers' co-operatives, district or local industry and district food industries belong to group B.

Gross turnover is the total industrial output in terms of money, produced during the current period by all the departments of an enterprise.

Thus, the gross turnover being the sum of the output of all departments includes, in monetary terms, finished goods, semi-manufactured goods, unfinished production as well as all the work of industrial character and the value of the whole output of subsidiary departments. Hence, gross turnover characterises the total volume of production of the enterprise.

Unfinished production is not estimated as the balance at the end of the current period, but only as the difference between the balance at the end and the balance at the beginning of the current period ; for the goods remaining unfinished at the beginning of the current period are accounted for either in the group of finished goods or in the group of semi-manufactured goods after further application of labour during the current period.

The goods, manufactured from the raw materials supplied by a customer are included in the gross turnover at full value.

Gross Output of an enterprise, in constant prices, is the value of all finished goods and semi-manufactured goods produced in the current period both from the material of the enterprise and the material supplied by customers, plus the value of fulfilled work of industrial character minus the value of finished goods and semi-manufactured goods produced in the same enterprise and consumed during the current period for the production needs of the enterprise, independently of the time when they were produced. Unfinished production, which is equal to the difference between the remainder at the beginning and the remainder at the end of the current period is included in the gross output of machine building enterprises and enterprises producing metal constructions.

The following items are not included in gross output : all kinds of spoilage, all expenditures of an enterprise on experiments, analysis and research, output of training workshops, value of annulled orders and goods, the production of which has ceased according to the decisions of the Government, value of electrical energy, water, steam and gas received from outside and given away to other enterprises (resale), value of materials and semi-manufactured goods received from outside and given away to other enterprises without any processing, value of waste of production, value of output of subsidiary and accessory production of non-industrial character, value of new capital construction, restoration or reconstruction of enterprises, current repair of buildings and structures, works connected with installing and dismantling of equipment, current repairs of equipment, value of services of all kinds of transport, and value of pumping of oil and transportation of oil, gas, oil products through pipe lines.

Gross output of trusts, branches and the whole industry is calculated by summing up the gross output of industrial enterprises belonging to the trust, branch and industry respectively.

The index of gross output of an individual enterprise, in contrast to gross turnover, is free from repeated calculation of the same goods since semi-manufactured goods which go into further processing are not included in gross output. Hence, gross output characterises the final results of the work of an enterprise.

When the quantity of semi-manufactured goods produced is equal to the quantity of remade ones, gross output consists of value of primary raw materials and subsidiary materials and all subsequent expenditures of an enterprise in the process of production of this output.

In reality the cases are very rare when the number of semi-manufactured goods produced and the number of semi-manufactured goods remade in the same period are exactly equal. In most cases the number of semi-manufactured goods remade is either less or more than the number of semi-manufactured goods produced.

In the case where the number of semi-manufactured goods remade in the current period is less than the number of semi-manufactured goods produced during the same period, the balance is included in gross output as a positive quantity; when the number of semi-manufactured goods remade in the current period is more than the number of semi-manufactured goods produced during the same period (i.e., for remaking semi-manufactured goods they use, besides those produced in this period, some additional semi-manufactured goods from stocks) gross output is reduced by the quantity which is equal to the surplus of semi-manufactured goods remade over the semi-manufactured goods produced.

Incomplete production, as the difference between its remainder at the beginning and its remainder at the end of the current period, is included in gross output. When the remainder of incomplete production at the end of the current period is more than the remainder at the beginning of the current period, the incomplete production is entered in gross output as a positive quantity, if the remainder at the end of the current period is less than the remainder at the beginning of the current period gross output will be diminished by an amount equal to the diminution in incomplete production.

The methods of calculating gross output in constant prices : According to the first method gross output is equal to the sum of the value of all finished articles and semi-manufactured goods produced during the current period plus the value of works of industrial character carried out for customers plus the value of difference between the remainder at the beginning and the remainder at the end of the current period of incomplete production (machinery construction) minus the value of finished articles and semi-manufactured goods consumed for the production needs for the enterprise in the current period.

According to the second method, gross output is equal to the sum of the value of finished articles produced and delivered outside in the current period or destined for delivery outside plus the value of semi-manufactured goods delivered outside in the current period (independently of the time when they were produced—i.e., in the current period or before) plus the value of the works of industrial character

carried out for customers plus the value of the difference of the remainder of semi-manufactured goods at the beginning and the remainder at the end of the current period (both for own consumption and destined for delivering outside) plus the value of difference between the remainders at the beginning and at the end of the current period of incomplete production.

By delivery of finished articles and semi-manufactured goods by an enterprise outside we understand also the delivery of goods for its own capital construction, for capital repair of buildings and structures for communal economy and other non-productive needs of the enterprise.

Both methods of calculation give the same results.

For example :

	in roubles				
	remainder at the beginning of the current period	produced in the current period	remade in the current period	delivered outside	remainder at the end of the current period
semi-manufactured goods	3000	190000	175000	4000	14000
finished goods	—	250000	—	250000	—
repair work for others	—	20000	—	20000	—
total :	3000	460000	175000	274000	14000
incomplete production	15000	—	—	—	16000

Gross Output :

According to the first method $460000-175000+(16000-15000)=286000$.

According to the second method $250000+4000+20000+(14000-3000)+(16000-15000)=286000$.

Commodity output is the value of finished articles and semi-manufactured goods produced and realised during the current period or intended to be realised.

In contrast to gross output, the value of the difference between the remainder at the beginning and the remainder at the end of the current period of unfinished production of instruments, devices, models as well as of semi-manufactured goods intended for consumption by an enterprise is not included in commodity output.

Proceeding from the principle of calculating the index of commodity output, the latter includes not the full value of goods produced from the raw material of a customer, but an amount equal to the value of remaking these goods.

Commodity output as well as gross output is calculated according to the factory method. Commodity output is planned and accounted for in present (current) wholesale prices.

Net output is value newly created as a result of industrial production activity of an enterprise during a given period.

An industrial enterprise spends raw materials, lubricants and other subsidiary materials on gross output produced in the current period. These material values are not the results of the activity of the enterprise, but the results of the work of

other enterprises; they are the embodied labour of those enterprises. During the same period the means of labour wear out in the process of production and the value of their wear and tear has been transferred to goods produced. This part of the value of the manufactured product is also the embodied labour of other enterprises which produced the means of labour. Thus the means of production, consumed by the enterprise which are not the results of the work of the given enterprise are entered in gross output. Hence the index of gross output does not give an idea of the amount of the values newly created by the given enterprise, because gross output includes both labour embodied before and labour embodied by the enterprise itself in the process of production.

In the practice of industrial statistics net output or national income created in industry is calculated by the Central Statistical Office in a centralised manner. In the enterprises this index is not calculated.

Net output is calculated in the following way : all the material expenditures on production are subtracted from the gross output of a branch of industry; they are : raw materials, fuel, subsidiary materials, amortization of basic means, and other items of expenditure such as, for example, stationery etc. The difference between gross output and these material expenditures constitutes net output in industry. Net output is estimated both at present (current) prices and constant prices.

Spoilage of output is divided into corrigible and final or incorrigible spoilage. The corrigible spoilage is the spoilt articles which can be converted into good articles after some additional expenditure. Incorrigible spoilage is spoilt raw material which cannot be used and converted into good articles.

Indicators of spoilage for various types of articles are the proportion of spoilt articles in the whole output of a given type of articles. For an enterprise as a whole the indicators of spoilage are loss calculated in terms of money. Loss from final spoilage is the cost price of spoilt articles minus the value of these articles as raw material if they can be used as scrap in production. Loss from corrigible spoilage is the value of additional expenditure on correcting the spoilt articles.

Cost price is the sum of all expenses in terms of money, connected directly or indirectly with the production or the realisation of goods (expenditure on raw materials and basic materials, subsidiary materials, fuel, electrical energy, wages of workers and workmen of the managing and marketing apparatus, expenses on maintenance of the buildings of enterprises, equipment etc.), calculated as average per unit of output and also for the whole amount of output (of all or comparable commodity output, gross output etc.).

Factory—mill (production) cost price is the sum of expenses in terms of money connected only with the production of output.

Commercial (full) cost price includes both expenditure on production (factory mill cost price) and expenditure connected with the realisation of output (commercial expenditures)—i.e., maintenance of staff of storehouses, marketing offices, trusts, expenditure on transport, taxes, and duties, interests on credit, etc.).

28 June 1955.

STATISTICS OF AGRICULTURAL OUTPUT

By V. I. MANIAKIN

In order to determine the food and raw material resources of the country the central statistical administration gives close attention to the statistics of agricultural output, including output of animal husbandry. In the early days of the Soviet Government, a regular statistical system was organised for computing acreage under cultivation, agricultural yield and productivity of animal husbandry. On the basis of statistical data regarding the annual output of agricultural crops and animal husbandry the gross as well as net output of agriculture is determined in both physical and monetary terms. The gross output value in agriculture is the monetary expression of the output of agriculture and animal husbandry for the year. The net output of agriculture is the volume of output minus the cost of production.

Agriculture includes cultivation of crops as well as planting of fruit-trees, berries and other plants. No doubt forestry is one of the branches of agriculture, because of its specific affinity to agriculture. However, it is considered to be an independent industry of the economy and hence the output of forestry is not included in the agricultural output. The peculiar characteristic of forestry is the specific process of growing the forest.

The products of fishing and hunting and collecting of berries and fruits are not included in the output of agriculture. The products of primary processing of agricultural raw materials, such as oils and fats, are not included in the output of agriculture.

The net output of animal husbandry is determined as the value of output minus the cost of cattle-breeding. The products of bees and silk-worms are also included in it.

The agricultural output is estimated in both physical and monetary terms. Output in physical terms is calculated in terms of tons of wheat, and so on. The accounting of the output in physical terms is the basic account for studying the volume of output of agriculture. This accounting allows us to characterise the structure of the output of individual branches of agriculture and enables us to examine the volume of products in physical terms, to determine the volume of production and consumption of main products per capita, to prepare balances of these products as well as to construct a number of economic indicators.

On the other hand, the accounting of output in physical terms does not allow us to compare or sum up the results of the productive activities of the different groups; the physical units of output are different. The results of activities of different agricultural farms or branches of agriculture cannot be compared or pooled together. Hence, for calculating output of agriculture, as a whole, it is necessary to

undortake a monetary evaluation. This monetary evaluation of output is necessary for estimating both the gross and the net output of agriculture, to study the cost of production, to characterise the economic activities of the farms as well as to determine a number of economic indicators.

The gross output of agriculture is determined by individual types of agricultural farms and groups of farms, according to the practice adopted in the USSR. The gross output of agriculture is calculated for the following groups of farms : (a) governmental agricultural farms, (b) big governmental farms, (c) collective farms, (d) personal plots of the members of the collective farms, (e) personal plots of workers and employees, (f) individual peasant holdings and holdings of other groups of population.

The gross output of agriculture in physical terms is determined separately for agricultural products and animal husbandry products. For agricultural farms it is obtained by complete enumeration, while for the holdings of persons it is determined on the basis of sample surveys.

Agricultural output :

The agricultural output is determined on the basis of two elements, the area sown and the yield-rate. The main source of determining the area sown for all types of farms is the final enumeration of the result of sowing which gives the detailed list of crop acreages. The enumeration of area sown is done for all the crops on a uniform basis. This ensures complete comparability in respect of the territorial divisions of the country and the types of farms.

The final report on the results of sowing is submitted by the agricultural farms to the local inspector of the central statistical administration of the USSR. The information is given on the basis of the acceptance certificate which is prepared on the basis of direct measurement of the area sown. The area sown by the rural population is enumerated by village councils and for urban areas, special investigators are employed for sample enquiries.

The collection of accurate data on actual acreages is directly connected with the estimation of gross output of each crop. The second element which is necessary for agricultural output estimation, is the yield. The sources for the data on yield are : (1) the crop forecast, (2) preliminary data on the actual harvest, and (3) final data on the actual harvest.

The crop forecast is given by the agronomists of the agricultural farms and submitted to the local agency of governmental statistics. In crop forecast, the conditions of crops are taken into consideration, in order to give the most accurate estimate of the harvest. The crop forecasting for each agricultural farm is done for each crop, by weighting the established estimates in cwt. for the area sown, for a given field, and by weighting all the estimates for the area sown for the whole group of crops. Some reports for districts and republics are also based on the weighted mean, using the acreages under the crop as weights.

The organisation of the enumeration of actual yield of agricultural crops is more complicated. This accounting establishes preliminary and final estimates of harvest for all types of farms, on the basis of the reports of agricultural farms on harvest of crops as well as on other data. This accounting is done with the help of governmental statistics. Preliminary data on actual harvest is given by the farms. In the first report, the data are given for a limited number of crops at different times depending upon the weather and the soil conditions in different areas. The second report on the actual harvest is given by the agricultural farms on the first of November for the principal crops. The final data on actual harvest and on average yield-rate may be received only after the preparation of annual reports by the farms during the next year.

To ensure completeness and accuracy of data on harvesting of crops, timely and complete accounting of the actual harvest in all agricultural farms is carried on in a continuous manner by the agencies of the central statistical administration of the USSR from the beginning of the harvesting period up to the end. The work involves periodical checking of the accounting of the harvested crops, and the primary data in the farms including data on yield-rate of grain. During the preparation of annual reports by the farms, the agencies of the central statistical administration of the USSR carry out checks on sample basis and determine the accuracy of data in the annual reports of the farms.

The volume of harvest of personal plots is of negligible importance in the total harvest and it is determined by multiplying the average yield-rate, which is worked out on the basis of a sample, by the acreage based on the final enumeration of the area sown. The actual harvest of crops for holdings of collective farmers is given by the statistical agencies on the basis of family budget surveys. The average yield per acre is determined by dividing the volume of the harvested crop by the corresponding acreage in the farms under observation. The total volume of harvest and the holdings of collective farms for the districts, provinces and republics is computed by multiplying the average yield per acre by the area sown for the corresponding crops in the corresponding field on the basis of final registration of area sown. The actual harvest of the farm workers, employees and other groups of population is based on the estimates made by experts taking into consideration the yield for plots of collective farmers and for different types of farms. For districts, provinces and republics where there is no family budget survey, the actual harvest of personal plots is estimated from the ratio between the yield of farms and of personal holdings of collective farmers in neighbouring districts, where family budget surveys are carried out, after taking into consideration the local condition and the availability of information.

The actual harvest of agricultural crops in the USSR is based on the spring acreage, that is, the acreage which was under cultivation at the end of the spring-sowing period.

The agricultural output is determined for different groups of crops and products according to the following scheme :

A. (1) grain crops : grains, by-products (2) industrial crops : fibre crops, oil crops, medical plants, sugar, tobacco, tea and other industrial crops, seeds of industrial crops, planting seedlings (3) potatoes and vegetables : potato, vegetables, dry crops (4) fruits and berries : fruits, special tropical fruits, vines, berries, other berries, seed and seedlings, (5) fodder crop: fodder roots, hay, other fodder crops, seeds, manure crops, (6) flowers and decorative plants (7) other products of agriculture grown during the given year (8) output of agiculture of the given year in monetary terms.

B. The output of perennial plants, industrial plants, fodder plants, fruit plants, flower and decorative plants, increase or decrease in the cost of production in the process of agriculture from the beginning to the end of the calendar year and the output of agriculture of the given calendar year in monetary terms. This method is applied to all individual crops and products of agriculture, the output of the current year for fodder and fruit plants besides the yield of fruits, berries, tea leaf, medical plants should also include the cost of cultivation and growing of new plantation in the current year.

The output of flowers and decorative plants is calculated only for the plantations of industrial nature. Domestic flowers and decorative plants are not included in the output of agriculture. Industrial plants include silk-worm plants, besides tea and medicinal plants.

To determine the cost of agricultural production for a calendar year, it is necessary to add the increase or deduct the decrease in the cost of production in process from the beginning of the year to the end, to or from the cost of the gross output of agriculture for the current year.

The cost of production in process in agriculture at the beginning of the reporting year is determined as the expenditure for preparation of soil and plants and also for the different crops incurred in the previous year for harvests which are due in the current year. Similarly, the cost of production in process in agriculture at the end of the year is determined by the expenditure incurred in the current year for the harvest of the next year.

The main sources of statistical data on the number and composition of cattle are the current and annual reports of farms and the census of cattle. The census of cattle covers all types of farms. The characteristic of this census is that a considerable proportion of cattle, which is owned by the population and is not covered by the current and annual reports of farms, is also covered by the census. The census of cattle is the source of the complete data. (In 1959 there was a sample census of cattle owned by the population.)

The census of cattle covers the whole territory of the USSR and includes the cattle at distant winter pastures and also cattle in transit. The census of cattle is organised and directed with the help of governmental statistics collected though special enumerators. The unit of accounting in the census of cattle is a farm, which provides a number of important indicators for the analysis of the condition of animal husbandry by groups of farms, by the degree of availability of cattle, or by the size of animal husbandry. The reference date of the census of cattle is the first of January. After the census, 10 per cent of the population are checked; this control survey helps to establish the size of the under-estimation and also the necessary correction of the census data. The primary data for determining all types of production of animal husbandry are the data regarding the number of cattle, poultry, bees and so on, as well as accounting and statistical data characterising the changes of cattle population, productivity and the increase of output of animal husbandry in the current year.

In comparison with other industries, the estimate of output of animal husbandry, in physical terms, is less accurate, because it does not take into consideration the quality. The output of animal husbandry may be expressed in different units of measurement. The simplest though rough method is to estimate in terms of heads i.e. numbers. In this case, output is equal to the increase in animal population. More precisely, the output is expressed by the living weight of the cattle. As far as output of meat is concerned, output in living weight expresses the volume of production. But the physical indicators of output in living weight do not indicate the quality of the output. This is very important in the accounting of breeding and working cattle, the cost of which is determined not only by the weight of the animal but also with regard to the potential contents of meat and mainly by the quality of the breeding and working cattle. However, the increase in the weight of breeding and working cattle expresses a potential increase of meat.

The methods of determining the output of animal husbandry vary considerably, depending upon the type of farm where the commodity is produced and also on the conditions of the accounting in different farms. In governmental farms, the estimate of output of animal husbandry is based on the reporting of the total output of milk, eggs, honey and so on, as well as such products as young cattle and increase in weight of cattle and is determined by a sum of output in all the farms. The increase of weight is determined by weighting of animals which show the increase of the weight. The increase of weight remains with the animal up to its slaughter or sale. In the most simple case, when a farm is breeding pigs, the output is equal to the difference in the weight of all pigs at the beginning and at the end of the year. In the annual report of the state farms all increases in weight are summed up and the total increase for the year is given.

In the collective farms, the determination of the output of cattle for a year is possible both by taking into account the increase of weight, in the transformation of young cattle into productive cattle and increase of weight of pigs; and also these are noticed in changes in expenditure of and changes in the cattle population.

The accounting of the increase of weight in the transferring of one group to the other does not differ from the method of direct accounting of the increase of weight. It might be used in the data on the transfer of cattle of one group to the other and on the weight of the cattle by groups. The method of accounting of the increase of the young cattle and changes of weight of grown-up cattle, is based on the fact, that the increase of the weight of the young cattle is expressed in the difference of weight in the transfer of cattle from one group to the other, because the time of stay of the young cattle in the given group does not correspond to the calendar year. Thus, the difference of the weight may be calculated in the calendar year only arbitrarily. This method applied to a single farm or a small number of farms may give wrong results for different years due to difference in the time of transformation of young cattle into productive cattle. In bigger groups, however, the possibility of error is negligible. In collective farms, where there is direct enumeration of the output of milk, wool eggs, honey and so on, there is no direct accounting of the increase of weight of the cattle. The output of cattle is determined in the farm by the method of reverse accounting by the expenditure of the cattle population and its changes during the year. This method is based on the fact that all output is determined by the weight of cattle including those used for breeding as well as by the increase of weight of the available animal population minus the number of cattle which were received from outside.

The sources of data on the output of milk, wool, eggs in State farms and collective farms are the annual and monthly reports.

The methods of determining the output of animal husbandry owned by personal households differ considerably from the methods used for state and co-operative farms. In the holdings of the population, output is determined by sub-estimates made by the statistical agency. This is due to the fact that the accounting of the output in the personal holdings of collective farmers, workers and employees is not done.

The output of products of animal husbandry is determined from the corresponding indicators of productivity multiplied by the number of cattle. For example, the gross output of cow-milk is determined by multiplying the number of cows by the average yield of milk per cow. The output of cattle held by the population is determined by the method of reverse accounting, that is, taking into account the expenditure on the number of cattle. In this case, the primary data are the data of the annual cattle census as well as data of the sample survey of family budgets of collective farmers and factory workers and employees. In calculating output of products of animal husbandry and especially the output of cattle, the data of the reports of the collective farms on sales to the population and also on distribution to the collective farmers are taken into account. In addition, data on the purchase made by governmental farms and collective farms from the population are also used. Data on the sales of cattle and other products of animal husbandry to the state is also utilised.

The items of turnover of animal population, besides the sales of output to the state and procurement by the State and collective farms, and also the sales of cattle to them, which are necessary for calculating the output of animal population held by

collective farmers, is established for republics, provinces and districts, where there are family budget surveys, by expanding the results of survey on the total number of households of the collective farmers. This expansion is made for animal population of the corresponding type on the first of January of the given year. In those republics, provinces and districts, where there is no family budget survey, the data of family budget survey which are similar with the neighbouring districts are utilised to prepare the data on turnover of animal husbandry. The estimates of output for the farms of workers and employees are based on the data of census of cattle, and also on the ratios and and norms established for collective farmers taking into consideration the changes in the animal population on the farms of collective farmers, workers and employees. The data of the family budget of the collective farmers and productivity of animals are utilised also for estimating the output of milk, wool, eggs and so on.

Besides the output of products of animal husbandry, the output of slaughtered cattle, that is meat, fat, etc are also determined. The number and weight of cattle slaughtered by different types of farms is determined on the basis of the calculation of the turnover of animal population. For state farms and collective farms, there are also reporting data. The number and weight of cattle slaughtered in the personal farms of collective farmers, workers and employees, is determined on the basis of the data collected from the family budget survey of collective farmers, etc. This weight with adjustment for the age of the cattle is utilised for the cattle sold for slaughter at the collective farms market. In calculating the output of meat, the data of procurement organisations on the average living weight of cattle are used. The average living weight of the sold cattle is converted to the slaughtered weight. The conversion of the living weight to the slaughtered weight is done according to the ratio established on the basis of the data of slaughter houses and family budget surveys. In order to determine the meat output of poultry the same sources are utilised as for the estimates of the output of meat; besides, the data of output of incubators and poultry-breeding stations are also utilised.

The output of animal husbandry is also determined in monetary as well as physical terms, as in the case of other industries. The estimate is made at current prices of sales. Further, in order to determine the changes in the volume of production of animal husbandry, the estimate is also made at constant (hence comparable) prices. The gross output value of animal husbandry is the sum of the values of primary products received in breeding the cattle and animals : (a) the value received during the year when the animals are bred by the agricultural farms (b) the value of the increase of weight of cattle and poultry as a result of feeding of cattle and (c) the value of milk, wool, eggs, honey and other products during the year.

The scheme of calculating the output of animal husbandry is the following :

I. The output of animal breeding : (1) the value of young cattle and of the increase of weight by types of cattle (2) the value of products not connected with the slaughter of cattle : (a) milk (b) wool (c) hare (d) hen ;

II. The output of deer-breeding (1) the value of young cattle and of the increase of weight during the year (2) milk (3) horns ;

III. The output of rabbit-breeding (1) the value of the young rabbits and of increase of the weight of rabbits ;

IV. The output of animal breeding (1) the value of young animals and of their growth during the year ;

V. The output of dog-breeding (1) the value of young and grown-up dogs during the year ;

VI. The output of poultry (1) the value of poultry and of the increase of weight during the year (2) eggs (3) feathers ;

VII. The output of honey (1) the value of the increase in the number of beehives during the year (2) honey and wax ;

VIII. The output of silk breeding (1) cocoon ;

IX. The output of fishery (1) breeding of fish to catch fish in ponds.

Thus, the gross output value in agriculture is determined as the sum of the value of output of all products during the year. The value of output of agriculture is determined by monetary evaluation of the gross yields of individual crops with the addition of the cost of plantation of trees and the cost of increase in production in process. The value of output of animal husbandry is determined by monetary evaluation of all products received in the process of utilisation of animals and the output of breeding and feeding of agricultural animals.

The gross output value in agriculture includes not only the value of output sold outside the agricultural farms but also the value of goods consumed within the farms. For example, the value of fodder and seeds produced by collective farms and consumed within the farms during the current year is included in the gross output value. Thus, the gross output of agriculture is calculated on the basis of the result of deduction of products produced in the given enterprise and used in the process of production within the same enterprise. This method is called the method of gross turnover.

Besides gross output, the marketable output of agriculture is also determined, that is, output sold by agricultural farms, and by personal farms of the members of collective farms, and by workers and employees and individual peasants. The marketable output of agriculture includes governmental procurement of agricultural products, including the repayment of credits on the purchases of agricultural products by co-operatives and other major organisations, and the sale of agricultural products to the population and organisations through the collective farm market. Besides, the marketable output includes the payments in kind, for the work done by people who are not members of the collective farms. Only that part of the agricultural output of collective farms distributed to the collective farmers according to the work done, which is sold by the collective farmers, is considered marketable.

The marketable output of agriculture is calculated both in physical and monetary terms. The marketable output of agriculture is the sum of marketable outputs

of collective farms and includes the sale of agricultural products by the farms to other agricultural farms, that is, the so-called intra-village turnover marketable output. For example, the intra-village turnover marketable output includes the sales of agricultural goods by one collective farm to another, or by the collective farmers of one collective farm to those of another or by collective farmers to each other. Besides, the intra-village marketable output is also determined by all products of the intra-village turnover. The intra-village sales of agricultural products are determined by the survey of family budgets of collective farmers and also by preparing balances of products for different types of farms.

In the process of the analysis of marketable output, the indicator of marketability of output of agriculture is determined. This indicator is determined by individual products in physical terms, and also by groups of products of agriculture and animal husbandry, in monetary terms, and also for agriculture as a whole. In determining the indicator of marketability the by-products and non-marketable and gross output, the monetary evaluation of the gross marketable output is made at current prices and also at constant prices.

In order to determine the value of output of agriculture, the marketable output is evaluated at the prices of actual sales. The output sold to the Government is evaluated at governmental procurement prices, the output sold to co-operatives and other trade organisations is evaluated at actual purchase prices, and the output sold at the market at the prices prevailing in the market. The non-marketable part of the output consumed within the farm is evaluated on the basis of the following method: (a) the non-marketable part of output of State farms by the value of this output (b) the non-marketable part of the output of collective farms and personal farms by the average prices of marketable output during the given year.

The evaluation of the non-marketable output of hay, straw, potato and other non-transportable products is done by deducting from the average prices of these products the expenses for sale, that is, the expenses for transportation to the procurement point or to the market.

Whenever this deduction was not made, it led to an over-estimation of the value, and of the share of the non-marketable part of the output in the gross output value of agriculture.

The output value of breeding animals is determined in monetary terms in the following way : the number of young cattle is evaluated at the prices of the given year for the cattle of different ages; the value of the increase of young cattle is determined by the increase in the number of young cattle due to births in the previous year, at the values prevailing at the beginning of the year.

The monetary evaluation of the gross output of agriculture at prices of the current year is made for the determination of the national product, and also for estimating the net output of agriculture as a part of the national income. For the determination of changes in the volume of output of agriculture, and for studying the growth

of productivity of labour over a number of years, the output of agriculture is also evaluated at constant prices. The evaluation of output at constant prices is required to meet the following conditions :—(a) more detailed break-downs and evaluation of individual products taking into consideration their quality and (b) strict utilisation of a single price for the given major types of product. In cases where, in the total amount of the given homogenous product the share of higher credit is increased, the omission of the first condition leads to an under-estimation of the actual changes of the output value of this product. When the principle of single prices is violated that is, when the evaluation of food is done according to the local prices even in the same period, this leads to a wrong reflection of the changes of the volume of output because of a territorial bias in the location of the output of individual products. The average prices of evaluation of agricultural output for a certain year is taken as the constant price. In 1956 the average prices were taken as constants for determination of the gross output value of agriculture.

The net output value of agriculture is determined by the part of the gross output value left after covering the value of output consumed within agriculture. The net output of agriculture is a part of the national income of the country and a source of primary income of the agricultural farms and the agricultural population. The net output of agriculture is determined by deducting the inputs during the given year from the gross output of agriculture.

The inputs of agriculture include: (1) depreciation of fixed assets (2) seeds for sowing (3) fodder for cattle and poultry, (grains and products of processing of grains, fodder, milk, by-products of milk, straw, hay and so on, as well as eggs for feeding hens, honey for feeding bees etc.) (4) fertilisers (5) fuels (6) electricity (7) tea, chemical poison (8) medicines consumed in animal husbandry (9) expenses for repairs of buildings, agricultural machinery and implements (10) expenses for baking materials and small instruments (11) the payments for services connected with the transportation of agricultural products, materials and other goods for agriculture carried out by the transport organisation and other enterprises (12) other inputs.

The monetary evaluation of inputs and the determination of the net output of agriculture is done at both current and constant prices.

The monetary evaluation of inputs at current prices is done at the following rates : (a) for consumption of agricultural products and materials within the farms, at the average prices used for evaluation of non-marketable part of the output, and in State farms, at the cost of production of these products and materials (b) for the purchased agricultural products, materials and fuels, at the actual prices paid for them. The products and services of other organisations are included in the inputs after evaluation at the actual prices of those products and services.

The net output of agriculture at current prices corresponds to the value added in the sector of agriculture.

In order to study the changes in the volume of net output the indicator is calculated by conversion of the value of gross output and inputs in comparable prices.

INSTRUCTIONS FOR PREPARING STATISTICAL REPORTS ON CONSTRUCTION

By V. MANIAKIN

The report on the utilisation of investments is submitted by all establishments, organisations and institutions in the public sector, for which investments have been provided for the current year. The report is also submitted by the builder in the case where the construction planned for the current year was not started in the reporting period. In such cases, the column "annual plan" is filled, while the column "actual fulfilment since the beginning of the year upto the reporting month" is not filled.

PART I

THE VOLUME AND COMPOSITION OF INVESTMENTS

Row 1 shows the total volume of investments according to the plan; Row 2 gives the total volume of construction and erection work done by the contractor and by the builder's own labour, while Row 3 shows the volume of construction and erection work done directly by the builders with their own labour. Row 4 shows investments used for the procurement of equipment, whether requiring erection or not, production tools, and inventories of articles of small value and of quick wear and tear (provision for expenses on new establishments under construction is included in the plan of investments). Row 5 shows expenses for other capital works. This row also includes such items of expenditure as the drilling carried out according to the plan of investments.

Row 6 gives the investments for units which, according to the plan, should be commissioned in the current year (starting units), and for procurement of equipment which does not require erecting, and of production instruments and inventories which are not included in the estimates of units under construction. The difference between Rows 1 and 6 is the investment for units which are not due to be commissioned by the plan of the current year.

Columns 1 and 3 show the annual plan which is prepared by the higher authority. Reports on projects operating on the date of reporting should include all changes during the reporting period in the original plans, both in investments and in the methods of carrying out construction and erection work, including changes due to the transfer or receipt of investments on the basis of share participation, and also due to changes in the set-up of the reporting organisation during the reporting period.

Investments used from the beginning of the year upto the reporting month are shown (in columns 2 and 4) for all sectors of the organisation submitting the report, including the work received from other organisations which was done from the beginning of the year upto the reporting period; investments received on the basis of share participation are also included therein.

PART II

THE COMMISSIONING OF FIXED ASSETS

Part II shows the commissioning of fixed assets of productive and non-productive nature, for all units of construction by the organisation submitting the report. The commissioning of fixed assets is shown both at constant prices and at the prices of the corresponding year. Suppose the construction of the unit was started in 1950. The prices of 1950, which were used for the preparation of the design, must have changed by 1955. Investments from 1950 upto 1955 are shown at the prices of 1950 while investments in 1955 and succeeding years, upto the completion of the construction, are given at the prices of 1955, taking into consideration the new rates for construction work.

The total cost of the commissioned unit is estimated as the sum of investments in estimated prices from the beginning of the construction upto the stage of commissioning.

Row 7 shows the commissioning of fixed assets at the estimated cost and at current prices according to the plan for the current year, while Row 8 gives data regarding actual commissioning, from the beginning of the year upto the month of reporting. The plan and actual commissioning should mention changes in the set-up of the organisation submitting the report during the reporting period.

The projected annual plan for commissioning units transferred from other organisations in the current year, is included in the plan of the organisation which received these units and excluded from the plan of the organisation which transferred them. For the units transferred to other organisations, the fixed assets partially commissioned from the beginning of the year are to be shown in the reports of the organisation which received these units and excluded from the reports of the organisation which transferred them.

The actual commissioning of fixed assets is to be shown on the basis of the acceptance certificate in accordance with the established procedure. After commissioning, the cost of the completed individual units is to be included in the completed investment and at the same time in the fixed assets of the establishment. In cases where the unit of construction is commissioned by stages, the estimated cost of the commissioned part of the unit is to be determined according to established procedure. The cost of this part of the unit on the basis of the acceptance certificate is to be included in the commissioning of fixed assets.

Equipment which does not require erection, instruments, inventories and other articles, and working capital acquired from investments, are to be included in

fixed assets, on their arrival at the establishment (project), and included in its account-books. Equipment which requires erection but is used as permanent stock is to be included in the commissioned list from the moment of its inclusion in the stocks on the basis of documents according to established procedure.

PART III

INVESTMENTS FOR THE MOST IMPORTANT UNITS

Part III shows investments in construction and erection work for the most important units and, first of all, for the units which are to be comissioned in the current year. The list of such units is determined by the higher organisation.

Builders whose plans include investment for the work connected with construction of reservoirs for hydro-electric stations or for irrigation and other purposes, should show these works in Row 12.

PART IV

HOUSING

Total investments for housing and the commissioning of houses, according to the plan, are to be shown by the builder in this part. The report should mention all changes which took place in the current year in the set-up of the organisation sending the report. The established annual plan of investments for and commissioning of resi dential houses under construction, and those transferred from other organisations, is included in the plan of the organisation. Similarly, the investments for and commissioning of residential houses are to be shown in the report of the volume of work done from the beginning of the year. The organisations which transferred the units should exclude data on investments and commissioning relating to them from their reports.

The investments for housing (Row 13) should include :

(a) expenditure on construction and equipment of new buildings and raising the superstructure of existing buildings as well as additions to these buildings (housing includes work connected with erection of dwelling houses as well as work for construction of networks of water supply, sewage, gas system, electricity, telephone system, gutters, and so on, within the blocks, and other work included in the estimates of housing);

(b) expenditure for reconstruction of non-residential buildings for conversion into permanent residential ones.

Living space which is commissioned (Row 15) includes :

(a) living space in the newly built residential houses, and in extensions of and additions to the existing residential houses;

(b) living space in the commissioned non-residential houses reconstructed into residential houses;

(c) living space in newly commissioned buildings of non-residential nature (flats in schools, hospitals and so on);

(d) living space in hostels, boarding schools and so on (including the space in auxiliary units kitchens, bathrooms, corridors such as etc.);

(e) the space in summer houses, rest homes and hotels.

The indicators in column 1 for the annual plan for investments in housing, and in the column for the actual fulfilment from the beginning of the year, are to be given as on the date of reporting. All changes which took place from the beginning of the current year, including changes in the composition of the organisation sending the report (transfer or receipt of units), should be taken into consideration in filling in the 'annual plan' column. Investments in housing and the commissioning of housing from the beginning of the year upto the month of the report (column 2) are to be shown for all units of the organisation sending the report, including investments in and commissioning of housing from the beginning of the year by units transferred during the reporting period from other organisations. The investments and partial commissioning of housing from the beginning of the year by units which are transferred during the reporting period to other organisations are not to be shown in column 2.

Part IV should also mention investments in housing for removal of defects in previously commissioned houses.

PART V

CONSTRUCTION OF BUILDINGS FOR EDUCATION, CULTURE PUBLIC HEALTH AND MUNICIPAL CONSTRUCTION

In Part V the builder should show investments in construction of units for purposes of culture and public utility and their commissioning according to the plan. The report should include all changes which took place during the current year in the composition of the organisation sending the report. The annual plan for investments and commissioning for units which are transferred from other organisations is included in the plan of the organisation which received these units. Similarly, actual investments and commissioning for these units are to be shown in the report from the beginning of the year. The organisation which transferred the units should exclude them from its own report from the beginning of the year.

This part should show all expenditures, both for construction and equipment of new buildings and structures and for reconstruction, extension, addition and re-equipment of operating buildings and structures, including expenditure for procurement of equipment, instruments and inventories which are included in the plan of investment.

Investments for construction of units for education and culture (Row 16) should include construction and equipment of the buildings of research laboratories, colleges, schools, kindergartens, theatres, cinemas, clubs, museums, libraries and other houses for cultural and educational purposes. The report should give the capacities of commissioned units of education and culture, in physical terms, as shown in the acceptance document. For commissioned schools and kindergartens, the accommodation of the houses newly built for these purposes and their equipment are to be included; the number of places in the kindergartens and creches opened in the residential houses should also be given. For already functioning schools and kindergartens where space was increased by remodelling and re-equipment, only the number of new places is to be shown.

Investments for construction of institutions of public health (Row 17) should include construction and equipment of hospitals, dispensaries, polyclinics, maternity houses, rest-houses, stadia, sports buildings and other institutions of public health. Commissioning of new hospitals, polyclinics and rest-houses should be shown by the number of beds; for kindergartens the number of places in the newly-built buildings is to be given. Any increase of beds or places in the existing buildings due to their re-modelling, extension and re-equipment should also be shown. In addition, the number of places in kindergartens opened in residential houses should be mentioned.

Investments for municipal construction (Row 18) should include :

(a) construction and equipment for water supply, sewage, gas supply and so on,

(b) construction and equipment of bus and tramway yards and tramway network,

(c) procurement of means of municipal transport (buses, tramcars and so on),

(d) construction and equipment of hotels and guest houses, of laundries and other units of municipal servicing, and of streets, squares, bridges and pavements,

(e) the work for lighting and planting trees in cities and townships.

Investments for construction of plants and structures for purification and precipitation of dust (Row 19) should include :

(a) construction and equipment of plants and structures for purification of water in industrial establishments,

(b) construction and equipment of salvage units,

(c) construction and equipment of plants for generation and storing of gas, and for precipitation of ash and dust.

Part V should also include any capital expenditure for removal of the defects of units already commissioned, and also any expenditure exceeding the estimated cost of the construction and erection which are included in the construction of these units.

Investments for construction of office buildings are not to be included in Part V.

REPORT ON THE UTILISATION OF INVESTMENTS

for the month——————19——————

To be sent monthly by builders in the public sector after the end of the reporting month
1. To the higher authority
2. To the district statistical unit

I The volume and structure of investments

sel. no.	items of investment	investment at 1955 prices		investments at current prices	
		annual plan	progress from the beginning of the year upto the month of the report	annual plan	progress from the beginning of the year upto the month of the report
	(0)	(1)	(2)	(3)	(4)
1.	total investments				
2.	construction and erection total				
3.	out of that done by own labour				
4.	equipment, tools and inventories total				
5.	other capital works				
6.	investments for units which should be commissioned in the current year				

II Commissioning of fixed assets

		estimated cost	
		at 1955 prices	at cursent prices
	(0)	(1)	(2)
7.	annual plan of commissioning		
8.	commissioned from the beginning of the year upto the month of the report		

III Investments for the most important units

(in 000 Rs)

name of the most important units	total construction and erection			
	investment at 1955 prices		investment at current prices	
	annual plan	progress from the beginning of the year upto the month of report	annual plan	progress from the beginning of the year upto the month of the report
(0)	(1)	(2)	(3)	(4)
9.				
10.				
11.				
12.				

IV Housing

	annual plan	progress from the beginning of the year upto the month of the report
(0)	(1)	(2)
13. investments in housing—in estimated prices (in 000 rupees)		
14. investments in housing—at current prices (in 000 rupees)		
15. commissioning of housing—in physical terms		

V Construction of institutions of education, culture, and public health and municipal construction

	investments at 1955 prices (in 000 rupees)		investments at current prices (in 000 rupees)		commissioning in physical terms		
	annual plan	progress from the beginning of the year upto the month of the report	annual plan	progress from the beginning of the year upto the month of the report	unit	annual plan	progress from the beginning of the year upto the month of the report
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
16. construction of establishments for education and culture (total including schools and kindergartens)							
17. construction of institutions of public health (total including hospitals and polyclinics)							
18. municipal construction							
19. construction for purification and dust catchment							

Date——————19 ——

Signature of the Manager

THE MAIN METHODOLOGICAL PRINCIPLES OF PLANNING OF CONSTRUCTION

By A. P. STRUKOV

1. The volume and direction of investments are determined on the basis of the Governmental plan of economic development of the country. In preparing the plan of construction, it is necessary :

(a) to determine the investments needed in different industries for improving the utilisation of available capacities and for increasing the capacities of operating enterprises by perfection of technological processes, replacement and modernisation of obsolete equipment and development of specialisation and coordinated production. Complex mechanisation and automation of technological processes and other organizational and technological measures are also relevant in this context.

(b) not to diffuse material and financial resources on many projects and units, but to concentrate the investments first on those already started and then on other highly important ones, to reduce the time of construction, to decrease the volume of construction in process and to accelerate the commissioning of production capacities, housing, cultural and public utility structures. In distributing investments for individual projects, it is necessary, as a rule, to look to the necessity of providing investments in full for projects already started and only thereafter, to invest in new projects;

(c) to provide for high-grade technological assessment for the proper location of establishments under construction, for ensuring the most effective utilisation of natural resources, the location of industries near the sources of raw materials and also near the regions of consumption, and also proper specialisation and cooperation of establishments;

(d) to forestall reduction of the cost of construction by removal of unnecessary luxury in designs, and by exploiting the achievements of science and technology, that is, by utilising the most economic standard designs.

2. The plan of construction includes the following :
   (1) the investments in construction and erection work;
   (2) commissioning of capacities of production of the most important commodities of the basic industries;
   (3) commissioning of housing;
   (4) commissioning of fixed assets;
   (5) the list of important projects.

3. The following main directions of investments are considered in the plan:
   (1) construction of units of industrial nature;
   (2) housing;
   (3) municipal construction;
   (4) construction for public health, education and culture.

4. Investments for construction of industrial units include all expenses for construction of the units of the main, secondary and auxiliary type—these include transport, communications, water supply, sewage, district heating and other units for servicing the production, which are envisaged by the design and by the estimate for the construction of new establishments—and also for additions and alterations of existing establishments and for construction and outfitting of buildings of research and designing organizations, trade and warehousing buildings and other units.

5. Expenses for procurement of equipment and machinery (rolling stock, ships, motor cars, tractors, agricultural machinery, and so on), whether included or not in the estimates for the units under construction are included in the investments for industrial units.

6. Water supply, sewage, supply of gas and district heating, which are used for public utility purposes in cities and townships, are included in public utilities but excluded from investments for units of industrial nature.

7. The volume and direction of investments on construction and erection work of industrial nature are planned for each industry separately. For example, the following directions are shown for the iron and steel industry :

(1) iron and steel plants,

(2) establishments for mining iron and manganese ore,

(3) coke and chemical plants,

(4) tube-rolling mills.

8. The following should be taken into consideration in planning the volume and composition of investments :—

Investments include :

(a) the cost of construction work,

(b) the cost of erection of equipment,

(c) the cost of technological, power, transport and other production equipment required to be erected, used otherwise,

(d) the cost of inventories and tools which are included in the fixed assets,

(e) other capital expenses.

Investments do not include :

(a) expenses for capital repairs of buildings and structures,

(b) the preparatory expenses for commissioning, and further expenses for commissioning of the establishment,

(c) the expenditure incurred for manufacturing the pilot samples of the equipment, and for plants for research work and trial of the approved inventions.

9. The composition of investments is the following :

(a) construction and erection work,

(b) expenditure for procurement of equipment, tools and inventories,

(c) other capital expenditure.

10. The composition of investments in the plan is determined on the basis of designs and estimates of projects for different units which should be constructed in the plan period, or alternatively, on the basis of the estimates of similar projects. Any expenditure which is not included in the construction estimates but which occurs by way of investments (e.g. expenditure for procurement of equipment and machinery), is also included.

11. Construction work includes :

(a) all work for construction, expansion, addition and restoration of permanent and temporary industrial buildings and structures, residential houses, hospitals, dispensaries, kindergartens, rest houses, colleges, schools, cinemas, clubs, stores and other buildings for cultural and utility purposes, or connected with them;

(b) construction of sanitary installations, water supply, sewage, plants for purification of industrial sewage water, gas and ash catching plants, lighting, heating and gas network, oil pipe lines, belts for carrying commodities, gas lines, electric transmission lines, communication lines, bridges, embankments, roads, under-water works and other special works in construction, together with the cost of sanitary and technological equipment (heating boilers are included in the estimates of construction work);

(c) work for construction of basements, foundations and supports for equipment, brick lining of boilers, ovens, and so on;

(d) preparation of construction sites including removal of structures, removal of forests, drainage, levelling etc;

(e) afforestation of the project site;

(f) irrigation and other works;

(g) mining (besides works carried out through the operational expenses of the operational establishments);

(h) geological and hydrological works (boring) which are connected with the construction of buildings and structures;

(i) additional expenses connected with construction work under difficult conditions in hilly areas; and so on.

12. Erection work includes the following :

(a) the work for assembling power, transport and other equipment, including trials for assembling;

(b) the construction of transmission lines for equipment under assemblage;

(c) construction of sites and ladders for the equipment;

(d) isolation and painting of the equipment and the pipe lines;

(e) allowances to wages of workers in distant areas and in industries in mountainous regions.

13. Erection work does not include :

(a) the cost of the assembled equipment or the fabrication of parts for completing the equipment;

(b) cost of starting and setting up the work;

(c) work for assembling and dismantling of construction machinery and instruments.

Expenses for these purposes are included in the cost of operation of the machinery and equipment under question.

14. The cost of assembling the equipment consists of expenditure for materials (including expenses for transportation and storage), basic wage of the workers, expenditure for operation of construction machinery and equipment, expenditure for transport to the construction site, and overheads.

15. The volume of construction and erection that is envisaged in the Plan is determined by major directions for industries, and within industries on the same lines as for investments.

16. The expenditure for procurement of equipment, instruments and inventories includes the cost of technology, power, transport and other production equipment (assembled and non-assembled) and the cost of instruments, inventories and equipment for laboratories, workshops, pilot plants, and medical units necessary for commissioning of establishments, buildings and structures; it also includes expenditure for the procurement of equipment not included in the project estimates (locomotives, wagons, ships, tractors, motor cars, agricultural machinery, buses, tramway cars, electric cars and other machinery).

18. Non-assembly equipment is included in the capital investments, if it is received by the project or establishment in the plan period. Non-assembly equipment is included in the volume of work done after its inclusion in the balance sheet. The expenditure for procurement of the equipment includes payments to the ship-building yards for fabrication of certain units which are required by customers during the progress of the construction of the ship.

19. The requirements of equipment, inventories and instruments for projects under construction are determined by the designs and estimates prepared for buildings and structures; while those for operating establishments and structures are fixed on the basis of the plan after necessary calculations are made to determine requirements of equipment and machinery.

20. A summary balance of equipment in value terms is prepared to coordinate the allocations envisaged in the plan for production and distribution of equipment.

21. Other capital expenditure included in investments consists of :

(a) expenditure on operation, prospecting and boring of oil and gas in accordance with the plan of drilling;

(b) expenditure on the management of establishments under construction including technological control;

(c) expenditure for training of personnel for the operation of establishments under construction ;

(d) expenditure connected with bonus and allowances not included in standard rates of payment for assembling work, which are paid through separate bills (the bonus connected with the payment of premia, allowances for the time of service, premia for commissioning of units, and so on);

(e) expenditure on research envisaged in the designs and estimates of the projects;

(f) expenditure for resettlement of population connected with construction works;

(g) expenditure for procurement of structures from other organisations and persons;

(h) expenditure for afforestation (gardens, plantations, and so on).

22. Targets for commissioning of production capacities are prepared separately on the basis of the following information:

(a) commissioned capacities for projects and also extensions and reconstruction of the operating establishments; and

(b) increase of capacities at the operating establishments resulting from organisational and technological measures.

23. The targets for commissioning of production capacities for newly built, extended and reconstructed units are determined on the basis of the time needed for the construction, taking into consideration the volume of work for the units due to be commissioned in accordance with designs and estimates.

24. In preparing the plan, it is necessary to provide for coordination in time of the commissioning of mutually connected industries and units.

25. The production capacities commissioned during the construction of individual structures, workshops etc., at the operating establishments are included in new construction.

26. The plan of commissioning of fixed assets includes :

(a) the cost, total or by States, of commissioned works completed in the plan period, establishments, buildings and structures, trade and storage buildings, railway lines, high-ways, means of communication, irrigation systems, canals, housing, hospitals, recreation centres, administrative and other institutions (including auxiliary establishments and structures);

(b) the cost of commissioned works in the plan period: equipment of all types of construction, machinery, means of transportation (locomotives, wagons, motor cars, buses, ships plying on river and sea and so on), tractors and agricultural machinery;

Equipment which is not to be assembled, e.g., transportation and agricultural machinery, building equipment and so on, and equipment which is to be assembled but used as permanent reserve, are included in the fixed assets after their receipt by establishments and organisations, when they are also included in the balance sheet.

(c) the cost of inventories, instruments and durable goods;

(d) the cost of afforestation and works of drainage etc;

(e) the cost of drilling oil and gas wells and also prospecting drilling (the cost of these wells, when included in the fixed assets, is taken as the cost of operational drilling);

(f) expenditure connected with preparation of water reservoirs and the areas they submerge which are envisaged in the estimates of the construction of hydro-electrical stations.

Reservoirs for agricultural purposes are included in the fixed assets of hydro-electrical stations. The cost of reservoirs includes:

(1) re-settlement of the population and monetary compensation to the private owners of houses and other structures;

(2) transfer of houses and structures of private owners, co-operatives and other public organisations;

(3) reclaiming of land and betterment thereof;

(4) preparation of the bottom of the reservoir for anti-malarial measures and for safety of navigation in the reservoir;

(5) archaeological works connected with preservation of ancient monuments;

(6) cleaning the bottom of trees and bushes;

(7) protection of localities and establishments from submerging;

(8) transfer of houses, industrial establishments, transmission lines, lines of railways and other structures as a measure against submerging of the region and losses connected with such transfer. (The losses are shown in the balance sheet as the cost of these units minus the cost of recovered materials and equipment.)

27. Expenditure which does not increase fixed assets is not included in the cost of fixed assets. Items of such expenditure are :

(a) expenditure for temporary buildings and structures constructed from the overheads for buildings organisations;

(b) expenditure for training of operational personnel (included in the estimate for construction);

(c) cost of non-durable goods irrespective of their cost;

(d) cost of special instruments and devices irrespective of their prices;

(e) cost of special dress, foot-wear etc., irrespective of their cost and durability, excluding bed-sheets in hotels which are included in fixed assets;

(f) expenditure for prospecting of land and its utilisation, not connected with the construction of the project;

(g) expenditure for conservation of the project.

(In preparing the plan of commissioning, the cost is estimated at the prices prevailing at the time of construction.)

28. In determining the target for commissioning, it is necessary to determine both the units and the equipment which should be commissioned and included in the fixed assets in the plan period. It is necessary to analyse in detail the composition of construction in progress and adopt measures for the reduction of the construction in progress.

29. In determining investments and targets for commissioning, it is necessary to take into consideration work already started in order to provide for the commissioning beyond the plan period and also to ensure even progress of construction.

30. The volume of work in progress in different units is planned on the basis of the tasks of perspective development of the economy and of individual industries, and also on the cost and the time of construction of these units.

31. The governmental plan includes housing constructed through governmental investments and also housing constructed by workers and employees with their own means, or with the help of governmental credit. The plan of governmental housing includes :

(a) construction of residential houses and hotels through investments according to governmental plan;

(b) construction of hostels for students;

(c) construction of residential houses for personnel connected with the exploitation of railway and motor transport, pipe lines, rest houses, hospitals etc.;

(d) non-residential buildings (apartments in schools and so on);

(e) transformation of non-residential buildings into residential buildings through investments according to governmental plan.

The governmental housing construction also includes :

(a) investments through governmental plans for construction of water supply, sewage, gas supply, power supply and so on, for servicing houses under construction;

(b) investments according to governmental plan connected with the construction of pavements, fancy-sheds and so on.

32. The plan of housing does not include:

(a) construction of residential buildings for special purposes (barracks etc.);

(b) construction of temporary living houses and hostels for construction labour;

(c) expenditure connected with the transfer of houses from regions submerged by hydro-electric power stations;

(d) expenditure connected with improvement of servicing of already existing houses and townships (this expenditure is met through investments for municipal construction and allocation for house repairs);

(e) expenditure on the equipment of establishments of trade and other institutions in residential houses.

33. Investments for municipal construction include expenditure for construction of public utility services to the population: water supply, sewage, power network, municipal transport, bridges, hostels, and so on.

Investments for municipal construction also include expenditure for improving the servicing of residential houses.

Public utility does not include industrial water supply, structures for purification of industrial water and gas supply for technological purposes.

34. The plan includes targets for commissioning of the main capacities: for commissioning of water supply capacities in thousand cubic metres of water per day and length of water supply lines in km.; for commissioning of sewage lines in km.; and for supplying gas by number of flats and the length of gas connections in km.

35. Investments for construction of centres of education, culture and public health include expenditure for construction and equipment of universities, schools, kindergartens, theatres, cinemas, clubs, libraries, research institutions and other units of education and culture, and also of hospitals, polyclinics, maternity houses, rest houses, sports centres, medical establishments and other units of public health, physical culture and social welfare.

36. Lists of projects of special importance are included in the plan. In preparing these lists it is necessary to bear in mind the fact that the units may be included in the list as a rule only when they are provided fully with the investment funds and material resources in accordance with the established norms prevailing at the time of construction. This list contains :

(a) the name and the location of the project;

(b) the duration of construction (the year of commencement and the year of completion of construction);

(c) the capacity according to design;

(d) the estimated cost;

(e) the volume of work done and the commissioning of capacities from the beginning of the construction up to the plan period;

(f) the investments and commissioning of production capacity in the plan period with breakdown by years.

The main units to be started are shown within the projects.

ORGANISATION OF INVESTMENT STATISTICS IN THE USSR

By V. MANIAKIN

Investment plays an extremely important role in the economy of the Soviet Union. Continuous increase in social production and systematic rise in its technical level demand constant increase in the volume and quality of fixed capital. Fast increase of fixed capital is also a characteristic in the non-productive sphere, consisting, for example, of dwelling houses, schools, maternity homes, etc., which become necessary for continuously developing needs (material and cultural) of the society and also in view of the increase in population.

All these call for investments of huge dimensions, in such volumes as would secure the extended reproduction of the basic capital of the country.

The volume of investment in the USSR is, in fact, stupendous. It goes on increasing from year to year and the composition of the investments becomes more and more varied with each passing year.

In a planned economy like that of the USSR, accounting of investments, organised over the entire territory, has a necessary social function. On the aggregate data of such accounting, planning of investments and their economic analysis are based. We should note, however, that the statistics of investment is a branch of economic statistics. This branch, as distinguished from the statistics of agriculture, industry, transport, etc., which had their own pre-revolutionary history, did not have anything by way of previous experience to depend upon.

In pre-revolutionary Russia, Government statistics did not furnish information on size of investments or on their composition. There were available only data on the population employed in construction. For determining the volume of construction, quite casual estimates were used, for instance, the data available in the assessment by insurance societies of the insured real estates over different periods of time.

In other countries also statistics of construction came to develop only in recent times. We know, for instance, that current statistical reporting on construction in the USA began in the year 1915 and that the first census of building industry in that country was conducted in the year 1930.

The building industry as a system of building trusts and offices came into being in the USSR during 1924-25.

Upto the present day the system of building organisations has been growing and continuously gaining in strength over all the five-year plan periods during which investments have been expanding.

This essentially new industry—the building industry—possesses at the present time a great number of permanent skilled personnel and is equipped with powerful

industrial equipment. At the present time more than 80 per cent of the entire building programme of the country is executed by financially independent contract organisations which work on terms of agreement with customers. The contracting building trusts and offices conduct work for Government and co-operative organisations. Not only the contract organisations but also the customers themselves draw up accounts about all these works and prepare returns which are used for capital investment statistics. However, besides these returns, other forms of data collection are also known, for instance, the censuses and surveys of construction. These are significant for reasons that follow. Part of construction is done with the means of individual citizens and not by the resources of States and co-operative organisations. Private construction by citizens may be made in towns or villages. Such a construction includes the erections made by collective farm workers, industrial workers and Soviet intellegentsia in the form of dwelling houses for private use. But even when we are concerned with construction undertaken by Government and co-operative organisations, not everything may be covered by the data of the returns, because these returns include a limited number of the most important indicators. Moreover, the requirements of statistical analysis may well surpass the limits of the established returns. Here other forms of data collection—census and survey—become useful. These forms are employed in studying a whole series of questions, viz., the available stock of building machinery, the existing resources of basic materials, regional distribution, specialisation and co-operation in the activities of building industry, composition of building workers according to occupation, and similar questions.

Returns were not always the basic form of observation in Soviet construction statistics. Before 1932 other forms of observation were more in use. Statistics were based on the data of registration of permits for construction or for putting into operation completed projects. Such a source of data is also known to have been used for statistical work in other countries but it suffers from great arbitrariness. In the USA the basic source for data on housing construction is, at present, the information on permits given. Of course the data of permits do not coincide with the actual beginning of the work: moreover the volume of the approved project may not coincide with the actual volume of construction made. The larger the construction, the greater the gap in time, not to speak of the fact that some part of the construction permitted may remain partly unrealised, or may come to be realised during a period different from that noted for registration. Statistical observations based on the returns on investments, received periodically from all the Government and co-operative organisations, qualitatively alter the organisation of the whole work. Returns yield, for statistics, not indirect indicators of construction but direct data of the current reports. In the beginning, when returns and accounting were not yet organised at projects according to a single standard procedure, the returns did not provide the information required for statistical purposes. The indicators of the physical volume of construction, its variation over time, the productivity labour and the dynamics of the cost of works,—all these were extracted from the materials available from compulsory registration and surveys.

The importance of the returns went on increasing. In 1932, the Central administration of national economic accounting was charged with methodological guidance over the accounting and the returns on construction in the country. It was also charged with the task of supplying all projects with uniform standard forms for calculation, accounting and returns. Thus, the complete systems of accounting and statistics of investments came to be created.

In a planned economy the tasks of accounting and statistics become more extensive. The system of basic indicators of the surveys, the general methodological principles of conducting such surveys, the programme of preparation and processing of reports—all are more suitable for standardisation there than under other economic conditions. The general and uniform principles of current accounting and preparation of returns based on them are made compulsory for each building organisation and for every enterprise. By introducing standard elements it is possible to obtain from the returns comparable information, which is necessary for statistical purposes and for measuring the progress of the plan comprising the whole country, individual economic regions and branches of the economy.

Statistics of construction activity are variation data of accounting and returns of a building organisation, data that are necessary for the operational work of the organisation. Returns, which simultaneously serve the needs of the building organisation as also the requirements of national economic accounting may combine in it two functions, if it has to be a standard one. The Central Statistical Administration of the USSR has to play a guiding role in standardising the returns. It approves the compulsory minimum of indicators and forms of returns for building organisations and industrial enterprises. But these latter organisations and enterprises may, of course, if necessity arises, extend this minimum range. All the returns meant internally for a building project or for a factory and needed for controlling the operations of different sections of the building organisation or a building department, its sections and labour gangs or the operations of an industrial enterprise, (its shops, sections and labour brigades) are prepared by their respective managements. The reliability of returns depends on the state of accounting. This explains why the general guidance over primary accounting has been entrusted to the Central Statistical Administration of the USSR and its local agencies. But here also the question reduces itself only to the definition of the initial principal positions. The primary accounting in the enterprises and building projects, control over such accounting and also the approval of the forms of accounting are the functions of local administration agencies. Such a procedure of organisation of accounting and returns provides fully reliable and regularly available sources of data. It is important to note that great freedom is given for continuous improvement in accounting and for maximum adaptation of the returns to make them suitable, as far as possible, for the operating needs of an enterprise.

As a form of statistical observation, accounting is distinguished by the reliability of its data. A feature of this form of *observation* is the grouping of

statistical material according to different characteristics defined in view of the purposes of investigation, and for this the statistical agencies collect returns of primary building organisations and conduct their further statistical analysis on the basis of these returns.

The fact that current standard returns serve as the basis of construction statistics greatly simplifies its organisation, because we do not have to prepare every-time a new system of indicators or to prepare instructions to brief statistical workers or to organise observation on spot afresh on each occasion. The system of returns remains stable; of course, changes can be made and are actually made in practice. But such changes have a marginal character and do not affect the essence of the matter. But at the same time returns must be distinguished by their effectiveness. For this, proper timing is of considerable importance. The returns must be minimum in number and, as a matter of fact, they are so. There is also another requirement, viz., that of limiting the group of indicators which are included. In this case, however, the requirements of national economic accounting do not always coincide with the requirements of accounting for operational control of the business and its management.

The subject of statistical work on construction may naturally change. Necessity might arise for intensive statistical study of the individual aspects of the activity of building organisations, individual branches or regions of construction. This, of course, does not mean that the returns have to be revised every time such necessity arises. In such cases, very often we find other forms of statistical observation to be useful,—censuses and surveys which extend and intensify our knowledge obtained from the returns. One example of such a case may be the sample survey organised at present on the construction of the most important new projects by different branches of the national economy. This survey covers about one thousand projects, i.e. less than one per cent of the projects in the USSR.

In solving the task of organising the national economic accounting of construction, Government statistical agencies are concerned with two kinds of work.

The Central Statistical Administration of the USSR exercises extensive methodological guidance not only over the current reporting but also over statistics. This is one of the basic functions connected directly with the processing and summarisation of statistical data.

Statistics of construction comprise not only the organisation of observation in different forms, control, summarisation and groupings of the statistical information but also the analysis of the statistical data, because such analysis is necessary for exercising control over the progress of the national economic plan from the plan in the course of its fulfilment and also over the causes giving rise to such deviations. Finally, analysis enables us to discover internal reserves in the economy and to utilise these reserves for a quicker realisation of the building programme of the country.

As we can see from the discussion above, the methodological work regarding construction conducted by the Central Statistical Organisation concerns problems of methodology of primary accounting and statistical methodology.

The methodology of primary accounting is concerned exclusively with the main problems, on the correct and uniform solution of which the quality of returns, the possibility of summarisation and grouping of the data depend, not to speak of the assessment of the results of activities of the building organisations and comparative analysis of this data. This purpose is served above all by the use of standard forms of the primary documents meant for accounting the volume of building works, output of building workers, performance of building machinery and cost of construction.

Besides the form of primary accounting, groupings of expenditure for construction work and classification of investment as a whole are also standardised forms. Moreover, the standard procedures for reflecting the financial results of the activities of each building trust and also of their separate administration subdivisions—building offices and enterprises—are also defined.

All these sub-divisions are independent economic units, each of which has its separate balance sheet and its own programme of work. Hence it is very important to know the progress of this programme and the quality of the activities—productivity of labour and cost—and also to know the financial results of its activity. Grouping of the data of the returns by such characteristics refers to the circle of problems studied by capital construction statistics.

While working out the methodological principles for primary accounting of construction, government statistical agency sets before itself concrete tasks, for example, of ensuring the comparability of data on the construction with the indicators of the plan and of the estimates in the technical designs, on the basis of which construction is conducted. As a general rule for the organisation of construction in the USSR, the construction agency must have in possession essential technical and design documents. The estimate reflecting the volume of construction and its cost must form a part of such documents.

During the course of construction it is obligatory to proceed exactly according to these documents and the targets of construction, which reflects the volume of work envisaged in the estimate during different periods.

Thus, Government and Co-operative constructions must be conducted according to the plan in pursuance of the design and the estimate, while Government Statistical agency has to organise systematic observation on fulfilment of these requirements, utilising for this purpose the system of standard indicators of primary accounting and the returns. In the organisation of the statistical work based on the returns, the entire system of governmental statistics beginning with the local statistical agencies and ending with the Central Statistical Administration of the USSR takes part. Local statistical agencies collect the returns, which flow to them periodically at fixed dates by mail or, should such a situation arise, by telegraph. They check these returns and prepare summaries according to a definite programme, taking into account the requirements not only of the local but also of the Republic authorities on planning. Summary data in tabulated form are submitted to the Statistical Administration

of the Republics, which consolidates them once again and sends them to the Central Statistical Administration of the USSR. We should note that all this work is conducted by extensive utilisation of mechanised computing, as every provincial and Republic Statistical Administration has a computing station equipped with computing machines of high capacities. Those machines go to replace manual labour for checking, tabulation and grouping of the statistical data and also for calculating averages and relative indicators based on these data. These computing stations make it possible to prepare the summary reports in the local statistical agencies. At the present time, they prepare monthly and quarterly reports on construction and industry in each individual economic administrative region and under each economic council.

Thus the introduction of mechanical accounting is not limited only to purely statistical work. The computing stations provide the possibility for solving another very important task, viz., to mechanise accounting in the building organisations themselves, and this goes to improve their quality and to reduce overhead cost in construction.

Moreover, the mechanisation of statistical and accounting work greatly increases the possibility of using the data of primary accounting for economic work.

Organisation of observation, filling in of the reporting schedules, processing and consolidation of the returns etc.,—all these works are simplified to a great extent and become manageable owing to the extensive use of mechanised accounting.

The whole work of economic analysis of capital construction, which go on developing in the system of the agencies of Governmental statistics, could not have assumed such a scale without the powerful computing technique, which not only simplifies the work of the statistical apparatus but also makes it easier.

II

The programme for statistical work regarding construction consists of two fundamental parts.

In one of them, investments are studied and, in the other, the building activity. Each of these two important parts of statistics of construction has its own system of indicators and sources for data.

We shall be dealing with statistics of investment first.

The subject of study for investment statistics are the expenditure for creating new and for expanding the existing fixed assets of industry, agriculture, transport, communication, trade and the like, as also the expenditure for erecting dwelling houses, public utilities, schools, hospitals, etc. Efficiency of a specific industry is in the last resort determined by the volume, composition and industry-wise structure of the basic assets which are created, and also by the tempo of introducing these assets into actual operation.

All these questions are studied by statistics of investment for the country as a whole and for independent economic regions. The first thing to be decided when undertaking this task is to distinguish investments from expenditure similar to them.

Evidently, to solve this question correctly it is necessary to prepare a classification of investment with concrete definitions of the nature of the expenditure which must be looked upon as capital expenditure. Simplification is also needed. For instance, the purchase of materials of value upto 500 roubles each, or all articles with a service-duration upto one year irrespective of cost, should not be included in investments. Such articles are accounted for under the heading of circulating assets of an enterprise. Investments also do not include the expenditure on repair of equipments, buildings and structures. Expenditure for these activities is included directly or indirectly in the expenditure on inputs by the given enterprises. As regards the personal property of citizens, structures of permanent nature are only included in investment. Other durables are not included in investment. In view of the varied character of investments, they are classified according to different characteristics.

Statistics of investment also determine the volume of investment in different branches of industry by purposes. From industrial classification the distribution of investment among different industries of the national economy may be clearly seen. It can also be ascertained what portions of investment are directed respectively to the sphere of material production and the non-productive sphere. Not only the aggregate data but also the statistical groupings relating to territories and regions are subjected to industry-wise classification. Otherwise statistics of investment would not possess the great significance as a tool of cognition which it possesses to-day. This underlines the significance of combined groupings of the indicators of the volume of investments for different industries and regions.

One important characteristic of the classification of investment is the structural sub-division of the investments.

The distribution of investment among the branches of national economy shows for what purpose they are meant, i.e. the respective needs which they satisfy. But the elements of material production included in investment should be known. For this, investment is classified into the following basic categories :

(1) building works,

(2) equipment required for installation work,

(3) equipment under installation,

(4) equipment which does not require installation—means of transport, instruments and inventory goods accounted for in the stock of fixed capital, and

We clarify the relations among the production of industrial equipment, its distribution over territories and its use by the different branches of the national

economy and by the different economic regions. On the other hand, the volume of building and installation work, which becomes apparent in this classificatory scheme determines the programme of activities of the building industry, its spread over different regions and its specialisation into different branches of production and into different kinds of work. The same indicators of the volume of the building work also serve as the basis for calculation of the materials necessary for construction and for the determination of designs, machine-techniques and working cadres.

The use of such a classification, in which we separate the building and installation work becomes also necessary for calculating the national income and the total national product, of which building and installation works, but not other items of building investment, represent a component part. (The methodology used in the Soviet Union in estimating national product and national income excludes the possibility of double counting. The finished output of industry (equipment requiring or not requiring installation) is not included in the volume of construction and installation work sand are not consequently considered as the output of construction.)

Finally we should note that the statistical study of the structure of investment plays an essential role in the clarification of the questions regarding efficiency. As a matter of fact, the general trend in the development of production technique leads to an increase in expenditure for equipment. Thus the share of the most productive part of the fixed assets of an enterprise goes on increasing.

Statistics of investment are based, as we have already noted, on the data of returns. Returns as a form of statistical observation has assumed a leading role everywhere except in the case of investments for private dwelling houses of collective farm workers, city dwellers and workers of settlements on their own account. In this latter sphere statistics depend on censuses conducted from time to time and on current registration of the number of houses built.

Inasmuch as certain investments become necessary for normal functioning and for planning the development of any enterprise, each enterprise must be taken as a separate accounting unit for statistical purposes. The same can be said also in respect of industrial, trade, agricultural and like enterprises that are being built, and also of the organisations and institutions having non-productive character, viz., stadia, theatres, hospitals, etc.

The number of accounting units is large; but their composition is simple and well-defined. This is possible because all enterprises, organisations and institutions, which make investments, are clients of the long-term investment banks.

These banks are broadly of these types.

The industrial bank finances investment in industry, transport, communication and trade. The public utility banks headed by the central bank for municipal housing, finances investments for municipal housing, for institutions, and for organisations of public health, culture and education. The agricultural banks finance agricultural investments.

Here we should note that by far the largest part of investment in the country is undertaken according to a definite plan. For each district or smaller "rayon" administrative region the sum of investments is known as well as what are the investments of each enterprise, organisation and institution according to the plans. The local planning and economic agencies deal with this matter directly. As accounting units, all the organisations, institutions and enterprises, making investments, are called "builders". This term has a wide meaning. Builders are not only those who invest capital in construction, but also those who increase their own fixed assets through purchase and installation of new equipment or purchase of means of transport and other items of basic assets. And hence, though we estimate that at the present time there are more than one hundred thousand projects in the USSR, the number of builders is even more. We should not miss noting that, while solving the question of selection of accounting unit for capital investment statistics we have not taken a building or a structure as a unit of accounting, but have taken a larger unit, a known aggregate of them defined by a definite organisational characteristic.

This characteristic is contained in the concept of "builders", which may combine in itself different items of construction which are necessary to the builder according to the character of his activities. As an accounting unit, the "builder" represents a quite stable entity. It is extremely important for construction statistics. The data of investment are collected from builders, each of whom prepares returns containing the standard system of indicators. Three kinds of indicators are found in such returns, viz., first, the investments made; secondly, the items of assets and production capacity commissioned; and thirdly, the financing of investment.

On the basis of these indicators we study three interconnected subjects. While outlining measures for investment we must, above all, know the expenditure involved in this. The volume of such expenditure is determined by the estimate and on the basis of the estimate the sum to be financed is determined.

Thus the first thing that must interest the statistician who deals with investment, is the sum of money actually received by the builders. But the amount of finance, i.e., the resources received, may not be the same as the sum of investments actually made. Statistical indicators of investment are the expenditure by which a definite item of asset is created, fully or partly. For instance, the expenditure for building the foundation or for the equipment for this foundation is an item of investment. But if the materials for the foundation or the equipment in question remain in the warehouse of the building organisation, the expenditure incurred on them does not constitute investment. However, the case of those objects which come to be operated in a mobile condition, such as power equipment for agriculture, building machinery, means of transport, etc. is somewhat different. The very fact of their acquisition by the builder is sufficient to decide about their inclusion in the investments. Hence we can understand the meaning of the indicators of investment made

as a characteristic not only of expenditure but also of the physical volume of investment in the fixed assets, making no distinction between the items to be expanded or to be created anew.

The volume of investments is expressed along with capital expenditure in value terms, i.e., in terms of roubles. But there is a distinction; for calculating the volume, the prices of a given year are used. These are the prices used for preparing estimates for investment. This creates a stable base—a system of prices which remain constant during a number of years, because estimates are framed according to the current procedure on the basis of the prices of a certain year of the same period. Thus, for example, during the period 1937-45 estimates were prepared in the prices of 1936, thereafter during 1945-49 in the prices of 1948 and so on. At the present time (beginning from 1955) estimates are prepared in the prices current on 1 July 1955. Such a practice of framing estimates takes into consideration the change in the delivery prices fixed by the Government, these prices being periodically revised with rise in labour productivity and reduction in the cost of output. Each time, while changing the level of the estimate prices there may be a full possibility for defining a coefficient of deviation of new estimated price from that prevailing earlier. Statistics of investment extensively use this possibility. With the help of such coefficients, indexes of estimate prices are prepared and these indexes are necessary for calculating the progress of the actual volume of physical investments in the same estimate price. The estimate prices of 1955 are used at present for calculating the volume of investments during the entire period of Soviet power. The index of the physical volume of the capital investments is calculated from the data of their estimated value in terms of the price on 1 July 1955 and such data are prepared with the help of the index of the estimate prices. In a word, constant prices are used for measuring the progress of physical investment.

Alteration in the delivery prices, or a general revision of prices is not made very often. Partial alteration in the delivery prices for individual commodities is a continuous operation and such alteration is not accompanied by corresponding change in the base year prices.

In view of the huge scale of construction in the USSR it is very important to see to it that the preparations of estimates are done in an organised way, so that the preparation of estimates might be based on approved norms and prices. Whenever the estimate norms and prices are to be changed, the estimate handbooks and price lists are prepared well ahead of time. Of course, there is no sense in changing the estimate base for every change in delivery prices. It is true, and it should not be forgotten, that the functions of estimate are not limited to planning and accounting of the volume of investments. An estimate serves, above all, as a financial document as well as for settlement of accounts between the builder with the contracting organisation, because the sum stiplulated by the agreement of the contract is fixed by the estimate. Hence it is natural that every change in

the delivery prices must not be reflected also in the accounts for the construction. This, however, is done without revision of the estimate prices and without revision of the estimates themselves. Estimates go on being prepared in the same prices as taken in the earlier period but in the financial documents for settlement of accounts revisions are made on the basis of alterations in the delivery prices and the degrees of their influence on the expenditure for building production. Thus, during the period intervening between general revisions and changes in the delivery prices, stable estimate prices are preserved, and this does no harm to the normal conditions in the economic activity of the building organisations.

We should note that the use of constant prices has an advantage not simply from the point of view of the correct and easy solution of the purely statistical problems. No less essential is the fact that the existence of constant prices simplifies observation on the expansion of construction according to the targets fixed for the different regions and branches of the industry and observation of the progress of the economic activity of each building organisation taken separately. Thus the correct solution of the question of estimate-price-level is necessary not only for planning, but also for operational work of the building organisation and for the banks supplying finances. This is also necessary for settlement of accounts between the building and the contracting organisations and these accounts relate to the volume of work calculated in terms of the estimate prices.

Only the volume of work fulfilled in accordance with the technical document and accepted by both parties is to be paid for by the customer; and this requires that construction statistics are based on fully reliable initial data on the primary documents. Statistics here depend on those actual data, which are found with each building organisation and with each builder and needed by them for current management.

Now we shall discuss the indicators of the commissioning of fixed assets and production capacities.

The commissioning of fixed assets and production capacities is the aim of investment. Statistical study of these indicators is of great interest. The basic form of observation, which is used in this type of statistical work and which is also used for studying the volume of investments is the same, i.e., through returns. But for studying commissioning, not only the value indicators are used but also the indicators in physical terms. Value indicators are the estimate and actual cost incurred for the items of fixed assets and enterprises brought under operation. This permits us to measure the total increase in the fixed assets as a result of investments and to determine the rates of such increase as a whole for the individual industry and for the individual economic region.

Physical indicators of the volume of the fixed assets put into operation are necessary for analysing a series of most important questions concerning the progress of the plan of investments. Housing construction plays an important role in the USSR and certainly it is impossible to evaluate its scale and rate only on the basis of

the data on estimate cost of the houses built. It is necessary to know also the number of houses and flats, their floor-space, and a number of other indicators characterising the qualitative aspect of dwelling house construction and the duration of construction of the buildings and other indicators. The numerical data combined with the data on value enrich the whole statistical information. The technical and economic indicators necessary for analysing comparative efficiency of the construction of dwelling houses or industrial structures of different types and in different regions are based on their combination. Of course we cannot measure all the fixed assets with the same physical unit. The units are different for diffrent types of fixed assets and hence a correct choice of the physical measures has great methodological significance for the organisation of investment statistics.

Physical measures may be classified into the following categories :

(1) *Items of assets.* The number of assets are determined mainly by the number of buildings—dwelling houses, and public utility construction such as schools, theatres and other structures of a non-productive nature, In construction for production purposes we count, as a rule, the number of whole enterprises, (factory, works, mines, power-stations) or the number of individual production units (blast furnace, open-hearth furnace and the like).

(2) *The capacity of the objects of construction.* These measures are non-homogeneous. For dwelling houses the measure of the number of flats or living space, for schools the number of seats provided to the students, for hospitals the number of beds, for theatres the available capacity in terms of seats in them. As regards the construction units for production purposes the physical measure of capacity must indicate the production capacity of the unit, and these indicators must express the special character of production of each industry. Thus, for power stations the indicators are capacity in K/W hours, for blast-furnaces output of pig iron, for mines the output of coal, etc.

However, for manufacturing industry we can define a general aggregate physical indicator, which may also be used in statistics. Such an indicator is the production space of the enterprise. The indicator of space is of special significance for the manufacturing industries where the enterprises produce heterogeneous products in large varieties. This is mainly the case with machine building works. Physical indicators of the production space in m^2 when combined with the data on the projected capacity of the works for output in money terms is widely used for comparative analysis of the efficiency of investment, maximum utilisation of productive floor space of the new factories, output per unit of production space, etc. It can be well understood that such a method of statistical study is also suitable for manufacturing industries—light industry, textile and shoe industries, etc. In these cases, these methods are also used to a certain extent.

Like the volume of capital investment, commissioning of the completed project is reckoned by the builders at the sites, and this is necessary in view of the condition

of administration and for making final settlements of construction with the contractor. At this stage statistics of investment are based on direct accounting data, which are thereafter used for preparation of returns and for consolidation in national summaries.

Returns do not reflect much of the information contained in the primary reports of the projects. For current statistical observation the most important information is collected from the accounting data. In this case, the data on the execution of the programme of construction of dwelling houses and cultural buildings are of the highest priority. In this part the indicators on commissioning are summarised in physical and value terms for the country as a whole. There is always a full picture on the additions to the housing of the country, the composition of new housing, its territorial distribution and so on.

Following a similar procedure, statistical summaries are also prepared in respect of schools, hospitals, kindergartens, creches, boarding schools for secondary school students, clinics, etc., which are commissioned for use.

Current observation is conducted for the country as a whole only for a number of relatively large and important industrial projects. Smaller projects do not directly get reflected in the national summaries.

For a number of leading branches of heavy and light industry the production capacity of the fixed assets put into operation appear in the aggregate without reference to individual characteristics of the projects. This fully satisfies the current needs for economic analysis, because in statistical processing the data are given industry-wise and building-wise. The building programme is carried out mainly on contract which is the predominant type of building activity. Hence, in the plan of Government statistics of investments special importance is attached to the study of the building industry—the system of building organisations working on contract. Indicators of their activities are regularly expressed in statistics and cover the following questions: the composition of the contract organisations, their distribution over regions, specialisation and cooperation of their activities, volume and structure of the works performed by them, labour and labour productivity in them, machanisation of construction, stock of material and their utilisation, cost and the profitability of construction works.

While organising statistics of this industry it is necessary to proceed on the basis of the essential peculiarities of construction.

The output of construction consists of buildings and structures or of their parts. Buildings or structures are extremely varied as regards their purpose, technical features, etc. But irrespective of this fact, all of them, as output of construction, possess one general feature, by which to distinguish them from the output of other industries. The main feature of the output of construction is that it is fixed to a definite place; the output of other industries say, of any factory, moves from the

place of production to the place of final utilisation, while the production unit remains fixed at a place. In contrast, the output of the building industry remains fixed at a place, while the producing units, viz. the building organisations shift from place to place. The primary building organisations—building administrations, offices, sections —continuously change their place of work. The changing composition and territorial location of construction lead to alterations in the structure and location of the building organisations working on contract. These peculiarities also influence organisational structure of the units working on contract. As a rule, they operate within trusts which are created for definite territories and have a large region of activity comprising of cities, districts and even a whole Republic, if we have in view the specialised trusts working under contract. Trusts are treated as legal personalities and control the work of subordinate construction agencies, namely sections, offices, directorates which are under them.

In this organisational structure a statistician can use two kinds of reporting units. In one case this will be a trust as a whole and in the other, each primary organisation working under contract. The selection depends on the purpose of investigation. Thus, for studying questions of territorial distribution of the network of building organisations working under contract, their specialisation and co-operation, it is of doubtful value to limit the study by such a large accounting unit as a trust working under contract. For current study of volume, structure and cost of construction, the number of workers engaged in construction under contract, productivity and the stock of building machinery and their utilisation, a whole trust may be taken as the primary reporting unit.

This is also used in statistical practice. Groupings of the basic indicators of the activity of contract organisations and the process of summarisation for the whole country is based on the summary reports of the building trusts working under contract. Hence we may conclude that statistics of building industry uses as an accounting unit a building trust and also a building organisation under it. The latter is administratively independent and also prepares separate balance sheets and conducts its economic activity independently, conforming to the plan fixed by the trust. All of them prepare returns of their own activities and send them to the local statistical agencies; this permits the summary data of the trust to be subjected to detailed scrutiny and analysis and also the data on the work of the building industry to be grouped according to individual organisations of the trust. Because the information of Government statistics is extensively used for actual control over the economic life of each individual district of the country, the data on construction have to be arranged under these two heads out of practical necessity. They are used locally and also for consolidated summary of the national economy.

The processing of these data presents some of the most complex methodological questions. But there is a very general indicator of specialisation and co-operation which is in extensive use in Soviet construction statistics. Specialisation of contract organisation is reflected in the structure of work

and the method of performing such work. The entire work according to the design is given to one contract organisation. The main contracting organisation executes one part of the work out of its own resources, i.e., the part which is most labour-intensive and most complex from the technical side. The rest of the work, special kinds of work (the sanitary engineering works, electrical works, etc.) are given by the main contracting organisation to other organisations, which are specialised in the given branch of the building activity. The more the specialisation, the more the share of work performed by the contract organisations of this category. These latter act as sub-contractors in their respective relations with the main organisation. Such organisation of construction by contract is reflected in the statistical indicators of building industry.

Each contract organisation, at any rate the main organisation, shows in its returns indicators of the volume of construction on contract under two headings :

i) the total volume of work including the work performed by other organisations according to the terms of the contract or the sub-contract; and

ii) the volume of work performed by own means, i.e., by the personnel of the reporting organisation.

Such data, summarised and grouped by districts, economic regions and Republics, show the actual work of any group of contract organisations.

In the statistical summary the significance of the indicator of the total amount of all works consists in the fact that it permits us to define the share of sub-contract work in the total work done by the contracting organisation by its own means, i.e., work done by way of specialisation and co-operation. The above-mentioned method is used for current processing, because it is simple and can be easily done. Direct information on the composition of contract organisations, their number, location, type and kind of specialisation and co-operation is obtained by surveys. The initial data for these surveys are collected from the same returns but they may be supplemented according to the questionnaire.

These surveys mainly deal with the more detailed groupings of current data in the building industry collected by the statistical agencies. The schemes of such groupings envisaged in the surveys contain, as a rule, indicators characterising the regional distribution of the building organisations, their specialisation, grouping by the volume of work, as well as according to the departments they are subordinate to.

All the indicators mentioned above are based on the data available in the current returns of the contract organisation, but their processing is not done automatically. By conducting a survey, Government statistical agencies obtain necessary information not from the contract ortganisations but from the local statistical agencies which process information obtained from the reports of the contract organisations collected independently of any survey.

The programme of statistical study of building industry includes the indicators which indicate the basic conditions of the productive activities of the building organisations.

Labour indicators such as data on available labour, their composition and utilisation of labour, and particularly data on the productivity of labour are of utmost importance.

Each project keeps a current account of all the personnel employed in it. Simultaneously account is kept of the workers actually attending. The balance shows absenteeism due to different reasons (Governmental and public duties, illness, etc.).

These data are shown in the returns and are processed by statistical agencies. The occupational composition of the workers is not currently studied, this would be a very complicated matter. But from time to time separate censuses are held on the subject and the information obtained is used for analysing the occupational structure and the availability of certain categories of workers for construction, and the changes in the occupational pattern owing to alterations in building technique.

Now we shall be dealing with the indicator of labour productivity. In construction statistics, labour productivity is studied on the basis of the data on the average output of workers of the building organisations. Account is taken of the average volume of building work (in estimate prices) performed by the workers during a definite period, say a year, a quarter or a month. This indicator is very simple : it is obtained by dividing the volume of the work performed by the average number of workers; and this is incorporated in the return of every building organisation. It is true that there is a danger that the indicator of output in estimate prices is not always suitable for indicating the productivity of labour, owing to variations in the pattern of the operations undertaken in construction. But those considerations are not essential for statistics meant to study the productivity of labour by groups of building organisations. Such variations are actually smoothed out and hence cannot distort the trend shown by the indicator of output. This is the case, not only in the national economic summaries but also in the case of smaller summaries, i.e., the Republic and district data. If we take the case of building organisations, the structural changes due to specialisation, which more and more goes on influencing their activity, become less and less noticeable. Each building organisation at the present time performs a very definite, limited and homogeneous type of work. The arbitrariness of the concept of labour productivity in estimate prices is felt in the comparative analysis of the work of different building organisations of different specialisations. One should not forget that output is determined by the sum of all the expenditure for production and that the composition of the expenditure depends on the character of work done. Some works require more material than others. Works are also different in labour intensity. All this often makes the data on the output of building organisations of different specialities non-comparable; but there remains

the possibility of using data on output for comparing organisations which are akin in respect of the character of work.

The statistical analysis of labour productivity is intimately connected with the analysis of the mechanisation of construction work. Extensive mechanisation has been one of the most important factors for increasing the output of construction in the USSR. This has lightened the labour of the building workers and reduced the labour intensity, not to speak of the resulting increase in the tempo of construction.

The use of building mechanisms and machines is not limited by the aim of increasing the profit. Whenever mechanisation lightens and economises labour of a worker, it is introduced, even when there is no direct possibility of obtaining profit.

Any economy in working time is advantageous for the whole society, because this would offer the possibility of utilisation of labour more efficiently.

Statistical observation on the mechanisation of construction is undertaken only for relatively large building organisations. Information in this respect is collected under three headings :

1) the stock of building machinery and their composition,

2) the utilisation of this stock, and

3) mechanisation of the basic labour-intensive works.

Finally, we have one question more on the indicator of cost in construction work. The methodological peculiarity of this subject is the selection of the unit of statistical observation and the definition of a basis for estimating the actual cost of work as per returns. At first we encounter the necessity for accounting all construction works done by objects of construction, i.e. in terms of the buildings and structures without any break-down into different kinds of works and different elements of design viz,. earth work, foundation, walls etc.

Though an attempt for such detailed study of the cost of construction was made before, the results of such efforts were not positive. This was so owing to the technical complexity of detailed accounting of the building work—the list of different operations of construction works being large in number. In the case of earth-work alone there are more than 100 operations, different in character, according to the nature of the soil, the method of earth-cutting, modes and distance of transporting the earth etc.

At present statistics of cost is based on the general data on expenditure for an object as a whole without any distinction being made among the different kinds of works involved.

Actual reported cost of building works is compared with the estimate cost. This latter, and not the actual cost of another reporting period, is the base for cost analysis. The building organisation does not maintain accounts of the actual cost

of separate items of building works, because the list of these operations is extremely long. Under these conditions the index of actual cost is calculated on the basis of the index of variation of actual cost from the cost in estimate prices.

Such calculation presupposes that the estimate prices are constant over all the years and we have already remarked that the prices as on July 1, 1955 serve as such prices.

The statistics of building industry also cover the work which is performed by the means in possession of the builders themselves. In the returns of the builders additional indicators for such activities are incorporated : data on the labour employed in construction, mechanisation of the works of building materials and their stocks and cost of construction. Finally, we should point out that the statistics of investments are periodically published in the statistical handbooks issued in large number of copies and also in the form of biennial or annual publications of the Central Statistical Administration of the USSR regarding the progress of the national economic plan. These materials inform the entire population of the achievement of the country in the sphere of capital construction, and they help us study the investment and the activity of the building industry and also assist us in discovering the potentialities in the sphere of construction.

BASIC PROBLEMS OF THE STATISTICS OF NATIONAL INCOME IN THE USSR.

By P. M. MOSKVIN

The problem of national income is one of the basic problems of the reproduction of national economy. The volume and dynamics of national income reflect the economic development of the country and the growth of public production. National income is the source of expansion of production and consumption by the population.

The production of material wealth in any social structure is an indispensable base for the existence of human society. The material objects of consumption produced in the branches of material production constitute, in their totality, the social product.

In the process of production a part of the total social product is used for the compensation of the means of production consumed. This part of the total social product contains the expenditure on previous labour, transferred from the means of production spent to the product. The national income is what remains of the total social product after deducting from it the part which compensates for the means of production consumed.

National income is that part of the value of the total social product which constitutes newly created value but not transferred value.

In its material structure, national income is the total volume of the means of consumption produced in the country and that part of the means of production produced which is used for the expansion of production. National income is a source of the incomes of all classes of society and not just the sum of individual incomes as is believed by some economists.

The character of reproduction of social product and national income, their production, distribution and utilisation are conditioned by the nature of the relations of production underlying a given economic system.

In the USSR the reproduction of social product and national income, the rate of growth, the nature of distribution and utilisation of social product are determined by the basic economic law of socialism. The basic economic law of socialism expresses the purpose of socialist production—securing maximum satisfaction of the constantly rising material and the cultural requirements of the entire society and provides the means for achieving this—continuous expansion and perfection of socialist production on the basis of higher technique. The basic economic law of socialism determines all main aspects of the development of socialist economy.

Let us examine the scheme of reproduction of national economy.

The scheme of reproduction on an expanded scale may be denoted by,

Department I	4000c	1000v	1000m	6000
Department II	1500c	750v	750m	3000

In the scheme, Department I is concerned with the production of means of production and Department II, means of consumption while c, v and m respectively stand for constant capital, variable capital and surplus value.

In the given case, the total volume of socialist production amounts to 9000.

National income in terms of value is equal to $(1000v+1000m)$ of Department I$+(750v+750m)$ of Department II. In its material form it will consist of the product of Department II (3000) and the accumulated part of the product of Department I (500). National income in its material form may be considered also as $\frac{1}{3}$ of the product of Department I plus $\frac{1}{2}$ of the product of Department II. (In the given case, under the conditions of Soviet economy, $1000v+750v$ is the product for the individual and $1000m+750m$ is the product for the society). In socialist society the law of value is not a regulator of production. The sphere of operation of the law of value is chiefly confined to articles of personal consumption. The law of value regulates, within certain limits, only the movement of goods in circulation. The movement of the means of production in the national economy is not regulated by the law of value.

But how is it that we can speak about the value of the means of production, their cost and price ? It is necessary for determining the profitableness and unprofitableness of enterprises, for checking up and control of activities of enterprises. Though the law of value does not function as a regulator of production in the Soviet economy it does influence production because of the fact that the expenditure of man-power in production is covered by consumption goods which are governed by the law of value in socialist reproduction. This makes it necessary to take into account the effect of the law of value in the production not only of consumption goods but also of means of production. The money value of a commodity expresses the quantity of labour spent on it not only wheret hese goods are produced but in the whole of social production. In this sense we can speak about the value (monetary expression) not only of goods which are used for consumption but of the whole social product.

In the USSR social property in the implements and means of production is the basis of the relations of production which signifies a fundamental difference between the social-economic contents of the national income of USSR and those of any capitalist country. The national income in USSR belongs entirely to the working people and is used in the interest of the whole society.

National income may be shown in two-fold form : as the aggregate of material wealth used for non-productive consumption and accumulation and as a definite amount of value expressed in monetary terms.

One of the fundamental problems in studying the national income is the problem of differentiation of productive and non-productive spheres, the question of determining in what branches of the national economy, national income is produced. Only on the basis of delimitation of thes phere of material production from other forms of social activity is it possible to determine the real volume of the national income and correctly characterise the process of its distribution, redistribution and utilisation.

The material production is the basis for the existence of the sphere of production of services, basis for the existence of workers engaged in non-productive sphere. Hence it is necessary to distinguish between the labour for the production of material wealth, and the labour in the non-productive sphere, such as that connected with functions of general administration, cultural and municipal services.

The social product and national income are not created in non-productive branches. The workers, engaged in non-productive spheres (state administration, culture, municipal services, medical service etc.) do not produce material wealth. The labour spent in branches of non-productive sphere is labour of social utility.

But material production is the base for the development of society. The tasks of the development of national economy demand further simplification of the state as an administrative apparatus, liquidation of superfluous links in the apparatus of general and economic administration, elimination of unnecessary links in the sphere of distribution of means of production and in the sphere of commodity circulation, and establishment of just proportions in the distribution of labour in manufacturing enterprises.

To the sphere of material production belong, the branches, the distinguishing feature of which is that labour in these branches creates use values, i.e. goods used for the satisfaction of peoples' requirements either directly as consumer goods, or indirectly as means of production.

The branches of material production, i.e. the branches in which the social product and national income are formed are the following :—

Industry
Construction
Agriculture
Forestry
Transport (for transportation of goods)
Communication (only for serving production branches)
Trade (in the case in which it deals with continuing the process of production in the sphere of circulation : storage, finishing off, transportation, packing, etc.).
Other branches of material production (e.g. publishing, film studio etc.).

In the conception of the bourgeois economists it is possible to consider any income as compensation for services rendered by labour, capital or administration. According to this "theory", the source of profits received by the capitalists is not surplus value created by the working class but the "activity" of the capitalists themselves, the source of incomes of officials of state capitalist apparatus is services rendered by them to the society. In such an interpretation of the problem, real source of income is invisible, the problem of redistribution of national income is actually ignored and its exaggerated volume is given.

Such an interpretation of national income inevitably means giving up any objective criterion for the definition of its contents and its quantitative characteristic. Attributing the sphere of services—legal offices, various pleasure houses, religious organisations as well as government organisations, army, court, police—to the branches in which the national income is produced, these economists, if they want to be consistent, should consider also the services rendered by individuals to themselves as belonging to these branches.

Indeed, in the case of output of branches of material production, it is quite right that not only is the commodity output taken into account, but also output in kind, for example, output produced and consumed in the peasant households.

But it is clear that an interpretation of national income according to which the national income would include the services rendered by individuals to themselves is quite incorrect.

National income created in the branches of material production goes into distribution.

Under socialism the distribution according to labour is the only possible and necessary way of the distribution of material wealth. The economic law of distribution according to labour requires the distribution of products directly depending on quantity and quality of labour of every worker.

National income in socialist society is distributed in the following way. Nnational income created in the state sector is divided into two main parts. One part of income assumes the form of wages and salaries of workers and employees of state production enterprises. This part of income is the production for oneself, created by workers engaged in material production. The other part of national income created in the state production sector is the product for society or net income. Net income of the state production sector assumes two main forms: (1) net income of state enterprises (profits of enterprises) and (2) contributions to income of the State (turnover tax and other taxes).

National income created in the commonly-owned farming of the kolkhozes (collective farms) is the property of the kolkhozes; it also consists of two main parts: one part is the product for oneself, the other part is the product for the society. The product for oneself created by the labour of kolkhozniks (collective farmers) in the commonly-owned farming of the kolkhozes assumes the form of incomes in kind and in money distributed among the kolkhozniks according to their workday units.

In addition, collective farmers earn incomes in kind and money from their subsidiary husbandry.

The product for the society created in kolkhozes is the net income of the kolkhozes. A part of the net income of a kolkhoz is used for developing kolkhoz production for satisfying the needs of the whole kolkhoz and the material and cultural requirements of kolkhozniks. The other part of net income created in the kolkhoz sector goes to the state to be turned into the centralised net income of the state. In this way kolkhozes take part in the public expenditure of the state on the expansion of production in town and village, on the development of culture, the strengthening of the defence of the country, etc. The distribution of the products created in producers' co-operatives are also treated in the same manner as those of kolkhozes.

The incomes of socialist production enterprises and the incomes of workers engaged in these enterprises are called primary incomes or incomes received under primary distribution.

To incomes received under primary distribution also belong incomes from subsidiary husbandry of kolkhozinks, workers and employees and incomes from private farming of individual farmers and small enterprises of handicraftsmen not belonging to co-operatives.

The sum of incomes of the population and incomes of socialist production enterprises received under primary distribution gives the grand total of national income.

The component parts of incomes, mentioned above, into which national income is divided in the sphere of material production go partially through the stage of redistribution. By planning, mainly through the state budget, the state concentrates a part of national income into a fund which is necessary for covering the expenses on general administration, defence, social-cultural needs and on financing capital construction. This fund is almost entirely formed out of the net income of socialist productive enterprises and, first of all, state socialist productive enterprises. This fund is formed from the turnover tax, going to the state budget and paid by state enterprises, deductions from profits and income-tax paid by kolkhozes and co-operative producers' organisations. Only a very small part of this fund is formed out of receipts from the population (taxes and State loans).

The wages paid to workers in the fields of education and health, and workers in the state apparatus are met from that part of the net income of society which is expended by the state on social and cultural needs and administration. Thus a part of net income spent by the state on the maintenance of the non-productive sphere, assumes the form of incomes of workers engaged in this sphere. The expenditure on cultural needs and daily necessities of the urban and rural population are partly met by the State. The state pays pensions, allowances, stipends, and provides for various benefits and paid annual vacation etc.

All these payments and benefits, received by the working people of the Soviet state, increase the real wages of workers and employees and the real incomes of peasants.

Some of the institutions and enterprises for satisfying cultural needs and everyday necessities of life compensate for their expenditure by receiving payment from the population for services rendered to them.

National income of socialist society is divided into two parts: the fund of consumption and the fund of accumulation.

The consumption fund consists of the part of national income, which is used for satisfying the increasing material and cultural demands of the working people of the USSR. The largest part of the consumption fund goes to the personal consumption of the population. The other part of the consumption fund is the expenditure of material wealth in institutions and organisations of the non-productive sphere, which is non-productive consumption in these institutions and organisations. Non-productive consumption in the institutions and organisations of non-productive sphere may be enumerated as the expenditure on fuel and lighting, current repairs. books, medicines, and other expenses of these institutions.

The accumulation fund is the part of national income of socialist society, which is used for expanding and perfecting socialist production, for increasing non-productive funds set for housing, construction of schools, hospitals, sanatoria, etc. and also for increasing reserves. It consists of the increase in the basic production funds, the basic non-production funds, stocks of raw materials, fuel and other means of production, and also the increase in the stocks of consumption goods.

As already mentioned, national income is the difference between the volume of social product and the volume of material production expenses, connected with its production. National income is calculated according to the branches of national economy and forms of property. National income of a branch is called the net output. The total sum of national income is estimated as the sum of net outputs in the various branches of the national economy.

The scheme of estimation of the national income of the USSR in the branches of national economy is presented below:

branches of national economy	gross output	material production expenses	net output (col. 2—col. 3)
(1)	(2)	(3)	(4)
industry			
construction			
agriculture			
forestry			
transport (transportation of goods)			
communication (for supplying production)			
trade			
other branches of material production.			

We shall first consider the methods of estimation of the volume of social product. As mentioned before, social product is the aggregate of material wealth produced in the national economy during a definite period of time. However, from the standpoint of quantitative characterisation, such a definition is inadequate.

In the total social product, the value of products which go through successive stages of processing can be repeatedly taken into account. So, the value of ore, produced in a given year and consumed in the process of production of metal in the same year—will be included in the value of the metal; the value of metal smelted and consumed in machine-building industry will be included in the value of machine components, etc.

It is not difficult to see that the transferred value is taken repeatedly into account. Hence the more the number of stages in which the social product is included, the larger is the quantity taken repeatedly into account. It leads to the fact that in computing the total sum of output we shall arrive at different results, depending on the stage of the production process from which we start the estimation of the total sum of social product. We shall have one result if we assume, as a basis, the output of different departments and another result if we assume, as a basis, the output of different factories, etc.

The question is, from which stage we should start computing the total sum of the social product.

The social product is the sum of outputs of individual enterprises, and for a socialist economy the social product is the product, which goes into the turnover of national economy from a given enterprise, or remains in it for the expansion of production or for non-productive consumption. The turnover of output among the various enterprises should not be confused with the transference of material elements within an enterprise, because such transference of material elements from one department to another is a separate stage of the production process; it is not a turnover from the standpoint of the national economy. It would be incorrect to exclude from the social product the turnover among the different enterprises.

The enterprise is the primary link in the social division of labour. According to it, the enterprise is a primary economic unit in the system of economic administration.

The enterprises in the USSR operate in accordance with the principles of economic accountability (Khozraschet). The State provides enterprises with basic and circulation funds and they have to produce on the basis of economic accountability. In the USSR, the supply of output by one State enterprise to another does not signify a sale of goods. But the transference of this output from one enterprise to another is not analogous to the transference of semi-manufactured goods from one department to another of the same enterprise. The transference of output from one enterprise to another means that the output goes into economic turnover of the country.

Hence, the social product is the total of the outputs of individual enterprises.

As seen from above, for each enterprise taken separately, for example, for an industrial enterprise, the gross output as a component part of the social product is calculated as the final output which either goes out of the given enterprise or is the increase in semi-manufactured goods which will be re-made in the enterprise in the future production cycle, or which goes for capital construction or capital repairs or is used within the enterprise for non-productive needs (in kindergartens of the enterprise etc.). It means further that the value of semi-manufactured goods produced in a given enterprise and converted into final output in the enterprise should not be taken into account, as it has been already taken into account in the final output of the enterprise.

The gross output of a branch is the total gross output of the individual enterprises in that branch. The circulation of output among individual enterprises is not excluded from the gross output of the branch and accordingly, from the social product taken as a whole.

Such a consideration of the social product as the total output of individual enterprises emphasises its connection with the system of the social division of labour. So, for characterising the connections and correlations between individual branches, between the departments of the social production—the production of the means of production and the production of the means of consumption, it is necessary to take, as the starting point, the output of the individual branches as the total gross output of individual enterprises.

These principles, with some exceptions, are the basis of calculation of the gross output in the individual branches of the national economy.

The gross output of industry is calculated as the total of gross outputs of individual enterprises. While calculating the gross output of individual enterprise inter-factory turnover is excluded. It means that the value of semi-manufactured goods, produced in a given enterprise to undergo further treatment in a given period within this enterprise is not included in the value of gross output, as their value has been already taken into account in the value of finished goods.

The gross output of agriculture is calculated as the value of all products of plant growing and animal husbandry, obtained during a year. The gross output of agriculture is calculated according to the method of gross turnover. It includes the value of agricultural products, obtained in agricultural enterprises, which had been consumed in the same enterprises in the form of means of production. Thus, the value of fodder crops, grown and consumed in the same agricultural enterprises is included in the gross output of agriculture.

The gross output of agriculture includes the increase in value of unfinished production in process.

The gross output of construction includes the value of completed works, such as works of building, installing, geological survey work, the work of boring, prospecting and project work, dealing with definite objects of construction, less the value of the equipment installed. The gross output of construction includes also the value of capital repairs of buildings and structures.

The gross output of transport, as a component part of social product, consists of the receipts of transport enterprises from the transportation of goods.

The gross output of communication, as a component part of social product, consists of receipts from the operations of communication enterprises serving production.

The gross output of trade is defined as the difference between the selling and purchasing prices of commodities.

In Soviet statistics, output is calculated in kind and in money. The most important problem of statistics of output in kind relates to the definition of the quantity of manufactured products and its correspondence with the adopted plan. Theaccounting of output in kind for every article is practically impossible and even unnecessary. The choice of articles, from which summary results about output in kind are to be obtained, is made with an eye on the practical tasks of planning and management of national economy.

The generalised characteristics of social output are presented on the basis of monetary accounting. For obtaining the volume of social product in terms of money, the output produced in individual branches of national economy should be estimated. The output of individual branches is estimated at current selling prices of the branches in which it had been produced. Such prices in industry are the wholesale prices of enterprises *plus* turnover tax, which is a part of the price of industrial output. Output of agriculture is estimated in the following way. The transacted part of the output is estimated at actual prices realised. The rest of the output is evaluated at the average price of the transacted output.

In order to show the changes in the volume of output, as the definite aggregate of material wealth produced in definite periods of time, output is also estimated in comparable prices, i.e. in the prices prevailing in a given period, assumed as a base.

As far as calculation of volume of material expenses is concerned, it is necessary to take into account the material expenses of the following :—

1. Value of raw materials, fuel, electrical energy and materials spent on production of output and current repairs of basic production funds.
2. Payment for production services (cargo-carrying, transport and communication).
3. Wear and tear of basic production funds.

The following items are not included in material expenses on production :—

1. Wages of workers and salaries of employees engaged in the branches of material production, deductions for social insurance, incomes of kolkhozniks received according to their workday units and other payments to workers of material production.

2. Payment by production enterprises for non-production services (passenger-transport, etc.).

3. Payments to financial credit system—taxes and dues, interest for credit, and also payments not connected with production (fines, penalties etc.).

All these items of expenditure are parts of net output or national income of the country.

In agriculture, the gross output is calculated as the total of separate products, i.e. by the method of gross turnover. For calculating net output, the products manufactured in the very same agricultural enterprises and spent as production expenses in these enterprises (for example, fodder) along with the materials to be purchased should be considered as belonging to the material production expenses.

National income is calculated at current prices, i.e. in actual prices prevailing in a given period of time and comparable prices—the prices of any given period assumed as a base. The national income calculated at current prices characterises, as a part of the total social product, the real volume of value, newly formed during a definite period. With national income calculated at current prices are comparable such indices as the fund of wages paid to workers and employees, profits of enterprises, the revenue and expenditure of state budget etc. For study of the dynamics of the physical volume of national income, national income is calculated at comparable prices.

The total sum of national income in comparable prices can also be obtained by estimating in comparable prices the part of national income which has been used for non-productive consumption and part of it which has been used for accumulation.

An important problem in the study of national income is the analysis of factors of growth.

National income increases as a result of an increase in the quantity of labour spent in the branches of material production (increase in the number of workers engaged in branches of material production), the growth in the productivity of labour and the economies in utilisation of means of production (raw materials, electrical energy, fuel etc.). More economical utilisation of means of production, which means saving of embodied labour, characterises the increase in the productivity of labour.

The growth of productivity of social labour is the main factor in the growth of physical volume of national income in the USSR.

STATISTICS OF NATIONAL INCOME IN THE USSR

Soviet statistics studies not only the volume of national income produced, but its distribution and redistribution and its final utilisation as well. It studies the distribution and redistribution of national income and its final utilisation in socialist productive enterprises, in the enterprises and institutions of non-productive sphere, and the incomes of the population and the utilisation of income.

The scheme of distribution and redistribution of national income in socialist productive enterprises has the following form :

	state enterprises	co-operative and kolkhoz enterprises
I. formation of national income :		
1. gross output of socialist production enterprises		
2. material production expenses		
3. national income		
II. primary distribution of national income :		
1. incomes of socialist enterprises		
2. wages of workers and salaries of employees of state enterprises		
3. incomes of kolkhozniks received from collective farms according to workday units		
III. redistribution of incomes of enterprises :		
1. payments to financial system including :		
a) turnover tax		
b) deductions from profits		
c) income tax from kolkhozes and co-operatives		
d) payments to the fund of social insurance		
e) other payments of financial system		
f) direct assigning of incomes to non-productive institutions		
2. receipts from financial system including :		
a) financing capital construction		
b) financing production/increase in circulating funds, operation expenses and so on		
3. balance of redistribution		
IV. final incomes of enterprises :		
a) used for increasing basic funds		
b) used for increasing circulating funds		

The primary incomes of socialist productive enterprises are the differences between the national income produced in these enterprises and the sum of wages of workers and employees engaged in the branches of material production and incomes

kinds of enterprises and institutions of the non-productive sphere	receipts				expenses			final incomes	
	from financial system	for payments of services	from productive enterprises (deductions from fund of director for cultural needs and everyday necessities)	other receipts	payment into financial system	payment of wages to workers and employees	expenses on payment for services	spent on current material expenses	receipt for increasing basic and circulating funds
I. enterprises and institutions for producing services :									
a) education									
b) health									
c) enterprises for satisfying public utilities and every day necessities.									
II. general administration									
III. scientific institutions									
IV. institutions and organisations rendering financial service to the national economy (banks, savings-banks, institutions of state insurance and so on).									

of kolkhozniks received by them from collective farms according to workday units. The final incomes of productive enterprises are equal to the primary incomes of the enterprises less the payments of these enterprises to the financial system plus the receipts of these enterprises from the financial system. The final incomes of production enterprises are used for the expansion of production.

The scheme of redistribution of national income in enterprises and institutions of the non-productive sphere is given below. Incomes of the population may be classified as follows :—

1. Wages of workers and employees.
2. Incomes of kolkhozniks according to workday units both in terms of money and in kind, received from kolkhozes and incomes of members of producers' co-operatives.
3. Incomes from subsidiary personally-owned husbandry of kolkhozniks, workers and employees.
4. Pensions, allowances, stipends received by the working people from the state and the funds of public organisations.
5. Incomes of individual farmers and incomes of handicraftsmen, not belonging to co-operatives, from their small individual farming.
6. Premia not included in wages, returns from state loans, interests on deposits in savings-banks etc.

The incomes, mentioned above, are the personal incomes of the population.

Besides these incomes, the working people of our country receive from the state a number of additional benefits in the form of various allowances and in the form of cultural and other services.

Incomes of the population are divided into incomes received in the process of distribution and in the process of redistribution.

Incomes received in the process of distribution include wages of workers and employees engaged in the branches of material production, incomes of kolkhozniks received from kolkhozes according to workday units and incomes of members of producers' co-operatives, incomes from subsidiary, personally-owned farming and husbandry of kolkhozniks, workers and employees, and incomes of individual farmers and handicraftsmen, not belonging to co-operatives, from small individual enterprises.

Incomes received in the process of redistribution include wages of workers and employees engaged in enterprises and institutions of non-productive sphere, pensions and gratuities, and interests and prizes from loans, received by the population engaged in both productive and non-productive spheres. To the incomes received in the process of redistribution also belong stipends, receipts from State Insurance, etc.

The aggregate income received in the process of distribution and redistribution is not equal to the aggregate income which is used for consumption and accumulation, since a part of these incomes goes to the financial system and a part is used for the purchase of services.

Incomes of the population used for personal consumption and accumulation are the final incomes. The difference between the sum of incomes received in the process of distribution and redistribution on the one hand and payments on the other, constitutes the final incomes of the population. Besides this, the material consumption in those enterprises which cater to the cultural needs and every day necessities and which provide medical services to the population (providing food in medical and children's institutions, lighting, heating in schools, hospitals, sanatoria, etc.) should be included in the total of final incomes of the population.

For characterising the growth of incomes of the population in different periods of time, indicators of growth of real incomes of workers, employees and peasants should be computed.

The sum of incomes of socialist production enterprises and incomes of the population received in the process of distribution yields the total sum of national income. The sum of the final incomes of socialist production enterprises, and institutions of non-productive sphere and the final incomes of the population also yields the total sum of national income.

The generalised characteristic of the reproduction of social product and national income can be given in the following form :—

1. social output produced
2. fund for compensation of material production expenses
3. receipts for expansion of production
4. receipts to increase the reserve or insurance fund
5. receipts for covering the expenses of general administration and expenditure on the defence of the country
6. receipts for forming funds for the satisfaction of certain general requirements (to maintain schools, hospitals and so on)
7. receipts to form funds for invalids
8. receipts for distribution among the participants in material production

Statistics of national income in the USSR show the volume of national income, its dynamics, the branch structure of national income, distribution, redistribution and final utilisation of national income, volume and dynamics of incomes of individual classes and social groups of the population, volume and dynamics of incomes of the state, collective farms and co-operative organisations, redistribution of national income in the process of the formation of funds for satisfying social needs, and its utilisation for consumption and accumulation.

23 May 1955.

NATIONAL INCOME ESTIMATES IN THE USSR

By A. P. STRUKOV

For purposes of planning and statistics in the USSR, national income is defined to be part of the national product newly created during a year in the sphere of material production. The sphere of material production includes the following industries: mining and manufacturing; agriculture; forestry; construction; freight transport and communications servicing production; trade, public catering and procurement (in cases where the further process of production is continued by way of sorting, packing, storage, etc.); supply of materials and equipment; and other industries of material production. The national income is not deemed to originate in the non-production sphere : administration, defence, education, public health, passenger transport, communications servicing population, etc.

The existence and development of the non-production sphere is dependent on the generation of national income in the sphere of material production. The estimates of national product and national income are made by industries and by forms of property. In planning and statistics of the USSR, the main method followed in estimating national income is the production method according to which the total national income is a sum of net outputs of industries of material production. To determine the net output, the cost of inputs (raw and other materials, fuel, power, depreciation, etc.) is deducted from the gross output.

In addition to the production method of estimating national income, the distribution method is also used according to which the national income is a sum of incomes received by the participants in material production (sum of primary incomes). In this case, the incomes received in the non-production sphere are not included in national income. This method does not allow estimation of national income for a plan period and that is why it is of auxiliary nature.

National income is estimated at current prices, i.e. the prices during the year for which the estimate of national income is compiled as well as at constant prices of a base period. The national income estimate at current prices shows its movement in terms of variations in actual prices, while the estimate at constant prices enables is to study its dynamics. The main principles followed for estimating gross and net output by industries are given below.

Industry

Gross output of industry is a sum of gross outputs of individual establishments, i.e. it is calculated by the so-called establishment method. The gross output of the industry by the establishment method includes :

i) the cost of finished commodities produced during a certain period and the cost of semi-finished goods made for sale,

ii) cost of services of industrial nature for other customers,

iii) the changes in the stock of goods in process, mainly for engineering.

The establishment method for estimation of the gross output of industry includes multiple counting. For example, the cost of iron-ore is accounted at the following stages of processing; iron-ore, iron, steel, rolled metal, products of engineering industries and so on. This double counting reflects real production exist among industries as a result of social division of labour. Estimation of inputs relations which for the industry also includes double counting. That is why by deducting inputs from gross output, the net output becomes free from elements of double counting, i.e. it becomes real net output. The industrial inputs include :

i) cost of raw and other materials, fuel and electricity consumed for production of commodities,

ii) depreciation of fixed assets.

The following information is used for estimating gross output of industry for the reporting period :

i) current statistics on the progress of the plan of the establishment,

ii) data from annual reports of industrial establishments,

iii) data from census of small scale industry (industries of collective farms and so on).

Data on cost of production of commodities are used to estimate inputs. The estimates of gross output and input for the industry are made first of all at wholesale prices of the establishments, which include the cost of production and profit (3 to 5% of the cost of the commodities).

However, the wholesale price of the establishment is not the final selling price of the commodities. The commodities are sold on the basis of the wholesale price of the industry, which includes centralised net income of the Government, i.e. the so-called turn-over tax. However, the turn-over tax is not included in the price of the commodities of heavy industries, in estimating cost of construction, and in prices of agricultural raw materials. But tax is included in the prices of consumer goods and food industries.

Thus for final total estimate of the output of industry, it is necessary to add turn-over tax to the extent it is included in the price of industrial commodities. The net output of industry estimated by the above mentioned method thus includes:

i) wages of industrial, office and professional workers of industrial establishments,

ii) payments of establishment for social insurance of industrial, office and professional workers,

iii) net income of the establishments (profits),

iv) the centralised net income of the Government (turn-over tax).

Agriculture

The gross output of agriculture is a sum of individual products including that part which was used for processing within the farm (establishment) during the same year, for example, grains and agricultural products used as fodder in animal husbandry. In other words, the gross output of agriculture is estimated by the method of gross turn-over. The gross output of agriculture includes :

i) cost of finished products of agriculture and animal husbandry,

ii) cost of increase in the stock of goods in process in agriculture,

iii) cost of perennial plantations (besides forest).

The agricultural products are sold through different channels (Government procurements, collective farm market) each of which has its own prices. A part of the products is utilised within the farm (seeds, fodder, payments in kind for the work done, etc.). In estimating the gross output of agriculture at current prices, the marketable part is evaluated in terms of actual sale prices : in the State Farms at Government delivery prices, i.e. at prices at which State Farms deliver their products to the Government; in collective farms subjected to Government procurements by the Government procurement prices; at the collective farm market at the prices of collective farm markets; in the households of the population at the price of the collective farm market, and at prices at which the part of the output is sold to the co-operative and Government organisations.

The non-marketable part of the output in the State farms is evaluated at cost in the collective farms, and in personal households at the average prices of their marketable output. For example, let the total output be 1,000 metric centners. Out of this, 300 centners are sold to the Government at thep rocurement price of 50 roubles per centner, 100 centners are sold to the collective farm markets at the price of 45 roubles per centner and the remaining 600 centners are consumed within the farm.

In this example, the average price of sale of 1 centner of the marketable produce is equal to

$$\frac{50\times300+45\times100}{400}=\frac{15000+4500}{400}=\frac{19500}{400}=48.75 \text{ roubles}$$

Hence the gross output in monetary terms is equal to $50\times300+45\times100+48.75\times600 = 48650$ roubles.

In order to evaluate the finished products of agriculture by the above mentioned method, it is necessary to prepare a balance in physical terms for each product for different farms and evaluate all items of this balance. The output of agriculture is estimated separately for agriculture and animal husbandry.

The output of animal husbandry includes the products received from the animals: milk, wool, honey, wax, etc. as also products of the breeding industry. The output of breeding industry is the young cattle bred during a given

year. A part of the growth leads to the increase of the herd, a part goes to the slaughter houses and a part remains with the industry at the end of the year. For practical purposes, output of breeding cattle at current prices is calculated in the following way: the value of meat, hides and other products obtained after slaughtering the cattle during a given year, in terms of actual prices plus the value of cattle bred at inventory prices minus the value of cattle slaughtered at inventory prices. For calculations at constant prices for determining the dynamics of gross and net output of agriculture, the average prices per unit of production for all types of farms are used. The inputs in agriculture include: cost of seeds, fertilizers, fodder, fuel, depreciation of fixed assets, materials for repairs, expenditures for maintaining the network of veterinary dispensaries, hospitals and so on. The evaluation of inputs of agricultural products (seeds, fodder, etc.) is done in the process of evaluation of the balances of these products. The evaluation of the inputs of industrial products is done at actual purchase prices. The net output of agriculture after deducting inputs from gross outputs includes : i) for State farms : wages of workers and employees of the farms, payments for social insurance, profits; ii) for collective farms : payments in money and in kind to the collective farmer for the work done and other forms of payments for work in the collective farms, incomes of the collective farmers used for formation and augmentation of public funds of the collective farms and payments of the income tax; iii) for the households : income of the households used for personal consumption and savings. For the estimation of gross and net output of households, the data of family budget and other sample surveys as well as the data on acreages, censuses of cattle, etc. are used because of lack of more specific data.

Forestry

The output of forestry originates from the labour for maintaining forests in the State suitable for operation as well as for planting forests. In evaluating gross output of forestry at current prices the output of forests is evaluated as the sum of actual inputs, while the value originating in the maintenance of it is evaluated as the sum of final payments made by the timber enterprises.

Construction

The gross output of construction includes :

i) cost of construction works and works for assembly of equipment,

ii) cost of prospecting and drilling of oil wells made from the appropriations for construction,

iii) cost of designing and prospecting connected with certain construction work,

iv) cost of major repairs of buildings and structures.

In determining the gross output of construction for a certain period, data from actual reports of Government and co-operative establishments and organisations are used, and for households banking statistics showing credits for housing, insurance statistics on insurance of new buildings, data from surveys of buildings built by the

population, etc. are used. Data on incomes of collective farms and their utilisation are also used in preparing the plans for determining the volume of construction by collective farms. Similar estimates are prepared for the households of the population. To determine the net output, the inputs are deducted from the gross output of construction. Inputs include the cost of building material consumed, electricity, steam, water received from other establishments, transport, depreciation of building, machinery and equipment, etc. The inputs for Government projects are based on the data on cost of construction, for collective farms they are based on the annual reports, and for population on the estimates of experts.

Transport

The gross output of transport is determined on the basis of revenues received from the goods carried by the transport establishments. The estimate of gross and net output of transport is given for the following modes of transport :

i) railway transport of the Ministry of Railways as well as of the industries in respect of the work done for other customers in land transport,

ii) inland water transport,

iii) sea transport,

iv) motor transport of the specialised transport organisations as well as of other industries as far as the work for other customers is concerned,

v) air transport,

vi) animal transport.

The gross output of railway transport is worked out as the sum of revenues of the transport establishments from the transportation of goods and other activities connected with the transportation of goods (loading and unloading and so on). The gross output of sea transport is the sum of incomes (revenues) from the transportation of goods or activities connected with transportation of goods (loading and unloading, storage and so on). In the same way, the gross output of inland water and motor transport is determined. To determine the net output of transport, the inputs (fuel, lubricants, depreciation and so on) are deducted from the gross output.

Communications

The gross output of communications includes that part of incomes of communications which is received for servicing in the sphere of material production. In the USSR, according to sample surveys, the income of the communications establishments for servicing in the sphere of material production is one-third of the total income of the communications establishments, while two-thirds of the income is used for the servicing of the population and the establishments and organisations of the nonproduction sphere.

Trade

The gross output of trade is the difference between the costs of goods evaluated at the selling and purchase prices. In order to eliminate double counting in

the gross output of transport, it is necessary to deduct from this difference, the sum of the payments for transport of goods by the trade organisations. The net output of trade is obtained from the gross output after deducting payments for hired transport and the inputs in trade. The gross output of trade is estimated separately for the following types of trade :

i) retail trade including storage of vegetables,

ii) public catering,

iii) wholesale trade of consumer goods.

Because of the lack of data on the profits and inputs of the collective farm trade, its gross and net output is not estimated separately and this trade is not separated from agriculture. The inputs in trade include the expenses for their own transport, expenditure for maintenance of buildings, current repairs, wastage of goods, expenses of packing, fuels, electricity and steam in public catering, consumption and washing of clothing, and expenditure for advertisement.

Procurement

The gross output of procurement is the difference between the costs of goods evaluated at selling prices of the procurement organisations and at procurement prices. The gross output is obtained as the sum of trading costs excluding expenditure on the hired transport plus the balance of profits and losses.

The supply of materials and equipment

The gross output of the organisations dealing with supply of materials and equipment is the difference between the selling and purchase prices of the means of production, sold through these organisations. The gross output is the sum of trading costs less expenses for hired transport plus the balance of profits and losses. The expenses of organisations dealing with supply include stationery, printing, mail, telegraph, depreciation of fixed assets, expenditures for packing (excluding the incomes for packing) and so on.

Other industries of material production

Other industries of material production include the following activities which are not included in the main industries : printing, procurement and primary processing of scrap, procurement and primary processing of used materials; production of films; procurement of the products of the forestry, fishery and hunting by the population; auxiliary cottage activities of the population.

This output is about 1 to 2% of the total national product of the USSR.

In estimating gross and net output of household industries, data of family budget surveys, statistics of collective farm markets and the information collected in other sample surveys are used.

BALANCE METHOD AND ITS ROLE IN ECONOMIC PLANNING

By A. P. STRUKOV

The essence of the balance method

National economy is a complex structure which has close inter-connections between its different parts. Hence, an economic plan should take into consideration these relations and along with this it should define the desired changes in existing ratios. The balance method is used to show these relations and ratios of the economic development. It is the main method of preparing current and perspective plans.

The balance method is being used in the USSR from the early days of the Soviet power when the balances of foodgrains and fuels were introduced. This method was more widely used during the preparation of the first perspective economic plan of the USSR—GOELRO which was for 10-15 years. During the preparation of this plan, the most important commodity balances as well as a balance of finances were prepared.

With the development of national economy the task of planning becomes more complicated. The organisational set-up and methods of planning were perfected. The variety of inter-industry relations required perfection of planning for achieving proportionality among different components of production. In connection with this, the system of balances was widely used in the process of planning in the USSR which made it possible to show the various inter-relations in the national economy and establish necessary ratios in the development of all industries and economic regions of the country. The balance method is also used for establishing the most important economic ratios, between the development of industry and agriculture, between production of producer goods and consumer goods, between consumption and savings, between productive and non-productive spheres, between incomes of the population and supply of consumer goods and services, between the development of mining and manufacturing, between the development of national economy and transport and industries.

Thus the system of balances includes synthetic balances, labour balances, commodity balances and balances of productive capacities.

Synthetic (*value*) *balances* include the balance of the national product, balance of the national income, balance of fixed assets, balance of monetary incomes and expenditures by population, balance of revenues and expenditures of the Government, cash and credit plans of the State bank, Government budget and so on. *Labour balances* include the balance of labour resources, balance of skilled labour, balance of graduates and diploma-holders. *Commodity* (*physical*) *balances* include the most important commodities of heavy industries (metal, coal, electricity, machinery and equipment by type, cement, timber, building materials and so on), balances of the most important consumer goods (bread, meat, fats, fabrics, footwear and so on),

balances of the most important agricultural products (grains, potato, vegetables, sugarbeet, cotton, wool, meat, milk etc.), summary balances of equipment so on. *Balances of productive capacities* include the balances of productive capacity for the most important commodities of heavy and light industries (iron, steel, rolled metal, iron ore, coal, oil, fabrics, footwear, meat, butter and so on).

Synthetic (value) balances

The balance of the national product characterises resources of the national product and its utilisation. The resources of the national product include :

1. domestic production,
2. import,
3. miscellaneous (aid from foreign countries and so on).

Output of the national product is shown by industries, types of product, main subdivisions (producer goods and consumer goods). In the process of its utilisation national product, the national product is used for :

1. recovering the consumed means of production (productive consumption),
2. non-productive consumption (private and public),
3. savings,
4. export.

The value of productive consumption or the total fund of recovery is distributed industrywise, e.g. industrial output is used for making good the producer goods consumed in industry, agriculture, construction, transport and trade. At the same time the recovery fund of industry includes along with the industrial output, the output of agriculture, construction (wear and tear of fixed assets) and transport.

Non-productive consumption includes :

A. *Consumption by population :*

1. Individual budget
   - —consumption of goods through retail trade,
   - —consumption of goods received from collective farms and personal households,
   - —domestic consumption of electricity, water, gas.
2. Budget of establishments and institutions of non-productive sphere (expenditure of the institutions of education, public health and so on).

B. *Expenditure on general administration and science :*

A part of the national product is saved. These savings are distributed into three types of investment,

1. productive investment,
2. non-productive investment,
3. allocation to reserves.

Productive investment includes increase of fixed industrial assets (buildings, structures, equipment and so on), increase of working industrial assets (raw materials, materials, fuels, goods in production).

Non-productive investment includes :

—increase of fixed non-productive assets (housing, schools, hospitals, office buildings, research institutions, and so on),

—accumulation of stocks of consumer goods in trade and by agricultural producers.

The reserve fund includes :

—accumulation of governmental material reserves,

—formation of reserve insurance funds in collective farms and other cooperative organisations.

A part of the national product goes abroad through foreign trade and also as an aid to other countries and finally there are some losses of the national product due to different kinds of natural calamities and so on. The balance of national income indicates the characteristics of the movement of that part of the national income which corresponds to the value added during the year. It further reveals the direction of its movement (production, distribution and redistribution and then final utilisation).

The balance of the national income characterises all the constituents of the national income which include

1. production,
2. other sources (credits from abroad, foreign aid and so on).

The volume of the national income at the stage of its production is a sum of net outputs of different industries (net output is equal to gross output minus inputs). The distribution of the national income is first of all given in the balance as primary distribution. In the process of primary distribution the national income is divided into the incomes of the participants of the material production : population, government, co-operatives.

Primary incomes of population :

A. Government sector :

—wages of workers and employees in the sphere of material production,

—other incomes similar to wages.

B. collective farms and cooperative sector :

—monetary incomes and incomes in kind received from the collective farms,

—incomes of members of handicraft cooperatives,

—incomes from household's occupations.

Primary incomes of the Government (governmental economy) :

—net income of the Government establishments (profits),

—net income of the Government exchequer (turnover tax),

—Government social insurance payments.

Primary incomes of co-operatives :

—payments in the public funds (guaranteed insurance fund for aid to invalids and so on).

The balance also shows the process of formation of public funds and secondary incomes (incomes of non-productive sphere). In the process of formation of public funds (the fund for extended reproduction, fund for the development of science and culture, fund for social security, fund for maintaining administration and defence) the financial system and especially the State budget play a decisive role. The budget includes all the turnover tax, considerable part of the profits (as a form of payments from profits), payments for social insurance, income tax of population as a form of voluntary and compulsory payment. With the completion of the process of distribution and redistribution of the national income, the final incomes of the population, the Government and the cooperatives are formed. The final incomes are the incomes used for balancing consumption and savings. In the process of utilisation of final incomes, the national income is divided into two funds :

1. fund of consumption,
2. fund of savings.

The balance of fixed assets characterises the movement of fixed assets : the availability at the beginning of the period, commission, renewal due to wear and tear, and finally availability at the beginning of the next period. The comparison of the fixed assets for these two dates gives the increase (investment) of the fixed assets. The balance of fixed assets is given by industries with the breakdown for productive and non-productive spheres and by types of assets at full original costs and also at costs minus wear and tear. The balance of fixed assets is related to the summary balance of equipment.

The balance of monetary incomes and expenditures of the population characterises all the resources of monetary incomes of the population and their utilisation. The co-ordination of monetary incomes of the population with the development of production of consumer goods and trade is provided with the help of this balance. The balance of monetary incomes and expenditures of the population is an important instrument for regulating money circulation (it is used as a basis for the preparation of the cash plan of the State Bank of the USSR). Now, in the USSR, this balance is prepared for the current and plan periods for the country as a whole and for each Republic. The balance is prepared not only for the population as a whole, but also by groups of population :

a. workers and employees,

b. peasants.

The main headings of the balance are given below :

I. Monetary incomes of the population.

1. Monetary incomes received by the population in the Government, co-operative and public organisations :

—wages,
—incomes similar to wages,
—pensions, allowances and stipends,
—monetary incomes received from collective farms,
—monetary incomes received from sales of output and cattle by Government and cooperative organisations,
—other monetary incomes.

2. Monetary incomes received from sales to other groups of population (the movement between the groups of population—sales of agricultural product by the collective farmers at the collective farm market to the workers and employees).

II. Monetary expenditures by the population.

1. Compulsory and voluntary payments :
—income tax,
—buying bonds of the 3% loan and lottery tickets,
—deposits in the saving banks,
—payments to the public and cooperative organisations.

2. Expenditures for services (rent, transport, gas, water, electricity, heating, laundries, cinema, etc.).

3. Expenditures for buying goods :
—from Government and cooperative trade,
—from collective farms,
—from population at the collective farm markets.

III. Surplus of incomes over expenditures (+) or expenditures over incomes (−).

The balance of revenues and expenditures of the Government (*financial balance*) covers all revenues and expenditures of the Government. The preparation of this balance allows a check up of the coordination of the Government plan as far as the financial balance is concerned. The financial balance of the State as well as the balance of monetary incomes and expenditures of population are closely connected with the balance of the national income and they are the main data used for the preparation of the balance. In contrast to the balance of the national income, these balances are more of operational value.

I. Revenue part of the financial balance:

1. savings from the governmental economy
—profits of the Government establishments (by industries),
—turnover tax,
—incomes from foreign trade,

—funds of Government social insurance,

—depreciation payments;

2. payments from collective farms and other cooperative organisations

—income tax,

—insurance payments;

3. receipts from population

—taxes,

—deposits in the saving banks, purchase of lottery tickets and bonds;

4. other incomes of the Government and Government budget.

II. Expenditure part of the financial balance:

1. capital expenditures;
2. expenditures for major* repairs of the fixed assets;
3. expenditures for social and cultural measures (without capital expenditure and major repairs)

—expenditure on education,

—expenditure on public health and physical culture,

—expenditure on payments of pension and allowances,

—expenditure on science;

4. expenditure on Government administration and defence;
5. increase of credits in the national economy;
6. expenditure on the increase of Government reserves;
7. expenditure on increase of domestic working capital.

III. The surplus of incomes over expenditure (+) or expenditure over incomes (−).

The summary financial balance is, in its contents, wider than the Government budget for the former covers not only all revenues and expenditures of the Government but also all revenues and expenditures of the State-operated economy. While the Government budget is an operational document, annually approved by the Supreme Council of the USSR, the financial balance is an internal working document of the Planning Commission of the USSR. The cash and credit plans are also operational documents prepared quarterly by the State Bank of the USSR. These documents constitute the basis for the regulation of money circulation in the country and for short term credit.

Labour balances

The problem of supply of labour to all industries is of utmost importance for the preparation of the Plan because labour is a decisive factor of production. In connection with this, the balances of labour resources, skilled labour and diploma holders and graduates, are prepared. The balance of labour resources characterises labour resources absorbed in the national economy as also manpower not absorbed

* Repairs which are not in the nature of maintenance.

and their distribution by industries. The preparation of this balance enables us to check up the supply of labour to industry, find the reserves of unutilised labour and so on. The preparation of the balance of labour resources is closely connected with the preparation of targets for labour productivity. For example, suppose the preparation of the balance of labour resources show that there is a shortage of labour for the planned programme of production, development of education, culture, public health, science and so on. To meet this shortage, it is necessary either to reduce the targets or prepare measures for the increase of labour productivity in order to fulfil the production programme of the plan with less labour employed in production. The balance of labour resources is prepared not only for the country as a whole but also for different regions because in some regions there may be shortage of labour for some types of jobs while in others there may be a surplus.

The perparation of balances of labour with the territorial breakdown enables us to prepare schemes for inter-regional shift of labour. The modern production as well as the development of non-production sphere require an increasing number of skilled labour as well as diploma-holders and graduates. In this connection, along with the balance of labour resources, the balance of skilled labour and the balance of graduates and diploma-holders are also prepared.

Commodity (physical) balances

The system of commodity balances enables the coordination of production and consumption of the most important commodities for the country as a whole and also for different regions. The commodity balances characterise the distribution of the resources. The standard material balance is the following :

	year
I. Resources—Total	
including	
1. production	
2. import	
3. other resources	
4. residuals at the beginning of the year	
a) with producers	
b) with consumers	
II. Distribution—Total	
including	
1. production and operation	
2. construction	
3. marketable fund	
4. export	
5. government reserve	
6. residuals at the end of the year	
a) with producers	
b) with consumers	

Each industry being the supplier of the commodities produced by it to other industries at the same time consumes implements of production, raw materials, and fuels produced by other industries, which are necessary for its production.

These complex relations among industries are expressed quantitatively in the expenditure part of the balance, namely, in the part where the consumption of a given commodity for inputs of different industries is shown.

The planning of production for each industry determines at the same time the industrial consumption of the given industry and consequently the requirements for the development of production in allied industry which supplies necessary raw materials and producer goods. Their distribution is expressed in commodity balances.

Production and consumption are closely connected. Material production leads to the consumption of the necessary producer goods.

Material balances reflect these various economic relations between industries, development of social division of labour, expansion of specialisation of production and the production cooperation. With the help of commodity balances, Government is enabled to influence actively the development of production of the necessary commodities in certain economic regions of the country. The above standard scheme of commodity balances for individual commodities is adjusted in accordance with the peculiarities of production and consumption of a given commodity. For example, the balance of gross resources of grains for the country is the following :

> the production of grains from the harvest of the given year +other receipts of grains = consumption by population+consumption for seeds+consumption for cattle fodder+consumption for processing+Government reserve+exports+ +losses during harvesting and processing—increase of residuals.

In its turn, the balance of Government resources of grains reflects its own pecularity and is the following :

> residuals at the beginning of the agricultural year+receipts through purchases+other receipts = consumption for supply (marketable funds)+ +supplies for procurement of agricultural products+processing+grain fodder +export+reserves for seeds+Government reserves+residuals at the end of the agricultural year.

Balances of gross and Government resources of other agricultural products, e.g. raw cotton, oil seeds, and so on are prepared on similar lines.

In the interpretation of the industrial processing by directions it is easy to see balance relations among, for example, procurement and purchase of grains, their consumption for production of alcohol, production of synthetic rubber from the produced alcohol, production of tyres from this rubber, etc.

The balances show relations between agriculture and industry, between the development of grain production and animal husbandry, between increase of agricultural raw material base and the growth of light and food industries, etc.

The balances prepared for commodities of engineering industry have their own peculiarities. They show the requirements for certain machinery and equipment for more complex commodities of engineering industry, which allows us to take into

consideration other requirements to establish proper ratios between volumes of production of certain types of machinery and equipment, e.g. between production of transformers and mercury rectifiers, between production of heavy dump trucks and excavators with the necessary shovel capacity, etc.

These material balances as a whole are the system of equations which reflect complicated relations and mutual dependence which exist among different manufactures.

As a result, the preparation of the economic plan with the help of commodity and synthetic balances provides a solution of a complicated system of equations and yields the requisite proportionality and harmony in the development of all the different sides of the extended socialist reproduction. For the plan of 1958, the Planning Comsion of the USSR prepared commodity balances for 760 commodities which were approved by the government (excluding inter-industry balances—balances of manganese and iron ores and others).

Besides, the balances prepared by agencies of the Planning Commission of the USSR and other Ministries and Departments of the USSR included about 6,000 commodities which were not included in the national economic plan. Thus, commodity balances were prepared approximately for 7000 commodities including 2140 items of equipment, machinery and cables and 1170 items of chemicals and rubber goods.

Commodity balances are usually classified as,

—balances of industrial commodities meant mainly for fabrication of means of work,

—balances of industrial and agricultural commodities for utilisation as objects of labour,

—balances of industrial and agricultural commodities mainly for personal consumption.

The most important is the classification of the balances according to their role in providing the ratios in the development of basic industries.

Economic relations between industry and agriculture are clearly seen in the balances of grains, sugar-beet, animal raw materials, cotton, milk and other agricultural raw materials on one hand and also in the balances of tractors, combines and other agricultural machinery as well as in the balances of oil products, mineral fertilisers, timber, cement, trucks, and other industrial commodities on the other hand.

Economic relations between the national economy and transport are seen in the balances of fuels, metal, timber, oil products, tyres as well as other commodities of mass production and in the balance of transportation by modes of transport and types of goods.

These relations between individual industries are seen in all balances of the industrial commodities.

The preparation of commodity balances is of great importance for the augmentation of the investments in the national economy.

Balances of metal, equipment, timber, cement and other building materials are main commodity balances which determine possible construction. Construction consumes 24 per cent of the total metal taking into consideration further processing, about 20 per cent of timber, 80 per cent of cement, up to 90 per cent of soft roofing and up to 40 per cent of window glass and a considerable part of the output of engineering industry.

Improvement of balances of the above-mentioned materials and equipment enables us to make more sound decisions on the investments.

The balance of the ferrous rolled metals is one of the key-commodity balances, which determines investments, development of engineering industry, ratios among basic industries as well as the ratios between the development of iron and steel industry and the development of transport.

The structure of the consumption of ferrous rolled metals including the utilisation of the further fabricated commodities is the following for 1955:

engineering industry	...	50 per cent
construction	...	24 per cent
rails	...	7 per cent
repairs and other requirements		19 per cent

The allocation of metal for engineering industries determines the development of machine tool construction, motor car construction, ship-building, wagon-building industry and other industries.

A considerable part of rolled metal is allotted for motor car construction. At the existing level of specialisation scores of industries and hundreds of establishments take part in the production of motor cars. Metallurgy provides motor car production with ferrous and non-ferrous metals, chemical industry with synthetic rubber, automobile with tyres and paints, textile industry with cord necessary for tyres, oil industry with industrial alcohol which is used for synthetic rubber, roller and ball-bearing industry with bearings, electrical industry with electrical equipment, glass industry with glass etc.

One can see complicated inter-industrial relations originating from the rolled metal among the industries participating in the fabrication of the motor car.

The balance of metal is closely connected with the fuel balance and first of all, is used for the allotment of metal for the production of pipes necessary for the construction of gas pipe lines.

The increase of production and utilisation of gas in its turn influences the level of output of oil. The development of motor car industry is connected with the development of oil industry and so on.

The increase of production of rolled metal requires increase of production of many raw materials and fuels, which is seen from the following data.

	consumption norm (in tons)	consumption per ton of rolled metal (in tons)	norm
steel per 1 ton of rolled metal	1.3	1.3	
iron per 1 ton of steel	0.765	.765×1.3	=1.
iron ore per ton of iron	2.0	2×1	=2
scrap per ton of steel	0.355	.355×1.3	=1.46
coke per 1 ton of iron	1.0	1×1	=1
coking coal per ton of coke	0.46	.46×1	=0.46
railway transportation (in ton milometers)	net gross	4362 7400	
consumption of coal by railways	—	0.3	
consumption of electricity	kwh	340	
consumption of coal for generation of electricity	etc.	0.28 etc.	

It is necessary to note that the above-mentioned norms of the relations among the levels of production of different important industrial commodities suggest the possibility for utilisation of cybernatics for calculation of balances—electronic computers for fast determination of the necessary levels of production of industrial commodities at different patterns of production of the most important industrial commodities.

The balances of non-ferrous metals (copper, aluminium and so on) make it possiale to determine necessary ratios among development of non-ferrous metallurgy, electrification of the country and the development of electrical radio industry.

Balance of fuels provides co-ordination of fuel-consuming industries and specially non-ferrous and ferrous metallurgy, engineering (consuming considerable part of generated electricity), all types of transport consuming 20.9% of all fuels of the the country with the development of fuel and power-consuming industries.

The preparation of summary balance of fuel and power is of special importance now with the steady increase of the share of oil and gas in the fuel balance.

Summary balance of equipment is an important balance which determines the ratios between savings and consumption in the economy. It is known that investments are spent in two main directions : construction and erection work and procurement of equipment.

As technological progress in all industries is accelerated, it is very important to coordinate the contemplated construction programme with the planned output of engineering industry, which is done with the help of the summary balance of equipment and machinery in value terms. This is a very complicated balance.

It is not approved by the Government and is used mainly as a check on the correctness of the ratios between construction and machine-building programme.

The essence of the summary balance of equipment and machinery is the following : total output of mechanical engineering and metallurgy. The output of civil machine-building not financed from investments is excluded, e.g. metal consumer goods, deliveries on cooperative basis, assembling and repairs.

If the shipments of equipment through imports and non-installed equipment at the beginning of the year are taken into consideration, it is possible to determine the resources of the equipment for construction, exports, marketable fund and reserve, and envisage necessary norms for non-installed equipment at the end of the year.

Having found the possible resources of equipment which may be supplied for construction it is necessary to compare this in monetary terms with the structure of capital expenditures.

Naturally; expenditure for agricultural machinery, rolling stock, fleet and motor transport is excluded from the envisaged expenditure for equipment and thus expenditure for technological equipment for assembling is determined.

As a rule, in modern conditions the expenditure for equipment for each million roubles of construction and erection work is being increased because of the replacement of old machinery.

With the help of commodity balances, mutual coordination of construction activities and technological changes in industries is effected.

The balance method in combination with the technical and economic estimates is an important tool for finding the most effective ratios among industries and proper proportions in their development.

The economic balance may be reached at different ratios of the development of the individual industries.

The task of economic planning is to find with the commodity balance and economic estimates the most effective ratios in the development of industries which provide maximum increase of labour productivity and maximum rates of economic development.

Now in the USSR the process of changes is going on which is followed by the changes in inter-industrial ratios, higher rates of development of gas and oil industries than of coal industry; increase of relative shares of generation of hydro-electrical power; the changes in the railway traction; wide utilisation of prefabricated ferro-concrete structures in construction instead of timber and metal. All these lead to radical changes in the ratios of the levels of production of allied industries, change in inter-industrial ratios which should be taken into consideration in the preparation of perspective balances. The importance of this is seen from the following: approximately 30 per cent of the transportation by railways are transportation of coal. At the same time the railways consume approximately 20 per cent of the coal output of the country.

Hence the heaviest traffic comprises of the transportation of the output of the coal industry. At the same time a considerable output of coal industry is consumed by railways. A considerable part of railways' turnover is connected with the provision of activities of iron and steel industry. At the same time a considerable part of the output of iron and steel industry is consumed by railways.

Coal industry consumes about 7 per cent of the total output of coal, iron and steel industry consumes approximately 10% of rolled metal, consumption of electricity by electric power houses and losses in transmission nets are about 13.9% and so on.

The main problems of preparation of commodity balances are :

firstly, the determination of the requirements of material resources for production, construction, distribution of the output of engineering industry, especially in the preparation of perspective plans taking into consideration progressive actual norms of consumption of material resources and technological progress of different industries ;

secondly, determination of the necessary norms of production stocks in the economy in connection with the proper organisation of the system of supply of materials and equipment which provides steady continuous operation of the whole industry. Let us discuss these problems.

Determination of the requirements of material resources :

The requirements of material resources for production are determined on the basis of estimates based on the programme of the production and norms of consumption of raw materials, fuel materials and electricity.

The requirements in resources are determined by direct calculations according to the norms for rolled steel, pipes, rolled copper, rolled aluminium, cable, non-insulated wire and others as 60-80 per cent of the total requirements. For the commodities of engineering industry where no norms are used, the requirements in metal are determined by the rates of growth of gross output of engineering industry and metal works and by the dynamics of the consumption for the previous years. The requirements in the resources for construction (metal, timber, cement and others) are determined not by the physical volume of work because of the complicated nature of this method but in average per one million of the cost of construction and erection works and by industries.

The most important task in the improvement of work on the commodity balances is the scientific basing of the consumption norms of materials in production and construction taking into consideration technological advance, improvement of the management and supply, improvement of technical and economic indicators of the utilisation of productive capacities.

The norms of consumption of material resources reflect all the various processes taking place in the technology and in the management in all industries.

The economy in costs is an important factor promoting the increase of productivity of labour and decrease of the cost of production because the relative share of raw materials, fuels and materials is considerable in the cost of industrial commodities.

Through norms of consumption of resources in industries and in construction the measure of socially necessary imputs per unit of production is established.

Proper norms of consumption in production and construction determine in the long run the ratios in the development of inter-connected industries. Wrong norms of consumption may lead to disproportions in the economy.

It is necessary to note that some norms of consumption call for heavier consumption of resources than do others. It is enough to note that the norms of consumption of coal for coke as in 1957 determine 14.2% of the total consumption of coke in the national economy.

Correspondingly, the norms of production of coal for generation of electricity determine 19 per cent of the total consumption of coal in the country. At the norms of coal consumption for the generation of electricity by the thermal stations which were 512 kgs. per 1000 kwh in 1958, each additional consumed kgm of fuel means more than 10,000 tons of coal for the whole country. At the norm of coal consumption for locomotives which was according to the 1958 plan I & F kilograms per 10 thousand ton kilometers, the consumption of coal is equal to 12.5% of coal consumed by the economy as a whole. Each kilogram of coal consumption equals 417 thousand tons of coal for the country; this requires very careful approach to the establishment of consumption norms while preparing the economic plan.

The consumption norms of electricity in engineering and metallurgy determine more than 12% of the total consumption of the electricity in the national economy. The consumption norm of caustic soda for rayon fibre determines 18% of the total consumption of caustic soda. 10 main norms of consumption of sulphuric acid determine more than 72% of the total requirement of sulphuric acid for the national economy.

The acceleration of rates of technological progress in all industries, intensification and automation of production processes, origination and development of new industries lead to big changes in the whole national economy and greatly influence the consumption norms of material resources in production and construction, and also to the changes in the existing proportions and establishment of new ratios in the development of inter-connected industries. The technological progress is closely connected with the savings of manual labour and economic resources.

Thus, increase of production of low-grade alloyed steels leads to great economy of rolled metal in engineering and construction. The economy of material and labour resources in the national economy is reached as a result of rapid development of production of prefabricated ferro-concrete structures, wide utilisation of which reduces requirements in timber and labour. The development of production of wire for

prefabricated ferro-concrete structures as well as low grade alloyed metal and replacement of metal structures by prefabricated ferro-concrete structures lead to the economy of metal in construction and so on.

Reduction in consumption norms, and saving of material resources in production and construction as a result of technological progress, are by their economic nature equal to the intensification of production processes, better utilisation of existing capacities and available production space. If, as a result of the intensification of production processes, economy and more rational utilisation of investments is provided, then the same final economic results are due to the reduction of consumption norms of material resources in production and construction which leads to relative decrease of the requirements of the national economy in material resources and hence to corresponding decrease of investments for production.

One of the major problems for further improvement of the work on the commodity balances is the preparation of a well-defined system of consumption norms in production and construction and also organisation of the corresponding accounting of the actual consumption of objects of labour.

Improvement of accounting system of consumption norms and its maximum adaptation to the requirements of planning require also improvement of primary accounting of the consumption of materials by establishments and projects. This requires the organisation of scientific statistical study of the utilisation of resources in the economy.

Balances of productive capacities are important for phasing the production programme. The balances of production capacities show :

1. Capacities available at the beginning of the year;
2. Commissioning of new capacities;
3. Removal of capacities due to their wear and tear;
4. Capacities available at the end of the plan period.

BALANCE METHOD IN SOVIET SOCIO-ECONOMIC STATISTICS

By I. Y. PISAREV

The balance method is the main method in planning the national economy of the USSR. This role of the balance method arises from the requirements of balanced (proportional) development of the national economy. Accordingly, the balance method is of wide use in Soviet statistics also.

Balance calculations are made for each branch of the national economy and for the national economy as a whole. Economic analysis of statistical balances gives an opportunity of investigating many vital problems of socialist reproduction on an enlarged scale.

We shall briefly formulate the general requirements which must be met by statistical balances so that the latter might serve the purpose of national economic planning.

1. Statistical balance should correspond to plan balance. It should be so constructed that the processes of the national economy might be observed in it in conjunction with the work quota of the plan. The statistical balance is of no value if this requirement is not satisfied. Unless viewed against the work quota of the plan, the statistical balance can neither serve the purpose of checking up the fulfilment of the plan nor the purpose of controlling the quality of the plan itself. For example, if the plan provides a certain balance of production and consumption of pig iron in the national economy, the object of statistics of pig iron is to show what is the actual fulfilment of that task and also to estimate to what extent planning has taken into consideration the actual requirements of the national economy and the possibilities of their satisfaction.

One of the important objects of collecting statistics is to fully reveal reserves for overfulfilment of plans. In the process of the fulfilment of plans some possibilities of production may come to light, possibilities which were not fully taken into account while planning. As statistics is an instrument of planning, it should estimate and show in the tables, particularly in balance calculations, new resources and reserves which were not taken into account while the plans were being formulated.

This serves as an actual basis for correction of the plans for the purpose of their improvement and perfection.

2. While calculating material balances, it is necessary to trace the *actual path* in space (and perhaps also along time) along which a certain product moves in the process of social production, and to give a detailed break-down of the product so that quantities of the product can be located in each particular place of production (each unit or enterprises) thus showing the *role* of the goods in question in the process of production. These three tasks may be emphasised in three slogans:

actual movement ; *place* ; *actual role*. The state in which the statistical material is made available, renders this task very complicated and sometimes insoluble. But its solution should be as far as possible aimed at, especially in cases where the balance is compiled for products of importance to the national economy. The idea can be illustrated by an example.

The balance of fuel in the national economy may be calculated according to the following scheme :

1) Stock of fuel of different kinds at the beginning of the year ;
2) Supply of fuel of different kinds during the year ;
3) Consumption of fuel during the year ;
4) Stock of fuel of different kinds at the end of the year.

This balance of fuel is of a certain cognitive importance. It defines the structure of the supply and utilisation of fuel.

It may be used for investigating the *dynamics* of the fuel balance, provided there are similar calculations for preceding years. It may also be used for international comparisons, for example, for comparative estimation of the role of coal or oil in the fuel balance of one or another country. But the drawback of such a balance is that *fuel is considered in it in isolation, apart from the process of social production.*

It is possible to calculate a fuel balance of another type. This other type of statistical calculation gives incomparably wider possibilities forec onomica nalysis. In a balance of this type it is possible to observe the actual movement of fuel in its economically important aspects. A balance of this type facilitates a more profound investigation of the production of fuel : The investigation is conducted in conformity with forms of property—state property, co-operative-collective farm property, personal property of separate individuals. The investigation is organised with regard to the economic districts of the country in order to ascertain the territorial distribution of production of fuel, the geographical aspect of the production ofd ifferent fuels and also their technico-economical indicators andt heir regional differences. Again, the conditions of production are investigated separately for big enterprises, equipped with the newest machinery, and for medium and small enterprises. Similar detailed investigation is carried out for the consumption of fuel in different branches of material production and in non-production sectors.

"QUALITATIVE INDICATORS"

3. In the statistical investigation of material balances, an extremely high significance is given to the problem of "qualitative indicators". The material balance must be so constructed that there should be a full possi- bility of comparing actual expenditures of raw and auxiliary materials and direct labour with the fixed, progressive, scientifically proved norms of these expenditures.

This requirement of the methodology of balance is a general one, i.e. it concerns all balances. Balances of personal consumption of foodstuffs by population,

and also of clothes, shoes etc. must also be compared with scientifically established norms. The difference is that in the sphere of material production there exist technological norms while in the sphere of personal consumption there cannot be any single norm whic can be planned *ex ante*. However, it is possible to estimate the achieved level of personal consumption and the ratio of different items.

It is necessary to keep in mind that receipt and expenditure (while taking into account the change of stock at the beginning and at the end of the year) will be always balanced anyway in the accounting sense. But the problem of calculation of the national economic balances is by no means an accounting problem. It is a problem of statistico-economic analysis, and as it is, it cannot be successfully solved without comparing actual ratios with scientifically proved progressive ratîos. Only under this condition is it possible to estimate correctly the basis and the qualitative level of achieving balance.

Danger of levelling

4. It should always be kept in mind that balance calculation as well as many other statistical work involve the danger of levelling implicit in the law of averages. So, for example, in a balance of fuel which has not been compiled scientifically, the shortage of fuel in certain enterprises would be compensated by the surplus of fuel in some other enterprises, and the result would be a picture of prosperity which has nothing to do with the actual state of things. That is why so much stress was laid on the fact that statistical balances should reveal *actual movement, actual place and actual role of one or another goods* in social production.

In Soviet socio-economic statistics the balance method is combined with the method of grouping of like phenomena.

Each item of a balance should be based on statistical investigation. This investigation need not necessarily be complete ; in a number of cases, complete investigation is in fact impossible as in the case of investigation of losses in the national economy. While calculating balances, the sample survey method should be widely used. The balance method is practically used not only in combination with the method of grouping and group averages but also with sample surveys. When all items of a balance have been obtained on the basis of special statistical investigations, there will arise the necessity of their mutual checking-up, mutual coordination, after which all elements of the statistical balances are brought together, thus solving the problem of calculating the balance. Simultaneously, the balance should undergo a thorough economic analysis so that all conclusions for the development of the national economy and planning might be drawn.

The socio-economic condition in the USSR and India are entirely different. There is no doubt, however, that wide application and use of balance calculations by Indian economists and statisticians might be quite fruitful in studying the economy of India.

BALANCE OF NATIONAL ECONOMY

By P. M. MOSKVIN

Introduction

Balance of national economy is a system of inter-connected indicators showing the flow of the social product on an enlarged scale. It reflects the objective inter-connection between the various elements of the national economy and shows the process of social production and its utilisation on an enlarged scale.

By means of a series of economic indicators the balance shows the level and the rate of economic development of the country—the volume and change of the social product and social wealth; change in the standard of living of working people, factors and sources of the social product, growth of technical equipment of labour, growth of labour productivity, labour resources and their distribution in various sectors of social production and their utilisation, mutual relations and proportions between individual elements of the social products, mutual relations between production of means of production and production of consumption goods, interdependence among individual branches of the national economy—between productive and non-productive sectors, between production and consumption, between consumption and accumulation—and a number of other general and particular characteristics of the national economy. The balance of the national economy also shows the development of socialist enterprises in its two forms—state enterprises and co-operative collective-farm enterprises and the interrelation of these two forms of socialist enterprises.

The balance of the national economy reveals disproportions which might arise in the process of fulfilling the national economic plans, and is therefore useful for checking the occurrence of such disproportions in future by proper planning. The balance of the national economy also shows the volume of reserves which have not been utilised in the economy.

In drawing up the plans of national economy the balance method is widely used. It makes it possible to determine the interdependence among the individual parts of the national economy and to ensure their mutual co-ordination. The important indicators of the balance of national economy are also useful in planning. The comparison of the individual indicators of the balance with the indicators of the plan enables the determination of the degree of fulfilment of the levels and the tempo of the development of national economy.

Production divisions and their interdependence

The basic subdivisions of social production are—(1) production of means of production and (2) production of consumption goods. In the process of socialist production, the production of labour power also takes place. The planned supply

of labour power to enterprises is one of the most vital conditions of socialist production. Constant raising of quality and cultural standards of the whole mass of working people is a characteristic feature in the building up of cadres.

In the process of social production an interchange takes place between the subdivisions, (1) and (2)—i.e. between the production of the means of production and the productions of consumer goods, and also inside each subdivision.

Firstly, an interchange takes place among the various branches of subdivision (1). One part of the means of production in subdivision (1) remains in the branch where it is produced and ensures simple reproduction. This part of the produced means of production is used as replacement for the wholly or partially worn out means of production and also for repair and maintenance and for renewal of the utilised stock of raw materials, etc. The other part of the means of production ensures production in the various branches of the national economy included in subdivision(1).

Secondly, there exists also an interchange among the various branches of subdivision (2).

Thirdly, there exists an interchange among the subdivisions (1) and (2). A part of the means of production manufactured in subdivision (1) must be used for the replacement of the partially or completely worn out equipment of labour and for replenishment of stocks of raw materials, fuel, etc. utilised in the branches of subdivision (2) and also for increasing equipment of labour, stocks of raw materials, fuel and materials of this subdivision. A part of the consumption goods produced in subdivision (2) is exhausted in payment of wages and salaries of people working in subdivision (1), through the network of commercial establishments. The rates of expansion of production and technical progress of the branches of subdivision (2) depend on the amount and quality of the means of production received from subdivision (1). This fact explains the leading role of subdivision (1) in respect to subdivision (2).

In socialist production subdivision (1) must produce the amount of means of production necessary for ensuring the constant expansion of production on the basis of higher techniques in both the subdivisions but mainly in subdivision (1). On the other hand, subdivision (2) must produce the amount of consumption goods necessary for the satisfaction of constantly rising requirements of people working in both subdivisions, both old and new workers, and also the requirements of people employed in non-productive industries. In every period of time a part of the means of production and consumption goods is used for increasing reserves.

Material and financial balance

The social product of the USSR can be expressed in two forms—aggregate of materials and their money value. In socialist society the law of value is not a regulator of production. Articles of personal consumption are valued in terms of money. The means of production in economic circulation within the country are

not commodities, in the sense of having money value, in the USSR. Only outward flow of such commodities are valued in terms of money. However, the means of production are valued in terms of money for the purpose of determining profit and loss of an enterprise, and for the control of activities of an enterprise. Again, since the expenditure of man-power engaged in production is covered by consumption goods which are commodities in the sense of having money value, it is necessary to take into account the money value of the production of both consumption goods and the means of production. Money value expresses the quantity of labour spent not only where consumption goods are produced but in the sphere of social production as a whole. In this sense, we can speak about the money value of all social products.

In accordance with the two forms of expression of the social product, social production should be studied in two aspects—the material characteristics of production and the money value of production. Corresponding to these two main aspects of production there are two main sections in the balance of the national economy: 1) balance of production, consumption and accumulation of the social product, and 2) balance of production, distribution and redistribution of the social product (financial balance). The first section of the balance deals with the characteristics of reproduction of the social product from the standpoint of its material contents, while the second section of the balance deals with the characteristics of production of the social product from the standpoint of its money value. Of course, these two sections are indissolubly connected, for they characterise one and the same process.

Balance of production, consumption and accumulation

Among the most important sections of the balance of national economy we find the balance of labour, which characterises existence, structure, changes and uses of the labour resources in the country; balance of fixed capital, balance of receipts and payments of the population, material balances of certain products, etc. Each of these balances may be presented in the form of a table including a certain system of economic indices, which characterise various aspects of social reproduction. All these tables are connected with each other, reflecting various aspects of social production. In their totality they reflect the process of social production as a whole. It is necessary, however, to have along with these interrelated tables, a general table which might synthetically characterise the process of production as a whole.

The balance of production, consumption and accumulation of social product shows the circulation of social product in the national economy—its production and utilisation as the means of production, its use for non-productive consumption and for the purpose of accumulation. This balance shows the growth of the social product, the national income, non-productive consumption and accumulation. It also reveals the relations between separate parts of the social product—most important proportions and relations in the national economy.

The interdependence among different forms of property in producing social product and national income, the interdependence between the production of the means of production and the production of consumption goods, between production and consumption, between consumption and accumulation and among particular branches of the national economy—all these are brought out in the balance. This balance also shows the volume, structure and change of the funds of non-productive consumption and the volume, structure and change of the funds of accumulation. Unlike the material balances of certain concrete products which are usually worked out in terms of materials, the balance of production, consumption and accumulation of social product is shown in terms of money.

It does not show intermediate stages in the movement of the social product, which characterise the processes of distribution and redistribution of the social product and national income. Investigation of these phases in the movement of the social product is dealt with by the balance of production, distribution and redistribution of the social product and national income (financial balance).

In the balance of the national economy, the study of inter-branch relations in the national economy, especially the relation between industry and agriculture, are of great importance. Inter-branch relations show the exchange of particular activities taking place in particular branches of the national economy. The study of relations between particular branches of the national economy implies working out balances of industrial products, agricultural products, transport balances, etc. Problems of working out balances of particular products acquire a special significance in this case. This is necessary for studying relations and correspondence between branches of the national economy such as industry and agriculture, as well as for studying relations and correspondence among particular branches of the national economy.

The main indicators of the balance of production, consumption and accumulation of social product are : total volume of the social product, size of its part spent on the consumed means of production in a given period of time, volume of national income, funds of non-productive consumption and funds of accumulation.

The balance of production, consumption and accumulation of the social product is constructed in the following way (see tables on pages 122, 123 and 124). The classification of the elements of the social product is according to their economic purpose.

The social product is divided in the table into two groups : (1) the means of production and (2) consumption goods. The means of production includes : means of labour (buildings of enterprises, machinery, equipment, etc.), and the objects of labour (raw materials, seeds, fodder, etc.). Consumption goods include foodstuffs, clothing, housing, etc. If the balance is more detailed, then these groups should be divided into some smaller sections.

The table of the balance of production, consumption and accumulation of social product gives data concerning national wealth, social product, national income,

consumption and accumulation. These indices of the balance are given according to the branches of the national economy, forms of property and social classes of the population. The table provides data concerning import and export. Losses are also pointed out in the table.

The total national wealth includes fixed capital, stocks and state reserves.

Fixed capital is shown in the balance of production, consumption and accumulation of social product in their original value minus depreciation. Stocks are divided into those of the means of production and of the consumption goods.

Production of the social product includes the total gross output of all branches of material production. Consumption of the production sectors includes consumption of circulated means of production and depreciation of fixed capital. If the total expenditure on materials and depreciations are subtracted from the total social product, we shall find the total national income. Non-productive consumption of establishments and organisations includes the material expenditure on keeping these establishments, e.g. heating, light, stationery, materials for current repair, etc.

Consumption of the population includes consumption from all sources, i.e. consumption of the personal income as well as consumption in hospitals, sanatoria, etc. Depreciations of houses are also taken into account in consumption of the population. Consumption of the population is calculated for separate social sections.

Accumulation is the difference between the total national income and the total of non-productive consumption, or the difference between the total social product and all kinds of consumption, both production and non-production consumption.

Accumulation is presented in the balance according to the forms of enterprises. Not only the total accumulation, but its material structure is shown in the balance. The increase of basic productive and non-productive capital as well as increase in stocks is shown. Besides that, the increase in the reserve capital supplied by the state for ensuring the normal process of production of the national economy in case of natural calamities or some unforeseen circumstances is also shown.

Besides being consumed and accumulated within the country, part of the manufactured products may be exported abroad, while some other products may be imported. This part of commodities—export and import—is given in the detailed table of the balance of production, consumption and accumulation in special columns. Losses of production due to natural calamities, epidemics, etc. are also shown in a special column of the balance. The total of material expenditures on non-productive consumption, accumulation, losses and export must be equal to the total social product with the addition of imported goods.

Thus, the balance of production, consumption and accumulation of the social product gives:

(a) the total social product produced in the country,

(b) the role of particular forms of property and of particular branches of the national economy in the process of production of the social product,

(c) material structure of the social product, proportion between the means of production and the consumption goods,

(d) the total national income for particular forms of enterprises and particular branches of the national economy,

(e) utilisation of national income for consumption and accumulation and their proportion,

(f) relations and proportions arising in the process of production,

(g) the results of production of the social product, displayed in the increase of national wealth.

The comparison of the indicators of the balance (of production, consumption and accumulation) of the social product for a number of years gives the rates of growth of the social product and national income, of the standard of living of the population, and of the development of the national economy.

By comparing the indicators of the balance with the indicators of the plan one can see how far the levels, tempos and proportions actually realised in the economy conform to the norms laid down in the plan.

Balance of basic fund (fixed capital)

A component part of the material balance of production is a balance of fixed capital.

Major part of the fixed capital in the USSR (with the exception of a part of residential buildings and some means of labour personally owned by the population) is in public socialist ownership.

Fixed capital is divided into two big groups : productive and non-productive. Productive fixed capitals are the equipment with which labour works to produce materials; they are of the utmost importance for the development of the national economy.

The productive fixed capital includes buildings, structures, power-supply equipment, plant and machinery, transmission devices, etc. used in production. In the process of production they retain their material form, they wear out partially and transfer their value to the output also partially. Non-productive fixed capitals are objects used for non-productive purposes. They include houses, buildings, equipment and other accessories of schools, hospitals, office establishments, etc.

Productive fixed capital or basic fund is compensated by means of their value transferred to the social product, and the depreciated non-productive fixed capital is replaced at the expense of the national income. A form of the balance of fixed capital according to their full original value is given below. (The full original value of the fixed capital is determined by the total of actual expenditure

on the construction and purchase of the fixed capital. The full original value includes expenditure on the delivery of purchased equipment and implements to the place of their utilisation and also the value of their installation).

forms of property and branches of the national economy	the full value of fixed capital in the beginning of the year	cost of putting into operation	depletion of basic funds due to depreciation, obsolescence, etc.	the full value of the fixed capital at the end of the year
(1)	(2)	(3)	(4)	(5)

The value of the fixed capital at the end of the year is calculated as follows : column (5) = column (2) + column (3) — column (4).

The full primary value of all fixed capitals of the national economy as a whole may increase only because of putting into operation of new fixed capital and decrease only because of physical removal of fixed capital due to obsolescence, breakdowns and other reasons.

The balance of fixed capital according to their primary value (after subtracting wear) is also constructed. The form of such balance is given below.

forms of property and branches of the national economy	primary value of fixed capital (after subtracting wear) in the beginning of the year	cost of putting into operation	capital repairs	wear in the year	losses of value of fixed capital due to other reasons	primary value of fixed capital at the end of the year (after subtraction of wear)
(1)	(2)	(3)	(4)	(5)	(6)	(7)

The value of fixed capital after subtracting wear by the end of the year is calculated as follows : Column (7) = column (2)+column (3)+column (4)—column (5) —column (6). If the balance of fixed capital is constructed not according to the full primary value, but according to the primary value *minus* wear, it must be noted that the increase of the value of fixed capital *minus* wear occurs not only as a result of putting new fixed capital into operation but also as a result of capital repairs. At the same time the decrease in the value of fixed capital takes place mainly because of the gradual loss of value of basic funds due to wear.

The mutual relation of production of fixed capital and social product in any particular year may be established if there is a comparable estimate of fixed capital and output in money terms. Such comparable estimates are achieved by revaluation of fixed capital by substituting for their primary value, their replacement value, which signifies the expenditure necssary for creating similar fixed capital under present conditions.

THE FINANCIAL BALANCE

The financial balance, as well as the balance of production, consumption and accumulation, shows the reproduction of the social product. The financial balance presents the social product as the fund of income and expenditure while the balance of production-consumption-accumulation, although valued in terms of money, considers the social product in its material aspect.

The difference between these two balances might be illustrated by an example. Let us consider the coal industry. In this case components of the balance of production-consumption-accumulation will be: the volume of coal mined, consumption of coal as the means of production in the national economy, non-productive consumption of coal in the national economy and, finally, the increase of coal stocks. All these components of the balance may be expressed both in material and monetary terms.

But in the financial balance there will be the following components: the production of coal in monetary terms, production expenditure on materials required for coal mining, wages paid to the workers of the coal industry, and residual incomes of enterprises in coal industry.

The financial balance shows the distribution, redistribution and final utilisation of the social product and national income, and the formation of income at various stages of the turnover of the social product. However, the financial balance does not reveal the interrelations between the credit and financial system on the one hand, and the various branches of national economy on the other. (The final utilisation of the social product covers compensation for the means of production consumed in the process of production, creation of basic funds and stocks, and non-productive consumption). Further, the financial balance shows the portion of the fund of non-productive consumption used for covering general managerial expenditure not connected with production and for the defence of the country, the portion spent on the satisfaction of common requirements (for keeping schools, hospitals, etc.), the portion spent for invalids and the portion used for personal distribution among the workers engaged in material production.

The primary distribution of national income in socialist society proceeds as follows. The national income produced in the state sector is divided into two main parts. One part takes the shape of wages and salaries of people employed in state manufacturing enterprises. This part of the income is the product for oneself produced by workers engaged in material production.[1] The other part of the national income produced in the state production sector is the product for society or genuine income.[2] The genuine income of the state production sector appears

[1] The labour-income of employees of state manufacturing enterprises is the counterpart of what Karl Marx called the 'necessary labour-time'; as such, it represents this part of the product taken up by the working peoples.—Ed.

[2] In a socialist economy, this is appropriated by the society as a whole.—Ed.

in two basic forms: (1) as profits of state enterprises and (2) as turnover tax, deduction from profits, deduction for social insurance, etc.

The national income produced in collective farms also consists of two main parts: one part is the product for workers, the other part is the product for society. The product for workers appears in the form of material and monetary income which is distributed among collective farmers according to working-day units. The product for society, produced at a collective farm, is the genuine income of the collective farm. One part of this income of the collective farm is used for its expansion, and for the satisfaction of material and cultural requirements of the collective farmers. The other part of it is given to the State where it is added to the centralised genuine income of the State. The collective farms, then, can be regarded as contributing to State outlays, the expansion of production in towns and villages, to the development of culture, to the strengthening of the defence of the country, etc.

The wages and salaries of people employed in branches of material productions, income received by collective farmers from collective farms (according to the working-day units both in the form of money and in the form of goods), the incomes of State manufacturing enterprises and of the collective farms—all these components are obtained through primary distribution. The financial balance also shows the process of redistribution of the social product and national income. Principally through its revenues, the State collects part of the national income for organising funds for the satisfaction of collective needs.

For socialist enterprises, the main payments to the financial system are payment of the turnover tax, deductions from profits for the State revenue, payments for social insurance, income-tax payments by collective farms and enterprises. Some smaller part of the funds for satisfaction of collective needs is also formed out of receipts from the population (taxes, loans).

Redistribution of incomes also occurs through the payment for services rendered to the population by non-productive organisations. The biggest part of the services is given free by the State but some part of the services is paid for by the population out of their income (theatres, cinema, passenger transport). By paying to the enterprises and organisations of non-productive sectors for their services, the population transfers part of their income to those enterprises and organisations, which will be using it for expenditures within these enterprises and for wages and salaries of employees.

Various payments and fees contributed to the financial system form the common fund which afterwards is redistributed by the State for the satisfaction of the national needs. Part of these funds is distributed to productive industries for their investments, working capital, etc.; a second part is spent on the maintenance of establishments rendering free services to the population (education, medical care, etc.), and a third part is spent on administration and defence of the country. Still another part is paid to the population in the form of pensions, stipends for

students, etc. The financial balance reflects this total process of the redistribution of the social product and national income.

In the concluding section of the financial balance the final distribution and utilisation of the social product and national income is shown. As already mentioned, at the stage of the final distribution the social product is divided into the fund for compensation of material production expenditure, the fund for non-productive consumption and the fund for accumulation. In case of any loss in the national economy, the part of the social product spent on their compensation is also shown. As a total, the social product utilised in the whole national economy must be equal to the actual product which was produced in it, and the total of final incomes must be equal to the national income.

As a supplementary to the financial balance some other balances are worked out, which reflect more concrete features of the process of the distribution of the income. Such particular balances are : the balance of receipts and payments of the population, the balance of exchange relations of the financial system with industries and with population and some other balances. The balance of receipts and payments of the population shows the movement of the part of the national income which is distributed among individual members of the society in the form of money. This balance serves the purpose of analysing and planning commodity circulation, money circulation, etc.

Enterprises of the production sectors, enterprises and establishments of non-productive sectors and groups of the population may appear in relation to the financial system both as payers and as recipients of money. These relations may be presented in the form of a balance of exchange relations between industries and the population on the one hand and the financial system on the other. The balance of exchange relations shows all kinds of payments to the financial system by the production branches of the national economy, establishments of the non-productive sector and population, and also all kinds of receipts from the financial system by the productive branches of the national economy, establishments of the non-productive sector and the population. The data of the balance of exchange relations are of great importance for characterising the process of redistribution of the national income, for the analysis of the achievement of the national economic plan of accumulation, etc.

Balance of labour

A very important factor of the socialist production is labour-power as a whole, and skilled labour-power in particular. Labour resources of the country are the initial point in the process of the social reproduction. The distribution of labour among different sectors and branches of the national economy and labour-training facilities appear to be one of the most important national-economic indicators.

BALANCE OF THE NATIONAL ECONOMY

The balance of labour must show : (1) the amount of labour resources in the country, their distribution among various branches of material production and social activities, (2) utilisation of labour resources and the amount of non-utilised resources of labour power, (3) the potential labour power. The balance of labour must check with some norms regarding the proportions between particular categories of workers, e.g. between managing personnel and workers employed directly in the production; between workers, employees, engineers, technicians, etc.

The scheme of the balance of labour resources is given below :—

	average annual number	number at the beginning of the year	number at the end of the year
1. population of working age (except non-working invalids)			
2. working people of other age categories			
total labour resources from the total :			
(a) employed in the branches of material production (for particular branches and forms of property)			
(b) employed in establishments and organisations taking care of living and cultural conditions (for different services)			
(c) employed in the establishments of general management			
the total population employed in the national economy : (a+b+c)			
(d) students of working age			
(e) population in working age occupied with domestic duties			

Labour resources comprise the whole population of the working age with the exception of non-working invalids. Besides that, people of other age-groups who actually work in some or other branch of the national economy are also included here.

The distribution of labour resources is shown in the balance as follows : first of all, comes the population employed in the various branches of material production; the balance of labour resources must show the distribution of people employed in the sector of material production, by particular branches of that sector and according to the forms of property. Workers engaged in state enterprises, in the enterprises of co-operative producing organisations, in collective farms, in subsidiary husbandries of collective farmers, in private husbandries of individual

farmers and in handicrafts (not organised in artels) are considered separately. Along with the population employed in the branches of material production, the balance considers the population engaged in taking care of living and cultural conditions, in scientific establishments, in managing offices and establishments. The separation of the non-productive branches gives the possibility of estimating the proportion of the distribution of labour between the sector of material production and non-productive sector.

The balance of labour resources indicates the number of students of working age, i.e. the part of working-age population which does not work because of their studies and accordingly cannot be considered as a labour resource for a given period of time. Along with the above-mentioned groups, the balance of labour resources shows also the working-age population occupied with domestic duties.

The balance of labour resources is presented in terms of number of people. Along with this balance another balance is worked out, namely, the balance of utilisation of labour. This balance is worked out in terms of working time units, for example, days. This gives the possibility of discovering non-utilised resources of working time. The comparison of time spent on production with the total social product gives the opportunity of determining output per unit of time, both in the national economy as a whole and in its individual branches.

In addition to the balance of labour resources, other balances are also worked out which give more detailed characteristics of labour resources by types, and their utilisation in separate branches of the national economy. Along with the tables mentioned above, the summary table of the balance of national economy is also drawn up.

Summary table

In addition to the above-mentioned basic indicators some other indicators are also included in the summary table of the national economy, e.g. the number of persons according to social classes, groups, labour resources, fixed and circulating capital of the national economy, the production of the social product, national income, their primary distribution, redistribution and final utilisation (productive consumption, non-productive consumption and accumulation).

The balance of the national economy appears as a system of interrelated indicators. Thus, the total national income is the result of a certain amount of labour, equipped with certain amount of fixed capital, i.e. labour having a certain level of productivity. So the social product and national income are related to labour resources of the national economy and the utilisation of the fixed capital of the national economy.

BALANCE OF THE NATIONAL ECONOMY

The volume of the national income, and accordingly, the volume of consumption and accumulation, are connected with the utilisation of fixed and circulating capital and with the economisation of the means of production. A more economical utilisation of the means of production is equivalent to a release of additional resources in the national economy for further expansion of production and increasing the material welfare of the people.

By comparing the manufactured social product to labour resources it is possible to obtain an important quantitative indicator of productivity of the social labour. Such comparison of total social product with labour resources, for separate periods of time, shows the changes of the labour productivity with time.

The balance of the national economy reflects most essential relations between the components of the social product according to its value and according to its material structure. Among such relations are the relation of receipts of the population and the volume of commodity circulation, the relation of the overall income of the population and the fund of non-productive consumption, the relation between final incomes of socialist production enterprises and the accumulated part of the means of production, etc.

BALANCE

OF PRODUCTION, CONSUMPTION AND ACCUMULATION OF THE SOCIAL PRODUCT IN THE NATIONAL ECONOMY OF THE USSR DURING.....

components of social product	national wealth according to the branches of the national economy and forms of property at the beginning of the year	production of social product according to the branches of the national economy and forms of property	import	total received during the year	consumption in production (material production expenditures) according to the branches and forms of property	non-production consumption			export
						of the population (according to social groups)	of enterprises and establishments of non-production sphere	total	
means of production									
consumption goods									
total social product									

losses (according to the branches and forms of property)	accumulation (according to branches and forms of property)			national wealth (according to branches and to forms of property) at the end of the year
	increase in basic funds	increase of circulation material funds and stocks	increase in reserves	

BALANCE

OF PRODUCTION, DISTRIBUTION AND REDISTRIBUTION OF THE SOCIAL PRODUCT AND NATIONAL INCOME DURING .....

	social product produced	material production expenditures	national income produced	the primary distribution of national income		sum total given by enterprises, organisations and population through the redistribution
				incomes of the population received in production (product for oneself)	incomes of socialist manufacturing enterprises (product for society or genuine income)	
I. socialist enterprises of the sphere of material production (according to branches and forms of property)						
II. establishments, organisations and enterprises of non-production sphere (according to branches and forms of property)						
III. population (by social groups)						

contd.—

transferred		redistribution of social product and national income								received
		including				including				
payments and fees to financial credit system	payment for services	wages by non-production organisations	direct transference by enterprises of production branches for keeping non-production branches	total received by enterprises, organisations and population through redistribution	receipts from financial credit system	received from the sale of services	wages received from non-production organisations	direct receipts from manufacturing enterprises for keeping non-production branches	balance of redistribution of social product and national income

final distribution and utilisation of social product								
	non-productive consumption			accumulation		losses in social product	compensation of losses from basic and circulation funds
for compensation of the material production expenditures	consumption of the population	consumption in the establishments and organisations of the non-productive sphere	total	in basic funds	in material circulation funds	total accumulation		

ON THE PREPARATION OF BALANCES OF THE NATIONAL ECONOMY FOR PLANNING IN THE USSR

By A. P. STRUKOV

The economic balance is prepared in the USSR for an aggregate characteristic of the reproduction during the plan or current period. The economic balance characterises the most important economic ratios : ratio between the production of producer goods and that of consumption goods; ratio between different industries (industry and agriculture and so on); ratio among social sectors in production and consumption of the national product and national income; ratio between consumption and savings; ratio between productive and non-productive spheres, and so on. In the Gosplan, the preparation of the plan economic balance is based on the current balance which is prepared annually by the Central Statistical Administration of the USSR. The plan economic balance is prepared during all the stages of the preparation of the plan (at the preliminary stage of the preparation of the bench mark targets and at the final stage of the preparation of the plan-frame). The formulation of the main indicators of the economic balance is of the highest priority while preparing the plan. In consideration of the special importance of this stage of the preparation of the plan, we may study this in detail. First of all, what is the organisation of planning in the Gosplan? The Gosplan has industrial and co-ordination divisions. The industrial divisions comprise :

1. the division for industrial planning; the division for iron and steel, and non-ferrous metallurgy; divisions for fuel and power (coal, oil, gas, electricity); divisions for mechanical engineering; building materials and construction division;
2. the division for planning agriculture;
3. the division for planning transport and communications.

The industrial divisions of the Gosplan prepare draft plans for individual industries with their breakdown for Republics. These plans include targets for production in physical and value terms, targets for capital expenditures with the breakdown for construction and plant and equipment, for putting into operation productive assets, targets for utilisation of installed capacities, targets for labour (number of personnel, labour productivity, wages fund) and for the cost of production. Along with the industrial divisions the Gosplan has also co-ordination divisions which co-ordinate the most important breakdowns of the plan and the plan as a whole. There are the following co-ordination divisions :

1. division of labour and wages which in co-operation with industrial divisions prepares targets of the plan for labour for the whole national economy and for the Union Republics;
2. division of trade which prepares the plan of retail trade for the whole of the country and for the Union Republics;

3. division of finance and cost which prepares in co-operation with industrial divisions targets for cost of production and a balance of monetary incomes and expenditures of the population and the aggregate finance plan (the balance of the incomes and expenditures of the country);
4. division of commodity balances which prepares in co-operation with the industrial division balances for the most important commodities (metal, equipment, fuels and so on);
5. finally, the coordination divisions which include the division of economic plan, which carries out the coordination of the plan as a whole. This division also prepares a balance for the national economy.

In order to prepare a plan properly and to avoid unnecessary work, it is necessary to have main projections (limits) for the development of individual industries before the individual industrial plans are worked out. First of all a projection of capital expenditure is needed. The main problem of a plan, especially a perspective plan, is the problem of capital expenditures. If the total amount of capital expenditures and their distribution by industries is given properly, then it would mould the quality of the plan.

The formulation of the main targets of the balance of the national economy at this preliminary stage of work on the plan allows one to work out preliminary projections for the development of the national economy and its main industries. While determining the total volume of capital expenditures, it is necessary to take into consideration all the complex issues connected with it. The main problems are concerned with :

(a) the availability of the resources for capital expenditures, and

(b) the share of consumption and savings in national income as well as the proximate growth of incomes and expenditures of the population. (Preliminary balances of national product and the national income are prepared for this purpose. Their characteristics are given below in detail).

To determine the total capital expenditure, it is necessary to find out material resources for investment. As is known, inputs in construction (building materials and equipment) are covered only by the output of the heavy industries (iron and steel industry, building materials industry, and machine building industry producing equipment). The part of the output of heavy industries used for construction should be determined on the basis of the analysis of current data. (It is obviously necessary to prepare a balance of utilisation of the output of industries). Then on the basis of past rates of the development of heavy industries and evaluation by experts, it is possible to find a rough estimate of the possible output of heavy industries in the plan period. Let us take the following example :

1. the output of heavy industries in a current year is one thousand million;
2. the share of output of heavy industries used in construction for previous years is 20%;

3. annual average increase of output of heavy industries for previous years is 10%; and

4. the rate of increase of production of heavy industries for the plan period is 10%.

Then, under these circumstances, the output for the next plan period will be 1,100 million. If we take the same pattern of utilisation of the output which prevailed during the previous few years, then for construction one may use 220 million of the output of heavy industries. Let us assume that inputs of materials and equipment are 60% of the total investment, then it follows that the total investment will be $\frac{220}{60} \times 100 = 370$ million. The figure received for investments should be further analysed in detail by the calculations for metal, cement and other building materials and equipment. As was pointed out, the investments should be studied from all aspects. That is why along with the estimate we mentioned above, the estimate of national income and its utilisation for consumption and savings is made. While determining the rates of increase of the national income the current data for a number of years are analysed in detail and evaluations by experts are given for the plan-period. Having analytically reviewed the utilisation of the national income for consumption and savings with the given volume of investments, one can calculate the changes in the utilisation of the national income which may take place. In the analysis of the rates of increase of the national income as well as of industrial output and in determining the necessary amount of investments, the indicators characterising the utilisation of fixed assets (amount of output in value terms for a unit of fixed assets given in value terms) are used. While finding out the ratio of the national income for consumption and saving it is necessary to have in mind that the rates of the increase of the national income and output of individual industries for maintaining their existing levels require an increase of the share of the production savings (if this is not followed by the radical changes in the technology and productivity of labour which allow for the same or even less investments to get more output). It is seen from the following example.

		1950 (m. tons)	1957	1958	1959
output of iron	...	40	44	48.4	53.2
absolute increase	...		+ 4	+ 4.4	+ 4.8
percentage of increase	...		+10	+10	+10

The example shows that the rate of increase of iron is maintained at the 10% level while the absolute increase is from 4 million tons to 4.8 million tons. It is clear that for providing absolute increase in 4.8 million tons more investment is needed than for the increase in 4 million tons. This is true for the whole national economy. When

the Soviet Union was solving the problem of industrialisation in a short time this led to a considerable increase of the share of savings (in 1930 savings were about 9% of the national income while now they are about 25%). Thus the preparation of the main targets of the economic balance allows orientation in the rates of economic developments, investments and ratios between consumption and savings. When the possible investments are known then it is possible to distribute them by industries in the light of the economic and political tasks before the country. Certainly the work on the plan is not concluded with this. The extensive work requires participation of a large number of experts for the final formulation of the plan. At the twenty-first Congress of the Communist Party of USSR were discussed the bench mark figures which had been prepared by the Gosplan of the USSR in co-operation with the Council of Ministries of Union Republics, Ministries and Departments, Academy of Sciences and other Research Institutions. On the basis of the bench mark figures it will be possible to prepare perspective plan for each Union Republic, economic council, establishment and project. The balance of economy prepared on the basis of the draft plans for the development of industries gives the characteristics of possible economic proportions in the plan.

The most important parts of the economic balance are :

—balance of output, consumption and savings of the national product (it is called balance of the national product);

—balance of production, distribution, redistribution and utilisation of the national income (it is called balance of the national income);

—balance of labour;

—balances of fixed assets ; and

—commodity balances.

Let us briefly describe the respective functions of these balances.

The national product balance is aimed at determining the characteristics of the national product in the light of its original social structure, utilisation for recovering, non-productive consumption and savings. The gross national product is the total amount of material wealth produced in the society on the basis of the social division of labour during a certain period of time. The national product is created only in the sphere of material production, which includes mining and manufacturing and agriculture, construction, freight transport and communications which are used for serving material production, trade, in the portion where the process of production is continued, procurement of material and technical supply (wholesale trade). The national product is not created in the non-productive sphere (administration, finance, banking, education, health). The origin of national product is contributed by the social sectors (public, co-operative and private). The most important economic ratio is the ratio between production of producer goods and that of consumer goods. The balance of national product should show these ratios. The balance of national product should show the utilisation of the national product for the recovery of the used-up producer goods as well as for consumption and savings.

PREPARATION OF BALANCES IN THE USSR

SCHEME OF THE BALANCE OF THE NATIONAL PRODUCT

	total	including			out of grand total	
		producer goods	consumer goods	industrial goods	agricultural goods	miscellaneous
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. resources of the national product						
1. output (by industries, industry and agriculture, and so on)						
2. imports						
II. consumption of the national product						
1. for recovering consumed producer goods: in industry, in agriculture and so on						
2. for savings: —fixed assets, —working capital, —stocks						
3. non-productive consumptions: —domestic consumption of population —consumption of population through the institutions of non-productive sphere						
4. exports						
5. losses						
6. total utilisation						

The balance of national income characterises the part of the national product which is the surplus of the current industrial consumption and may be utilised as an income, i.e. for private and public consumption and savings. The national income of the society is the value annually added by the labour and the part of the national product corresponding to it. In the USSR the main method of calculation of national income is the productive method (inventory method). To determine the total amount of the national income it is necessary to determine the net output for each industry (net output = gross output *minus* inputs), and the sum of the net outputs of industries of material production. The national income in its dynamics goes through a complicated process of distribution and utilisation. In the process of primary distribution the national income is divided into the incomes of population engaged in material production and incomes of States and co-operatives. The primary incomes of population include the following : wages of productive workers, incomes received from collective farms and personal households.

The primary incomes of the Government include : savings of Government establishments in the form of incomes and sales tax, the payments of social security. Primary incomes of co-operatives and collective farms include : payments for formation of social funds (insurance fund, seed fund, etc). Primary distribution does not end the process of the distribution of national income, for, in course of the process national income is distributed among those who participate in production. Along with the productive sphere, there is a non-productive sphere (education, health, administration and defence) which does not create but consumes the national income, but without which a society cannot exist. Then to provide expanded reproduction it is necessary to have a corresponding fund. In the process of further distribution, in which an important role is played by the financial system, the social funds are formed which are necessary for maintenance and development of the non-productive sphere as well as for the development of production and creation of reserves (funds for public health, education, social insurance, expanding the production, defence, administration, stock). In the process of formation and utilisation of this fund final incomes of the population, Government and co-operatives are generated. Finally in the process of utilisation of final incomes the national income is divided into the funds of consumption and savings. At all the stages of the dynamics of the national income the total should be the same. The produced national income will differ from the utilisation in the amount of losses and the balance of credits with other countries. That is why along with the production (inventory method) which is the main aspect, the national income may be determined as a sum of the primary incomes or as a sum of consumption and savings.

The characteristics of the dynamics of the national income at all stages are given in the balance of national income.

The balance of monetary incomes and expenditures of the population is closely connected with the balance of the national income.. This balance correlates the income of the population and supply of goods and services as well as the finance plan which correlates the incomes and expenditures of the Government.

The labour balance

An important task of the plan is provision of labour for establishments and projects. For this the balance of labour is prepared which on the one hand gives the characteristics of all the labour resources and on the other hand distributes it by industries. The labour balance is prepared for urban and rural areas, not only for the country as a whole but by the economic regions and Union Republics. The labour balance characterises the labour as on certain date (this is very important for agriculture) and also in annual averages.

Along with the balance of labour, a balance of skilled labour is prepared. These balances characterise on the one hand the requirements of qualified labour and on the other hand the sources for meeting this requirement.

The balance of fixed assets gives characteristics of the availability and changes of fixed assets.

THE SCHEME OF THE BALANCE OF NATIONAL INCOME

	total	productive sphere	including			
		total	govt. sector	co-operative	population	non-productive sphere
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. resources of the national income (total) including						
1. production (by industries)						
2. credits received						
II. primary distribution of national income						
— income of the population						
— income of the govt.						
— income of the co-operatives						
III. further distribution						
— transfer (receipt) for the non-productive sphere for the formation of public funds						
— receipt (transfer) by non-productive sphere for the utilisation of the public funds						
IV. utilisation of the national income						
1. consumption (total) including						
— consumption of the population on their personal funds						
— consumption of the population through institutions of the non-productive sphere						
2. savings (total) including						
— fixed assets						
— working capital						
— inventories						
— increase of stocks						
3. credits						
4. losses						
5. total utilisation						

The balance of fixed assets characterises them with the breakdown for productive and non-productive sphere by industries and forms of property. The balance of fixed assets reflects their dynamics: putting in operation of new fixed assets, the losses of fixed assets due to wear and calamities. The balance of the fixed assets gives the original cost and the original cost *less* depreciation.

THE SCHEME OF LABOUR BALANCE

(million persons)

	for the USSR in the whole			
	total	including		including economic regions and union republics
		urban areas	rural areas	
(1)	(2)	(3)	(4)	(5)
1. total labour resources in industries including				
(a) in the sphere of material production total for industries; industry, agriculture and so on				
(b) in non-material sphere (total and by industries) out of total:				
— in the govt. establishments				
— in collective farms				
— in private households				

Commodity balances are prepared for the most important commodities :

1. balance of the most important commodities of heavy industries (metal, fuel, electricity, equipment),
2. balance of food and consumer goods,
3. balances of agricultural raw materials.

Commodity balances constitute a very important complement to the balance of the national product and give more detailed ratios. The commodity balances show on the one hand the total resources and on the other hand the distribution of the resources by direction.

THE SCHEME OF THE BALANCE OF THE RAW MATERIALS

(in m. tons)

	1956	1957	1958 etc.
1. total resources including			
— production			
— imports			
— inventory and stocks			
2. distribution of the resources			
— production and maintenance (machine building)			
— construction			
— transport (rails)			
— sales to the population			
— increase in inventories and stocks			
— export			

Other balances are prepared on a similar basis. Thus the economic balance gives characteristics of all aspects of the expanded reproduction, makes it possible to study the most important economic relations and ratios, and is an important tool of economic planning. Till recently the economic balance was prepared only for the USSR as a whole. With the reorganisation of the management of industry and construction, conditions are created for the preparation of the economic balances for Union Republics as well. The first stage of this work is the formulation of the targets for national product and national income, which is done now by Union Republics.

THE HISTORY OF THE ELECTRIFICATION PLAN OF SOVIET RUSSIA

(*Goelro plan*)

By M. I. RUBINSTEIN

The aim of this lecture is to give a brief analysis of one of the important stages of the economic history of the USSR in the 20's—the working out and the implementation of the state electrification plan (Goelro)—that marked the beginning of the organised planning of the whole national economy in Soviet Russia. In spite of different conditions of economic and social development in various countries, the analysis of this stage of economic planning in the USSR is, in my opinion, of interest to every one who is interested in planned development of the national economy for the sake of the growth of productive forces. and greatest satisfaction of the needs of the population.

What was the economy of Soviet Russia like in the period of the preparation of the Goelro plan ? It was the economy of a backward agrarian country, ruinedby the first world war and the intervention of imperialist states that followed the October revolution of 1917. Soviet Russia defeated the troops of interventionists and counter-revolutionary generals, but the economic situation of the country was extremely difficult at the end of the civil war. Production of industries had fallen many times in comparison with 1913, the pre-war year. For instance, production of steel had fallen from 4.2 million tons in 1913 to 0.19 million tons in 1920. Production of coal in the same period had fallen from 29.1 million tons to 8.6 million tons, of oil from 9.2 million tons to 3.8 million tons, of cement from 1.5 million tons to 0.02 million tons, etc. For many years the Soviet State had been cut away from its main sources of raw materials—from Donetz coal, oil from Baku, steel from the Ukraine and Urals, cotton from Central Asia, grain from Siberia, Cuban and the Ukraine. The whole country suffered from lack of food and fuel. Under such conditions, working out of the plan of the radical reconstruction of the whole economy of the country on the base of electrification, that is, the most modern techniques, was certainly a very bold idea. The well-known English writer, H. G. Wells, who visited Moscow in the difficult days of 1920 and had a long talk with Lenin about the electrification plan, called this plan 'utopia' and Lenin, who had been the initiator and chief author of the plan, "The Dreamer in Kremlin". Events have shown that the plan of electrification of Russia, though bold in it srevolutionary scope, was not utopian but really a scientific plan, based on a correct estimate of the possibilities of Soviet Russia's economy and natural resources and on a scientific analysis of the trends of development in economics and technology.

PLANNING AND STATISTICS IN SOCIALIST COUNTRIES

I. Working out of the electrification plan

In February 1920, a commission of representatives of scientific and other organisations that were connected with problems of electrification, (for instance, the Central Electro-technical Council, the Research .and Development Council, etc.) was established. Government had given the State Electrification Commission (Goelro) substantial means and instructed all governmental institutions to deliver to Goelro, according to its requests, all statistical and other material necessary for its work. The Commission had its own organ, "Bulletin of Goelro".

Lenin had many times given instructions about the working out of an electrification plan. He stressed that what was needed was not a simple programme of building electrical stations, but also a plan for the corresponding development of industry and the whole State economy. On his proposal, the programme of work of the Goelro Commsision provided for the working out of perspective plans (for 10 years), for the main branches of industry, transport, agriculture, and separately on fuel supply, electrical industry, use of water resources, and rural electrification. The detailed programme of the Goelro Commission had been worked out with the participation of scientists, engineers, agronomists, statisticians and other specialists in different committees and sub-committees in different branches of the economy and the economic districts of the country. Among the specialists who participated in working out the Goelro plan were also opponents of the Soviet revolution. But they were fascinated by progressive ideas and the scope of the plan and worked on it with the greatest interest because they acknowledged that the way of electrification, theoretically outlined by Lenin, was the only correct way of reconstruction and development of the national economy. It was formulated in a resolution of the Goelro Commission, that the main factor in the economic revival of our country is the steadfast implementation of the *united economic plan*, outlined for the coming historical epoch, and that the basis of the united economic plan must be the electrification of production, that is, of industry, transport and agriculture. The current economic tasks of different State institutions must not be a simple sum of needs taken into account, but results of thepe rspective economic plan. These reflected the main principles of socialist planning formulated by Lenin viz,. :—(1) Indissoluble connection of current and perspective economic plans. That the United Economic Plan cannot be just a summary of different projects, outlined by various economic institutions, but the current economic programme must proceed from the tasks of the perspective plan. (2) The greatest importance must be attached to the correct definitions of the main link of the plan. A State plan has to ensure in the first place, implementation of the main and decisive tasks and the development of all branches of the economy must be subordinated to these plans. (3) Implementation of the outlined plan requires persistent work, which is drawing to the cause of scientific construction greater and greater masses of the population (Lenin, vol. 30, p. 455—Russian Ed.).

The Goelro Commission pointed out that the economic development plan of Soviet Russia could not be outlined by the method of simple extrapolation, that

is, by transferring proportions and tempos of the economic development of Russia in the past years for the future. The Goelro Commission collected huge material about the economic conditions in the country. It worked out programmes of statistical surveys for the different branches of the economy and various districts. The programme of survey of industries included a short historical sketch of the development of the given branches, analysis of the geographical location of the main industrial enterprises, of necessary raw materials, power, fuel, etc. The surveys were designed to secure a thorough description of the contemporary position of each branch of industry, and were related to the current general perspectives of its development, including the provisional production plan for 10 years and the country's demand for the products of the particular industry.

The Goelro Commission held that working out of the economic plan for a district must be done by the district itself, because it requires deep knowledge of local conditions and active participation of the population. Without these conditions the working out and implementation of the plan is not possible.

More than 200 of the best scientists and specialists of the country working on the definite task of the Government's unified programme gave concrete calculations, to indicate how in a very short period it is possible to restore and raise the economy of Russia and base it on modern technique, that is, on electrification.

Lenin repeatedly emphasised the idea of an indissoluble connection between the electrification programme and the unified economic plan. He wrote: "To work out the project of electrification of Russia, means to give a leading thread for the whole creative activity, build the main scaffolding for the realisation of the unified state economic plan". He called for a broad use of the experience of the advanced capitalist countries and not mere imitation. He wrote: "We must get out of the bad habit of looking to advanced Europe for ready models and progressive solution of our current tasks."

The work of the Goelro Commission was carried on at two levels: 1) the general group of the Commission worked out general problems of electrification of the economy and outlined the plans for the main branches of industry, and special groups worked out the plans for transport and agriculture; 2) district groups worked out plans of development for various economic districts of the country. As we have already mentioned, the task of each group was to prepare a survey portraying the economic conditions of the corresponding branch and a production plan for 10 years, based on the most rational, geographical location of plants, proceeding from the location of raw materials, fuel, food, labour force, transport facilities, etc.

In its instructions to the Goelro Commission, the Government demanded work on a scientific basis and in conformity with concrete realities in each division of the industrial and district plans. The Government further requested the Commission to avoid groundless suppositions and utopian projects. Therefore, the Goelro Commission recommended that its industrial and district groups should base all their projects on real calculation of resources and possibilities of achievements in science

and technology and trends of their development. But the main task of surveys had to be in the future and not in the past. Projects of all groups were based on certain common normatives or ratios. For instance, to estimate the demand for electric energy of different types of consumers, coefficients were established, say, the number of kwhs per year for 1,000 inhabitants in towns and in villages for industrial plants of different types, for electrified railways, etc.

One of the important tasks of the Goelro Commission was to give expert conclusions on current plans and individual projects of electrical stations. Another important task was a broad propaganda for electrification. For that purpose, Goelro formed a special "Lecture Commission" to popularise the idea of electrification. To make this propaganda more concrete, Lenin considered it very important to create in every small district at least one electrical station and turn that station into a centre of education, lectures, courses, etc. for the whole population. He outlined the following questions in the programme of propaganda for electrification: 1) Modern technique and its connection with electrification; 2) Restriction and development of the productive forces of the country; 3) Centralisation and planning of the economy; 4) Communism is equal to soviet power plus electrification of the whole country; 5) Unified economic plan as the centre of activities of the people; 6) Growth of the cultural development of the masses; 7) Not simple literacy, but knowledge of the bases of modern science and technology. Lenin called on all engineers, agronomists and teachers to study the tasks of electrification and acquaint the population with them. He considered it a big achievement that we were able to attract to the preparation of the electrification plan hundreds of the best scientists and engineers, rouse their interests for this aim and collect important data on all problems of the plan.

After the approval of the Goelro plan by the Government, the study of this plan was declared obligatory in all high schools of the country. For detailed discussion of technical and economic problems connected with the implementation of the plan and for drawing the broad masses of intellectuals into active participation in it, in October 1921, a special session of the electro-technical congress was called. In its work about one thousand delegates—scientists, engineers, factory directors, representatives of trade unions and others—participated. The congress discussed the Goelro plan, the problems of production and consumption of fuel, heard reports on the development of electrification in capitalist countries and the achievements of science in this field. Lenin, in his greetings to the congress, stressed the great importance of electrification and development of the big machine industry as the main economic basis of socialism and as the means of saving humanity from wars that bring death to millions of men.

II. Principal tasks of the Goelro plan

The first part of the Goelro plan contains a summary of the unified economic plan with the following divisions: (1) Electrification and the plan of development of the State economy, (2) Fuel supply and fuel balance for 10 years, (3) Use of water

power, (4) Transport, (5) Industry. This part contains also the general programme of construction of 20 steam and 10 hydro-electric stations with their location and detailed description of the economic role of each station.

The second part of the Goelro plan was devoted to the perspective of electrification of economic districts of the country. The Goelro plan outlined a firm course to create in Russia its own heavy industry as a basis of the independence of the country and socialist reconstruction of the economy. The plan was to overcome the technical and economic backwardness of our country and to prepare the way to industrialisation, that is, quick development of steel, machine-building, power, chemical and mining industries, production of building materials and other means of production.

Production of industry had to increase two times in comparison with 1913 and many times in comparison with 1920. While big industry as a whole had to increase 100 per cent, production of the means of production had to increase 117 per cent and production of articles of consumption 47 per cent in comparison with 1913.

The principal tasks of the Goelro plan in comparison with the level of production in 1913 and 1920 were as follows:

production	unit	1913	1920	task of Goelro plan
pig iron	mls. tons	4.2	0.116	8.2
steel	„	4.2	0.194	6.5
iron ore	„	9.2	0.164	19.6
coal	„	29.1	8.6	62.3
oil	„	9.2	3.8	12.16
cement	„	1.5	0.036	7.75
bricks	bln. piece	2.1	0.2	10.0
paper	thous. tons	197.0	30.0	688.0
aluminium	„	0	0	9.8
capacity of dist. elec. stations.	thous. kwt.	177	—	1750

The Goelro plan pointed out that for the development of the productive forces of the country, quick creation of the machine-building industry was necessary and laid stress on metal and fuel as the main links of the electrification plan. Without metal and fuel, the progress of industry and transport and the development of all economy is impossible. The plan outlined measures to overcome the fuel famine and also gave instructions for the economic and rational use of fuel in various branches of the economy. The plan laid special stress on the development of the extraction

of local fuels—lignite, peat, etc. aiming at abolishing superfluous transportation. In agriculture, aiming at liquidation of the lagging of agricultural production behind the demands of the population and the economy, the plan outlined measures for the extension of the cultivated area with the help of tractors (at that time imported), crop rotation, use of artificial fertilizers, better seeds, etc. Production of agricultural machinery was to be doubled.

In railway transport, corresponding to the growth of production and trade, the plan provided for the growth of freight turnover by 80–100 per cent in comparison with 1913. The plan outlined a broad programme of construction of new railways, (about 20,000 km.) and reconstruction of main trunk lines, which handled the principal part of transporation. It was proposed to start the electrification of some of these main trunk lines. Together with the change of economic proportions in the line of turning the country from an agrarian country into an industrial one, the electrification plan outlined great changes in the territorial location of production, for bringing the manufacturing industry nearer to the sources of raw materials and fuel and to centres of consumption.

The second part of the Goelro plan contained a complex plan of 8 main economic districts along with a scheme of rational division of work and of collaboration of districts, taking into account their natural resources and possibilities and aiming at the quickest progress of the national economy. An important achievement in the methodology of planning was the practical application in the Goelro plan of the balance method as a tool to ensure correct proportions in the development of the economy.

In order to coordinate in a unified economic plan the programmes of different production branches and districts of the country, to unite the production, construction and financial plans and other divisions of planning, elaborate calculations were made and balances drawn of metals, fuels, building materials, labour and financial balances of electrification. Lenin wrote that the Goelro plan for the first time had given on a national scale material and financial (in gold roubles) balances of electrification, aimed at doubling industrial production in 10 years. To implement the first part of the electrification plan (construction of 30 district electrical stations), it was necessary to have about 6 million barrels of cement, 150 million bricks, turbo-generators with a capacity of 1.1 million kwt., hydro-turbines and generators with a capacity of 0.6 million kwt., certain quantities of boilers, transformers, insulators, wires, etc. The necessary labour was roughly calculated to be about 370 million working days. The financial balance of electrification gave the following approximate figures of the required investment. Electrification (1.5 million kwt.):—about 1.2 bl.r. Extension of manufacturing industry by 80 per cent in comparison with 1913:—5 bl. r. Extension of extraction industries by 80–100 per cent:—3 bl. r. Restoration and extension of transport:—8 bl.r. Total: about 17 bl.r. Thus, the Goelro plan contained rough calculations, showing in terms of broad magnitudes what was necessary to raise the national economy on the basis of modern techniques, that is, electrification.

All calculations of industrial capacities in industries, projects of electrical stations, of grids and long-distance high voltage lines, etc. were worked out on the basis of the highest achievements of science and technology at that time.

The Goelro plan pointed out that after the restoration of the economy and doubling of industrial production in 10 years, with simultaneous liquidation of former disproportions in the economy, the possibilities for further greater economic growth of the country, with a higher tempo of economic development, would be created. Events have justified that assumption.

III. The fulfilment of the Goelro plan

Already before the affirmation of the Goelro plan, under the difficult conditions of intervention and economic blockade, very great shortage of machines, building materials, food and skilled workers, the Soviet State had started the construction of the first big electrical stations as planned projects that were later included in the Goelro Plan. These constructions (Wolhow hydro-station and Thatura and Kashira steam stations) became a practical school for builders, electrical and hydro-electrical engineers and scientific workers to solve new technical problems. After the affirmation of the Goelro plan the construction of many new electrical stations was started and the grid connection of Moscow and the industrial towns of the central district was implemented. This implementation demonstrated one of the advantages of the planned economy. The construction of local electrical stations in towns and villages was gradually growing with technical and, partly, financial assistance from central organisations. Many industrial plants were helping to electrify the neighbouring villages. An important role in rural electrification was played by co-operation, including production co-operatives of home industries and handicrafts (textile, hosiery, etc.). Peasants of neighbouring villages formed special co-operatives for the construction of common electrical stations; this had a progressive influence on the whole economic and cultural life of the rural population. Electrical stations were used not only to illuminate houses, schools, hospitals and clubs, but also to move motors in mills, various workshops, and threshing and winnowing machines. As a typical example I can cite the case of Kashin district, where peasants organised in 1920 a co-operative society named "The Dawn" for the electrification of the villages. They collected share payments and advances. Those who could not pay because of poverty were also included in the co-operative. (Such persons could pay afterwards). The co-operative applied to the electrical department of the regional economic council where the estimate was calculated and an engineer was sent to work out a plan. The generator was purchased by the co-operative's union, and a locomobile from the workshop of the home industries' artel was converted into a prime mover. Building works, mounting of poles, etc. were done by peasants themselves. In November 1920 Lenin came to attend the opening of the station and told later on that the peasants had said: "We were living in darkness and now we have a light, man-made light, that will illuminate our way to a bright future."

Summing up the results of the first year of the implementation of the Goelro plan, Lenin said that it was a very modest start for our vast country. If we compare, these first results of soviet electrification with the data of industrially developed capitalist States, they will seem insignificant. However, these first achievements showed clearly that it is possible to move forward in spite of difficulties that no country had ever faced.

These first modest achievements were a pledge of future development of soviet electrification and all the current plans and measures of economic activities were tied up with that future.

In the statutes of Gosplan (State Planning Commission) written by Lenin in February 1921, it was pointed out that the "Planning Commission has been created to work out the unified State economic plan on the basis of the electrification plan, and for general supervision on implementation of this plan." Analysing the possibilities of creating socialist economics in such an agrarian country like Russia, Lenin wrote: "Is it possible to think about direct transition to socialism from the small peasant holdings, that are now dominating in our economy? Yes, it is possible, but only under one condition, which we know now exactly, thanks to extensive and successful research work. This condition is electrification".

Lenin directly related the implementation of the electrification plan with the creation of modern industry and the development of peasants' cooperation. Thus the electrification plan was an organic part of the socialist industrialisation of the country, that is, of transforming Soviet Russia from a backward country into an advanced one, into a country of modern industry and progressive agriculture, a country of electricity and steel, machines and tractors. At the same time, electrification was considered a mighty tool to bring together towns and villages and to liquidate the contrast between them.

The aim of this lecture is not to include the analysis of the five-year plan of the USSR; that requires special consideration. Suffice it to say that in the field of electrification, the first five-year plan, in its production and construction programme, went much ahead of the Goelro plan targets. The first 5-Year Plan outlined construction of 42 district electrical stations (against 30 in the Goelro plan for 10–15 years) and of 1500 big industrial plants, the creation of many new industries, automobiles, tractors, turbines, machine tools and others.

Doubling of industrial production in comparison to 1913 that was outlined in the Goelro plan was achieved in 1930. At the end of 1930 the Goelro plan had been implemented in the production of electric energy and at the end of 1931 also in the construction of electrical stations, the capacity of which reached 1.7 million kwt. Thus, in 10 years—the minimal period provided for the Goelro plan—this plan had been fulfilled. In December 1935, that is, 15 years after the affirmation of the Goelro plan, two big State electrical stations had an installed capacity of about 4.3 million kwt., that is three times more than in the Goelro plan targets. At the end of the

second 5-year plan (1937) the capacity of electrical stations had increased 8 times in comparison with 1913, and production of electricity was 20 times greater than in pre-revolutionary Russia. The Dniepr hydro-electric station alone had given that year more electrical energy than all electrical stations of Tsarist Russia. The coefficient of electrification of working machines in that year reached 85 per cent against 35 per cent in 1931. Four-fifths of the electrical balance of the country was given by the stations united in grid systems, and two-thirds of the balance by 8 main grid systems.

Already before the second world war the Soviet Union had achieved substantial progress in the field of electrification and captured in the production of electrical energy as well as in industrial production the first place in Europe and the second place in the world. We shall describe the development of electrification in the USSR after the second world war in a special lecture.

Now, only few more remarks. In 1950, that is, 30 years after the beginning of the Goelro Plan, the annual electrical balance of the USSR was 15 times greater than that provided by that plan. In the fifth five-year plan for 1951-55, the capacity of electrical stations of the USSR will increase 2 times, and the capacity of hydro-electric stations 3 times. During this five-year plan will be put in action the greatest hydro-electric stations of the world : for instance, the Kujbishev station on the Volga, with a capacity of 2,100,000 kwt. and an annual production of electricity about 10 billion kwt-h. Production will start also on the Gorki station on the Volga, the Molotov station on the Kama, and Kahovka on the Dniepr. By the time these big hydro-electric stations are completed the construction of the high voltage (400 thousand volt) Kujbishev-Moscow transmission line (length about 900 k.m.) will have been completed. It will unite in one grid system the electrical stations of a great part of European Russia. After the war, began the mass electrification of agriculture. In the summer of 1954, in the USSR, the first electric station in the world run on atomic energy, with a capacity of 5,000 kwt., was put into action and designs for atomic stations of a higher capacity are being prepared.

I think that in spite of all differences of social, political and economic conditions, some general directions and methodology of the Goelro plan as well as of its further development in Soviet Five-Year Plans, could be studied and taken into account in the planning of the national economy that is developing in India.

ON THE SYSTEM OF TRAINING OF STATISTICAL PERSONNEL IN THE USSR

By A. I. EZHOV

In tzarist Russia the number of Government statisticians was very limited. There were no special colleges for training statisticians. Since 1904, the Statistical Committee of the Ministry of Home Affairs had started a two-year course in statistics. But the number of trainees was small. The chair of statistics was filled by unsuitable persons in most of the colleges. People had a notion that the ability to work in the statistical field could only be attained by practice and that education was unnecessary for statisticians. This state of affairs, however, did not continue in the socialist economy.

In 1918 the Congress of Statisticians submitted to the Government a suggestion to organise a college for statistics. However, in conditions of civil war, it was not possible to make a beginning. The statistical section of the department of social sciences in the Moscow University was first organised in 1921. In 1925, a statistical section was opened in the Department of Economics of the Moscow College of National Economy. Later on, a statistical department was created in Kharkov. In 1932 two special colleges known as institutes of national economic accounting came into being. Further, eleven special intermediate schools in statistics (for training diploma holders) were started at the time. Finally, statistical departments were established in more colleges.

I. Higher Institutions for Statistics and the Courses.

Higher education in statistics is given in the following colleges in the USSR to-day : The Moscow Economic and Statistical Institute, All Union Correspondence Economic and Statistical Institutes and statistical sections of the departments of economics of a number of universities (Moscow, Leningrad, Kharkov, Tbilisi, Riga and in some other cities). Education in statistics is also given to the students of many colleges of economics (for example, in Mowcow State Economic Institute, Finance, Credit and Finance and Trade Institutes, Engineering and Economic and Construction Institutes and industrial colleges).

The Moscow Economic and Statistical Institute is under the Ministry of Higher Education. It trains specialists of high qualification under the categories : (a) statistician-economist and (b) engineer-economist, the latter specialising in mechanisation of accounting and computing.

In the section of "statistics", students have the following lines of specialisation : (1) statistics of industry and construction, (2) statistics of agriculture, (3) statistics of trade and material and technical supply and (4) statistics of population and family budget surveys. In the section of "mechanisation of accounting and computing", students get the following specialisation: (1) mechanisation of accounting in industrial establishments and (2) mechanisation of accounting in banks and credit establishments. The Institute admits persons with high education who have already

passed entrance examinations in certain subjects (physics, chemistry, mathematics, history and geography) after 10 years of study in schools. The Institute trains about 2,500 students and 500-600 students graduate per year. The training for statistics takes 4 years; for mechanisation of accounting and computing, 5 years.

The procedure of training is described below :

(A) In the section of "statistics" the students have 3,440 hours of training during 4 years of study. This is composed of : lectures—2,000 hours; laboratory work —100 hours; and practice, seminars and exercises —1,340 hours. The allocation of total number of hours by subjects and by the three modes of instruction are given below :

subject	number of hours			
	total	lectures	laboratory work	practice, seminars, exercises
Political economy and philosophy	680	470	—	210
History of national economy of the USSR and foreign countries	140	110	—	30
Economic geography of the USSR and foreign countries	170	150	—	20
Higher mathematics	170	100	—	70
Mathematical statistics	70	40	—	30
Civil and labour law	100	100	—	—
Foreign language	140	—	—	140
Planning of national economy	150	90	—	60
Finance and credit of the USSR	130	100	—	30
Principles of mechanisation of accounting	100	40	60	—
Book-keeping, accounting and balance analysis	240	120	—	120
General problems of theory of statistics	200	80	—	120
Statistics of branches of economy	140	80	—	60
Economic statistics	240	120	—	120
Economics of agriculture	50	40	—	10
Economics of industry	60	50	—	10
Agriculture and animal husbandry	100	80	20	—
Physical training	140	—	—	140
Technology of the most important branches of industry	90	70	20	—

Besides, students also study the following subjects depending on their specialisation :

subject	number of hours			
	total	lectures	laboratory work	practice, seminars, exercises
(1) Those who specialise in statistics of industry and construction :				
1. Statistics of industry	180	80	—	100
2. Statistics of capital construction	80	40	—	40
3. Organisation and planning of an industrial establishment	70	40	—	30
(2) Those who specialise in statistics of agriculture :				
1. Statistics of agriculture	230	100	—	130
2. Organisation of agricultural production	100	60	—	40
(3) Those who specialise in statistics of trade and material and technical supply :				
1. Statistics of trade	180	80	—	100
2. Statistics of material and techinical supply	80	40	—	40
3. Economics, organisation and planning of trade	70	40	—	30
(4) Those who specialise in statistics of population and family budget surveys :				
1. Statistics of population	180	80	—	100
2. Statistics of family budget surveys	80	40	—	40
3. Statistics of culture and public health	70	40	—	30

(B) In the section of "mechanisation of accounting and computing", the students have 3,890 hours of work during the 5 years of the course. This can be broken down as follows :

Lectures	...	2050 hours
Laboratory work	...	450 „
Practice, seminars,exercises	...	1360 „
Course projects	...	30 „

The allocation of the total number of hours by subjects and by four modes of instruction is given below :

subject	number of hours				
	total	lectures	laboratory work	practice, seminars, exercise	source projects
Political economy and philosophy	610	400	—	210	—
Economic geography of the USSR	90	70	—	20	—
Principles of civil and labour law	60	60	—	—	—
Higher mathematics with the principles of mathematical statistics	300	150	—	150	—
Chemistry	70	40	30	—	—
Physics	170	100	40	30	—
Electrical engineering	170	110	40	20	—
Drawing, geometry and machine-building drawing	100	20	60	20	—
Foreign language	140	—	—	140	—
Calculating methods	60	—	60	—	—
Metals and their technology	90	60	30	—	—
Theoretical mechanics	100	60	10	30	—
Resistance of materials	70	40	10	20	—
Theory of tools and machines and parts of machines	120	60	—	30	30
Calculating machines	270	130	80	60	—
Organisation of mechanised accounting and computing	260	120	90	50	—
General statistical theory	100	60	—	40	—
Economic statistics	120	80	—	40	—
Book-keeping and accounting	190	90	—	100	—
Planning of national economy	70	60	—	10	—
Finance and credit of the USSR	130	100	—	30	—
Technology of production of calculating machines	60	40	—	20	—
Physical training	140	—	—	140	—

Besides, students, according to the special course of study which they choose, study the following subjects :

subject	number of hours				
	total	lectures	laboratory work	practice, seminars, exercise	course projects
(1) Those who specialise in the mechanisation of accounting in the industrial establishments :					
1. Industrial accounting	150	70	—	80	—
2. Industrial statistics	120	50	—	70	—
3. Economics of industrial establishments and organisation and planning of industrial establishments.	130	80	—	50	—
(2) Those who specialise in the mechanisation of accounting in banks and credit establishments :					
1. Accounting in credit establishments	170	80	—	90	—
2. Banking system	70	30	—	40	—
3. Organisation and planning of credit	160	80	—	80	—

Students who specialise in statistics have their *first* training in accounting and statistics in different establishments for 10 weeks by the end of the third year of their study (6th term) in actual conditions of work. According to their specialisation, they work in industrial, trade and agricultural establishments and projects. In the middle of the last year of their study, that is, in the 4th year or 7th term, the students have their *second* practice in actual office and establishments for 12 weeks, this time in the government statistical agencies, starting from a local inspecting agency, then in the statistical board of a region (republic) and finally in the Central Statistical Board.

Students who specialise in the mechanisation of accounting and computing have their practical training in actual offices and establishments four times. The nature of this training is described below :

	period of the practice	term	weeks
1. general training	1 Sept. — 14 Sept.	5th	2
2. accounting	3 May — 30 June	6th	8
3. calculating machines	3 May — 30 June	8th	8
4. pre-diploma practice	1 Dec. — 23 Jan.	9th	8
total number of weeks			26

N.B. The detailed courses of study for statistics and for mechanisation of accounting and computing are reproduced in the appendix in a tabular form.

II. The Government Examinations

After the completion of training, the students have to pass a government examination held by the Government Examination Commission. The section of statistics of the Institute has four departments. The section of mechanisation of accounting and computing has two departments. Thus each special subject has a department of its own. Every year a Government Examining Commission is formed for each department. The membership of these Commissions is subject to the approval of the Ministry of Higher Education. Top officials of the Central Statistical Board of the USSR (deputy chiefs and members of the Board) are appointed Chairman of the Commission.

Students who graduate from the Institute in statistics have seven weeks (from 9 May to 30 June) to prepare before they sit for the government examinations. Philosophy, political economy and statistics are the three subjects covered in the examination. The examinations are oral. Usually an examinee has to answer two or three questions which are given in a ticket which has been chosen by the student at random. The examinee who sits in a room with the Commission has 45 minutes for thinking over the answers to the questions. The members of the Examination Commission have the option to put one or two additional questions. Students who pass the government examinations receive the diploma of "economist".

Students who graduate from the Institute in mechanisation of accounting and computing have twenty weeks (from 7 February to 30 June) to prepare their diploma projects, which they have to defend before the Commission. When they have successfully defended their diploma projects, they graduate from the Institute and receive the diploma of "engineer—economist".

Six months before graduation, all the students of the Institute are allocated by the Central Statistical Board to different government statistical agencies in which they will be subsequently given employment. Some of the students are selected to work as local inspectors, some work with the staff of the statistical boards of regions, districts and republics and a very small fraction is absorbed in the Central Statistical Board itself.

III. Correspondence Institutes

The Correspondence Economic and Statistical Institute and the All Union Correspondence Economic Institute do not differ from the Moscow Economics and Statistics Institute in the syllabi and programmes. The period of training in these Institutes is five years instead of four and the subject taught is statistics. The graduates of these Institutes have the same qualifications, diploma and rights as the graduates of the Moscow Economics and Statistics Institute. The students of these institutes are mainly the staff members of the Government statistical agencies. The training in these institutes is carried on by correspondence. The institutes send lectures, exercises and methodological instructions to the students who send back to the insti-

tute the work done by them in a written form. Thanks to the correspondence institutes, those who desire to get higher statistical education can do so without discontinuing their work. They take their examinations twice a year in branches of the institutes which are located in some higher educational institutions of the larger cities. To prepare and to appear in these examinations, the students are given a month's leave with pay. Similarly, for Government examinations also they are given a month's leave with full pay by the offices in which they work.

IV. Intermediate Special Schools for Statistics

The training of statistical personnel of medium qualification is carried on in the USSR by special schools, the *statistical technicums*. The statistical technicums are responsible to the Central Statistical Board of the USSR. Now there are fifteen permanent technicums and one correspondence technicum. These statistical technicums admit young men and women having seven years of general training. The period of training in the technicum is for four years. Recently arrangements have been made in statistical technicums to admit young men and women having ten years of high school education. These students receive special education for two years to become diploma holders.

After completing their studies in the statistical technicums, the students have to pass Government examinations and those who pass receive a diploma. Six months before their graduation, the students of these statistical technicums are allocated to the Central Statistical Board of the USSR to various Government statistical agencies, mainly in the local and town inspection services of the Central Statistical Board of the USSR and in the regional (district) statistical boards. A small fraction is allocated also to the statistical boards of the Union Republics. Later on, during their work in various statistical agencies they acquire some practical experience and become suitable for higher statistical education. They may enter, for example, the Moscow Economics and Statistics Institute. Those who live in Moscow may study in the evening department of the Institute without discontinuing their work in the offices. But those who live in other cities have to discontinue their work and study in the day department of the Institute. Alternatively they can enter the Moscow Correspondence Economics and Statistics Institute or the All Union Correspondence Economics Institute. The education in the statistical technicum is carried on by the method of lessons and not by the method of lectures and seminars, as it is done in the Institute. At a lesson, the teacher explains a problem relating to the subject of study and then asks the students various questions; i.e. the lesson is given through a conversation between the teacher and the students. In certain periods, that is by the completion of a term, students take their periodical examinations. The students of the technicums have also periods of training and work practice in the Government statistical agencies and industrial establishments.

The All-Union Correspondence Statistical Technicum is under the Central Statistical Board. The staff of local Government statistical agencies who have practical experience in statistics but have no special statistical education are trained in this

technicum. The training is carried on by sending lectures, exercises and methodological instructions to the students. The students on their part send back their worked-out exercises to the technicum. Periodically the students have to appear in examinations in the branches of the correspondence technicum located in the big cities of the country.

V. Short-term Courses

The State Planning Commission of the USSR has *advanced courses in economics* with a period of training of four months. These courses are attended by the top officials of the State Planning Commission and the Central Statistical Board of the USSR and planning commissions and statistical boards of the Union Republics, regions and districts. The courses are for persons already having a high education and are meant for advancing their knowledge in the fields of planning and statistics. The reason of this is as follows. These top officials certainly had a higher education in planning or statistics. However, a long period has passed after their graduation from a higher educational institution. There has been progress of science. Methods of planning and organisation of statistics have changed. That is why advancing the knowledge of the top officials is periodically necessary in order that they may keep abreast with the modern level of developent of science and practice.

The Central Statistical Board of the USSR has also, for the same reason, permanent courses for refreshing and advancing the knowledge of division and section chiefs as well as of specialists who work in the local Government statistical agencies. Ordinarily, the period of training in these courses is two or three months. The top officials of the Central Statistical Board of the USSR deliver lectures in these courses and explain modern methods of organisation of statistics, collection and processing of data and analysis of statistical information. They also speak about the tasks of Government statistical agencies.

The Central Statistical Board of the USSR is responsible for the guidance of accounting and statistical work in the country. That is why the Central Statistical Board is keen to ensure that the establishments, offices, projects, collective farms, State farms and other similar institutions have accounting personnel with necessary special knowledge. To provide this, the Central Statistical Board has a special department. This department, in its turn, has a wide net-work of training centres, schools and courses spread all over the country through which it imparts training to new personnel, accountants, statisticians and book-keepers, as sell as, arranges refresher courses for personnel already in employment. This department for training of accounting personnel is financially self-sufficient. Any establishment or organisation which wants to train new personnel or to give refresher training to personnel already in employment pays from its funds some amount for training. This payment constitutes the income of this department. From this income, the department pays salaries to the teachers and other personnel, maintains buildings and incurs other expenditure. The period of training in these courses varies from six months to two years depending on the character of training, i.e. whether it is for accountants or for book-keepers or whether it is for a man receiving training for the first time or for a man attending a refresher course.

Appendix

A. Syllabus for the four-year course for statistician-economists.

I: SCHEDULE OF TRAINING

Year of training	Sept.				29 Sept.	Oct.			27 Oct.	Nov.				Dec.				29 Dec.	Jan.				31 Jan.	Feb.			28 Feb.
	1	8	15	22	5	6	13	20	2	3	10	16	24	1	8	15	22	2	3	10	17	24	6	7	14	21	6
	7	14	21	28	Oct.	12	19	26	Nov.	9	16	23	30	7	14	21	28	Jan.	9	16	23	30	Feb.	13	20	27	Mar.
I																			1	1	1	5	5				
II																			1	1	1	5	5				
III																			1	1	1	5	5				
IV										1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	5	5

Year of training	Mar.			28 Mar.	Apr.			25 Apr.	May				June				1 July	July			29 July	Aug.			
	7	14	21	3	4	11	18	1	2	9	18	25	1	8	15	22	7	8	15	22	2	3	10	17	24
	13	20	27	Apr.	10	17	24	May	8	17	24	31	7	14	21	30	July	14	21	28	Aug.	9	16	23	31
I													1	1	1	1	5	5	5	5	5	5	5	5	5
II													1	1	1	1	5	5	5	5	5	5	5	5	5
III					1	1	3	3	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5
IV								1	1	6	6	6	6	6	6	6									

Symbols:—
examinations: 1 actual practice: 3 vacations: 5 state examinations: 6
theoretical training: blank

II: SUMMARY DATA ON TIME BUDGET (in weeks).

year of training	theoretical training	exams	training practice	actual practice	deploma projects	state exams	vacation	total
I	34	7	—	—	—	—	11	52
II	34	7	—	—	—	—	11	52
III	26	5	—	10	—	—	11	52
IV	17	5	—	12	—	7	2	43
total	111	24	—	22	—	7	35	199

Subject	distribution according to terms			hours					distribution of years terms and weeks									
					including				Years									
									I		II		III		IV		V	
	exams	control tests	diploma projects	total	lecture	laboratory works	practice, seminars, exercises	course projects	terms									
									1	2	3	4	5	6	7	8	9	10
									weeks per term									
									18	16	18	16	18	8	10	7		
									hours per week									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1. Political economy and philosophy	2,4,5,6	1,3,4	3–4	680	470	–	210	–	7	9	8	11	4	4	–	–	–	–
2. History of economy of the USSR and foreign countries	3	2	–	140	110	–	30	–	2	3	3	–	–	–	–	–	–	–
3. Economic geography of the USSR and foreign countries	1,2	–	1–2	170	150	–	20	–	6	4	–	–	–	–	–	–	–	–
4. Higher mathematics	1,2	–	–	170	100	–	70	–	6	4	–	–	–	–	–	–	–	–
5. Mathematical statistics	3	–	–	70	40	–	30	–	–	–	4	–	–	–	–	–	–	–
6. Civil and labour law	8	7	–	100	100	–	–	–	–	–	–	–	–	–	6	6	–	–
7. Foreign language	4	1,2,3,6,8	–	140	–	–	140	–	2	2	2	2	–	–	–	–	–	–
8. Planning of national economy	7	5,6	–	150	90	–	60	–	–	–	–	–	4	5	4	–	–	–
9. Finance and credit in the USSR	8	7	–	130	100	–	30	–	–	–	–	–	–	6	3	7	–	–
10. Principles of mechanisation of accounting	3	4	–	100	40	60	–	–	–	–	3	3	–	–	–	–	–	–
11. Book-keeping, accounting and balance analysis	4	2	–	240	120	–	120	–	–	4	6	4	–	–	–	–	–	–
12. General statistical theory	5	4	5	200	80	–	120	–	–	–	4	6	2	–	–	–	–	–
13. Economic statistics	7	4,6	–	240	120	–	120	–	–	–	–	4	6	4	4	–	–	–
14. Optional subject according to the speciality	5,6,7,7	5	7	330	160	–	170	–	–	–	–	–	10	6	10	–	–	–
15. Statistics of the branches of national economy	7,8	–	–	140	80	–	60	–	–	–	–	–	–	5	3	10	–	–
16. Economics of industry	5	–	–	60	50	–	10	–	–	–	–	–	3	–	–	–	–	–
17. Economics of agriculture	5	–	–	50	40	–	10	–	–	–	–	–	3	–	–	–	–	–
18. Technology of the most important industries	1	–	–	90	70	20	–	–	5	–	–	–	–	–	–	–	–	–
19. Agriculture and animal husbandry	–	1,2	–	100	80	20	–	–	2	4	–	–	–	–	–	–	–	–
20. Physical training	–	1,2,3,4	–	140	–	–	140	–	2	2	2	2	–	–	–	–	–	–
Number of hours of training				3440	2000	100	1340	–	32	32	32	32	32	30	30	23	–	–
Number of course projects and works				4	.....				–	1	–	1	1	–	1	–	–	–
Number of examinations				29	.....				3	4	3	4	5	2	5	3	–	–
Number of control tests				27	.....				5	5	4	5	2	3	2	1	–	–

IV: OPTIONAL SUBJECTS
(approximate list)

subjects	term	hours
1 Foreign language	5—8	100
2. Physical training	1—8	350
3. Calculating methods	1	30
4. Application of mathematical Statistics in Quality Control	4	30
5. History of Statistics	7	40

V: PRACTICE

kind of practice	period	term	weeks
1. in accounting and Statistics	from 18th April to 30th June	6	10
2 Statistical	from 1st Dec to 20th Feb.	7	12
total number of weeks		—	22

VI: DIPLOMA PROEJCTS OR DIPLOMA WORKS

The period of the Government examinations

from 9th May to 30th June

VII: GOVERNMENT
Examination Subjects

1. Philosophy
2. Political economy
3. Statistics (According to specialisation)

VIII: SYLLABUS FOR OPTIONAL SUBJECTS

subject, specialisation of optional subject	distribution in terms			hours					distribution of years; terms and weeks										
					including				years										
	exams	control test	course projects	total	lecture	laboratories	practice, seminars etc.	project making	I		II		III		IV		V		
									terms										
									1	2	3	4	5	6	7	8	9	10	
									weeks per term										
									18	16	18	16	18	8	10	7			
									hours per week										
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
Statistics of industry and construction																			
1. Statistics of industry	6,7	5	7	180	80	–	100	–	–	–	–	–	6	4	4	–	–	–	
2. Statistics of capital construction	7	–	–	80	40	–	40	–	–	–	–	–	–	2	6	–	–	–	
3. Organisation and planning of industrial establishment	5	–	–	70	40	–	30	–	–	–	–	–	4	–	–	–	–	–	
Statistics of agriculture																			
1. Statistics of agriculture	6,7	5	7	230	100	–	130	–	–	–	–	–	4	6	10	–	–	–	
2. Organisation of agricultural production	5	–	–	100	60	–	40	–	–	–	–	–	6	–	–	–	–	–	
Statistics of trade and material and technical supply																			
1. Statistics of trade	6,7	5	7	180	80	–	100	–	–	–	–	–	6	4	4	–	–	–	
2. Statistics of material and technical supply	7	–	–	80	40	–	40	–	–	–	–	–	–	2	6	–	–	–	
3. Economics, organisation and planning of trade	5	–	–	70	40	–	30	–	–	–	–	–	4	–	–	–	–	–	
Statistics of population and family budget surveys																			
1. Statistics of population	6,7	5	7	180	80	–	100	–	–	–	–	–	6	4	4	–	–	–	
2. Statistics of family budget surveys	7	–	–	80	40	–	40	–	–	–	–	–	–	2	6	–	–	–	
3. Statistics of culture and public health	5	–	–	70	40	–	30	–	–	–	–	–	4	–	–	–	–	–	

B. Syllabus for the five-year course for engineer-economists.

I: SCHEDULE OF TRAINING

Year of training	Sept. 1	8	15	22	29 Sept. 5	Oct. 6	13	20	27 Oct. 2	Nov. 3	10	17	24	Dec. 1	8	15	22	29 Dec. 2	Jan. 3	10	17	24	31 Jan. 6	Feb. 7	14	21
	7	14	21	28	Oct. 12	19	26	Nov. 9	16	23	30	7	14	21	28	Jan. 9	16	23	30	Feb. 13	20	27				
I																			1	1	1	5	5			
II																			1	1	1	5	5			
III	2	2																	1	1	1	5	5			
IV																			1	1	1	5	5			
V										1	1	1	1	3	3	3	3	3	3	3	3	5	5	4	4	4

Year of training	28 Feb. 6	Mar. 7	14	21	28 Mar. 3	Apr. 4	11	13	25 Apr. 1	May 2	9	18	25	June 1	8	15	22	1 July 7	July 8	15	22	29 July 2	Aug. 3	10	17	24
	Mar. 13	20	27	Apr. 10	17	24	May 8	17	24	31	7	14	21	30	July 14	21	28	Aug. 9	16	23	31					
I														1	1	1	1	5	5	5	5	5	5	5	5	5
II														1	1	1	1	5	5	5	5	5	5	5	5	5
III						1	1	1	3	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5
IV						1	1	1	3	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5
V	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4									

Symbols :—

examination : 1 training practice : 2 actual practice : 3 diploma projects : 4 vacations : 5
theoretical training : blank

II : SUMMARY DATA ON TIME BUDGET (IN WEEKS)

year of training	theoretical training	exams	training practice	actual practice	diploma projects	vacation	total
I	34	7	—	—	—	11	52
II	34	7	—	—	—	11	52
III	25	6	2	8	—	11	52
IV	27	6	—	8	—	11	52
V	10	3	—	8	20	2	43
total	130	29	2	24	20	46	251

subject	distribution according to terms			hours					distribution of years, term and weeks									
					including				Years									
	exams	control tests	diploma projects	total	lectures	laboratory work	practice, seminars, exercises	course projects	I		II		III		IV		V	
									terms									
									1	2	3	4	5	6	7	8	9	10
									weeks per term									
									18	16	18	16	16	9	18	9	10	
									hours per weeks									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(12)	(13)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1. Poltical economy and philosophy	2,3,4,5,7	1,3,4,6	4	610	400	–	210	–	4	9	6	8	4	4	4	–	–	–
2. Economic geography of the USSR	–	–	–	90	70	–	20	–	5	–	–	–	–	–	–	–	–	–
3. Principles of civil and labour law	9	–	–	60	60	–	–	–	–	–	–	–	–	–	–	–	–	–
4. Higher Mathematics with the principles of mathematical statistics	1,2,3	–	–	300	150	–	150	–	8	6	4	–	–	–	–	–	6	–
5. Chemistry	1	–	–	70	40	30	–	–	4	–	–	–	–	–	–	–	–	–
6. Physics	3	2	–	170	100	40	30	–	–	5	5	–	–	–	–	–	–	–
7. Electrical engineering	4	3	–	170	110	40	20	–	–	–	4	6	–	–	–	–	–	–
8. Drawing, geometry and machine-building drawing	1	2	–	100	20	60	20	–	4	2	–	–	–	–	–	–	–	–
9. Foreign language	4	1,2,3,6,8	–	140	–	–	140	–	2	2	2	2	–	–	–	–	–	–
10. Calculating methods	–	1	–	60	–	60	–	–	3	–	–	–	–	–	–	–	–	–
11. Metals and their technology	3	–	–	90	60	30	–	–	–	–	5	–	–	–	–	–	–	–
12. Theoretical mechanics	2	–	–	100	60	10	30	–	–	6	–	–	–	–	–	–	–	–
13. Resistance of materials	3	–	–	70	40	10	20	–	–	–	4	–	–	–	–	–	–	–
14. Theory of tools and machines and parts of machines	4	–	5	120	60	–	30	30	–	–	–	6	2	–	–	–	–	–
15. Calculating machines	5,6,7	–	7	270	130	80	60	–	–	–	–	–	8	8	4	–	–	–
16. Organisation of mechan.. d accounting and computing	7,9	8	9	260	120	90	50	–	–	–	–	–	–	–	8	6	6	–
17. General statistical theory	5	–	–	100	60	–	40	–	–	–	–	–	6	–	–	–	–	–
18. Economic statistics	9	–	–	120	80	–	40	–	–	–	–	–	–	–	–	–	–	–
19. Book-keeping and accounting	5	4	–	190	90	–	100	–	–	–	–	8	4	–	–	–	–	–
20. Planning of national economy	9	–	–	70	60	–	10	–	–	–	–	–	–	–	–	4	8	–
21. Finance and credit of the USSR	7	–	–	130	100	–	30	–	–	–	–	–	–	–	–	4	4	–
22. Technology of the production of calculating machines	8	–	–	60	40	–	20	–	–	–	–	–	–	6	4	–	–	–
23. Physical training	–	1,2,3,4	–	140	–	–	140	–	2	2	2	2	–	–	–	6	–	–
24. Optional special subjects	6,7,8	5,6,7	6,8	400	200	–	200	–	–	–	–	–	5	14	8	6	–	–
Number of hours of training				3890	2050	450	1360	30	32	32	32	32	29	32	28	26	24	–
Number of course period and works				6	.....				–	–	–	1	1	1	1	1	1	–
Number of examinations				34	.....				4	4	5	4	4	2	5	2	4	–
Number of control tests				22	.....				4	4	4	3	1	3	1	2	–	–

IV : OPTIONAL SUBJECTS
(approximate list)

subjects	term	hours
1. Foreign language	5—8	100
2. Physical training	1—8	350
3. History of technology	6	30

V : PRACTICE

kind of practice	period	term	weeks
1. general training	from 1st Sept. to 14th Sept.	5	2
2. accounting	from 3rd May to 30th June	6	8
3. calculating machine	from 3rd May to 30th June	8	8
4. pre-diploma practice	from 1st Dec. to 23rd June	9	8
total number of weeks		—	26

VI : DIPLOMA PROJECTS OR DIPLOMA WORKS

The period of the pre-partition and defence of the diploma projects and works from 7. II to 30. VI.

VII : GOVERNMENT

Examination subjects

Diploma project.

VIII: SYLLABUS FOR OPTIONAL SUBJECTS

subject, specialisation of optional subject	distribution in terms			hours					distribution of years, terms and weeks									
				including					years									
	exams	control test	course projects	total	lecture	laboratory work	practice and seminars etc.	course projects	I		II		III		IV		V	
									terms									
									1	2	3	4	5	6	7	8	9	10
									weeks per term									
									18	16	18	16	16	9	18	9	10	
									hours per week									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Mechanisation of accounting in industrial establishments																		
1. Industrial accounting	6	5	6	150	70	–	80	–	–	–	–	–	5	8	–	–	–	–
2. Industrial statistics	7	6	–	120	50	–	70	–	–	–	–	–	–	6	4	–	–	–
3. Economics of industry, organisation and planning of industrial establishment	8	7	8	130	80	–	50	–	–	–	–	–	–	–	4	6	–	–
Total	6,7,8	5,6,7	6,8	400	200	–	200	–	–	–	–	–	5	14	8	6	–	–
Mechanisation of accounting in banks and credit establishments																		
1. Accounting in credit establishments	6	5	6	170	80	–	90	–	–	–	–	–	5	10	–	–	–	–
2. Bank statistics	7	6	–	70	30	–	40	–	–	–	–	–	–	4	2	–	–	–
3. Organisation and planning of credit	8	7	8	160	80	–	80	–	–	–	–	–	–	–	6	6	–	–
	6,7,8	5,6,7	6,8	400	190	–	210	–	–	–	–	–	5	14	8	6	–	–

ECONOMIC PLANNING AND MANAGEMENT IN THE SOCIALIST ECONOMY OF POLAND*

By OSKAR LANGE

I am going to speak on methods of economic planning and management in vogue in the Soviet Union, Poland, as well as in other countries of Eastern Europe in the last three years in particular. I shall exclude China on purpose since the situation there is rather different. In the European socialist countries a profound change in the method of planning and management of the economy has recently taken place. Formerly these methods were essentially oriented towards those of the Soviet Union. In the last few years the changes in these methods were rather different for different countries. I shall not speak much about the development and management of the economy for all countries in general but shall speak specifically about Poland.

The general trend common to all the socialist countries is decentralisation of the management of the economy—an organisation based on centralisation of planning for economic development on one side and decentralisation of the current management of the economy on the other. This takes place in almost all the countries mentioned above. The difference among various socialist countries lies essentially in the specific methods.

The development of economy in general presupposes development of productive forces. The remarkable development of productive forces which took place in the socialist countries makes it difficult to maintain the centralised systems of economic planning and management which was characteristic of the preceding period. I will give an example from the Soviet Union. The number of industrial establishments in the Soviet Union is 20,000. The number of construction undertakings is 10,000. So excluding agriculture and transportation there are 30,000 units to manage. A small number of units could be managed from one centre, say Moscow. But recently the number of units has increased so enormously that centralised management almost becomes impossible. Accordingly the entire Soviet Union was divided into 110 regions with Economic Councils which managed the units. The growth of productive forces necessitated the change in the method of management. The change in the method of economic planning is also indirectly connected with it.

The task of economic planning in the period that followed the revolution and in the period of industrialisation (as well as modernisation of agriculture) of the country was two-fold. It consisted in changing the economic and social structure of the country through a social revolution and developing the productive forces by developing industries that produced means of production. In other words, the transformation of the social structure of the economy and the development of means of production were the two major tasks of planning. This fact imposed the necessity of not only central planning but also centralised management.

* Summary of the speech delivered by Professor Oskar Lange at the Indian Statistical Institute on 12 February 1959, in which Professor Mahalanobis participated.

The necessity of centralised planning arose from two considerations. One was the need to mobilise and canalise all the resources to the industrialisation processes. Consequently no leakage of resources for non-essential purposes could be tolerated and all the resources were centrally and tightly managed and administered.

The other reason was as follows. Development of industries in backward countries meets with the difficulty of lack of experienced managerial personnel. In Poland during six years industrial production increased 2.7 times (compared with pre-war level it is 5 times greater) which meant a great increase in the skilled labour and the managerial personnel. But when competent managerial personnel is lacking one has to depend on the centre from where all the actions will be dictated. In this way the centralised system of management of the economy was born. Historical evidences have shown that such management proved useful.

The present task before the socialist economy is different. The social structure of the country is already transformed. The basic effort of industrialisation has been already successful. Agriculture has been transformed and more or less put on a modern technological base. The next task before the socialist economy is to raise the standard of living which means providing the population with consumer goods and services which the people did not use prior to the revolution. It is this task which calls for decentralisation of management. This may be said to be the maturation of the socialist economy which requires a change in the method of economic management.

The change from centralised to decentralised system of management was necessitated for several reasons. The centralised system of management of the economy was found to be unflexible. It caused a certain bureaucratic rigidity of the economy resulting from the fact that all decisions were taken by men at the top. The new task of raising the standard of living and of satisfying the increasing consumers' demand requires a system of management more flexible than that of the preceding period. This was essentially the basis which led to the transformation of the method of management of the economy.

Two aspects of development are prominent. First the separation of the current management of the economy from planning, second the decentralisation of management with a simplification of the plan i.e. the replacement of the administrative direction of the economy by an increasing utilisation of economic incentives as a means of implementation.

Formerly management and planning were practically one. The whole economy was operated as if it were one single enterprise for which a single plan was prepared and the various industrial, commercial and transportation organisations were nothing but agencies to carry out this plan. The plan was given to the agencies as an administrative directive and they carried out their tasks accordingly. The Planing Commission in Poland performed the task of preparation of a central plan and directed the various agencies in their respective actions. Now these functions have been separated. Planning remains centralised and the current management of the economy is decentralised for all practical purposes.

The trends of similar decentralisation were different in different countries. In the Soviet Union decentralisation was based on a territorial principle. The entire country was divided into 110 regions with an Economic Council in charge of the current management of the region. The enterprises within each region are executive agencies of these regional economic councils. But in Poland the basic unit of management is the enterprise. In Czechoslovakia the basic unit is called a trust which is nothing but a combination of enterprises. Now the different modes of decentralisation of the different countries are explained by the particular conditions of the various countries. The territorial principle of management of the Soviet economy is due to the geographical size of the country. In Poland, Czechoslovakia and other relatively small countries, the territorial principle of management was not needed.

We have already stated that in Poland the basic unit of the management is the enterprise. The enterprise is operated on the the basis of a charter, the individual charters of the enterprises being ultimately replaced by a general charter of the socialist enterprises. The general charter is defined in terms of association of persons to whom is entrusted the operation of some part of the means of production which are national property to be managed in accordance with the social interest and on the basis of the national economic plan. In carrying out these plans the enterprise has, however, a certain amount of autonomy. The fixed capital of the enterprise is fundamentally the donation of the State. If a new enterprise is started or an existing one vastly expanded, it is the State which donates the fixed capital. All the fixed capital investments are laid down in the national economic plan and are donated to the enterprises. However, in addition to these fundamental investments by the State, the enterprise has a freedom to make subsidiary investments in the fixed capital. However, the subsidiary investments are rather minor in form consisting of, say, modifications of buildings, installation of a few machines etc. The subsidiary investments are financed out of two main sources. One is the part of the amortisation which remains at the disposal of the enterprise to be used for autonomous investments which are not in the plan and for which the enterprise has not to ask for any permission. Secondly, the enterprise can take bank loans for fixed investments. So, out of amortisation funds and bank loans, the enterprise is in a position to make subsidiary investments of fixed capital. As the situation looks at present, some 80% of the total investments is out of donation by the State and the remaining 20% is in the form of subsidiary investments made by the enterprise itself. So some 80% of the total investment is fixed by the economic plan and some 20% is in the form of autonomous investments outside the plan.

Now comes the output prescriptions which are chalked out by the plan. The plan states how much and what kind of goods the enterprise is going to produce. On principle the total value of the output which the enterprise is to produce is laid down by the plan. If it is a shoe factory the plan would have clear prescriptions stating the total value of shoes the factory is going to manufacture. However, the enterprise autonomously decides what kind of shoes it will produce according to the specific demands of the market. In the case of particular key commodities the plan may lay down further restrictions. The plan also provides the total wage fund of the

enterprise which it is not allowed to exceed. However, the enterprise is free to make its own choice of labour namely, it can replace unskilled labour by skilled labour if it so desires. The composition of employment of the enterprise remains flexible at the enterprise level with, however, a constant wage fund provided by the State.

The plan further gives an expected level of costs and profits of the enterprises. The enterprise is expected to use its resources in such a way as to derive greatest possible profit. It should be emphasised at this point that the prices of products and of raw materials as well as wage rates are not determined by the enterprise. The price of products and raw materials are determined by special Price Commissions at a central or regional level, depending on the nature of commodities. The enterprise has no control over these things. Wage rates are determined by collective contracts between the branches of industries and the trade unions. The enterprise again has no authority here. Thus there is only one way of increasing the profit of the enterprise namely, by increasing physical efficiency of production i.e. producing more with the same resources and wage level. There is no possibility of increasing profit by price manipulation because prices are not under the control of the enterprise. Consequently the profit made by the enterprise is an index of physical productivity of the enterprise and maximisation of this index means maximisation of physical productivity.

The profit is generally divided into two parts. One part is vested to the State and the other part is distributed either as bonuses to workers or for general benefit of the workers in the shape of funds devoted to construction of houses and to social and cultural institutions for general workers.

The enterprises are usually organised in different branches, i.e. a combination of enterprises forms a sort of unit, namely chemical industries, coal-mining-machine industries and so on. These units of enterprises have a double function. On the one hand they are agents through which the government transmits its directives and on the other hand they are units through which the enterprises transmit their demands to the centre. The units have a direct interest on the profits of the enterprises since their revenue is derived from the profits of the enterprises. Next to the director appointed by the Minister there is a managing council of that unit which is comprised of all the directors in various enterprises. So the Managing Council is a representative of directors of the enterprises. Such councils have responsibility for the management of issues which have a general bearing on all the enterprises namely, procurement of raw materials, marketing of their products, labour policies and so on. Basically the enterprises are grouped into units according to branches, but sometimes they are also organised on the basis of territorial or other considerations.

In the field of trade almost a similar thing takes place namely, the decentralisation of the system over which the enterprises retain a certain amount of autonomy in securing their raw materials.

Such decentralisation also takes place territorially namely, a number of enterprises or local industries remain under the direct management of local governments, town councils, county councils, village councils and so on. A number of such enterprises have also been handed over to cooperative organisations dealing

particularly with consumer goods like bakeries etc. So decentralisation has really been completed by territorial decentralisation and by cooperative management etc.

Planning continues to be a central affair. As regards the contents of the plan, it deals basically with macro-economic problems namely, determination of size of investments and distribution of investments among the various sectors of the economy, such as industry, trade, transport, agriculture and so on. Planning determines the rate of investment and its distribution over the different branches of the country. Secondly, the plan establishes relation between outputs of basic commodities designed to maintain certain balances in the economy. Thirdly, the plan is required to maintain financial equilibrium, i.e. the equilibrium between the money income of the population and the supply of the consumer goods at the disposal of the population. Thus the output of consumer goods and investments must be determined in the plan. Moreover, what part of the consumer goods go for individual consumption must be determined and this has to be financially matched with the money income of the population.

Planning and assessment of money income, is, however, rendered complicated in some cases. In Poland money income of people engaged in agriculture is difficult to assess since agriculture is mostly private. On the side of production the plan provides the total value of output in the various industries. In certain cases it goes to the details of certain commodities as for example, steel, coal etc. i.e. goods which are very essential for the national economy. In other cases, however, the plan sets down certain macro-economic totals and the details are left at the choice of the enterprises.

Implementation of the plan under the system of decentralisation cannot, however, be carried out by the old method of administrative allocations. The basic economic incentive is the profit which the enterprise makes. The instrument for implementation of the plan is price policy. Under the old method, the incentive, say for the shoe factory, may be set in terms of an order to produce more children-shoes. Under the new method, the incentive would be set by fixing the price of children-shoes. Secondly, the method of physical allocations of commodities, raw materials etc. are gradually being substituted by allocations through price fixation and by changing the conditions of profitability of production, although the method of physical allocation is retained in some cases of glaring shortages of commodities where simply allocation by price policy would not work.

In describing the development of planning and management methods in the socialist economy, I would like to draw an analogy. I would compare the capitalist economy to a free baloon on which the pilot has no control whatsoever and which just moves around with the wind. The socialist economy of the earlier period which was a combination of centralised planning and management carried out by administrative directives may be compared to the old-fashined aeroplane where the pilot sits at the steering rod and steers according to atmospheric conditions. I feel that the ideal of planning in a socialist economy would be that of a self-propelled aeroplane. It is different from the free baloon in that the automatic machine is under human control. The aeroplane moves accordingly as man sets the mechanism. But once it has been set, it takes care of details. It should be added, however, that if the wind

becomes very strong, the mechanism may not work. The range of stability is not too wide for the machine to be capable of adjusting to all magnitudes of heavy upheavals of nature. The situation here is very similar. The first period of planning and management of the socialist economy was similar to a plane without an automatic mechanism where every detail was decided at the centre. In the new phase one builds up certain automatic response by creating certain rules of action, and certain incentives to which you know how the people will react. Accordingly you would plan so as to make the people react in a desired way and hence to develop the economy in a desired direction. The changes that are taking place in the socialist countries may be said to be due to maturation of the economies with a view to greater adaptability to the new situation.

The method of organisational management must be linked up with the development of productive forces. As the productive forces develop, new methods of planning and management become indispensable. In the socialist economy the method of planning and management is usually geared to the development of productive forces.

At this stage Professor Mahalanobis observed:

I thank Professor Lange for the interesting talk he has given us to-day. This raises interesting questions on broad aspects of economic development.

Some of those who are present here may recall that Mr. Leon Kyserling, who was at one time the Chairman of the Council of Economic Advisers to the President of the USA, was our guest some time ago. He gave some lectures here in which he said that not only was there need for planning in an economy like that of USA but there was actually a good deal of planning there. We have now heard from Dr. Lange, who is Chairman of the Economic Council of Poland, about recent changes in methods of planning in a socialist country.

For the economic development of India or of other underdeveloped countries there is definitely need of structural changes in the economy. Dr. Lange has stressed that such structural changes can come only through centralised planning and perhaps centralised management. As the economy becomes more and more developed, there is increase in the capacity of production, increase in the stock of capital goods and ability to expand industrial production out of domestic resources, and there is increasingly more effective utilisation of both human and natural resources. In this process there would be short period changes which cannot be called structural, such as price variations due to market relations in respect of specified commodities.

On the other hand, long term planning may be considered, in some sense, to be essentially physical planning. The longer the time horizon, the greater is the need for physical thinking. For example, we can pose the question: from a long term point of view which of the three forms of electric power (thermal, hydro-electric, and the atomic reactor) should be used in India? Here physical thinking is dominant. We may evaluate advantages of using atomic reactors fifteen years hence, and may have to pursue a certain policy because of such evaluation. The issue definitely

cannot be determined by current market conditions or existing supply and demand for power. Long-term planning in this sense is necessarily associated with some kind of physical thinking.

Short-term decisions, however, are entirely different. We may take an extreme example. In a bazaar (that is, the free market) in Moscow, the price of fruit varies from morning till evening, and such price variations are sometimes very great over a short period of time. Evidently market conditions have a good deal of influence over such variations. Determination of prices for such commodities evidently cannot be made by a centralised system of planning or management. Here the decision has to be made within a very short time depending on supply and demand. The possibility of centralised physical thinking is out of question.

According to Mr. Keyserling, there was so much of planning even in a capitalist country like USA that in the case of steel it was announced (I believe, in 1948) that if the private enterprises did not expand production by eight million tons of steel then the Federal Government would themselves establish plants for this purpose. The physical resources were, of course, available in a highly developed country like USA. But, at the same time, it is evident that the announcement of the Federal Government urging expansion of production could not have occurred without central planning. Planning was at the back of the expansion although the implementation of the decision took place in the private sector. In USA, obviously, implementation could be left to private enterprise as they had necessary stock of capital, technical personnel etc. In an underdeveloped country such decisions may have to be taken by central planning and moreover implementation may also have to be carried out by central action.

In the case of a socialist economy, as it becomes more and more mature, short-term changes influenced by free market conditions come into play. On the other hand, even in highly developed capitalist countries, in order to prevent trade booms and recessions, long term decisions tend to become more and more planned.

In India it may be profitable to experiment with both the approaches. We can take the best advantage of centralised planning to achieve long term structural changes; and at the same time we may try to derive the greatest advantage out of short term decisions, based on existing market conditions for realising short-term production targets. This would be a combination of long term physical thinking over a number of years with a centralised form of planning together with short term decisions based on existing market conditions. I wonder to what extent this is feasible.

Professor Lange's concluding remarks :

Centralised planning and management depend on the development of productive forces. As Professor Mahalanobis has stated there is a need for taking into consideration short term decisions specially in respect of consumer goods and services where supply and demand are highly fluctuating and are determined by a complex of considerations emerging from the existing market mechanism or other decentralised source of short term decisions.

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However, there is one point which has got to be noted in this connection. have already said that to-day in the socialist countries the tendency is towards decentralisation of management. But at the same time I am not all sure whether this tendency is a permanent one. Further development of productive forces might necessitate a return towards centralisation of management and this may be visualised in the form of a peculiar technological revolution. As for example, high development of atomic power would make it necessary to enforce centralised management because such decisions cannot be taken by the different territorial councils but have got to be controlled by one centre. The very nature of such a highly technical process makes it completely unsuitable to decentralised management. It should be added that we must have a consequent development of planning techniques with developing productive forces. In Poland highly centralised planning and management techniques were criticised because of their limitations. Now techniques are developing with the introduction of input-output analysis, theory of programming etc. It becomes a problem, however, to solve thousands of equations which cannot be tackled without the assistance of a highly efficient electronic computer. It may be argued, however, that such mathematical problems do not always admit of solutions and it may be worthwhile to experiment with the management of planned scheme by decentralised units acting according to certain rules. This may be considered a revolution in the sense that with the electronic computer at the disposal, the administrative decision will be very centrally determined by solving a system of equations. The machine lays down certain administrative perscriptions which have got to be strictly adhered to in course of implementation of the plan. This, as one can see, visualises a highly centralised method of planning and management.

There is another observation to be made in respect of the limitations of centralised management. There are two different situations to be taken note of in this connection. In one you *may* decentralise management and in the other you *must* decentralise management. Management can be decentralised whenever it is possible to set up incentives and rules of behaviour so that the executive units will be acting accordingly. The units need not be given orders but will be expected to act according to the prescribed rules of behaviour. One can save the trouble of thinking at the centre and fully rely on the units since they will act exactly in the manner one would have them do. The other situation where you have to decentralise management occurs when the time needed for passing information from the units to the centre and instructions from the centre back to the units is so long that an irreversible situation is created. In Poland we have had a lot of irreversible situations namely, the economy would develop in a manner quite different from what was intended in the plan. The usual reaction in such cases was to increase the power at the centre and the more it was done the more was the development observed to go against the plan. It was the time lag that was responsible. Before the centre was informed, before the information went from office to office and before the administrator could make up his mind as to what to do about it all and the order went back, the situation was completely changed.

PLANNING IN YUGOSLAVIA*

By ALBIN ORTHABER

1. The problems of the methodology of planning are among the most nteresting and important ones posed today in applied economics. The idea that it is the purpose of science not only to explain the world of phenomena and thought surrounding us, but also to help *change* this world, is true for the social as for the economic sciences. It was rather late that the recognition of the indispensability of directing economic development was perceived by the human mind.

2. In spite of expansion of planning in both practice and theory, there can be no uniform theory or practice of planning. The methodology of planning seems to depend, above all (a) on the economic system and (b) on the extent of development of the forces of production and (c) on the level of scientific progress. Plans are, as we know, set up in countries in different stages of development of the forces of production and with different economic systems. On account of this, there are bound to be differences between the economic plans of, for instance, Yugoslavia and Japan, India and the Benelux countries, or Turkey and Australia.

3. The greater part of the theoretical and methodological views on planning originates, in most countries, from the *practice* of planning itself. As, however, planning is based *primarily* on general economic *conditions*, we get various aspects in this still very young branch of science.

These different ideas are often a reflection of the practices of central planning institutions. But at the same time these aspects are formed by the influence of some big economists or research workers. As an aspect associated with Professor Mahalanobis asserted itself in India, aspects appeared in some socialist countries associated with the names of Oskar Lange in Poland, of Strumilin in the Soviet Union, or in the West with the names of Ragnar Frisch in Norway, Jan Tinbergen in Holland and Gerhard Colm in the United States.

4. Differences in the methodologies of planning, however, entail also the fact that every person or institution creating them proceeds on the basis of his or its own experience or from the standpoint of the experience and wants that have arisen in the country in which the plan is being designed. For this reason also the present article will be restricted only to the problems of planning in Yugoslavia.

5. It is necessary to give some general information about planning in Yugoslavia in order to make more comprehensible what is sought to be explained. The First Five Year Plan was set up after the war, for the period of five years, viz. 1947-1951.

* The figures (targets, data, etc.) are not included here. They are to be found in the English translation of Second Five Year Plan.

The incredibly hard National Liberation Struggle against the occupier was being fought by those social forces that had already before the war been in favour of socialism and of a planned economy. After the liberation, as soon as conditions became consolidated to such a degree that further development could be anticipated, Yugoslav authorities passed on to the designing of a plan without delay. Among the principal targets of the First Five Year Plan were the electrification and industrialisation of the country.

The great enthusiasm of the people politically united in the war, the sense of being capable of realising great tasks and, of course, the great needs, contributed to the fact that the targets of the First Five Year Plan were set rather high. However, the break with the Cominform countries and the consequent economic embargo caused a delay in the realisation of these tasks, even some main ones, over the basic year 1951.

The First Five Year Plan was adopted at the time of the so-called *administrative socialism*, at a time when State organs were setting up plans not only for the national economy as a whole, but also (although in agreement with the enterprises), plans for enterprises. The directive character of the plan reflected itself particularly in that the indicators of the plan were obligatory for the individual enterprises.

The First Five Year Plan was followed by numerous one year plans. Up to 1957 there had been no middle-term (5-year) planning in the country.

Because of special circumstances, especially such as had been caused by factors outside the country, in other words by the economic embargo, no long-term forecasting of the economic development had been possible at that time. This was the main reason for the prevalence of short-term one year plans in a period of nearly five years.

In recent years foreign policy has been normalised, and what is perhaps of even greater importance, the new economic system has asserted itself to such a degree that planning of the economy for an intermediate period and for a long period ahead has also become practicable. Therefore the (Second) Perspective plan for the years 1957-1961 could be drawn up. In addition to this, preparations will begin in a few weeks' time for a long-term plan which will refer to a long period of 10-15 years.

The Second Five Year Plan has been drawn up in different economic conditions and with different objectives as well as on a different theoretical basis with regard to the function of the State or the directing of the economy from those of the First Five Year Plan. It should, therefore, be borne in mind that what is going to be said in this article on the methodology and particularly on the character of planning, refers, in the first place, to the present plan.

I

6. Some special features of the economic system of Yugoslavia reflect some genuine features in the methodology of planning which make it different from that of other socialist countries. Some methodological characteristics of planning

can be explained with the help of certain external forms of the plans. The external characteristic of the plans in Yugoslavia is shown mainly in the rates of growth of *microeconomic magnitudes* and in *macroeconomic proportions*. At first sight this characteristic of the plan seems to be only a formal one. But in reality it is closely connected with the economic system itself. For the form of the plans indicates *who* makes and *who* performs the economic decisions contained in the plan.

In directive planning, that is, in such planning as existed in Yugoslavia in the first post-war years and still exists in some socialist countries, the *individual* economic units were *formally obliged* to carry out the targets contained in the plan. Every enterprise was fairly precisely allotted its determined target.

It is different with SFYP designed in proportions. Such a plan *does not fix the targets for each individual enterprise* as the proportions refer only to the national economy as a whole. Macroeconomic proportions are only *a frame* and represent only such a forecast constellation of macroeconomic magnitudes as would ensure a higher rate of growth of the national economy and a relatively dynamic equilibrium.

7. For decisions taken at different levels the *criteria* (of choice) are also different. The criteria employed in the choice of various alternatives as to production, investments and the like, are not the same in the plans of enterprises as in the plan of the national economy. But let the problem of the subjects and of the level of decisions be discussed first.

As mentioned before, the method of planning is in close connection with the economic system, for which there are two special characteristics in present day Yugoslavia: (1) The *self-management of enterprises by workers' councils* with a high degree of freedom in taking measures in economic matters. (2) *Market economy* where the socialist enterprises act as competitors.

These are the two remarkable features of socialism in Yugoslavia, often sharply criticised and strongly defended by theorists and politicians.

8. The right of taking decision on their own economic affairs is, of course, an immanent element of an economy based on the management of enterprises by workers' councils and not by State organs. Only if the executives of the enterprises take a whole series of decisions, such as what should be produced, what the prices of the products will be, how much will be invested and to what purpose, only then can one speak of a true self-management of the workers' councils. Otherwise it would only be self-management on paper.

There are, on the other hand, decisions which one enterprise alone cannot take. These are decisions on all those basic proportions expressing the economic policy of a given period, especially those expressing the formation and distribution of the national income, and through all that on the rates of growth of the national income, which an individual enterprise can on no account take. Only the representatives of the producers together with the political representatives can take such decisions in a centralised manner (in parliament). Thus, for instance, a commune

can decide on the construction of a brick-kiln or a mill, but it cannot decide on the construction of a great steel plant or a railway line, not only on account of formal obstacles but because of lack of financial means. Even less so can it decide on the share of national income to be invested in the entire national economy.

> Besides purely institutional effects, there are also causes arising out of economic habit which acts on the competency of enterprises to decide upon, design and realise plans. The best planner cannot foresee exactly in a centralised planning which targets are most convenient for the individual enterprises, how to adapt them to changed conditions and meet the interests of the workers, enterprise and society.

Detailed plans and calculations which should favour the interests of the individual workers and at the same time that of the enterprise as a whole are, therefore, made by enterprises only. The interests of the society as a whole are in this case assured through planning proportions and economic policy measures (instruments).

9. The above-mentioned system of taking decisions on the plan is, therefore, a *combination of centralised and decentralised decisions*. It aims at an accordance of the common interests of the whole economy with those of individual enterprises, as well as of individual strata of the population.

So far have been indicated only some *subjects* of the decisions and the *level* at which planning decisions are taken. At least equally important is the question of the *criteria of choice* employed in the decisions.

For this purpose it is first of all necessary to recognise the *character* of decisions made by central political and economic organs and to see in which respect the central decisions differ from those made by individual enterprises and institutions.

10. As already mentioned, the proportions determined by the plan for the entire economy express the optimum rates of growth of the individual magnitudes, e.g. the growth of national income and of industrial and agricultural production as well as the optimum proportions between the macroeconomic magnitudes. This refers above all to quantitative relations between capital formation and consumption or between wages and savings in the interests of the society as a whole.

As the optimum in *this* case would be considered all relations that influence the growth of the national economy but ensure a proportionality and continuity in its movements (dynamics) as well as all that help to realise the economic and political targets (economic policy targets) within a given period. In defining the idea of the optimum in such a way its limitations should be borne in mind as being only a rough one.

Measuring of the optimum among the proportions of the *whole* national economy is very complicated in practice. Pareto's definition of the optimum solves the problem only by describing it in a mathematical manner.

For this and similar reasons it is intuition more than exact calculations that affects decisions on optimum combinations at the level of the whole national economy.

No account is taken here of the problem of solving the preference functions, after they have been chosen. This problem is of a different nature in enterprises.

11. Decisions of socialistic enterprises are, in fact, adaptations to four groups of factors, viz. (1) Claims of the employers (e.g. regarding a rise in wages), (2) Needs of the enterprises as a whole (e.g. for larger investments for lower costs etc.), (3) Market conditions (prices and opportunities for sales, etc.) (4) Instruments directing the enterprises towards the realisation of the proportions (taxes, rates of interest, credit and the like). The factors I have just mentioned are not listed according to their significance.

As can be seen, enterprises do not adapt their activities to the proportions of the plan. They perhaps do not even know them, but try to attain with their plans the greatest possible rentability. The greater the rentability, the greater is the extent to which the means of stimulating the individuals in the enterprises are increased, as well as the means for meeting investment and other material needs of the enterprises. To increase their rentability enterprises take advantage of market conditions.

Enterprises must, as has been seen, take into account the instruments or (economic) policy measures, through which society—these measures are taken (voted) in parliament as well as in the producers' councils—tries to influence the operation of the enterprises so as to create proportions in the plan. Thus the instruments are the means by which society intervenes in the economy, not intervening directly as into individual enterprises but in the economy as a whole.

There is, of course, the drawback in the struggle for a greater rentability, that enterprises with a monopolistic position in the market may work up the prices and attain rentability through a mere raising of prices and not through reducing the production costs. Particularly in the years 1954 and 1955 many enterprises have used their monopolistic positions to drive up the prices. As mentioned before, this is one of the main problems being tackled in recent times and that by leading away the gains resulting from exploiting the market situation for the needs of the society. It must be pointed out that it is extremely difficult to differentiate between the gains attained through exploiting the market situation and those resulting from economy of labour.

12. The right of the enterprises and the impossibility of an exact mathematical calculation of the optimum proportions of the national economy do not mean that the choice of these proportions is left solely to intuitive decision. The so-called subjectivistic decisions, which are not the result of a comprehensive estimate of real possibilities might be more an expression of wishes than of feasible possibilities. Every decision challenges some real consequences and choosing alternative means is, as a matter of fact, choosing between one consequence and another.

It is the primary task of the expert planner to offer several alternatives and to indicate on the basis of a quantitative calculation what would be the consequences

of the choice of each of them separately. This, above all, effects the objectivisation of the problem of planning and the contribution of scientific analysis to one decision or other.

To recapitulate, I must first of all stress this as a fundamental characteristic: in the choice at the national economy level the alternatives which are most lucrative have not exclusive preference. Here the choice *that takes into account social utility is of decisive importance.* It is obvious that in deciding whether to increase the production of steel or textiles we shall not act according to the comparative calculation of the rentability of steel and textiles. At this level (of the national economy) also the choice of those alternatives is decisive which guarantee a dynamic equilibrium and a high speed of reproduction.

Only when the proportions are established, such as investments among the individual branches, choice begins according to the principle of rentability. Only *after* deciding, for instance, upon investing in the non-ferrous industries or in coal production objects of the greatest rentability are a prticular sum of mony, sought *within* this proportion, which may enjoy priority in the allotment of investment credits.

Such a method of making decisions in fact *regulates and co-ordinates the interests of society with the interests of individual working councils in a non-antagonistic manner.*

Such an economy, which might be termed also an economy of socialistic imperfect co petition and which is characterised by a relative freedom of making decisions requires a thorough knowledge of the probable behaviour of economic units. Unforeseen reactions on the part of economic units and the influence of exogenous factors are sometimes the main reasons why certain parts of the plan have only a prognostic character.

II

1. So far we have been briefly acquainted with the institutional characteristics of planning, especially the ones dependent on the economic system. And now we are mainly interested in the methodological problems of planning, particularly some technical ones met with in practice by the organs of planning when drawing up the plan.

2. Questions arising in practice are not just questions of mere practice. Although the methodology of planning results, first of all, from experience gained in producing the plan, the empirical manner of recognising methodological questions is certainly not more important than the theoretical one.

3. According to Marxist theory which is in its essence based on the deterministic view of the world, the social and economic development is determined by a series of objective necessities, called economic laws.

These laws are, of course, not identical with legal rules established by man himself. Economic laws are the complexes of inevitable phenomena appearing in economic development irrespective of whether they are agreeable

to the people or not; they appear independent of their desires and will. We all know that every society must incessantly reproduce means of production for further existence. This necessity will be called the law of reproduction. Further, in capitalist society concentration and centralisation of capital occur in a spontaneous way as a consequence of expanded reproduction. Concentration is thus an inevitable symptom in capitalism which no anti-monopolistic laws can do away with. Likewise, also in socialism there are phenomena which cannot be avoided by the socialist society as a whole. I shall mention here only some of them. In addition to the law of expanded reproduction, they comprise the law of the standard of living as well as the law of economy of labour, which F. Engels once called the basic economic law of future socialist society. The law of value has a special role, characterised by a series of spontaneously arising but inevitable phenomena manifesting themselves as, for instance, a tendency towards an equivalent exchange of goods, a deviation of the market price from the normal price and the like.

Economic laws operate in both capitalist and socialist society and in every economic system, however in different ways. In liberalistic capitalism they operate spontaneously but on account of innumerable individual and inconsistent decisions, also anarchically.

I think the most significant consequence of the anarchical operation of economic laws is that, as a result of their operation there is a cyclical movement of the economy. Another consequence of the anarchical operation of economic laws is a relatively slower development of the economy particularly in underdeveloped and exploited countries.

As long as all laws operate spontaneously their macroeconomic manifestations are only the average of all individual, microeconomic decisions. Common investment in a country, for instance, is only the sum total of the decisions of individual investors.

Socialistic planning is based on the knowledge of economic laws and on the direction of their operation. Of course, this does not mean a platonic declaration of this standpoint.

The application of economic law does not only mean that their *existence* and inevitableness are taken into account, but it *also means* the *recognition of the degree of their operation* and the change in the degree of their external manifestations. Knowing *this* the planner would be able to utilise economic laws.

One of the external proofs for the existence of law are the so-called normative figures (or structural constants or invariances as Tinbergen calls them). The fact that the consumption function is the result of the size of the available personal income and its distribution and that it amounts to a *certain* figure is only one of the manifestations of the existence of such laws. It is, of course,

similar to the function of saving and the new investments arising from it. Further, we all know that a certain input will give a certain output. In this case the input coefficient is the expression of natural and technical laws operating in the economy. Among the external manifestations of the existence of these laws I must list the already mentioned fact that in countries with a low productivity and a low national income the share of net investments is low.

If we say that planning is founded on the knowledge and use of economic laws we mean first of all that the planner must recognise the normative figures and avail himself of them in forecasting the future development of the economy. This is, of course, possible only up to a certain limit. In an economy there are quite a number of laws operating simultaneously, however, not always in the same direction, but sometimes even in contrary directions. This is the basic cause, besides institutional barriers, for the operation of economic laws within limits and also the reason why it is necessary to recognise these limits through analysis or measuring of "boundary conditions", "bounds of constraints", (outside of this, as we know some constraints can be fixed by man). For planning measures in underdeveloped countries it is essential not only to take into consideration *what* is conditioned by laws but what is *most important, to recognise the limits within which these laws would appear if they operate anarchically and to break them and achieve the optimum if necessary by means of the plan and of economic instruments.*

These are the general views on economic laws so far connected with economic planning, dealt with only in passing.

III

1. In drawing up a plan the planner acts according to economic policy directives on the one hand, and on the other hand, he must take into account a number of objectively necessary phenomena or economic laws he cannot avoid and which operate in a general interrelationship and sometimes even in opposite directions. Their operation is recognisable by means of theory and empirical analysis.

The contents of the plan designed to solve the main economic problems influence the methodology but indirectly. However, we shall try to give a somewhat more complete picture of the problems. In general, the fundamental economic problems of the Yugoslav economy are similar to those of underdeveloped countries endeavouring to escape backwardness and poverty. In order to increase the people's standard of living as much as possible, production must be increased as quickly as possible. For this purpose the largest possible investments must be made for an expanded reproduction of the means of production and for greater experience of people in their work. This requires considerable financial means for investments.

It is a specific feature of socialist countries that property relations brought about by redistribution of national wealth change essentially and rapidly in them for this purpose. Land reform and nationalisation, particularly of large enterprises, create not only (more) righteous ethical relationship but also improved conditions for the flow of saving for the needs of society.

The distribution of *incomes* makes it possible to use the greatest possible amount of means for eliminating historical disproportions that appeared in the economy during the capitalistic regime and to create a new, more advanced structure of the economy and, through it, a speedier economic growth. In using this criterion for the utilisation of the means redistributed, there is not always an *opportunity* of creating *profit*, but of creating social utility, which is an important characteristic of planned redistribution in socialist countries.

In order to eliminate disproportionality in development, the basic industry and electrification are supplied with these means. This makes possible a reconstruction of all the other branches of the national economy. For eliminating the disproportionality in regional development the hitherto backward regions are primarily provided with these means. In Yugoslavia these are specially Macedonia, Montenegro and a part of Serbia. To abolish the inequality in the welfare of the people, the major part of the current income produced is allotted to those social strata that have so far had the lowest income, although in principle in such a manner that their created and disposable income depends on their contribution to production. The accumulation formed in both the private and the socialist sections strengthens the socialist section to a considerable degree.

In promoting the economic growth a range of problems and tendencies are arising, which are a symptom of constant development in backward economies and which can be even intensified by some exogenous factors.

The tendency to rapid changes in the structure of the economy and to a rapid increase of productive wealth requires a high rate of investment and with it a relatively slower growth of the fund of disposable consumer goods which gives rise to a constant tendency towards inflation, as there is also a disproportionality between the total amount of saving and the demand arising from it which is greater than the disposable investment goods. If this demand can be met only by imports, a tendency towards a deficit in the balance of payments is created as a further symptom of this process of rapid growth and affirmation of the material basis. Owing to the fairly equal distribution of the income, the diverting of the income of a few rich people to an immense number of poor people causes only a slight rise of welfare.

These tendencies are more intense because of the relatively long time lags in the effects of investments on the growth of the fund of consumer goods. The difference in the time of effect is due above all to the fact that investments

are made especially in objects of basic industries which do not produce for consumption, and partly to their protracting construction. The tendencies toward unbalance are also furthered by the migration of the rural population to towns or, in other words, from agriculture to non-agricultural industries, as well as by the increased volume of their consumption and changes in their consuming habits.

This nearly inevitable process of passing from the former stagnation and disproportionality in economic development arises simultaneously with a whole series of new factors which tend to and from time to time actually do unbalance the economic development.

In the past twelve years a speedier economic growth has indeed been achieved. While before the war national income increased by approximately 1 per cent per capita, it has been increasing in post-war years by approximately 5 per cent.

However, these problems are of interest to us here from the aspect of the *methodology* of planning. This state of affairs has influenced the contents of the Second Five Year Plan and therefore its basic targets are above all the abolition of the disproportionalities just mentioned, that means especially a speedier increase of welfare, increased agricultural production and a reduction of the deficit in the balance of payments.

IV

The sequence in planning. Planning in practice.

1. The sequence of procedures in planning is approximately the following.

The plan is first drawn up *to first approximation*, in the second stage it is completed (perfected) and more exact figures and numerous indices are put in it.

When the plan is being drawn up to first approximation only the most important rates of growth are set as targets or reckoned say, for the national income, for industrial production, for agricultural production as well as some of the most important proportions. Among these are, in the first place, the ratios of the distribution of the national income to consumption and accumulation as well as to reserves, and also to the probable sum total of imports and exports, and the rate of wages and saving in national income. At present equations are most frequently in use in the first stage, similar to the ones used in econometrics. In all the first cases numerical value of unknowns is calculated by means of known variables on the one hand and structural constants or invariances on the other.

2. The procedure in drawing up the plan to first approximation is different from that adopted in the gradual approach to the more exact figures of the plan.

It was perhaps the very possibility of completing the plan of the national economy with the plans of individual enterprises that accounted for the fact that a complete (entire) model of planning, a model in the true sense of the word with parameters and the invariances belonging to it, is not used in Yugoslavia. As the basic model, therefore, there is in use a fairly detailed scheme of the process of reproduction based on Marxian theory and developed to such an extent that it is possible to quantify *ex post* by means of statistical material and to set up *ex ante* positions from it. This model has the same main drawbacks as we find in the models of other countries, namely, that they do not sufficiently take into account the elements of dynamics in economic processes.

However, the partial application of econometric models does not mean at all rejection of complete models. On the contrary, people are of opinion that the completion and combination of partial models in a consistent whole is necessary and that it is an excellent means of planning to *first approximation.*

3. It has already been said that the fixation of fundamental targets (or preference functions) is of great importance for methods of planning. The starting point in drawing up the plan in our country is final consumption and within it, most important for welfare, the consumption of the population and the balance of payments.

How Consumption Is Planned

4. On the basis of estimates of national income and its distribution the probable amount of the disposable income of the population is planned. In Yugoslavia, for instance, forecasts are made for the disposable income of the population to increase on an average by 6-7 per cent per capita annually and for the distribution to changes in a sense that the share of skilled and highly skilled will increase, in the total amount of wages, to a larger degree.

When the disposable income has been planned for the purchase of consumption goods as well as its distribution, planning begins for the probable composition of consumption according to main groups of consumption goods. The composition of consumption is estimated by means of the co-efficients of the elasticity of consumption.

On the basis of this it has been assumed that the consumption will change by 5.5 per cent per capita per year up to 1961.

5. For the estimated volume of consumption, a *balance* of comsumption goods, food, garments etc. is made for each individual year of the future-period. When doing this the estimated demand for consumption goods and the estimated production and imports of consumption goods are made to balance. In reality a *partial* balance of money-commodity equilibrium is effected.

6. If consumption is planned in the manner described, a whole series of *problems* arises. Some of these are characteristic of planning in underdeveloped countries and will be briefly dealt with for the purpose of comparison.

(a) A considerable portion of the total fund of consumption goods is produced in agriculture and shows, therefore, deviations of two kinds—deviations of the joint production of consumption goods in agriculture arising from climatic conditions, and deviations of agricultural market production. The latter are dependent not only on the volume of the total agricultural production but also on the conditions for exchange mainly of the products of manufacture.

(b) The composition of consumption in Yugoslavia has characteristic features similar to those in many countries having an average of 200 dollars per capita national income, or something more than 100 dollars of disposable income. There is a high share in the consumption of food, a low level consumption of manufacturing products, especially of durable consumer goods and services.

All this leads to the fact that when income rises demand for foodstuffs, particularly for bread, fats and fuel, shows the smallest elasticity, whereas expenditures on milk, vegetables, drinks, tobacco and the like show a medium elasticity of 0.5 to 1.0 per cent. The greatest elasticity, that is, where the co-efficient is bigger than 1, is in expenditure on the purchase of manufactured goods and services.

(c) The expected changes in the volume and composition of consumption will probably reduce the share of foodstuffs and increase the consumption of industrial goods, especially durable consumer goods and services.

Investment planning

7. Investment planning, already dealt with briefly in connexion with the problems of choice of planning alternatives, presents some technical problems.

Investment planning to first approximation is carried out simultaneously with the planning of the rate of growth of national income. When the target is to examine what growth of national income is to be achieved, the necessary saving or capital formation is determined at the same time. For this purpose the capital-income ratio or capital-output ratio is employed as the invariant relation indicating how much additional capital is necessary to raise the national income by 1 per cent. In planning itself the relation taken on the whole tells us little. It is, therefore, necessary to supplement it with estimates according to branches or even industries of production. When the necessary net investment has been estimated in this way, replacement investment is added thus yielding the amount of gross investment.

8. If the amount of planned investments is too large and might essentially decrease consumption it is necessary to reduce the forecast volume of production or to hire foreign resources. The second Five Year Plan forces to invest (net) 19.7 per cent of net disposable means in fixed and circulating capital. This is a rather high rate of accumulation; however, if we take into account that it would be lower according to the western conception in estimating the national income, the problem is mitigated to some extent.

9. Investment planning to first approximation is thus above all planning with regard to the volume and with regard to the money-commodity equilibrium. The distribution of investments among industries is, in the first stage, forecast only in the broadest proportions. Detailed planning of investment with regard to the branches of production, to their technical structure, and to the share of building, equipment, etc. is not carried out until they reach the stage of completing the plan.

Investment plans are usually drawn up in several variants taking into consideration the variability of exogenous factors.

The investment plan can be clearly seen from the model on page 180. Investment planning has thrown up a whole series of *problems*. Experience has shown for instance, the following :

(a) The partial econometric model with linear functions can be applied only to investment planning to first approximation. For detailed planning, it is necessary to include material balances, value balances and balances of labour.

(b) Regarding investment a five-year term for perspective planning is too short. This is experienced especially when we are concerned with basic objects having a longer "lag", of 4 and more years, for technical and material preparations, construction and for the introduction to the process of production.

(c) The stability of capital co-efficients differs in the various activities. It is definitely smallest in agriculture and this reduces the analytic value of entire capital co-efficient on the whole because of the considerable share of agriculture.

(d) Already when dealing with the balance of the equilibrium of the monetary and commodity elements of the reproduction process we were faced with the problem of a partial equilibrium of monetary means of investment. Experience has shown that just after the introduction of the market economy and independent investment decisions, the tedencies to a partial disequilibrium (in the sense of excess in investment planned) have increased.

(e) The explanation of the principles of the choice of investment alternatives enabled us to conclude that investment planning is not based on the theory of profit. The volume of investment is estimated on the basis of an analysis of the ratio of existing productive capital to output on the one hand, and of the ratio of planned output to the necessary additional capital on the other hand. Therefore, the theoretical basis of investment planning has, to a considerably larger degree, approached the theory of the flexible accelerator (examined by Chenery and Goodwinn), which is, regarding its conclusions nearest to the advanced theory of expanded reproduction.

The Co-ordination of Plans

11. Similar to the planning of consumption and investment is the planning of imports and exports, of reserves and also of value elements (wages, savings, etc.) Simultaneously with planning goes on the process of co-ordinating the planned magnitudes with other macroeconomic variables.

As the problem of the choice of planning alternatives have already been dealt with, an example from the field of balances, serving the purpose of directing economic processes towards equilibrium, will be illustrating. For, besides the question of choice among alternatives, the practice and theory of co-ordination of the reproduction process are perhaps the second most interesting field of planning.

As is known, equilibrium is in itself only something *hypothetical* and is never attained in economic reality. Planning with proportions and economic policy with instruments of economic intervention only promote and create *tendencies* towards an equilibrium. Economic development in reality moves with constant deviation from what is equilibrium.

12. There is a whole series of equilibriums to be realised by means of the plan.

Only a few of the large number of variables to be coördinated in planning economic processes will be mentioned; the relation between available natural resources and their exploitation, the relation between the supply of labour and the volume of employment, the relation between available capacities and exploited productive capacities, the relation between available and needed material resources, etc. In the market economy the equilibrium between money expenditure and goods on the market is of special importance. Disproportionalities in the reproduction process most frequently manifest themselves in the form of disproportions between money and material elements.

Some of the balances by means of which we try to attain harmony are easily comprehensible. Material balances, for instance, of steel production on the one hand, and its consumption in various branches, in various territories or for various purposes, on the other hand, are simple in their composition which is similar to that of the balance of available labour force. For reasons mentioned above, however, it is perhaps more interesting to deal with the money-commodity equilibrium.

13. The balance of monetary equilibrium is based on some of these already mentioned theory of proportions. The model of the balance of equilibrium will be persented in a very simplified form, without any parameters.

As it is known, Marx in his equilibrium equation dealt with general conditions which must be given so that the process of reproduction can go on without stagnation. For a stationary economy he assumed that the following relations must exist between the magnitudes of the reproduction process :

I = annual output of production goods.
II = „ „ „ consumer goods
c = depreciation
v = wages
m = surplus value (profit).

However, for the normal course of expanded reproduction the ratio between the individual magnitudes ought to be :

$$I\ (v+m) = IIc$$

$$I\ (c+v+m) = Ic+IIc$$

$$II\ (c+v+m) = I(v+m)+II(v+m)$$

In the theoretical case of expanded reproduction, the equation ought to be :

$$I(v+m+m_1v) = II(c+m_1\ c)$$

($m_1\ v$ is the part of surplus value intended for personal consumption; $m_1\ c$ is the part of surplus value for capital formation).

I should only mention in passing that regarding its purpose this equation is very similar to Keynes' general equilibrium equation expressed as

$$Y = C+I \text{ and further } I = S$$

In building his model Marx abstracted a series of circumstances which otherwise regularly appear in economic reality.

The model is designed on the assumption that

(a) there is no foreign market,

(b) prices of commodities are stable and the goods are disposed of according to their value,

(c) reproduction is taking place in pure capitalistic regimes where there are no other social classes than workers and capitalists.

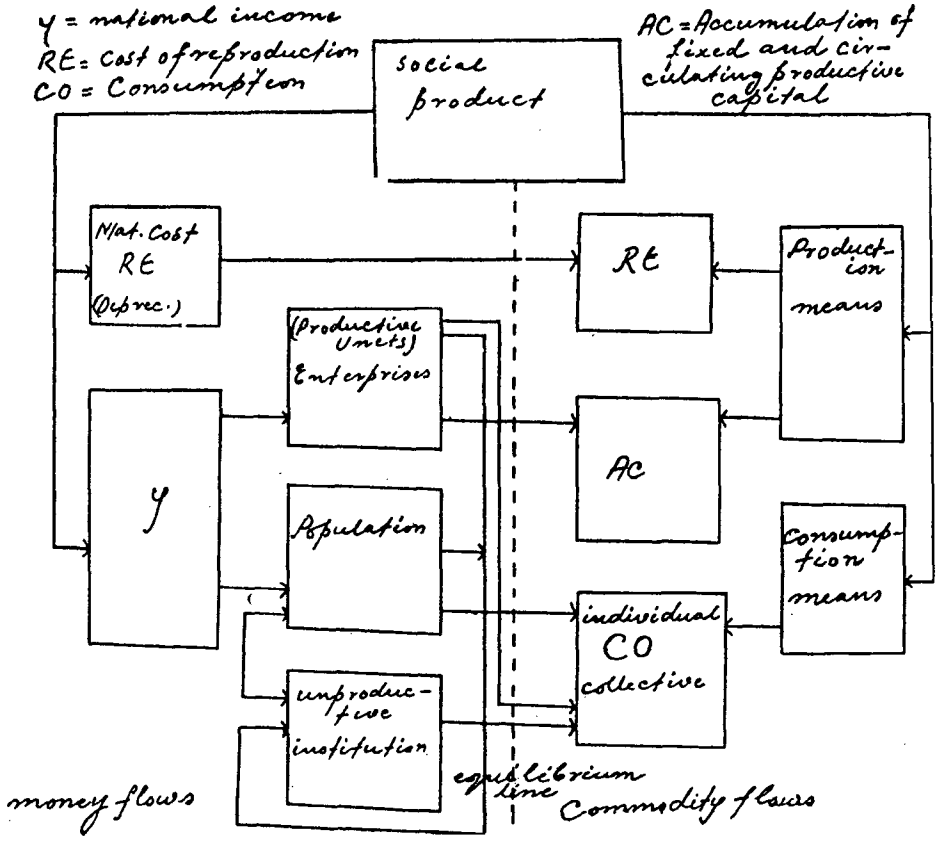
It goes without saying that in developing Marx's model into applicable forms it would be necessary to eliminate the above-mentioned working hypothesis successively and to introduce into the basic model all those elements which are significant in the process of balancing. That is to say, it would be necessary to supplement the equations in such a manner as to make possible their quantification with *statistical data*, containing all those main elements which are important for planning and directing the money-commodity equilibrium.

A balance scheme which have been constructed on the basis of such equations is very complicated in practice. It is complicated because of the multifarious forms in which production, distribution, exchange and consumption appear in it. Another reason for it is the peculiar conception of national income.

> In countries where national income is estimated on the basis of Marxist theory it is considered that it is formed only in six branches, namely, industry, agriculture, forestry, building, transport and trade, whereas social, cultural, health, administrative and defence activities have a non-productive character.

14. Designed in such a manner and simplified yet again, the scheme model presents the following picture.

The graphic scheme shows that it is a flow scheme, the one making possible only comparative statistical analysis and comparative statistical planning. It does not show a series of economic processes and categories that appear in reality (various forms of expenditure, international exchange, reserves, etc. are left out).



But the graphic scheme clearly shows to the economist who examines these and similar problems that the system of balances is divided up according to the criterion of equilibrium between monetary and goods items and that the equation of equilibrium is indicated by the vertical line.

If the above schemes were presented in terms of mathematics it would, of course, be necessary to include in individual equations structural constants, too. Thus, balance equations would be changed to functional equations, applicable to planning.

15. The scheme itself shows that, in addition to the total equilibrium $M = C$, also partial equilibria between individual groups of expenditure and groups of commodities are necessary. Disharmony between them causes changes in prices, and vice versa. Changes in prices may cause disharmony between material and monetary elements. This scheme can also be used as a basis for planning prices to the level of equilibrium by means of the co-efficients of elasticity. That is why the scheme might be a strong basis for the choice of instruments, co-efficients of exports and imports, taxes, interest, etc.

V

The Problems of Planning

Some concrete questions to be solved in drawing up a plan having been briefly dealt with, it can now be stated which are the alleviating and which are the aggravating elements exerting influence on the methodology of planning in Yugoslavia.

In Yugoslavia there appear some problems that are not found in other countries.

1. From a merely technical point of view it is possible to establish that in drawing up a plan a particular problem is presented by the variability of exogenous factors.

As in every country, here also, above all, three kinds of factors are to be included among the exogenous factors, namely, (1) considerable fluctuation in the agricultural production, (2) dependence of the economy on international exchange, and in addition, a third one (3) the activities of the private sector.

Among the exogenous factors mentioned, the extraordinary fluctuations in the agricultural production are of significance for Yugoslavia. Experience gained in the recent post-war years shows that almost every year was affected by drought. In the recent post-war years there were as many as three droughts, one of them catastrophic, while the year 1957 was extraordinarily fruitful.

Deviations in agricultural production exert an influence on the decrease of national income not only on account of a decreased agricultural production and cattle-breeding and of the agricultural processing industry, but also on a weakening of the other branches.

(2) Although the share of imports and exports in the national income of Yugoslavia is not high, the dependence of its economy on exchange

in the world market is considerable, especially because in the period of intensive investment a considerable part of the means of production is imported from abroad. This share has diminished in recent years not because of a reduction in investments, but, because a considerable part of machinery is produced at home. (Yugoslavia has also become an exporter of machinery). As there are close ties with the world market every re-orientation must, to a large extent, affect the domestic economy of Yugoslavia which is reflected in differences between planned and realised results

In the ten years of planning there have been several such re-orientations of results realised from planned figures.

(3) Also, in our country, the relative instability of structural constants and other normative figures is a special problem, as is the case in planning in every underdeveloped country which is being rapidly industrialized. This instability is caused by sudden adoption of new technological processes and new means of production whose effectiveness is increasing, and it is sometimes difficult to forecast their effects in normatives. Therefore, constant revision and supplementing of input coefficients and other constants are necessary. The stability of normative figures is, as is known, dependent also on the degree of aggregation and the mass of products. In countries with a relatively smaller production and more diversified products the stability of invariances is smaller. Therefore, for instance, the input of aluminium in the USA in the production of 10,000 aeroplanes is more stable than, for instance, the input of steel in the production of about 4,000 lorries in Yugoslavia.

This conclusion, of course, does not apply to technical coefficients or input coefficients only, but to an even greater degree to invariances of a purely economic nature, that is, to invariances that are not directly connected with technological production processes. Let us consider, for instance, the consumption function or the rate of elasticity of individual goods.

(4) Among the main elements affecting the exactness of planning and requiring more complicated methodological procedures are the numerous instruments or better instruments which are variable. As there are so many of them it is difficult to estimate their effect on other variables, especially because a good many instruments sometimes operate in opposite directions and because economic processes are the result of interaction of these opposing instruments. This results from the very cause of the origin of some of these instruments.

There are several causes of the existence of many instruments. A part represents the remainder of the previous, administrative planning; they are being abolished and will also in the future be gradually done away with. Among them are particularly those affecting prices. (For instance, the coefficients of imports whose purpose it is to bring imported articles to the level of prices in the domestic market, or to restrict the consumption of some imports).

A sudden abolition of these instruments might produce effects on the change in the composition of consumption which it is very difficult to estimate. This abolition will be carried out in the coming years when attempts will be made to achieve a more normal price structure.

In the methodological procedure of estimating planned magnitudes under conditions of a multiplicity of instruments, the simplest method would be to combine all those instruments which operate in the same direction. But as we have already mentioned, all the instruments do not always operate in the same drection.

After being acquainted with some more alleviating and aggravating circumstances influencing the method and quality of planning, one can now draw a general conclusion on the methodology of planning in Yugoslavia. It can be summed up in the following statements :

VI

(1) Planning is in conditions of social ownership and in underdeveloped countries an objective necessity and an inherent element of the social order. On account of peculiar institutional circumstances in Yugoslavia there exists a special type of planning based on the combination of centralised and decentralised decisions.

The greatest influence on the method of planning is exerted by the economic system whose fundamental characteristics are social self-management and market economy.

(2) The external expression of such a method of planning is that the rates of growth of macroeconomic magnitudes and proportions among the macroeconomic magnitudes are the main elements of the plan. Thus the plan does not contain concrete quantitative and qualitative targets to be realised by individual enterprises. Enterprises are not given directive targets; the proportions set in the plan are to be attained through general economic measures or instruments (taxes, credits, rates of interest, prices, etc.).

(3) With criteria regarding decisions made by the central planning organs on the one hand, and by enterprises on the other hand, the principle of rentability is here combined with the principle of choice according to utility and with the principle of creating a dynamic equilibrium. In microeconomic decisions of enterprises the criterion of rentability is the prevailing one, while in macroeconomic decisions the criteria of utility value and of economic equilibrium are prevailing.

(5) Deviation from the centralised direction and the introduction of market economy have freed economic forces to a great extent which resulted in recent times in a high rate of growth of production which influenced the increase of the volume of production, exports, investment, etc. All this and a better regulation of international

exchange have made it possible to plan, in the new perspective plan, a higher rate of growth and approach to solving some more difficult problems that have arisen in post-war years, and also such as were inherited from pre-war times.

(6) It was the main target of the First Five Year Plan to get over the consequences of the war, to build up a basic industry and to carry out electrification. During the period of carrying it out and up to 1957 the bases of the basic industry were laid and electrification was carried out to a considerable extent. Large investment and in addition bad crops, foreign policy relations and other circumstances caused a stagnation in agricultural production, and a lagging behind in the growth of the standard of living, and an increased deficit in the balance of payments. These are the reasons why a rise in the standard of living, a reduction of the deficit in the balance of payments and an increase in agricultural production are the main targets of the Second Five Year Plan.

Owing to the peculiarity of the economic system the methodology of planning has some special features. Since plans are not directive ones, it is possible to draw more exact plans for certain branches, while the plans in many fields, particularly in agriculture and in foreign trade, have a prognostic character.

(8) It is characteristic of planning that econometric procedures are applied to some extent only for drawing up the plan to first approximation. In completing the plan, however, value, natural and material balances respectively that are considerably divided up are used, as well as balances of labour and, finally, more or less established methods of gradual approach.

(9) As in econometric equations there will be used, in drawing balances to establish the unknown variables, a whole series of normative figures, invariances and structural constants. As new techniques are rapidly introduced, and because of new institutional elements causing a change of instruments, and due to the reduced mass character of production, normative figures are only relatively stable and must often be subjected to revision.

At present the methodology of planning is being supplemented. This supplementing consists of elimination of elements of administrative planning from the methodology, adapting it to the economy based on social self-management and on a market economy with imperfect competition. At the same time subsidiary means of planning are being supplemented, the first partial models are being constructed and the balance system is being built up. The experience gained in social accounting, (input-output matrices) is being used in this supplementing.

SOME PROBLEMS OF PLANNING THE DEVELOPMENT OF THE NATIONAL ECONOMY IN THE GERMAN DEMOCRATIC REPUBLIC

By JOHANNES RUDOLPH

Economic planning is the basic feature of the economic activity of the State; and it is a part of the whole economic activity of the State, as well.

Economic policy, another expression for the economic activity of the State, consists of two main parts :

a. *Planning* of the development of the whole national economy, and

b. *Management* of the branches, factories, farms, and other institutions of the whole national economy.

Planning means preparation of the economic policy.

Management means a system which leads the economic activity of all undertakings and institutions in the country in accordance with the aim and targets of the economic policy, cemented and fixed in the plan.

Economic policy is a part of the general policy of the Government, and so economic policy has to take into consideration the aims of the general policy of the State.

The Planning, or the preparation of the economic policy, *comprehends all considerations about the aims and ways and means of the economic development in the future.* Planning is the estimation and calculation of the influence of all the factors of the economic development in the country, viz. political, natural, biological, social, cultural and economic factors. In the process of the elaboration of the plan we have to investigate the influence of all these factors. And we have to see how the forces inherent in them have to be used, in order to fix the aims and to use the instruments corresponding to the *economic laws* in the most efficient way.

The main economic laws, to which the future development has to correspond, are the following :

a. The economic law of the conformity between the productive forces and the property relations of the means of production,
b. the *economic basic law* of the given social system corresponding to the prevailing property relations of the means of production,
c. the *economic law of proportionality* in the process of expanded reproduction,
d. *the law of value*, and
e. the economic law of the distribution of consumer goods in accordance with the quantity and quality of labour (in socialism).

The first mentioned economic law means, that the more collective the process of production in a technical sense becomes, with increasing level of the technique in the branches of production and increasing specialisation and division of labour connected with them, the greater becomes the contradiction arising from the more

and more collective production on the one hand and the private ownership of the means of production on the other. The mechanism of competition in the market is more and more losing ground and is being replaced by monopolistic regulations showing the objective necessity of an increasing centralisation of the economic management. The trial of planning of the economic development in capitalist countries is a characteristic symptom for this historical process.

Solution of this contradiction between the increasing collective production and the remaining private appropriation of the products arising from and connected with private ownership of the means of production, is only possible by creating more and more socialist property, owned by the whole society, represented by the State, or owned by groups of producers, represented by cooperatives.

Planning has to take it into consideration that economic law has been valid for all historic formations of the human society. But it must be understood that the political power has a responsibility to effect material change in the given social conditions.

Secondly, the basic economic law of the society in countries where socialist proprietorship of the means of production prevails, is the so-called basic economic law of socialism. It shows the characteristic features of the economic activity of the whole society : the main *aim* and the main *instrument* to achieve this aim. In socialism, or in a society on the way to socialism, the aim is the highest possible increase of the standard of living by means of the highest available level of the production technique.

But it may be mentioned here, that there must be two presuppositions for becoming or being a socialist society : viz. socialist proprietorship or of the means of production on the one hand and the political power in the hand of the working class, which is interested not in profiteering but only in increasing the standard of living, on the other hand.

This is the second important economic law that the planning has to take into consideration.

Thirdly, the economic law of proportionality in the process of expanded reproduction is full of efficiency only in a socialist society. In a capitalist society, for example, you have the economic development over a very long period, as a matter of fact, but there is never a full proportionality between the branches of production. This development is accompanied by the inconsistencies between supply and demand in the producer goods sector, as well as in the consumer goods sector. Because there is the market, the equilibrium of supply and demand is re-established from time to time by increasing or decreasing prices. In the crisis period, monopolies particularly try to get or maintain this equilibrium by expansion of export or by regulation of investment or production inside the country by means of the economic policy of the Government.

It is quite different in socialist countries. According to the aim of all economic activities, and the main instrument to achieve this aim—discussed in the economic basic law of socialism—production and investment will be found in accordance with

the increasing individual and social consumption as well as the increasing net investment and replacement in connection with the chosen techniques in the various branches. By this approach the total market-equilibrium and the allocation of the investment will be scientifically calculated. From this, the undertakings get their plan targets and "market-orientation" from the central planning authority. Hereby the condition of equilibrium at each point of time has to be secured so that there are no frictions which would check a continuous proportional development, creating a higher degree of development than in a capitalist country.

That is the third important economic law that the Planning has to take into consideration.

Finally there are two other conditions to fulfil. We have, during the formula tion of the economic policy, to take into account two other economic laws, the so-called law of value in socialism and the law of distribution of the consumers goods in accordance with the quantity and quality of labour, respectively.

This law of value says, that in a society where production takes place under a systm of social division of labour, the products are exchanged according to the average of the necessity. It would be beyond the scope of this article to explain the whole theory of the value of labour, and moreover, it is presumed that this theory is well known.

The elaboration of the plan means that there must be a condition of equilibrium between the rate of increase of the productivity of labour and the costs of manpower (which determines the values of these products) on the one hand, and between the changing (decreasing) value of the production, and the value of the various funds of productive and non-productive consumption and funds of purchasing power on the other hand.

Further we have to consider, in what way the changing prices affect the decisions of the undertakings, concerning production and investment of those products, for which the undertakings do not get any special market-orientation from the central planning authority, because there is only a small number of key-products for which this market-orientation is given. In the GDR this concerns only about 500 products. This is the fourth economic law that Planning has to take into consideration.

The economic law of distribution of the consumer goods in accordance with the quantity and quality of labour says that, on the basis of the cost of reproduction of manpower (different in the various professions), the wages and salaries are equal for the same work either done by men or by women, and they are higher for more exact, more intensive, heavier and more responsible work. The more the worker contributes to the wealth of the whole society, the more he receives from society.

It is perhaps not necessary to point out, that between these five main economic laws there is a logical conformity and consistency. Only if the targets of planning, and the instruments to implement them, correspond to the necessities of these economic laws, we have an internal consistency. This is the main presupposition for a

successful elaboration and implementation of the aims and targets of the economic policy.

When the plan has got the assent of the highest political authority, the Parliament, it assumes the character of a juridical law, giving obligatory basis for the management of the whole economy and its branches by the Government and the regional State authorities as well. The *management* consists of allocating financial and material means for investment, of changing the taxation, the prices, and the wages on the basis of an agreement with the Trade Unions, and of informing the undertakings about their plan targets etc. Over and above this, it has to keep current control with regard to the implementation of the plan, and in taking measures to secure the targets.

So the first part or the first element of the economic policy of the State can be defined as the determination of economic development in the future, and the second part or the second element as a system of methods to implement the aims and to reach the targets of the visualised economic development. And we learn, that planning and management of the national economy are two parts of the same thing, not separable from each other, and generally speaking, the economic policy of socialist countries can be defined as the scientifically based activity of the socialist State in the scope of the economy.

In respect of what has been said about the influence of the economic laws on the economic policy, the question arises whether there is any scope for subjective decisions in the economic policy. It will be seen, there is no scope for such economic decisions. But it will also be seen that not only the economic laws determine the economic development but that there is a set of other factors.

First it has to be examined in what range these economic laws determine absolutely the economic development in the future.

This may be illustrated by some examples :

(a) In the long run one cannot achieve the highest possible rate of increase of the standard of living when private property checks the development of large-scale production and utilisation of high technique. For instance, in the GDR, in agriculture we have a lot of small farms owned by peasants of an average of 10 to 15 hectares (65% of the area). In these small farms, it is not possible to use the highest level of agricultural technique, i.e. utilisation of tractors and machines for ploughing and reaping, and so on. So the peasants are persuaded to change their small-scale production to a cooperative large-scale production, because large-scale production has higher level of productivity of labour and yields greater crops per acre, and enables the peasants to have cooperative farms, a higher standard of living, as well as less working-hours per day.

(b) The highest rate of standard of living cannot be achieved in the long run unless the highest level of technique in industry, agriculture, transport etc. are used. That means, that the technological choices have to correspond to the highest

available technique. But it is understood, that as a rule the highest level of technique requires a higher amount of investment, and so one has to decide the allocation of the increase of national income to net investment and to consumption in such a way, that it is possible to make the investment on these highest level of techniques.

(c) The economic law of proportionality requires that there must be conditions of equilibrium between production and consumption, between the funds of products and the funds of purchasing power, between production, employment and productivity of labour (because it is to secure full employment), between the productivity of labour and the so-called output-capital ratio and the capital intensity per worker, and also there must be equilibrium between the productivity of labour and the high rate of the wages in the sphere of production. If these conditions of equilibrium do not exist, we shall have disproportions, leading to frictions in the economic development.

Beyond these economic laws we have to take into consideration other factors when we are elaborating the plan for the development of national economy. It may be possible to say that these are "non-economic" factors.

We have four kinds of such non-economic factors.

(a) Firstly the natural factors. These are, for instance coal, ore, water power, the area available for purposes of agriculture, forestry etc. and the climate. The more favourable these natural conditions are, the greater the possibility of a high rate of growth of national development and vice versa.

(b) Another non-economic factor is the change in population, the density of population in the country, the rate of birth and the expectation of life, the average level of education, etc. The change in population and the change in employment structure are clearly related. For instance, if there is a very slow increase of population in a highly industrialised country, there will be need of using the highest possible level of technique in order to maintain a high rate of growth of national income and to increase the standard of living. Or, if there is still unemployment, the first task from the human point of view will be to create full employment. But such a decision leads to certain consequences for the technological choices, because the fund of new investment is limited. In this case it would not be possible to choose the highest level of technique. The problem for the economic policy is to find the best combination between the time of removing unemployment or underemployment and the level of technique chosen, in order to get the highest possible long-term rate of increasing the standard of living. This is a real economic problem and it must be stated that it is a problem that has not been given due importance to so far.

(c) A third kind of non-economic factor consists of political aims. An important political factor is the necessity of measures for defence in socialist countries as long as there are two different social systems in the world, connected with the well-known international political tensions. Another political factor, for instance, is the relation among the socialist countries, appearing mainly on the creation of an increasing international socialistic division of labour. That means more and more

close political and economic cooperation among the socialist countries in order to take advantage of division of labour on a world-wide level.

(d) Finally, there is another non-economic factor. That is the *level* and *development* of technique and scientific perception in the field of technique as well as in the field of social sciences. It is not perhaps necessary to point out the importance of these factors for the economic development.

On these economic laws and the above-mentioned "non-economic" factors depends the destiny of economic development in the future. This development has to be fixed in such a way, that in the long run it will achieve the highest possible rate of growth of the standard of living, and, as a presupposition for achieving this aim, the security of the existence of the socialist society is necessary. It is the main task of the economic policy, and of planning, to fix the targets for achieving these aims in a concrete way, and to fix measures for the implementation thereof by the management of national economy.

From all these it is clear that there is no field for subjective or arbitrary decisions about the economic development in the future. The aim of economic development is determined by the social and political conditions of the society, and the target of planning consists in finding the best way of implementation of these aims.

It is very difficult to speak about such an extensive work in a short time. So a very simple scheme may be used in order to show in what way a plan for the development of the national economy has to be worked out.

There are different steps of the elaboration of a plan. The nature of the work is such that one has to begin with very rough estimations and proceed more and more to a plan which is sufficiently exact to give the basis for the management of the branches and undertakings of the national economy. The main problem of the whole work is, that from the beginning up to the end we have to secure these three things:

a. increase of socialist property,

b. proportionality of the economic development, and

c. the highest possible long-term rate of the standard of living.

This requires a system of balance sheets (known as Balance of National Economy, and Material Balance) and a set of figures showing whether these requirements are implemented in the plan.

Now, it has to be examined what kind of steps have to be taken in the course of the elaboration of the plan. The first step consists of the following work:

a. *One starting point* for the elaboration of the plan is an analysis concerning the development of the whole national economy in the past upto the year "zero", i.e. the year before the beginning of the new plan period. This analysis shows the level of economic development that has been achieved and the tendencies in the past from which can be seen the economic factors and their influence in the immediate future. Another starting point

is the analysis of the presumable influence of the so-called non-economic factors in the future. So it has to be investigated what kinds and sizes of natural resources are available, what increase of population will be obtained, how to change the private relations of property in order to make possible the introduction of the highest level of technique in the present private-owned sectors and so on.

Another set of starting points that has to be created are the so called perspective programmes for the development of the most important branches of the economy: for instance, heavy industry, engineering, agriculture. These perspective programmes have not the character of definitive plans of branches because there is, at the time when these plans are worked out, no orientation about the order of magnitude of the development of the production of these branches. For this reason, these programmes include as a rule several variants concerning the volume of production and the level of technique. Later on when we are working out a complete plan, we have to choose one of these variants in accordance with our overall economic calculation with the help of the Balance of National Economy. In these perspective programmes we investigate through the development of a certain branch, on the basis of several variants, with regard to production, supply position, raw material, development of technique and skilled labour as well as investment, including an analysis about problems of location of the new plants in connection with the transport facilities and in connection with town planning.

These perspective programmes are the basis for an overall economic calculation from which are obtained rough figures about production, investment, and employment of the branches of the national economy, as well as for the elaboration of the definitive plans of the branches.

The *next starting point* is then the overall economic calculation mentioned above. This overall calculation appears in the form of the so called Balance of National Economy. This Balance of National Economy shows roughly the development of total output of the national economy and its branches, the increase of national income and the distribution of the national income for investment and for individual and social consumption, as also the development of the standard of living. From this calculation are found also, for each branch, the increase of the productivity of labour, the development of the output/capital ratio and the capital intensity per worker.

The results of this work show the future development of the whole national economy in its main features, in terms of their order of magnitude. These results are the basis for the elaboration of the first project of the complete plan for the development of national economy in physical terms.

b. The *second step* of the elaboration of a long-term plan consists in the elaboration of the plans for all branches as well as for the standard of living. This plan includes the following plans of branches:

a. industries and construction,

b. handicraft and cottage industry,

c. agriculture, forestry and irrigation,
d. transport and communication,
e. foreign trade,
f. standard of living (including health, housing and other services, supply of food, retail trade in consumer goods, etc.),

The connections between the branches with regard to production and supply of raw material are coordinated with the so-called material balances. These balance-sheets show the sources of the whole amount of a certain kind of product, for instance, production and import. The other side of these balance sheets indicates the funds to which this total amount of products have to be allocated. These material balances are the above-mentioned 500 products for which we are working out. For the coordination of the development of the branches, there exist other parts of the plan of national economy (i.e. State budget).

This first project is the result of the work of the State Planning Commission only. When it is ready, it becomes the basis for the discussion about economic development in the cabinet, and in the Economic Commission of Parliament, about the principles of the economic policies in the future.

c. Then follows the *third step*. After this discussion usually some corrections of the initial figures and proposed measures are made. This corrected first project is the basis for negotiations among the socialist countries for the purpose of organising international division of labour and coming out from this: relations of foreign trade among these countries. After this a second project is made ready, including the results of these negotiations. It is understood that there are some discussions in the Cabinet and in the Economic Commission of Parliament during this period.

When this second project is finished, the State Planning Commission gives all the plan targets to the ministries and to the regional State authorities; and from there the corresponding plan targets are given to the factories. In the factories there are discussions, including the workers: in what way it is possible to improve the plan targets for the factory. On the basis of the results of these discussions each factory gives a proposal to its ministry, containing the results of these discussions. These discussions in the factory take place between the manager and his staff, the trade unions, and the workers in the different departments of the factory. So, the discussions for improving the plan are secured on a broad democratic basis.

d. *The fourth step*: The proposals of the factories, and finally of the ministries and regional State authorities to which these factories belong, are the basis for corrections of the initial plan-targets and for the elaboration of the third project of the plan. After this there takes place final negotiations about foreign trade among the socialist countries, and as a result of these negotiations we get the definitive plan for the development of the national economy. On this plan a draft of a bill is made and placed by Cabinet to the Parliament, including bills for the changes

in taxation, prices, and wages. When this bill has received the assent of the Parliament, the targets of the plan assume a mandatory character, and becomes the basis for the economic policy of the government. Furthermore, all ministries, regional State authorities and from them the factories, farms etc. under them, get their plan-targets, the basis for their work during the following year.

The management of national economy is different in the various sectors of property. In the GDR there are four sectors :

a. The State-owned sector.

b. The cooperative-owned sector.

c. The private sector.

d. A sector of private undertakings with a part of state-owned capital.

In the *State-owned sector* the work of all factories during the year goes along the plan-targets as mentioned before. On the basis of these plan targets the factories organise their production and their relations with their customers and suppliers, and also their investment and employment in the same way. The task of the ministries and regional State authorities consists in controlling the implementation of the plan targets, and they help the factories in fulfilling these plan targets when they are in difficulties. State-owned factories, farms etc. are economically and juridically independent undertakings with their own fixed and circulating capital. The profit they make is used to some extent for purposes of increasing their circulating capital as far as necessary, for small and rationalised investments, for giving premiums for very good labour to the workers, and finally for financing the social institutions of the factories, farms etc. like clubs, holiday hotels at seaside, in the mountains etc.

In the cooperative-owned sector the cooperative farms, cooperative societies in commerce etc. get their market orientation, i.e. figures about production and supply turnover from the respective regional State authorities. For their investment they need special licenses from these regional State authorities. The same kind of management takes place in the mixed sector.

In the *private sector of the industry* there exist Chambers of Industry and Commerce. These Chambers of Industry and Commerce are organised under advice from the regional State authorities, from which they get the plan targets for the private industry within their region. It is the task of these Chambers of Industry and Commerce to negotiate with private undertakings and to give them a special kind of license, with which they can buy their raw materials. For the new investment in the private sector of industry there exist the same kind of licenses like those in the cooperative sector. Applicants for investment have to go to their regional authorities. But it must be said that licenses for buying raw materials are necessary only for a limited number of certain raw materials, for instance, raw cotton, yarn, wheat, coal, tin plates and so on.

These raw materials belong to the 500 products mentioned earlier, particularly fixed in the plan of national economy. All other products can be bought without any license. License system or organised in a similar manner exists for investment. Licenses for investment are necessary only in the case where investment projects have a value of more than 20,000 Marks. There is a special system of management in the *private sector of agriculture* because 65% of the agricultural area is owned by peasants. From the village administration the peasants get an orientation about their production : crops, meat, milk, wool, and so on. A specified part of their production has to be sold to the State-owned Trade Organisation at fixed prices. They can sell the other part of their production at higher prices but the higher prices are also controlled by the State-owned Trade Organisation.

Further it may be mentioned that the whole *foreign trade* in the GDR is in the hands of the State-owned Foreign Trade Organizations; only in the field of export, industrial undertakings can have their own relations with foreign countries. But these relations are under the control of the State Bank and of the above-mentioned State-owned Foreign Trade Organisations.

The equilibrium of supply and demand of *manpower* in the different branches and professions is determined by wage policy, advising the citizens about the professional choice of their children, and by a system of fixing the places of vocational training in the factories, farms etc. and in the universities. The wages and their alterations are fixed by the government jointly with the Trade Unions.

The *price policy* is a part of the economic policy of the government. All prices of key products are fixed directly by the State Planning Commission or on the basis of instructions issued by this authority. Prices and price instructions are valid for all sectors of property. *Taxation policy* is like price policy, the same for all sectors of property. It is understood that the State-owned undertakings pay off their profit, not necessary for financing their own investment etc. to the State budget.

This system of management though based on some principles, is not rigid. It changes according to the changing conditions. After a certain consolidation of the political and economic leadership of the new ruling class of workers, it became possible in the socialist countries to change over from a more or less tightly centralised economic management to an increased decentralised system, so that now the factories and their branch administrations and the regional State authorities have greater rights; but they have got thereby greater responsibilities as well. These measures of decentralisation involve the possibility and also the necessity of greater participation of all citizens of the country. This kind of participation in public affairs is only known in socialist countries. Thus, general as well as economic policy changes over slowly to a subject of the so-called "common man" who is excluded from "high policy" in former kinds of society.

BALANCE OF NATIONAL ECONOMY-AN INSTRUMENT OF LONG TERM PLANNING

By JOHANNES RUDOLPH

1. The Balance of National Economy is an instrument of economic policy in the form of a system of economic figures and relations showing the characteristic features of the total process of reproduction in national economy during a certain period. It shows the circulation of material product (total output) of the whole economy and the corresponding money flows, employment and utilisation of the productive assets, and also the international economic relations, and the standard of living. It shows further, the increase of the productive forces of the society, of the standard of living and the changes in the property relations. It shows all that occurs in the national economy, with all its complexities, in a summarized form, so that it is possible to learn, whether there is a proportionality in the economic development, i.e. whether there exist the necessary equations of equilibrium, and whether the process of development of the main economic relations is consistent with the economic laws in general and the laws of expanding reproduction in particular.

Thus, this system ensures that all the aims and targets are consistent with each other. It is based on the Marxist theory of reproduction and is used in the formulation of economic policy as well as for the purpose of control over its implementation to achieve the desired aims.

In connection with perspective programmes for the development of the most important branches* of the economy, this instrument (balance of national economy), based on the statistical data for the past and keeping in view the foreseeable development of the international division of labour (between the socialist countries), the general aims of the State's policy, the increase of population and the necessities of technical reconstruction of the branches, is used to get rough estimates about the development of the main features (main economic figures and proportions) of the whole national economy and its spheres, divisions, sectors and branches. These estimates form the basis for the elaboration of the long term plan for the development of the national economy. During the process of elaboration of this plan the balance of national economy is used as an instrument for co-ordination of the targets of the parts of this plan (plans for branches, for investment, for the standard of living, for finances etc.). The balance of national economy is itself an essential part of this plan.

* e.g. Energy, mining, metallurgy, agriculture, forestry and irrigation, basic chemicals, transport; and also for the economic regions of the country. These perspective programmes are often elaborated for periods of 20 to 30 years.

2. The analysis of the proportionality of economic development characterises the various aspects of the process of reproduction, and clearly brings out the following economic facts and tendencies :

a) the volume, value and composition, the sources and funds of distribution of the total social product (total output);

b) the volume, value and composition of foreign trade and its influence on (a) ;

c) the volume and value, the sources and funds of distribution of the national income;

d) the size and structure of population;

e) the volume, value, and the composition of the national assets (and liabilities);

f) the money flows and the flows of goods;

g) the standard of living of the population; and

h) the relations of property (State-owned, co-operative-owned, private-owned etc. undertakings and institutions).

3. These facts and tendencies of development are shown in a set of balance-sheets and tables :

a) the balance of the total social product consisting of the balance of sources and funds of the total social product,
table for the analysis of the total social product according to means of production (and their essential parts) and means of consumption,
table for the analysis of the composition of total social product according to the following two parts of value (productive consumption and its composition and national income),
table for the analysis of the composition of total social product according to main-groups and groups of products and sectors and branches,
balances of sources and funds of distribution of the main groups and groups of products, showing flows of goods,
tables showing development of prices of the total social product, main-groups and groups of products ;

b) the balance of foreign trade, consisting of :
balance of trade
balance of payments,
(table for the analysis of the development of the rates of exchange);

c) the balance of population and man-power, consisting of :
balance of population and sources of man-power,
balance of demand and supply of man-power according to qualifications and professions, and sectors and branches,
table of the development of (nominal) wages;

d) the balance of the national assets (and liabilities), consisting of :
table of the total national assets,
table of the total national liabilities,
balance of productive assets, (fixed capital in the sphere of production),
balance of fixed capital in the sphere of consumption,
balance of stocks in the production sphere (without Government reserve),
balance of the Government's reserve;

e) the balance of money flows, consisting of :
financial balances of the spheres, sectors and branches of production*,
financial balances of the sectors and branches of the sphere of consumption*, without family households,
balance of receipts and expenditure of the family households,
balance of the Government's budget,
balance of credit, and
the table of currency;

f) the balance of national income, consisting of :
balance of generation and primary distribution of national income,
balance of redistribution of national income,
balance of final distribution of national income,

g) the analysis of the standard of living; and

h) the analysis of the relations of property.

These balances and tables (in simplified forms) will be found in Appendix I.

4. The following models and concepts have been used in this paper.
Spheres, Divisions, Sectors and Branches of the National Economy :

4.1. *Spheres* :

(i) *Sphere of production*

Division	A	:	Factories, producing means of production.
Sector	A 1	:	Factories, producing investment goods (i.e. equipments and buildings)
,,	A 2	:	Factories, producing raw materials and semi-manufactured products for sector A 1.
,,	A 3	:	Factories, producing energy products (inclding raw materials required for these products).
,,	A 4	:	Factories, producing chemical products for working on other means of production (including raw materials required for these products).
,,	A 5	:	Transport and trade.
,,	A 6	:	Factories, producing raw materials and semi-manufactured products for division B.
Division	B	:	Factories, producing consumer goods.

* In simplified forms.

In connection with this kind of subdivision, it is necessary to further subdivide the sectors of the productive sphere into branches, e.g. :

sectors	*branches*
A 1. Investment goods	a) heavy machine building (perhaps still more subdivided), b) construction of agricultural machines, c) ditto: textile machines etc.
A 2—A 5.....	.....
A 6. Raw material and semi-manufactured products for consumer goods	a) agriculture b) forestry c) fishery etc.
B. Consumer goods	a) food manufacturing b) clothing ,, c) paper ,, d) furniture ,, e) textile ,, etc.

(ii) *Sphere of consumption*

The sphere of consumption is sub-divided into sectors and branches, e.g.

sectors	*branches*
1. State activities	a) administration (ministries, boards etc.), b) police, c) army, navy etc., d) justice administration, e) diplomatic service etc.
2. Services	a) housing, b) education, c) health, d) arts, etc.
3. Banking, insurance etc.	a) banking, b) insurance, etc.
4. Research institutions	a) academy of sciences, b) others.
5. Public organisations	a) political parties, b) trade unions, c) religious organisations, etc.
6. Family households	

4.2. *"Main-groups of products"*

I Investment goods (including repairs).

II Raw materials and semi-manufactured products for investment goods.

III Energy products.

IV Chemical products for working on other means of production.

V Transport and trade services.

VI Raw materials and semi-manufactured products for consumer goods.

VII Consumer goods.

4.3. These main-groups of products are sub-divided into "groups of products", e.g. :

"main-group of products"	*"group of products"*
I. Investment goods	a) equipment for mining, b) ,, ,, energy, c) ,, ,, the chemical industry, d) ,, ,, construction, e) machine tools, f) buildings, etc.
II. Raw material and semi-manufactured products for investment goods	a) ore, b) metal, c) materials for construction, d) raw material produced by chemical industry etc.
III. Energy	a) coal, b) oil, c) gas, d) electricity etc.
IV. etc.	

5. Symbols :—Symbols used in this paper are as follows :

A = Total fund of accumulation, i.e., in the sphere of production (new investment fund I_n, increase of stocks V_n, increase of the Governments Reserve R_n).

C_p = Value of the products going into the productive consumption, i.e. means of production (= input).

$C_p = \sum_{i=II}^{VI} C_{p(i)}$; i = II, III, ... VI (main groups of products).

E = Employment.

E_p = Employment in the sphere of production.

$E_p(A1)$ = ,, ,, sector A1 etc.

E_k = ,, ,, sphere of consumption

Exp = Value of the export goods.

F = Finished products (from the point of view of each "group of products").

G_p = Capital stock containing investment goods in the sphere of production (fixed assets).

G_k = Capital stock containing investment goods in the sphere of consumption (fixed assets).

H = Semi-manufactured products (from the point of view of each"group of products").

Imp = Value of the import goods.

I_n = New Investment Fund.

K = Total fund of non-productive consumption.

K_l = Fund of consumption for the standard of living.

K_s = Fund of consumption for purposes of "other" non-productive purposes (government etc.).

K_m = Means of consumption (products going out of the sphere of production forever).

N = National income. $= P-C_p$.

N $= A+K = [I_n+V_n+R_n]+K$.

(P) = value of production (= output) :Value of all goods, sold by each factory (incl. the new investment and the increase of stocks of the means of production made by themselves, i.e. out of their own production; plus trade: costs of circulation).

P = Total value of production of all factories, belonging to the sphere of production (gross social product).

P $= \sum_{i=1}^{6} P(Ai)+P(B)$.

P $= P_m+K_m$.

P_m = Means of production (products going into the next stage of the productive sphere to be used up wholly or partially).

P(A1) = Sum of the value of production of all factories, belonging to the sector A 1.

Pop = Total population.

R = Government Reserve.

V = Capital stock, containing stocks of raw materials, semi-manufactured products, fully-manufactured products in the productive sphere (commodity stocks).

V_n = Increase of stocks in the sphere of production.

V = Rate of turnover of the stocks of commodities in the sphere of production; $v = V/P$.

α = New investment rate = $\frac{I_n}{N} = \left(\frac{\Delta G_p}{N}\right)$

β = Output/capital ratio = $\frac{P}{G_p}$

Δ = The difference between two years in absolute terms, e.g. $\Delta G_{p1} = G_{p1} - G_{p0}$

Δ = The rate of growth between two years, e.g. $\Delta' G_p = \frac{G_{p1}}{G_{p0}}$

η = Fund of consumption for purposes of the standard of living per capita $= \frac{K_l}{Pop}$

θ = Capital intensity per worker = $\frac{C_p}{E_p}$

ν = National income/output ratio = N/P

π = Productivity of labour (in terms of man-years). = P/E_p

6. In order to make the list of branches and groups of products it is necessary to base this on the existing division of labour in the country. Each product is to be attached to a "group of products", and each factory to a branch. Besides this, each product must be marked either as "finished" (*F*) or as "half-finished" (semi-manufactured) product (*H*) in accordance with its preponderant use, from the point of view of the "group of products" to which the product belongs. In the end, each product has to be fixed as a "means of production (*PM*) or "means of consumption" (*KM*) in accordance with its preponderant use (all this is to be determined by the statistical organisation in the process of collection of the statistical data in the factories, the trade enterprises etc.).

7. It may be mentioned here that for long term planning purposes, all figures (except *Pop* and *E*) have to be valued in terms of prices of the base year, i.e. the year before the long term plan begins (year 0). This would be the best way. However, it is also possible to take the prices obtaining during one or two years before the year 0.

Chapter I

ESTIMATION OF THE RATE OF GROWTH OF NATIONAL ECONOMY

1. The Starting Point.

1.1. Under conditions of full employment, we shall start with the following data :-

(a) Values of all figures and ratios mentioned in the Introduction for the year 0.

(b) Trends of all figures and ratios previously mentioned (Introduction) for about the last 5 years.

(c) Yearly Balance of population and manpower from year to year, over the whole plan period = 15 years.
Total population
—Children (0-14 years).
—Population out of the working age (more than 60/65 years).
—Population within the working age (15-60/65 years).
—Students, pupils in secondary schools etc.
—Invalids (in the working age).
—Other non-working persons (Housewives etc.).
—Population out of working age, but still working.
—Total of working people.

(d) Trend of changes in the ratio $E_p : E_k (E_p : E)$

(e) ,, ,, ,, ,, $C_p : N (N/P)$

For the first approximation in calculating the development of the figures P, E_p/E and N/P a rough extrapolation of the two trends (d) and (e) is sufficient. Besides this, an attempt may be made to compare their magnitude for each year or longer periods with those of the more advanced industrial countries in order to get lines about the inter-relation between level and trend.

1.2. Under conditions of under-employment we shall start with the same kind of approach and data as under 2.2, except in the case of "Other non-working persons", who have to be further divided into two parts.

(a) people who are never likely to work,

(b) people un-employed involuntarily.

Thus, there are two ways to estimate $\Delta' P$:

$$\Delta' P = \Delta' E_p \times \Delta' \pi \text{ and } \Delta' P = \Delta' G_p \times \Delta' \beta$$

and the equation $\pi = \beta\theta$ links both these methods.

The rate of increase of the capital stock can be expressed in the following manner :

$$\Delta' G_p = \frac{G_{p1}}{G_{p0}} = \frac{G_{p0}+\Delta G_{p1}}{G_{p0}}$$

Hence from $\Delta' P = \Delta' G_{p1} \times \Delta' \beta$

we get $\Delta' P = \frac{G_{p0}+\Delta G_{p1}}{G_{p0}} \times \Delta' \beta$

ΔG_{p1} is the main part of the accumulation fund A; it is equal to I_n, the new investment fund (in the sphere of production), i.e. $\frac{\Delta G_{p1}}{N} = \frac{I_n}{N} = \alpha =$ the new investment rate. It may be noted that the absolute amount of N is dependent on the division of P into C_p and N.

Now, we have $\Delta' P = \frac{G_{p0}+\left(\frac{\Delta G_{p1}}{N_1} \times N_1\right)}{G_{p0}} \times \Delta' \beta$

$$= \left[\frac{G_{p0}}{G_{p0}} + \frac{\frac{\Delta G_{p1}}{N_1} \times \frac{N_1}{P_1} \times P_1}{G_{p0}} \right] \Delta' \beta$$

$$= \left[1+\left(\frac{\Delta G_{p1}}{N_1} \times \frac{N_1}{P_1} \times \frac{P_1}{G_{p0}} \right)\right] \Delta' \beta$$

$$= \left[1+\left((\alpha_1 \times \nu_1 \times \frac{P_0 \times \Delta' P}{G_{p0}}\right)\right] \Delta' \beta$$

$$= [1+(\alpha_1 \times \nu_1 \times \beta_0 \times \Delta' P)] \Delta' \beta$$

and, by further transformation, we get, at last

$$\Delta' P = \frac{\Delta' \beta}{1-(\alpha_1 \nu_1 \beta_0 \Delta' \beta)}$$

1.3. The above equation shows, that the rate of growth of the total ouput ($\Delta' P$) depends upon

(a) the capital intensity per unit of output in the year $0(1/\beta_0)$ and its rate of increase $1/\Delta' \beta$ depends upon the relation between the growth of productivity per worker and the investment in the previous year under conditions of full utilisation of capacities. It may be noted that β being equal to $\pi/0$ is another way of expressing the level of technique.

Presumably, in this case also we will be required to find the trend of the ratio $E_p : E_t$, but here the absolute magnitude of E depends on

(a) the initial net investment rate α and the possibility of its increase in connection with the development of the population and the (political) decision as to the development of η,

(b) the techniques chosen in the different branches of national economy,

(c) the possibility of creating new jobs on the basis of increase of the consumption fund (services, administration etc.).

2. The first approximation

2.1. The volume (= value) of production in the year 0 is given by

$$P_0 = E_{p0} \times \pi_0$$

Since, $$\Delta'\pi = \frac{\pi_1}{\pi_0} \text{ and } \Delta E_p = E_{p1} - E_{p0}$$

we get $$P_1 = (E_{p0} + \Delta E_p) \times (\pi_0 \times \Delta'\pi)$$

In the case of full employment, ΔE_p is determined from the balance of population and man-power; the problem consists in the destination of $\Delta'\pi$.

From the relation between the three important figures P, E_p and G_p expressed in the relations

$$\pi = \frac{P}{E_p}, \quad \beta = \frac{P}{G_p} \quad \text{and} \quad \theta = \frac{G_p}{E_p}.$$

we get $$\pi = \beta\theta \quad \text{and} \quad \beta = \frac{\pi}{\theta}$$

It is possible to take as well $\Delta'\pi = \Delta'\beta\Delta'\theta$ and $\Delta'\beta = \frac{\Delta'\pi}{\Delta'\theta}$

Then we have $$\rho_1 = (E_{p0} + \Delta E_p) \times [\pi_0(\Delta'\beta \times \Delta'\theta)]$$

If we do not require the total value of P_1, but only want the rate of growth, we get

$$\Delta'P = \frac{P_1}{P_0} = \frac{E_{p1} \times \pi_1}{E_{p0} \times \pi_0} = \frac{E_{p1}}{E_{p0}} \times \frac{\pi_1}{\pi_0} = \Delta'E_p \times \Delta'\pi = \Delta'E_p \times \Delta'\beta \times \Delta'\theta$$

Since, $$\Delta'\theta_1 = \frac{\theta_1}{\theta_0} = \frac{\frac{G_{p1}}{E_{p1}}}{\frac{G_{p0}}{E_{p0}}} = \frac{\frac{G_{p1}}{G_{p0}}}{\frac{E_{p1}}{E_{p0}}} = \frac{\Delta'G_p}{\Delta'E_p},$$

$$\Delta'P = \Delta'E_p \times \Delta'\beta \times \frac{\Delta'G_p}{\Delta'E_p} = \Delta'G_p \times \Delta'\beta$$

(b) the state and development of the proportion of N (or C_p) in P $(= C + N)$ i.e., $N/P = \nu$, which, again depends upon the level of technique of production and the extent (profundity) of the division of labour. Usually, however, ν changes slowly and this may be treated as constant; and

(c) the rate of new investment.

In other words, it is possible, from the equation $\Delta' P = \frac{\Delta'\beta}{1-(\alpha_1\nu_1\beta_0\Delta'\beta)}$ and $\Delta'\beta = \frac{\Delta'\pi}{\Delta'\theta}$ to find out the changes in production, productivity per worker and employment, on the basis of different assumptions about investment rate α, taking into account the desired growth in the standard of living and other requirements of non-productive (Government etc.) consumption, as well as about V, β_0 and $\Delta'\beta$.

Also conversely, it is possible to determine the amount of new investment necessary for maintaining certain rates of growth of P and π. The calculation, however, is to be made from year to year. In this way it would also be possible to change the rate of new investment (α).

2.2. The last step consists in working out the balance of national income showing only the following items : (see Appendix I, Table 17-Balance of Final Distribution of the National Income) :—

Total output minus productive consumption = National income

$$P - C_p = N$$

Distribution of national income :

(1)	Accumulation fund	A
	(a) New investment	$I_n = \Delta G_{p1}$
	(b) Increase of stocks	V_n,
	(c) Government reserve (increase)	R_n
(2)	Consumption fund	K
	(a) For purposes of the standard of living	K_l
	(b) For other purposes (governmental consumption etc.)	K_s

3. Examination of the results derived from first approximation.

3.1. After getting this rough estimation about the main figures and main ratios of the economic development it is necessary to examine this result. For this purpose we have to use a seven sector model (see para 4.1 of Introduction, sectors A 1 ..... A 6 and B).

3.2. It is obvious that the development in the structure of total output, given by the main groups of products (I to VII of para 4.2, Introduction), changes

in a continuous way in a planned economy according to the growing productivity of labour and its need to step forward always towards a higher level of technique. The main features of this process are

mechanisation and automation,
application of new chemical processes,
use of more effective energy sources,
(electricity, atomic power).

The result is, that the main groups of products I—Investment goods (particularly equipments), III—Energy products and IV—Chemical products for working on the means of production and, in accordance with main group I, main group II—Raw materials and semi-manufactured products for investment goods, become a relatively greater part of the total output P. On the other hand, growing economy in using the equipment, raw materials, energy etc. as well as a better transport and trade organisation lead to a relative decrease of this part of P.

However, experience (in all countries) shows that the first factor, i.e. the improvement of technique, outweighs the other.

In order to find out, how this law of economic development would act in future, we have to come back first to the results of first approximation (para 2). From this we get

C_p—the volume of the productive consumption fund.

I_n—the volume of the new investment fund,

V_n—increase of stocks in the sphere of production.

We also have the volume of increase of the Government reserve.

The analysis of the data for the past years shows the trends of development of the structure in the main-groups of products of the three funds (C_p, I_n and V_n). Out of the plan of development of the governmental reserve also we can see this structure.

The most important of these funds are C_p and I_n. I_n consists only of investment goods. But the fund C_p consists of the main groups of products except VII. The main task now is to estimate the future development of its structure, because from this we get the main part of the demand of these products. For this purpose, we have to analyse the structure of the costs of production as far as it concerns the consumption of material products (belonging to P) :

(a) costs for replacement (amortisation) and repairs,

(b) costs for the consumption for raw materials and semi-manufactured products,

(c) costs for the consumption of energy,

(d) costs for chemical products for working on other means of production,

(e) costs for transportation and trade services.

This analysis is an important statistical task. But to anticipate future development, it is not sufficient to extrapolate the given trends; it is necessary to compare the levels of economic development (in P per capita) for each year or longer periods with those of the more industrialised countries in order to get the inter-relation between the level of P (per capita) and the structure of C_p.

Finally, we have to analyse the structure of the funds of non-productive consumption K_l and K_s. To start from the level of η (= individual consumption per capita) in the year 0 and the structure of K_l we have to estimate the future development with rough calculations concerning the inter-relation between the level of the standard of living, expressed by η and the structure of K_l (comparisons with comparable groups of income within the country or with more industrialised countries).

The funds K_l and K_s consist only of the main-groups of products I, III, V and above all VII.

In this way we get the structure of the demand of the whole economy in terms of main groups of products. This forms one part of the distribution side of the balance of total output.

3.3. Now, we have to derive the output of the sectors of the production sphere (A1 to A6 and B). This is necessary because the output of a sector does not consist only of the corresponding main-group of products. For example, in the sector A2 the output P(A2) consists of

x p.c.	main-group	of	products	I
y p.c.	,,	,,	,,	II
z p.c.	,,	,,	,,	III
and so on;				

Of course, group II represents the biggest share. The estimation of the composition of each $P(A_i)$ has to be based on statistical researches; in the same way, we get a set of figures that show in what proportions the volume of a main-group of products comes out of different branches; e.g. 100 out of main group III comes in the amount of

10	from	sector	A1
10	,,	,,	A2
45	,,	,,	A3
10	,,	,,	A4
5	,,	,,	A5
5	,,	,,	A6
15	,,	,,	B

If we use both these "structural figures" we get a table from which we can distinguish the output of each sector of the sphere of production.

In this connection attention has to be paid to another phenomenon namely, that the input (C_p) of every branch consists not only of products coming from other

main-groups of products, rather there is also consumption of semi-manufactured products of the self-same main-group. We have, therefore, to divide the output (the volume) of each main-group of products into

(a) products going into the individual consumption fund or into the investment fund or into the productive consumption of another main-group of products (F-finished products from the point of view of each main-group of products), and

(b) products going into the productive consumption in order to produce products of the self-same main-group of products (H-semi-manufactured products from the same point of view).

Thus, we find that the productive consumption of each sector of the productive sphere C_p (A1—B) consists of

(a) products coming from the main-group of products, corresponding to the respective sector, and

(b) products coming from "other" main-groups of products,

For example

C_p (A2) = x p.c. products of the main-group I
y p.c. „ „ „ III
z p.c. „ „ „ IV
t p.c. „ „ „ V
u p.c. „ „ „ II

The knowledge of the structure of each P(I ... VII) is of importance when we are deriving the volumes of production of the main-groups of products from the aggregated figures of the balance of national income like K, A and from replacement of the capital stock, and furthermore going backward from one stage of production to another, for instance, from A1 to the main-groups II, III, IV, V and to the corrsponding sectors. Having done all this we get a table which shows what assortment of P (in main-groups of products) has to be set up (approximately, as it will be shown later), and what volumes of production have been fixed (approximately) for each sector of the productive sphere.

3.4. Now we have to enquire what is the development of the figure $\nu = N/P$ or, in other words, the proportion $C_p : N$ in each sector. From this we shall see if our first approximation (para 2.1) has gone in the right direction. After this, it is necessary to see in what manner the figures of C_p-structure of each sector are developing, and from this we have to derive the demand for the means of production for all the seven sectors (in so far as they are going to the fund C_p).

3.5. The next step is to calculate investment requirements for each sector in accordance with the development of labour productivity, (man-power available, only in the case of full employment), technological choice and the new investment

fund available (para 2.3). From para 2.1 we have the equation $\Delta'\pi = \Delta'\beta\Delta'\theta$ which is valid for the whole sphere of production. The allocation of investment has to be done in such a way that the average increase of productivity of labour, arrived at by calculations on the basis of the sectors, at least comes up to $\Delta'\pi$, set up in para 2.1. By this we arrive at the most efficient way of economic development. However, for the purpose of an economic analysis the above is not sufficient, we also require a full and detailed technical knowledge of the average level of technique used in the different sectors (and in the branches belonging to the sectors), as well as the possibilities of technological development.

3.6. Here we have another opportunity to put the question (in the case of unemployment), whether it may be better to have a slower development of technique in order to create more employment, i.e. to create the necessary capacities of production on a lower level of technique. In this case, the actual rate of growth of production ($\Delta'P$) remains the same (but not the rate of growth of productivity of labour $\Delta'\pi$); but this means that the future $\Delta'P$ (and $\Delta'\pi$ as well) will be smaller than before. On the other hand, if we choose a lower technique but more employment one productive worker has to support a smaller number of absolutely unproductive people. At this stage of work we are also able to examine and change the rate of new investment (α), in the light of the changes in the volume of the funds K_l and K_s (individual and governmental consumption); the fund K_l can also be expressed approximately by η (individual consumption per capita).

3.7. After we have decided the question put in para 3.6 we are in a position to fix all figures of our model, and then we have the following balance-tables ready:

(a) Balance of production and distribution of output (like an input and output table),

(b) Balance of population and man-power,

(c) Balance of capital stocks,

(d) Balance of national income,

(e) Tables of relative figures showing the development of β, π, θ, ν, η, $\Delta'P$, α structure of C_p, structure of K_l and K_s, structure of P in terms of sectors and of main-groups of products.

3.8. All calculations must be made in such a way that the development of all figures occurs from year to year. This means that we have to step forward from year to year. Unless the projected development is sufficient for a certain year it is not possible to calculate the figures for the next.

3.9. In order to ascertain whether the projected development over the whole period is sufficient from the economic point of view we have to ensure that the rates of growth of $P_0\pi$ and η have the highest possible values. To find these values, we have to change the figures expressing the distribution of the national income, particularly the accumulation fund and the non-productive consumption funds K_l ad K_s.

Chapter II

ESTIMATION OF THE RATES OF GROWTH OF THE BRANCHES OF NATIONAL ECONOMY

1. As a result of the first step of elaboration of the scheme of balance of national economy, for a long term plan, we get a set of figures showing us the main features of the development of the whole economy in terms of their order of magnitude. On the one hand, only in such a way is it possible to have a survey of the economic strength of the country and on the other only these aggregate figures and ratios enable us to compare the development of the country with that of others. Later on, we shall also have figures of per capita production and consumption. However, this general survey is not sufficient for managing the national economy. It would be further necessary to have knowledge about the development of all branches of the national economy, viz.

a) branches of the sphere of production,

b) foreign trade,

c) branches of services (housing, education, health, etc.),

d) consumption of Government (army etc.),

e) standard of living.

This knowledge we get in two different forms (according to the two different stages of elaboration of the plan); at first, we have to calculate the development of the main features (main figures) of each branch in terms of value, and later on when we have to elaborate the complete plan, in physical terms also (capacities, production, import, export, productive and non-productive consumption, investment-objects etc.) as supplementary to the targets in terms of value.

In this chapter, we shall concentrate on the first step.

Here, the following concrete steps are necessary :-

a) An analysis of the development of the structure of the (non-productive) fund of consumption (K) in terms of "groups of products";

b) a similar analysis of the total investment fund and the increase of stocks in the branches of production as well as in the governmental reserve;

2. Estimation of the development of the sphere of consumption.

2.1. Here it is necessary to have estimates of the following :

a) the development of the average level of individual consumption (per capita) $\frac{K_t}{Pop} = \eta$ in the *future*; the total fund of consumption (K) *available* for the sphere of consumption; this we get from the "first step" of elaboration of the balance of national economy (Chapter 1).

b) the composition of the total consumption fund (see Appendix I, Table 9).

c) the composition (structure) of the consumption fund of the sectors (see Appendix I, Table 9), subdivided as shown in the above table (investment etc.), according to "groups of products".

The composition of the consumption fund in accordance with (b) and (c) is given for the year 0; it is further necessary to analyse the past years in order to get lines for the future development in the form of trends.

2.2. The first step we have to take is to fix (approximately) the development of the standard of living. In Table 9 it is expressed in the total amount of goods going to the items represented by "X". The sum of these items is equal to the fund K_l (see para 2.3,Chapter 1), and can be expressed as well by the equation. $K_l = Pop \times \eta$.

The purpose of this work is to ensure the projected development of the average standard of living, and, furthermore to see in what way this increase has to be realised (consumption of services like housing, health, education etc., or direct individual consumption like food, clothing etc., bought or received in kind by the family households). In order to solve this problem we have also to fix the development of the consumption of the workers in the productive sphere (on the basis of the sectors), of the workers in the non-productive sectors, and of the other groups of people (capitalists, pensioners and others). At this stage of work it is necessary to fix only the *relations* between these groups of workers and the people, because we have still to distribute the fund K_s (for consumption purposes other than the standard of living, represented by "0" in Table 9). This requires an estimation of the future development of these sectors concerning the consumption of goods as well as employment. This would enable us to fix all figures in Table 9 (in their absolute amount). It is obvious that this is a very difficult problem; because it requires that the Government influence the formation of the rate of profit afterwards (to be realised through wage-policy) and the amount of profit remaining in the hands of the private owners of factories etc. (by taxation-policy). This means further that we have to take into account a set of non-economic questions as well, for example, decisions of the government about the magnitude and the equipment of army, navy, air force; about the aims concerning the improvement of education (in the primary and secondary schools, in the field of technical training etc.); about the care of health; about the fulfilment of the needs of the field of research institutions etc. It is obvious that without knowledge about the directives in these fields, it is impossible to calculate the development of the branches in the sphere of consumption. If such directives are not already given (for the plan period) the Planning Commission has itself to make proposals about them. However, with regard to some of the problems the economist is not able to make such proposals, for instance, as regards the military development of the country he is only in a position to suggest the order of magnitude of expenses for that purpose which it is *possible* to allow, and he can show what consequences this or that level of military expenses would lead to with regard to investment and standard of living. In any case, it is advisable to request the authorities responsible for these questions to give certain outlines and principles. More difficult is the estimation of the consumption of the public organisations (parties, trade unions, religious organisations),

because it is as a rule impossible to get the necessary statistical data for either the past or the present. Once we have estimated in which way approximately the total fund of consumption is to be allocated to the seven "parts" of this fund (see Table 9) we are in a position to see what possibilities exist in the sectors 1–5 (and the branches) for creating new jobs. This can be seen approximately from the given structure of expenses of each sector and branch, if we base our calculation upon the average income of the engaged persons. But we have to examine the probable development of the composition (structure) of the expenses in each sector (in comparison with other countries or highly developed institutions of each sector in the same country); then we can correct the employment estimates in accordance with the development of the average income per engaged person. This average income we get from the above-mentioned statement of the relations of income between the different sectors of the sphere of production and consumption.

After the coordination of all figures in Table 9 we have to check up whether and in what degree our initial estimation of the ratio between the funds K_l and K_t on the one hand, and the development of η on the other, is able to maintain itself or in what direction does it require to be changed.

2.3. A special problem is to inquire about the needs of investment arising from the general rate of development (expressed in terms of total expenses and employment per sector, or branch respectively) of each sector and branch on the one side, and from the existing stocks of buildings, equipment etc. (= stock of formerly invested goods, still used) on the other. This means expenses arising from replacement. It is obvious that, as a rule, only the "new investment" will create new "capacities" (enlargement of schools, universities and other training facilities, of hospitals etc.). In order to see this, it is necessary to elaborate a "balance of capital-stocks, containing investment goods" (balance of the development of G_k) in the following form :

Description	Sectors and branches	Sectors 2 : Services		
		Education	Health	Housing
1. Total value of G_k (replacement value) at the *beginning of year				
2. Sum of depreciation (less replacement)				
3. Rate of actual depreciation ("2" : "1")				
4. Rate of annual depreciation				
5. Sum of annual depreciation (necessary for replacement)				
6. Replacement				
7. New investment				
8. Total value of G_k at the end of year				
9. Costs of repairs (not included in replacement)				

*Cf. P. C. Mahalanobis, The Approach of Operational Research to Planning in India; *Sankhyā* 1955, vol. 16, parts 1 and 2, page 29 (para 14).

2.4. Finally, we have to inquire into the composition of each part (sector, branch etc.) of the consumption fund in "groups of products". We get some idea from the subdivision of the total expenses of each sector (see Table 9) which breaks the figures into;

a) investment and repairs,
b) consumption of material, energy etc. and
c) individual consumption of the employees.

This problem can be solved in the following way :

a) The composition (structure) of the items "investment etc." and "material, energy etc." in terms of "groups of products" we know in absolute terms for the year "0" and we also know the past trends of development of each relative part. In connection with these trends, and paying attention to the fixed principles of the further development in the sectors and branches we have to make an estimation. Here we have to study the conditions in other countries and in highly developed establishments within the country.

b) To solve the same problem for the individual consumption of all persons, we have to sum up the items of individual consumption of the employees in the sectors 1–5 and the "parts" 6 and 7 of the consumption fund, which all together form the "demand of people", (a part of this is met by "natural income", another is bought by means of money, viz. at the retailer, direct at the factories, handicrafts, peasants etc.). But it is not possible to derive directly the composition (structure) of this demand in terms of "groups of products", rather, we have at first to find out the development of this demand in the following groups (kinds of needs):

a) food,
b) clothing,
c) habitation (including housing services, fuel, furniture, linen, refrigerators etc.),
d) transport etc. (cars, fuel, conveyance of passengers, postal services etc.),
e) education (books, newspapers, services etc.),
f) health (pharmaceutical and cosmetic products, medical services etc.),
g) recreation and entertainment (radio-sets, television sets, photo apparatus, sport articles, camping articles, cultural services etc.).

Between these kinds of needs of human beings a principal economic trend exists which shows that with higher income the more elementary needs decrease in favour of the higher needs (better food, more fat and meat, better clothing, better and bigger flats, better furniture, more cultural needs, less material needs etc.). It is an important statistical task to enquire into the development of each group of needs on the one hand, and of the composition of each "group of needs" in terms of "groups of products" on the other.

At this stage of the elaboration of the plan, it is only possible to get a rough estimation, on the basis of the development of the average income, approximately fixed as mentioned in para 2.2.

2.5. From these calculations we get the "demand" arising from the (total) consumption fund K.

3. Estimation of the demand in terms of "groups of products" arising from the investment and from the Government reserve.

3.1. The total demand of investment goods arises from

a) new investment,

b) replacement,

c) repairs (of buildings, equipment etc.).

The total amount of these three items we get from the results of the "first approximation" (Chapter I).

At first, we have to enquire as to what part of these items are formed by*

a) buildings,

b) equipment (machines, tools, transport equipment etc.),

c) other products (office furniture etc.).

3.2. The demand arising from the development of the Government reserve is to be derived from the decisions of the State regarding the creation of such a reserve (e.g. corn, rice, steel, fuels etc.). There is no economic problem involved here; the amount is given by the results of the "first approximation" (Chapter 1).

4. The estimation of the development of foreign trade and its composition in terms of "groups of products".

4.1. The main principles concerning foreign trade in a planned economy are,

a) equalisation of the "balance of payments" (including "planned" foreign credits) at any time, and

b) to have a sufficient reserve of foreign exchanges.

The "reserve of foreign exchange" has the same character as the Government's reserve of wheat, rice, steel, etc.

It may, however, be permitted by the Government to slightly reduce this reserve.

The "balance of payments" and the balance of goods are, as a rule, closely interrelated, since a surplus of import or export corresponds to a deficit or surplus respectively in the balance of payments position and entails either paying out to or receiving from other countries. This may also arise in case of services (insurance, costs for fares to foreign countries and vice versa, costs for diplomatic institutions etc.) and transfer of profit.

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* "investment cost-structure".

4.2. The first task consists in the estimation of this excess in order to learn whether the economy has to give a part of its national income to foreign countries or, is participating in the national income of other countries. The main reasons may be capital import (or export) and transfer of profit. Of course, it is a difficult problem to be solved by the planner; he cannot do it without consulting the Government about the principles of international policy, and without knowing if other countries are willing and in a position to give credits. Foreign credits (investment credits) should not be the main or too important a source for the development of the national economy. At this stage of elaboration of the plan it will only be possible to make some assumptions about such credits.

4.3. The next step is to enquire about the ratio between the total national consumption (productive and non-productive) and imports, and the development during the previous years of the composition of the imports in terms of groups of products*, and lastly, the countries from which they have come. Taking into account the trend of the ratio, import : total consumption, and the prospects about getting credits (as mentioned above) it is possible to get an estimation about the necessary volume of export, in order to cover volume of imports required for the national economy.

4.4. Next, we have to enquire what kinds of goods have to form the export. For this, it is necessary to have a concrete knowledge of the economic situation in other countries in order to find out which products are likely to be sold.

4.5. This gives us the composition of the export, which forms a part of the total demand, from which we have to derive later on the increase in output.

5. The estimation of the demand of investment goods and consumer goods and the calculation of the development of the branches producing these goods.

5.1. From our calculations made in the sections 3, 4 and 5, we get that part of the volume of production (output) of the groups of products, belonging to the main groups of products of I and VII, which has the character of "finished products" We get, furthermore, especially from the export and the increase of Government reserve, partly the demand for "semi-manufactured products" (H) of some "groups of products"; we take this into account later when we are ascertaining the demand for these "groups of products".

Before deciding on the basis of the figures of the total demand for each "group of products", we have to find out which part of this demand can be met from internal production and how much of the residual is it possible to get through import.

Now we have to see what is the ratio (and we have to make an estimation what the development may be) between the part of "finished" and "semi-manufactured products" of the different groups of products. And then we have to consider which "branches" participate in the volume of production of each "group of products".

* In so far as there are not only investment goods, and consumer goods, the composition in terms of groups of products will be corrected later on in connection with the calculations concerning the development of the branches of the productive sphere.

Then we have to see (and to estimate the future development) what part this is of the volume of production (output) of the corresponding branch. In each branch we have "branch-typical" and "non-branch-typical" production.

5.2. Thus we find out approximately the development of the volume of production (P = output) of the branches of the sectors A1 and B. In each "group of products" we get in that way (now only approximately, but later on, more precisely) the following table (for "equipment");

1.	*Demand*		
	(a) Consumption fund	—	
	(b) Investment	2000	
	(c) Export	100	(only finished product)
	(d) Government's reserve	—	
	Total	2100	
2.	*Supply*		
	(a) Production	2100	
	(b) Import	—	
	Total	2100	
3.	*Balance of production of the "group of products."*		
	(a) Finished products	2100	
	(b) Semi-manufactured products ($70F : 30H$)	900	
	Total	3000	
4.	*Distribution to branches.*		
	(a) Machine building	2850	(95 : 5)
	(b) Other branches (e.g. transport : repairs)	150	
	Total	3000	
5.	*Balance of production of the branch "Machine building".*		
	(a) typical production	90 p.c. = 2850	
	(b) non-typical (e.g. energy")	10 p.c. = 315	
	Total	3165	

6. Estimation of the productive consumption C in the branches of the sectors A1 and B for getting the demand of products of the "groups of products" belonging to the "main-groups of products" II—VI.

6.1. Starting from the already known volume of production of the branches belonging to the sectors A1 and B, it is now possible to estimate most of the volume and size of the "groups of products" and branches respectively, belonging to the main-groups of products II-VI and sectors A2-A6. For this purpose, it is necessary to know the ratio $\frac{N}{P}$ or $\frac{C_p}{P}$, in each branch (of the sectors A1 and B), and its estimated future development.

From C_p we get the demand of products of the preceding groups of products, if we analyse the structure of C_p given in Chapter 1 (sub-section 3.2). But it is additionally necessary to know the structure of these items in terms of "groups of products" (and to estimate the development). Costs for replacement (depreciation) and repairs would be of interest later.

The demand arising from these branches forms part of "finished products" of the preceding "groups of products".

In this way, we get the output P and the productive consumption C_p of each branch, and the volume of production P of each "group of products", so that we are in a position to fix a table (similar to the input/output table), which shows from where the volume of each "group of products" available is coming and for which purpose it is applied (see Table 3.)

6.2. When this work is finished, we are in a position to check our previous calculation concerning the volume of the national income, because we have now the development of the proportion $P = C_p + N$, for each branch and the amount of N as well. We have only to total up the "N" of all branches. We can now also take into account the "Balance of foreign trade" (excess of import or export). Thus we have :

National income, produced in the sphere of production ...	N_p
+/— Balance of foreign trade	$Ex-Im$
= National income, disposable for the purposes of consumption and accumulation	N_d

and we get $N_d = A + K$.

7. The calculation of investment needs in each branch of the sphere of production.

7.1. From the first step of elaborating the balance of national economy (Chapter 1) we have a rough estimation about the allocation of new investment to the sectors, and we have also a system of figures showing the development of π, β, θ. This gives us the first line for the allocation of new investment to the branches. Secondly, we have to enquire as to what the needs of replacement and repairs are.

This we get roughly from the development of C_p (its "costs for replacement and repairs" component) and more precisely from the "balance of capital stocks" (without stocks of raw material, finished products etc.), which has the form shown in Table 7.

7.2. Now, when we are going to investigate the investment needs of each branch, we have a concrete knowledge of the conditions which led in the past to the average values of π, β, θ. We know particularly from the biggest and most important factories the development of these figures and the composition of the capital stock in relation to the level of technique and the age of the plants and their equipment.

Furthermore, we take into account the value of the rate of depreciation and their development as well as the rate of current repairs. By taking into account age and comparing the "younger" with "older" plants we can see in what conditions the capital stocks in each branch are. This analysis gives us a basis to decide what parts of capital stock (equipment, above all) have to be replaced in the form of

a) replacement with the same efficiency (simple replacement), and

b) replacement with more efficiency : π is higher than before, so is θ, but β must not be higher; it is possible to come to a lower degree (reconstruction investment; "rationalisation and modernisation investment" in Prof. Bettelheim's terminology).

In practice, as a rule, the greater part of replacement is of the latter kind; beyond this every investment of this kind increases the productivity of labour as well as the capacity of production. So we find :

a) π, β, θ of simple replacement are nearly equal to the average values of these figures for the "old" capital stock available at the beginning of the year;

b) π and θ of reconstruction replacement and of new investment as well are higher than the average values of the "old " capital stocks.

7.3. To fix (preliminarily) the pattern of investment (each of them has its own parametres π, β, θ, ν) of each branch we have to enquire;

a) in which branches is the average level of π (compared with the newest plants and with other countries) relatively low, and

b) in which branches is the rate of actual depreciation relatively high.

Starting from these investigations we are in a position to find out that investment pattern which seems to be the most advantageous from the point of view of the branch. Thus we get for each branch

a) the equation $\pi = \beta \times \theta$ and ν

b) the new investment (in connection with the balance of capital stocks), and

c) the employment.

7.4. The economic problem to solve here is, in what way do we get the given growth of capacities (given by the increase of output, if we assume an optimal use of the capacities) with a minimum of new investment (or what degree of additional capacity can be created with a given investment).

The condition which the solution of this task has to satisfy is, that the π obtained is equal to or greater than what we have got in the "first step" (Chapter 1). However, at this stage of the work, we have the opportunity to change these figures if we want to get more employment. In which case, π is lower and the costs of production are higher than before and this in turn further restricts the possibilities of the reduction of prices or an increase in wages (or other personal income); lastly, the rate of growth of the standard of living ($\Delta'\eta$) is lower than when we choose the higher level of technique.

7.5. Once we have solved this problem, we have to investigate the composition (structure) of the investment etc. in each branch (and its development over the plan period) regarding buildings, equipment etc. and their breakdown in terms of "groups of products".

After this we are able to examine the initially fixed demand for investment goods as a whole, and we can then calculate more exactly the development of the branches of the sector A1.

This may lead to the modification of some of our earlier calculations.

8. At this stage, we are also able to calculate sufficiently exactly the increase of the stocks of raw materials, semi-manufactured products etc.

If we set

$$V = \text{volume of these stocks,}$$

we get from $\frac{V}{P} = v$

the "rate of turnover" which shows how many times the stocks turn over during a year (P is related to the year). Furthermore, we know the trend of $\nu = \Delta'\nu$ and from this we get the increase of $V = \Delta V$ and from our knowledge of its composition, the demand resulting from this increase. But it forms only a small part of the accumulation fund.

9. Now we have still to estimate what part of output will be distributed by wholesale trade and retail trade respectively so that we get as well the amount of sale of these branches, subdivided in "groups of products" and, in connection with the "rate of turnover" (cf. section 8) the necessary increase of stocks.

10. Thus we have for each "group of product" the "balance of sources and funds" (see Appendix I, Table 4).

It is in certain respects the sum of the "material balances" showing the sources and funds of each important product (from the point of view of the whole economy) which are elaborated both in physical and value terms in addition to the "rest" of production of this "group of products".

11. Finally, we now have a complete set of the balance of national economy, but without the balances showing the distribution and redistribution of the income received by the realisation (scale) of all the material products forming the figure P in terms of money. It is advisable to elaborate these "financial balances" also before going to the elaboration of the "plans of branches", because only in this way can we ascertain whether the given flows of money (based on the existing relations of property and the financial and credit policy of the Government, of the State Bank as well as of other "financial bodies" like private banks, insurance corporations, public organisations etc.) in conjunction with possible Government and State bank influences, are able to realise the targets of investment, income policy, consumption etc. This will be dealt with in the next chapter.

Chapter III

ESTIMATION OF THE DEVELOPMENT OF THE MONEY FLOWS AND OF THE FINANCIAL SITUATION OF GOVERNMENT

1. The problem—at a certain moment in each national economy there is a system of distribution and redistribution of the national income depending upon

a) the distribution of the whole national capital among the various properties,

b) the regulations of the Government with respect to taxation,

c) the redistributed savings of all kinds.

All changes in the productivity of labour, in wages, in distribution of capital stocks, in taxation, and in savings (and credit) influence the system of distribution. From the "plan of the development of the national economy" represented by the balance of national economy in the first steps of the elaboration of the "plan" (cf. Chapters I and II) we learn what the development of the productivity of labour would be, and what should be the development of income of the classes and groups of peoples getting income. From this, we can derive the development of profit in the different sectors and branches, as well as what amount of taxes the Government will receive (assuming no change in the regulations of taxation). From the same balance we also know in what proportion the State-owned sector of enterprises (of the productive and non-productive spheres) will be growing in relation to the private sector in all branches. From this, we get the amount of profit coming into the hands of the Government, and also the needs of expenses for investment in the State-owned sector, for health, education, State administration, military purposes etc. Furthermore, we get from the balance of national economy the volume of the means of consumption available on the one hand and the demand for consumer goods arising from the incomes of people on the other.

In the same manner as we have a proportional development with regard to material and manpower proportions, we need a financial proportionality too. To solve this problem, we have to use a system of "financial balances" which shows in which direction and in what measure we have to change the regulations of taxation (we assume that the prices do not change), the rate of interest and other instruments of the financial policy, in order to ensure a proportional development in the whole economy. Thus, we see that the system of financial balances is an integral part of the balance of national economy, and hence, the budget of the Government and the balance of credit of the State Bank must be integral parts of the "plan of national economy".

In this chapter we shall deal with the system of financial balances.

2. The system of financial balances consists of a number of aggregated balances :

a) the financial balance of the sphere of production, sub-divided into balances of the sectors and of the branches; each sector and branch further sub-divided into "sectors of property": State-owned, private-owned (national), private-owned (foreign), co-operative-owned, etc.

b) the financial balance of the sector of services*,

c) ,, ,, ,, ,, ,, ,, ,, State activities,

d) ,, , ,, ,, ,, ,, ,, branch of banking*,

e) ,, ,, ,, ,, ,, ,, ,, insurance etc.*,

f) ,, ,, ,, ,, ,, ,, ,, public organisations,

g) ,, , ,, ,, ,, ,, ,, sector of research institution*,

h) ,, ,, ,, ,, ,, ,, ,, sector of the households,

i) the balance of the budget of Government.

These balances have to show all money flows of importance; they are linked with each other in such a way that the total amount of certain sort of expenses (e.g. wages) in all (aggregated) balances is equal to the total amount of receipts in all balances (here : in the balance of the households).

The increase and decrease of cash holdings, savings and credit has likewise to be taken into account.

In this system of financial balances there are two conditions of equilibrium :

i) the receipts and expenditure, including the increase and decrease of currency, must be equal in each balance, and

ii) the value of each "fund of goods" must be equal to the corresponding total amount of the "funds of purchasing power" representing the demand to buy this "fund of goods",

The "funds of goods" are given in the aggregated "balance of sources and funds" which contains the balance of all "groups of products", the funds of purchasing power we get from the financial balances. (See Tables 10 to 15). The balance of Government's budget has to be an aggregated balance, including all budgets of district authorities, town authorities etc.

5. The elaboration of these financial balances within the framework of the balance of national economy has to be based upon,

a) the proportion of money distribution in the year 0,

b) the development of the ratio between productive consumption and output ($C_p : P$),

c) the development of the productivity of labour (π),

d) the development of the wages in the sphere of production as well as in the sphere of consumption,

* sub-divided principally like "a".

e) the development of the sectors of the sphere of consumption,

f) the development between the sectors of property.

All these figures and proportions we have got from the balance of national economy described in Chapters I and II. Here, we have to see in what way these decisions influence the money flows and the distribution of national income.

One of the most complicated questions in solving this problem is in what proportion the cost of production decreases (and the resulting profit increases). From the calculations of the balance of national economy we know the value of output "P" and the amount of the productive consumption "C_p". We get the relative developments of the wage-cost by dividing the rate of growth of (average) wages by the rate of growth of the productivity of labour; for example :

Rate of growth of productivity of labour = 1.10
Rate of growth of average wage = 1.03
Purchase share of wage to output in the year 0 = 40 per cent.

In the year 1 the relative share of wage cost to the value of output (with no change in prices) : would be

$$40 \times \frac{1.03}{1.10} = 37.45\%$$

But there are still other costs of production like insurance fees etc. From experience of the previous years we know their share in the value of output; on this we have to estimate the future development. In this way, we get to know the proportion in which the profit increases, how much profit comes from State-owned factories etc. to the budget of Government and are at the disposal of all kinds of proprietors. In a similar way, we get from the sectoral financial balances of the sphere of consumption, the profit and its distribution between the groups of proprietors, and we get furthermore the amount of financial means which is required for the branches of consumption like health, education etc., because they do not, as a rule, meet their expenditure from their own receipts but from Government funds. Then we have to take into account the figures of new investment, increase of stocks etc. which have to be met from profit, and the assumed development of savings and credit, and of the stocks of currency.

To complete the financial balances, we have to examine whether the "funds of purchasing power" (which had been fixed firstly in the amount of the corresponding "funds of goods") are still in the right proportion to the total expenditure in the frame of each balance.

After this, we are in a position to co-ordinate the financial balances. Any excess of purchasing power in any sector and branch, we have to skin off, and we have to investigate in what way this should happen : encouraging saving or life insurance, issuing public stocks, encouraging investment, increase of taxes (sales tax or income

tax) etc. Thus, we have to ensure that all financial balances will be well balanced. From this we get the principal lines of the financial policy of the Government.

4. *Planning of the development of prices.* If we have a well balanced budget of the Government, without creation of money, and there is consistency between the funds of purchasing power and goods, also in their "assortment" (in terms of "groups of products") there can be no increase in prices due to speculation by private manufacturers and dealers. If there exists, furthermore, a well functioning system of price-control by Government (implemented by State authorities) cutting the profit down to a certain rate (e.g. 6 or 8 per cent on the average, different for the various "groups of products" in accordance with the different capital intensity per unit of output) there would be, arising mainly out of the increase of the productivity of labour (similar to that fixed in the plan and implemented by the wage policy*) along with the development of wages, a constant decrease of prices of both consumer goods and producer goods. The planning of the development of prices has to be based upon statistical data showing not only the development of the financial figures in each branch, and in what way products of one "group of products" are going to all branches, but it requires besides this

a) the cost of production per "group of product", the sum of prices (= total value) of each "group of products" sub-divided into
material cost without depreciation,
depreciation,
wages, sales tax (turn-over tax etc.),
profit;

b) which "groups of products" form in what proportion the "cost without depreciation";

c) a method of evaluating the capital stocks by the replacement value in accordance with the development of the prices of investment goods.

The process of planning begins in the extractive production (mining, agriculture etc.) going forward to investment goods and consumer goods. (In the case where there are prices fixed by Government, the process of planning is more complicated.) The most complicated problems are to fix the sales tax and to change the rates of profit in accordance with the increasing capital intensity per unit of output. From this we get, similarly, lines with regard to economic policy.

5. Only when the balance of national economy is completed by the financial balances and there is no disproportion anywhere can we state that there will be an economic development without frictions and with the highest possible rate of growth under the given conditions.

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* which requires agreement between the Government, the trade unions and the unions of the employers.

Appendix I

SOME BALANCES AND TABLES, BELONGING TO THE "BALANCE OF NATIONAL ECONOMY"

TABLE 1: BALANCE OF SOURCES AND FUNDS OF THE TOTAL SOCIAL PRODUCT.

Sources	Funds
1. Production	1. Gross investment and repairs a) sphere of production b) sphere of consumption
2. Import	2. Used up raw material energy, etc. in the sphere of production
3. Government reserve	3. Carry over to stocks
4. Stocks	4. Carry over to Government reserve
5. Other sources	5. Non-productive consumption, (excluding individual consumption)
	6. Consumption (individual) of population (family households)
	7. Exports
	8. Plan reserve*
6. Total	9. Total
7. Excess (balance)	10. Excess (balance)

* This item appears only in the plan-balance, and is not mainly by the "money reserve" in the Government budget.

TABLE 2 : TOTAL SOCIAL PRODUCT ACCORDING TO MEANS OF PRODUCTION AND MEANS OF CONSUMPTION

(in main-groups of products)

Items	Volume of production	"Other" sources excess	Change by foreign trade			Available inside the country	Changes by Govt. reserve		Used up for purposes of				
									production				Consumption
									total	stocks		invest.	production
			import	export	excess		taking from	carrying to		taking from	carrying to		
1. Means of production, total													
a) Investment goods (incl. repairs)													
b) Energy—products													
c) Chemicals excl. raw material													
d) Raw material and semi-manufactured products for a–c													
e) Transport and trade services													
f) Raw material and semi-manufactured products for consumer goods													
2. Means of consumption (consumer goods)													
3. Total social product													

TABLE 3 :SOURCES AND FUNDS OF THE TOTAL PRODUCT

Group of products	Sources							Total volume of products available
	Sphere of production			.....	.....	Import	Others	
	Sector A1			.....	.....			
	Branches							
	A1,1	A1,2	.....					
1	2	3	.....	.....	.....	$n-2$	$n-1$	n
1. Investment goods								
1,1 Equipment for mining								
1,2								
.....								
Total			—					

Funds of consumption etc.						
Sphere of production			Sphere of consumption			Export	Other 2
Sector A1	Sector.....		Sector 1	.....	Households		
Branch A1,1	Branch		Branch 1,1	Branch			
C_p 1) Investment.....			Material energy....	Investment			
$n+1$	$n+2$....						

1) without replacement and repairs

2) Government reserve (e.g.)

TABLE 4 : BALANCE OF SOURCES AND FUNDS PER "GROUP OF PRODUCTS" (e.g. "ENERGY PRODUCTS")

(in terms of value)

Sector and branches	Sources					Funds used for			
	output	increase(+) decrease(−) of stocks (for sale)	effective sale	effective supply	increase of stocks	productive consumption	investment	non-productive consumption (health, culture etc. belonging to factories)	other purposes
1. *Sector A1*									
Machine building	20	—	20	100	5	90	—	5	—
.....									
Sector A3									
Coal mining	1100	−50	1150	150	10	130	—	10	—
Energy	1500	+100	1400	300	20	265	—	15	—
Sector.....									
Branch X1	—	—	—	1500	100	1380	—	20	—
,, X2	—	—	—	300	10	280	—	10	—
,, X3	60	—	60	400	10	380	—	10	—
2. *Foreign Trade*									
(Imports)	—	—	400	150	—	5	—	—	145 Export
3. *Inland Trade*									
Wholesale trade	—	—	300	310	—	5	—	5	300 sale
Retail trade	—	—	200	210	5	5	—	—	200 sale
4. Government reserve		—	10	120	—	5	5	—	115
	—	—	3540	3540	160	2545	—	75	760 of reserve

TABLE 5 BALANCE OF POPULATION AND SOURCES OF MANPOWER

Items	Number at the beginning of the period			Changes in the number of population									Number at the end of the period			Average number in the period		
				natural changes			emigration			total								
	total	male	female	t	m	f	t	m	f	t	m	f	t	m	f	t	m	f
1. Population total																		
2. 0–14 years old																		
3. More than 60/65 years																		
4. Working population																		
5. Pupils in secondary schools more than 14 years old																		
6. Students etc.																		
7. Invalids																		
8. Other non-working persons from this reserve of manpower																		
9. Still working people (out of working age)																		
10. Actually working people																		
a) total																		
b) entrepreneurs (working)																		
c) members of co-operatives																		
d) employees																		

TABLE 6 : BALANCE OF DEMAND AND SUPPLY OF MANPOWER (PER BRANCH AND PER PROFESSION)

Items	Number at the beginning of the period			Changes															Number at the end of the period			Average number in the period		
				Decrease						Total						Total								
				natural			others			from vocational training, elementary schools, universities, etc.			others										
	total	male	female	t	m	f	t	m	f	t	m	f	t	m	f	t	m	f	t	m	f	t	m	f
1. Total employment																								
3. *Per Branch*																								
(a) into capital groups (entrepreneurs, number of co-operatives, employees)																								
(b) capital groups into professions																								
3. *Per profession*																								
(a) into branches																								
(b) into groups of age																								

TABLE 7 : BALANCE OF FIXED ASSETS IN THE SPHERE OF PRODUCTION

Sectors and branches	Sphere of production (total)	Sector A1		Sector
		branch A1,1	branch	
1. Stock at the beginning of the year				
(a) total value.(replacement value)				
(b) sum of depreciation (less replacement)				
(c) rate of actual depreciation				
2. Separating parts (destroyed, put away as worn-out etc.) in the course of the year				
(a) TV (total value)				
(b) SD (sum of depreciation less replacement)				
3. Gross investment (new inv. and replacement) newly used in the process of production				
4. Stock at the end of the year				
(a) TV				
(b) SD				
5. Investment under construction				
(a) at the beginning of the year				
(b) at the end of the year				
6. Rate of depreciation (annual average)				
7. Sum of depreciation, total used for :				
(a) replacement				
(b) "general repairs"				
8. New investment				
9. Rate of current repairs				
10. Amount of current repairs				
11. Average values of the stock				
(a) TV				
(b) SD				
12. Rate of depreciation (SD/TV)				
13. Output/capital ratio				
14. Capital intensity per worker				
15. Composition of stocks				
(a) buildings				
(b) equipment				
(c) others				
16. Composition of gross investment				
(a) buildings				
(b) equipment				
(c) others				
17. Composition of "General repairs" a—c				
18. Composition of current repairs				

TABLE 8: BALANCE OF FIXED ASSETS IN THE SPHERE OF CONSUMPTION

Items	Sectors and branches	Sector 1	Sector 2 : Services		
		.....	education	health	housing....
1. Total value of G_k (replacement value), beginning of year					
2. Sum of depreciation (less replacement)					
3. Rate of actual depreciation ("2" : "1")					
4. Rate of annual depreciation					
5. Sum of annual depreciation (necessary for replacement)					
6. Replacement					
7. New investment					
8. Total value of G_k—end of year					
9. Costs of repairs (not included in replacement)					

TABLE 9: TABLE FOR ANALYSIS OF THE COMPOSITION OF THE FUND OF CONSUMPTION (K)

Parts of the K-fund (sector subdivided in branches)	Employment (in terms of man-years)	Consumption (in terms of value)			
		total	investment and repairs	means of consumption, energy transport etc.	individual consumption of the employees in terms of wages
1. State activities		0			×
2. Services		×			
3. Banking etc.		0			×
4. Research institutions		0			×
5. Public organisations		0			×
6. Wage fund of the workers in the productive sphere	—	×	—	—	1)
7. Individual (net) income of other peoples (capitalists, pensioners etc.)	—	×	—	—	1)
Total	=	K			

TABLE 10 : FINANCIAL BALANCE OF THE BRANCHES OF THE SPHERE OF PRODUCTION

Receipts	Expenditures
1. Value of goods sold	1. Value of goods bought
2. Receipts in order to increase the capital	2. Wages
3. Compensations from insurance	3. Taxes
4. Interest from deposits	4. Insurance fees
5. Decrease of deposits	5. Interest for credit
6. Increase of credits of bank	6. Revenue for the proprietors of the enterprises
7. Decrease of commercial credit	7. Value of the bought services of all kinds
8. Increase of commercial liabilities	8. Increase of deposit
9. Decrease of currency	9. Decrease of banking credits
	10. Increase of commercial credit assets
	11. Decrease of commercial credit liabilities
	12. Increase of currency
Total	

TABLE 11 : FINANCIAL BALANCE OF THE BRANCHES OF THE SECTORS OF SERVICES, STATE ACTIVITIES, PUBLIC ORGANISATION, RESEARCH INSTITUTIONS (WITHOUT BANKING)

Receipts	Expenditure
1. a) Receipts for using the services by people, enterprises etc. (sector of services, State activities, research institution)	1–10. like 1–9 and 12 in the balance of production
b) Receipts from the budget of Government (sector of services, state activities, research institutions)	11. Government allowances like pensions, scholarships etc. (in the balance of the sectors of State activities and services, e.g. high education)
c) Receipts from the contributions of the members (public organisations)	
d) Receipts from the insurants (insurance enterprises)	
2–6. like 3.4.5,6 and 9 in the balance of the sphere of production	
Total	

TABLE 12: FINANCIAL BALANCE OF THE HOUSEHOLD OF PEOPLES

Receipts	Expenditure
1. Wages	1. Value of the consumer goods bought
2. Revenue of the (private and co-operated) proprietors of the enterprises in the sphere of production and consumption	2. Value of the paid services
	3. Taxes
3. Government allowances	4. Insurance fees
4–8 = 3,4,5,6 and 9 in the balance of the sphere of production	5. Savings for partnership
	6–8 = 5,8,12 in the balance of the sphere of production
Total	=

TABLE 13: FINANCIAL BALANCE OF THE BANKING SYSTEM

Receipts	Expenditure
1. Interest for credit	1–7 = like 1–7 in the balance of the sphere of production
2. Compensations from insurance	8. Excess of receipts on expenditure (sec. No. 3 on the left)
	=
3. Excess of receipts on expenditure (for increasing the capital or reserve fund of security)	9. Decrease of deposits
	10. Increase of credit
4. Increase of deposits	11. Decrease of currency
5. Decrease of credit	
6. Increase of currency	
Total	=

TABLE 14: BALANCE OF CREDIT

Credit given	Source of credit
1. Home credit a) short-term b) long-term c) re-financing	1. Capital of the banks
	2. Reserve funds of security of the banks
2. Foreign credit	3. Deposits a) short-term b) long-term c) re-financing
	4. Foreign credit
	5. Emission

TABLE 15: BALANCE OF THE GOVERNMENT BUDGET (INCLUDING THE DISTRICT AUTHORITIES, MUNICIPALITIES ETC.)

	Receipt	Expense	Balance
1. *Sphere of production, total*	×	×	×
a) taxes, duties etc.	×		
b) income from State-owned factories etc. (profit)	×		
c) means to promote export		×	
d) means for centralised investment in State-owned enterprise		×	
e) increase of Government reserve		×	
2. *Sphere of consumption (without population)*	×	×	×
2.1 Sector of State activities	×	×	×
a) receipt (e.g. taxes)	×		
b) investment		×	
c) current expenses		×	
2.2 Sector of services	×	×	×
a) taxes, profit for	×		
b) investment State-owned		×	
c) current expense institutions		×	
2.3 Sector of banking, insurance	×	×	×
a) taxes, profit	×		
b) and (c) like 2.2		×	
2.4 Public organisation.	×	×	×
3. *Population*	×	×	×
a) taxes	×		
b) issue of public stocks	×		
c) repayment and interest of public stocks		×	
4. *Budget reserve*		×	×
Total			±

TABLE 16: BALANCE OF PRIMARY DISTRIBUTION OF NATIONAL INCOME

Items	Total sphere of production	Sectors and branches
1. Income of employees		
a) wages and salaries		
b) other allowances in money		
c) natural income (e.g. miners, agricultural labourers)		
2. Income of members of co-operatives		
a) money income		
b) natural income		
3. Income from private, capitalist property in the sphere of production		
a) money income		
b) natural income		
4. Income from private, capitalist property in the sphere of production		
a) money income of the entrepreneurs through works		
b) natural income of the entrepreneurs		
c) income from shares		
5. Income of the State (taxes)		
6. Accumulation		
a) productive assets		
b) cash in hand		
c) deposits		
7. Others (insurance fees etc.)		
8. Total		

TABLE 17 : BALANCE OF FINAL DISTRIBUTION OF THE NATIONAL INCOME

Items	Account
1. Produced national income	
2. Decrease of stocks, total a) stocks in the sphere of production b) Government reserve	
3. Excess of imports	
4. Other sources	
5. National income available	
6. Accumulation fund a) net investment b) increase of stocks in the sphere of production c) increase of Government reserve	
7. Consumption fund a) for purposes of standard of living b) for other purposes (Government administration, army etc.)	
8. Insurance fund (for replacement of productive assets, destroyed by natural forces, etc.)	
9. Excess of exports	

Appendix II

PROGRAMME FOR ELABORATION : A LONG TERM PLAN

I. To work out a long-term plan we have to proceed in two stages :

1. Elaboration of the main features of the economic development.

   A. Estimation of the main figures and proportions in the frame of the balance of national economy in terms of their order of magnitude.

   B. Principles underlying the development programme concerning

      a) the procedure of industrialisation (what branches and goods have to be advanced and priorities in import policy resulting from this, investment policy with regard to the different sectors of property) etc.;

      b) the procedure to get a higher productivity of agriculture (irrigation, mechanisation, fertilising, large-scale production and co-operative farms, State trading in agricultural products, forestry) etc.;

      c) the transport system;

      d) general education, professional and technical education) etc.;

      e) standard of living (health, housing, construction and re-construction of towns, supply of food, clothing) etc.

II. Elaboration of the plan of the development of national economy.

1. After collecting the main figures and proportions of the economic development as well as deciding the principles, we proceed to work out the complete "plan" (or a "plan frame").

Both the stages include analysis of the development in the past, viz. trends of development, and the factors creating this development as well as the figures, need for the plan, in the base year (year 0).

The result must be firstly a "draft plan-frame" showing the main features of the development in the plan-period and the aims to be reached as well as the principles of economic policy to achieve these aims; and secondly the complete plan-frame with a concrete programme of economic policy.

2. The "plan" will cover (principally) the following "plans of branches" :

   a) industry (including construction),

   b) handicraft and cottage industry,

   c) agriculture, forestry and irrigation,

d) transport and communication,

e) foreign trade,

f) standard of living (including health, housing and other services, supply of food etc., retail trade in consumer goods etc.),

g) other non-productive sectors (State activities, public organisations; including the reserve of Government),

h) education, science and research;
besides this we also need

i) a plan of regional development,

j) the balance of national economy (in order to co-ordinate the "plans of branches".

The plans of branches "a–d" consist of

a) plan of output (of each branch, and each "group of products"),

b) plan of material supply,

c) balances of sources and funds of distribution,

d) plan of investment (and supply of investment goods),

e) plan of employment, productivity of labour and wages,

f) financial plan (costs, receipts, profits, taxes, prices etc.).

For the plan of foreign trade, we shall naturally require a plan of import and export and the balance of foreign trade; in the plan of retail trade in consumer goods the plan of retail business supply, stocks and sale; likewise in the branches of services corresponding figures for the services concerned. The plan of the standard of living includes the balance of income and expenditure of the population. The plan of regional development will show the economic aims for the different parts of the country in the "economic districts" as well as in the administrative districts, and the location of the most important plants and other projects.

Appendix III

OUTLINE SCHEME OF A LONG-TERM PLAN FOR ENERGY PRODUCTION

1. In the course of industrial development, which is associated with progressive specialisation and division of labour, there appears a special sector of energy production. It consists of branches producing primary energy products (mining : hard coal, soft coal, mineral oil, uranium ore etc.), and of branches processing (refining) these primary energy products into coke, gas, briquette, petrol, diesel oil, electricity. The transport of gas and electricity belongs to the energy sector.

The rates of growth of the total output of the national economy, of the productivity of labour and of the standard of living depend essentially upon the development of the energy production. One of the main tasks of planning of the national economy is to ensure the proportionate development of the energy sector in the frame-work of the whole national economy.

2. Model balance sheets and concepts used in the planning of the energy sector.

2.1. The energy sector comprises all plants, the main aim of which is the production of coal, mineral oil, gas, electricity etc. It is sub-divided into branches :

hard coal-mining,
soft coal-mining,
briquette factories,
mineral oil mining,
mineral oil refining,
smoulding factories,
coke factories,
natural (earth) gas,
electricity plants,
gas network,
electricity network,
district heating works.

In this sector the main part of energy production takes place. But a small part of the whole energy production especially electricity, is produced in factories belonging to other branches (i.e. in chemicals etc.) and it is possible that there is import of energy products. On the other hand, it is possible that the output of the plants belonging to the energy sector consists not only of energy products but of products of other "groups of products" also. These facts we have to consider, too. (For example, in the German Democratic Republic in 1955 : 79.2 per cent of the output of the branch "energy" consisted of "energy products" and this 79.2 per cent represents only 46.8 per cent of the volume of the group of products "energy products".)

The main group of products "energy products" is to be sub-divided into the following groups of products :

solid fuels	(hard coal, soft coal, briquette, coke, dry soft coal, wood etc.),
liquid fuels	(mineral oil, benzenes, diesel oil etc.),
gas	(natural gas, coke gas, smoulding gas etc.),
electricity	(produced by hydro-stations, by steam, by diesel engine stations, by gas turbine plants etc.),
steam	(produced by district heating works etc.).

2.2. "Primary energy" comprises all energy products hauled directly out of the earth or nature; e.g. coal of all kinds, mineral oil, uranium, natural gas, water power etc.; "secondary energy" comprises all products got in processing primary energy into refined (improved) energy products like coke, gas, electricity, petrol etc. "Final energy" refers to all sorts of energy products going out of the energy sector to be used in all other sectors of the whole national economy. It consists of primary as well as secondary energy.

2.3. In the planning of energy production the following concepts are involved :

a) *Aggregated figures of over-all economic significance* :

i) $$\frac{\text{Rate of growth of the output of primary energy}}{\text{Rate of growth of the total national output}}$$

This figure gives us a rough estimation regarding the order of magnitude of the requirements of natural energy resources and enables us to learn whether the internal resources would be sufficient for the needs of the planned development of the whole national economy or imports have to be planned and also as to how many years or decades would be required before it becomes self-sufficient.

(ii) $$\frac{\text{Rate of growth of the total volume of final energy used up in the sphere of production}}{\text{Rate of growth of the total national output}}$$

This figure shows the relationship between the development of total output and the energy used up for that.

A similar figure has to be used to show the relationship between the rates of growth of the fund of (non-productive) consumption and the consumption of energy products (final energy).

(iii) $$\frac{\text{Rate of growth of final energy used in the sphere of consumption}}{\text{Rate of growth of the fund of non-productive consumption}}$$

Another figure,

$$\text{(iv)}\quad \frac{\text{Rate of growth of the total volume of final energy used up in the sphere of production}}{\text{Rate of growth of the productivity of labour}}$$

shows an important economic relationship. Sometimes in this relation the rate of growth of used-up electricity is put into the numerator because the increase of labour productivity is mainly connected with the utilisation of electric power in the process of production. However, both these figures give only rough indications.

$$\text{(v)}\quad \frac{\text{Volume of final energy (Kcal)}}{\text{Volume of primary energy (Kcal)}}$$

is a rough expression of the degree of thermal efficiency of the entire energy sector. It shows what volume of final energy will be available if we have a certain volume of primary energy. Two contrary tendencies influence the development of this figure. Technical progress, connected with the refinement of energy products, leads to a reduction in the losses incurred during this stage of production and to an increase of the quotient of thermal efficiencies. On the other hand, a lesser and lesser part of the volume of primary energy appears as final energy i.e. an increasing part of primary energy will be transformed into secondary energy. It is clear that in connection with the latter development the losses of energy transformation in absolute terms will grow, but this may be preferred as the secondary energy has a better co-efficient of utilisation in the process of consumption of the final energy. However this has to be examined in each case.

$$\text{(v)}\quad \frac{\text{Volume of (produced) secondary energy}}{\text{Volume of (produced) final energy}}$$

With every improvement in technique in the energy sector, this figure would get an increasingly higher value.

(b) *Technico-economic figures showing the relations between the different stages of energy production, the investment costs and the efficiency of technique* : In order to be in a position to plan the quantitative relations between the various (successive) stages of energy production we have to use figures as in the following examples :

In the process of smouldering soft coal briquette we get out of 1 kg soft coal briquette :

0.520 kg	(smoulding) coke,
0.130 kg	tar and benzene,
0.010 kg	tar dust
0.15 m^3	gas
0.010 kg	briquette—coal slack
.....	phenol, sulphur etc.

In the process of coking soft coal briquette we get out of 1 kg :

0.430 kg (hard) coke,
0.505 kg tar and benzene,
0.010 kg tar dust,
0.010 kg briquette—coal slack,
0.24 m^3 gas,

also steam out of the heat of coke, phenol, sulphur etc.

We need such figures for determining the relationship between the two succeeding stages of production. They naturally depend upon the technical procedure used in the different stages.

Closely connected with these figures are those showing the degree of thermal efficiency in each stage of refining of energy products, they show the Kcal content of the refined products and the relationship of this content with the content of Kcal in the primary product used as input for producing the refined product; e.g.

smoulding of soft coal	95.5 p.c.
coking of briquette	89.0 p.c.
gasification of soft coal (by pressure)	82.0 p.c.
electricity out of steam plants	14-23 p.c.

These figures are of great importance in the assessment of the various technical processes and the level of technique used in the country. Another kind of figure shows the specific investment costs per unit of capacity, e.g. ;—

In large scale steam power plants : 500—800 DM/KW of installed capacity.

In open cast soft coal mining including rubble : 22-37 DM/t p.a.

The first mentioned figure depends on the technical level of the steam power plants; e.g. in the last 40 years the specific investment costs for large scale steam power plant have decreased to half. In the latter figure the specific investment costs depend upon the relation of "rubble : coal".

A further group of figures shows the degree of utilisation of the capacity, e.g., "Factor of utilisation of the installed capacity in power plants" :

$$\frac{\text{No. of hours of utilisation of the installed capacity per year}}{\text{No. of calendar hours(8760h)}} \times 100$$

The development of this figure in the GDR was as follows, e.g. :

1950	1951	1952	1953	1954	1955
76.5	79.5	83.0	87.3	91.2	92.5

An important figure is the "amount of heat" (in Kcal) generated per KWh; in modern plants this figure is about 2500 Kcal/KWh.

Lastly there are figures showing the level of technique from the point of view of investment costs without equipment; e.g. in power plants:

"volume of buildings per unit of capacity" (m^3/KW) and from the point of view of manpower :

"operators per unit of capacity" (number of operators/KW). All these figures we use either to calculate the figures of the plan or to weigh the advantage of this or that kind of procedure and level of technique respectively.

(c) Figures for calculating the consumption of energy in other sectors and branches :

In the course of preparation of the plan for the energy sector we need more concrete figures regarding specific requirements of energy products of the other sectors and branches than the results of the balance of national economy yield. We know from the balance of national economy only, the development of the volume of production and the share of productive energy consumption. But we want to know how many KWh of electricity and tons of hard coal, coke, petrol etc. this item "energy consumption" consists of. To solve this problem, we have to enquire into the development of the composition of this item :

x p.c. electricity
y p.c. gas
z p.c. solid fuel
z^1 p.c. coke
z^2 p.c. hard coal
etc.

We need this composition for the year 0, and the trends of development. Besides this, we should know the reasons for such development. We can express these figures as under :

In the year 0, 1DM energy consumption
$= x$ KWh electricity, or y m^3 gas, or z ton coke etc.

From this we get the energy demand of all the branches (other than that of the energy sector) *in physical terms.*

Another way to get that demand is to see how many units of energy products have been consumed for 1000 DM value of output, and per worker in the various branches.

Branch	KWh consumed per 1000 DM output 1952	1955	KWh consumed per worker 1955
Industries, total	481	452	8.010
Mining	1404	1538	19.050
Metallurgy	1009	963	21.800
Engineering	156	148	2.125
Chemical	1259	1140	41.000
Construction materials	410	437	4.160
Electro technique	106	98	.995
Precision and optical instruments	93	86	.860
Wood working industry	94	85	.980
Textile industry	198	190	2.310
Ready made clothing industry §	35	34	428
Leather, shoes and fur §			
Cellulose and paper making	1458	1322	15.800
Paper manufacturing industry	71	74	
Polygraphy	71	76	.870
Food manufacturing	84	77	2.270

The energy consumption per worker is closely connected with the productivity of labour.

Besides this we use (later on) figures showing the specific energy consumption of certain energy-intensive products; e.g.

Product	Physical unit	specific energy consumption (1955)
Calcium carbide	*t*	3.400 KWh
Phosphorous	*t*	15.000 ,,
Silicon carbide	*t*	9.800 ,,
Aluminium	*t*	20.000 ,,
Electro-steel	*t*	1.000 ,,
SM—steel	*t*	1.000 m^3 weak gas
Cast iron	*t*	100–150 kg coke
Motor car	1 piece	1500–1800 KWh
Heavy steam locomotive	1 ,,	60000 KWh

2.4. Balance sheets used to plan the proportions within the energy seetor and the relations to all other consumers :

We have four kinds of balance sheets :

1. Plan of the natural resources,
2. Balance of primary energy,
3. Balances of the various stages of manufacturing (secondary energy) a) balance of soft coal briquette, b) balance of smoulding and coking of soft coal briquette, c) balance of coking of hard coal, d) balance of gas, e) balance of electricity, f) balance of liquid fuels,
4. Balance of final energy.

In order to make all these calculations comparable we use co-efficients showing the "heat value" of each kind of energy in terms of "hard coal units" (hcu). That means : Hard coal has an (average) "heat value" of 7000 Kcal/kg; soft-coal briquette = 4700 Kcal/kg; consequently

1 t soft coal briquette = 0.67 t hard coal (hcu).

Other examples :

1 t soft coal = 0.3 hcu,
1 t coke = 0.9 ,,
1000 m^3 natural gas = 1,33 ,,
1 m^3 wood = 0.25 ,,
100 KWh electroenergy = 0.6 ,,

2.5. The plan of natural energy resources shows

a) the minerals useful for purposes of energy production subdivided into
aa) definitely known resources,
ab) probably existing resources,
b) waterpower unused,
c) other resources (e.g. wood etc.).

The estimate of resources of minerals we get from the results of geological surveys and researches.

The subdivision (definite and probable resources) results from the density of the drilling *spots* and the calculations connected with *them.*

2.6 The balance of primary energy shows the sources and the purposes of consumption of primary energy according to the following scheme :

BALANCE OF PRIMARY ENERGY

Sources and funds	Kind of energy	Absolute quantities		Hard coal units (hcu)		
		physical terms	quantity	co-efficients	quantity in 10^6 t hcu	p.c.
1. Production	soft coal	10^3 t	200612	0.3	60184	84.1
	hard coal	,,	9667	1.0	9667	13.5
	water power	10^6kwh	759	0.6	456	0.6
	fire wood	10^3fm	1120	0.25	280	0.4
2. Import	mineral oil	10^3 t	600	1.7	1020	1.4
3. Increase/decrease of stocks	—	—	—	—	—	—
4. Total fund	—	—	—	—	71607	100
5. Productive consumption of the energy sector.	—	—	—	—	—	ca. 89.0
a) for electricity	soft coal	10^3 t	42843	0.3	12853	18.0
	hard coal	,,	1297	1.0	1297	1.8
	water power	10^6kwh	759	0.6	456	0.6
b) for briquettes	soft coal	10^3 t	—	0.3	—	ca. 58.0
c) for coke and gasification	hard coal	,,	—	1.0	—	,, 4.0
d) for benzene and diesel oil	mineral oil	,,	—	1.7	—	,, 1.4
e) others	soft coal	,,	—	0.3	—	,, 5.0
6. Productive consumption of other branches	—	—	—	—	—	ca. 9.0
7. Non-productive consumption	—	—	—	—	—	ca. 2.0
a) Branches (consumption)						
b) Family households						

The balance of secondary energy are built up, in principle, in the same manner as the balance of primary energy. In order to illustrate this we show below two balances,

1. *Soft coal briquette*

1.	Raw material including raw material for production of steam for the production of briquette	soft coal	10^3 t
2.	Production	s.c. briquette	,,
3.	+ decrease § of stock − increase §	s.c. dust dry coal	,, ,,
4.	Import		
5.	Total fund	—	—
6.	a) smoulding		10^3 t
	b) coking		,,
	c) gas		,,
	d) electricity		,,
7.	Prod. cons. of other sectors		
8.	Non-prod. cons. §		
9.	Exports §	11	
10.	Government reserve §		

2. *Electricity*

	Participation in production of electricity		Quantities	
	10^6 KWh	p.c.	unit	quantity
1. Raw material, total	28.695	100	—	—
a) hard coal	1.686	5.9	10^3 t	1297
b) soft coal	17.994	62.7	,,	
c) s.c. briquette	2.798	10.4		
d) s.c. smoulding coke	4.136	14.4		
d) dry coal (s.c.)	179	0.7		
f) water power	759	2.6		
g) mineral oil	33	0.1		
h) gas	878	3.1		
i) other	42	0.1		
2. Production			10^6kwh	27.530
3. Import			,,	210
4. Total fund			,,	27.740
5. Consumption				
a) industries			10^6kwh	21.505
b) agriculture			,,	510
c)				
d) family households			,,	1.985
e) exports				
6. Net losses			,,	1.992

2.7. Balance of final energy shows the results of all stages of energy production as far as they are going out of the energy sector. The composition (structure) of the total fund of final energy compared with that of primary energy shows the degree of the refinement of energy in the whole national economy. The share of primary energy in the total fund of final energy is continually decreasing.

That part of the balance of final energy (showing the distribution of all sorts of final energy) to the sectors and branches etc. is of great importance for planning, for it shows the connection between the energy sector and all other social activities. Here we have to balance supply and demand of energy. The balance of final energy has the form shown on page 249.

3. The elaboration of the plan for the development of the energy sector.

3.1 From the balance of national economy we get a number of figures showing us in which order of magnitude and in which proportions (roughly) the development of the energy sector during the period of the perspective plan (e.g. 15 years) will take place. Thus, we have as starting points the following (for each year of the plan period):

a) The volume (in terms of value) of the main group of products "energy products" subdivided into the groups of products,

b) the "balances of sources and funds" of these main group of products and "groups of products",

c) the volume of production of the "energy sector",

d) the investment fund and the development of the stocks of fixed capital, for the sector and the branches,

e) the demand for investment goods and other products (productive consumption),

f) the demand of manpower,

g) the figures π (productivity of labour), β (output/capital ratio), θ (capital intensity per worker), and ν (net product (=national income produced in the branch or in a factory)/output ratio).

From the analysis of the development of the energy sector in the past up to the year 0, we have got all figures and balance sheets mentioned in para 2. From our experience we know the concrete situation in this sector; and also in each mine or factory of importance. Furthermore, we must have knowledge about the economic characterisation of the various procedures of production and technical levels in the different branches. This knowledge we need not only about the levels of technique, used within the country concerned but with regard to the more developed countries as well, and we shall also need such information about levels of technique which are as yet in the stage of operational experiment (e.g. atomic power stations) so far as

it is feasible to use this kind of procedure in the plan period. This economic characterisation comprises (on the basis of a new building plant of an optimal size, or for plants of different sizes) the figures mentioned below :

a) P, C_p, E_p and π, β, θ, ν

b) the capacity and the coefficients of the optimal utilisation of capacity;

c) the investment cost per unit of capacity and the composition of the investment cost (equipment, construction, others) figures characterising the investment pattern (e.g. construction volume/unit of capacity etc.), period of maturity, rate of depreciation;

d) the consumption of the workers needed : professions, degree of qualification; average "W" of all workers (in terms of the present valid wage rates); "average wage/productivity of labour—ratio W/η;

e) the consumption of the used-up raw materials, energy and other products, in physical terms per unit of output and the composition of the value of the productive consumption (C_p) : depreciation, raw materials, energy, transport etc.; besides this partly : the composition of output related to the unit of raw material used up.

The knowledge of this characterisation of each level of technique is necessary in order to be in a position to decide in what way the development of a branch can be realised most effectively.

3.2 In the course of elaboration of the plans of the branches we have to take into consideration the following methodological problem: In regard to all items planned in physical terms it is possible that there may be a difference between the "gross output" and the "saleable output", This difference may be due to two factors : viz. :

1) increase or decrease of stock of finished energy product,

2) part of saleable output that may be used internally for productive purposes.

Since the value of output of a factory or branch does not include the value of the internally consumed energy product, it is necessary to have this information in order to know the rate of capacity utilisation.

All computations about these items planned in physical terms are related to the volume of "gross output", e.g.

capacities;

material balances (balances of sources and funds of distribution of each of these products); in these balances the "self-consumed output" is particularly shown in order to be able to get the aggregated balances of sources and funds of the "groups of products";

productivity of labour (gross output per worker).

BALANCE OF FINAL ENERGY

Sources and funds	Kinds of energy products	Total		Soft coal	S.C. briquette	Hard coal	H.C. coke	S.C. smoulding coke	S.C. hard coke	.....
		10^3t hcu	p.c.	10^3t	10^3t hcu	10^3t	10^3t hcu	...	...	
1. Production										
a) §										
b) §	Branches									
c) §										
2. ±Incr./decr. of stocks										
a) §										
b) §	Branches									
c) §										
3. Import										
4. Total fund										
5. Productive consumption (outside energy sector)										
a) §										
b) §	Branches									
c) §										
6. Non-productive consumption (without family households)										
a) §										
b) §	Branches									
c) §										
7. Family households										
8. Export										
9. Government reserve (increase)										

All the figures characterising the economic situation of the branches are statistical averages. These averages cover all the factories. But while we know the concrete situation with regard to a few i.e. the most important units accounting for the major part of the production of the branch concerned, for the "rest" we know only the aggregate figures for all units belonging to the "rest". In this way, we are also in a position to get the average values of those figures showing the relative ones and comparing the figures π, β, θ and ν etc., of the whole branch with those of the whole economy and adjust them in order to acquire the necessary proportionality.

It must be borne in mind here that targets of the plan have to be calculated from year to year.

3.3 The plan for the development of each branch consists of five parts:

a) the estimation of the demand and fixation of the target of production,

b) the estimation of the development of capacity and the choice of the level of technique including the calculation of investment,

c) the analysis of the raw material situation, regarding the supply of raw materials, energy, investment goods etc.,

d) the calculation of the supply of manpower and development of the average wage,

e) the analysis of the location and the regional distribution of the branch in relation to transport costs, new settlements for workers etc.

3.4 Estimation of the demand in the case of the energy sector means that we have to calculate the demand of final energy, i.e. we have to calculate the figures, belonging to the items 5 to 9 of the "balance of final energy".

From the balance of national economy we get the values of energy consumption in all branches outside the energy sector, possibly broken down into groups of products, if we have sufficient experience and concrete knowledge about the *alteration* of the composition of energy consumption. But we need the demand in physical terms, subdivided into all sorts of energy products we have in our balance of final energy. In order to get this we use the methods shown in section 2.3 (on the basis of the energy consumption for branch or on the basis of output). It is not possible at this stage of work to base this calculation on the energy consumption for the most important products of the other branches, because all plans of branches will be elaborated simultaneously. Later on we shall have to correct the demand of energy, when the assortment (composition) of that part of the volume of each branch which is represented by the products planned in physical terms is fixed. By addition of the demand represented by the items 3 to 9 of the balance of final energy we get the "total fund" of each sort of energy products.

Starting with the production of the year 0 and in comparison with our "plan of natural resources" we find out which kinds of energy products we shall have to import; from our general experience of the past years (already available in the balance

of national economy) we have to try to get an estimation of the order of magnitude of the export of each kind of energy products. Later on when we consider the development of capacities and techniques in connection with the investment fund available for the branch and economic benefit(from the point of view of the whole national economy) from increase in investment fund and decrease in imports, we will have to correct this statement. Thus, we get the production of final energy (which means, that part of the total volume of each energy product leaving the energy sector—secondary energy as well as primary energy).

The next step is to analyse the relations between the branches of the energy sector. But this presupposes that we take into consideration the development of technique in each branch in order to find out the changes in the co-efficients of the used-up raw material, because it affects the demand for energy products at the stage of production (e.g. briquette for coking, or soft coal, electricity etc.). In accordance with the investment fund for each branch we can achieve an approximation of these co-efficients which would be sufficient for our purpose. At the end of this process we will get the "gross production" of each energy product and the balances of secondary and primary energy as well. Now we are in a position to see, whether our natural resources are adequate to meet the demand resulting from the projected development of the whole national economy. From the point of view of the possibilities of technical development in the branches, we have a better starting point to decide more precisely which kinds of energy production we have to develop and we get a clearer idea of our important requirements. Here we are also able to weigh whether it is useful to replace to a certain extent the utilisation of one kind of energy by another which may be of greater efficiency (e.g. gas instead of coal), in the various branches *and households.* Such an investigation has always to be made with respect to investment. Having thus got a certain clarity about the direction of the principal development of the energy sector we have now to look for the ways of implementing the plan by means of the requisite investment.

3.5 Now we have all "balance of energy" with such a degree of accuracy that we can proceed to inquire how to meet the problem of expanding capacities. While assessing the demand and production in the various branches and stages of production we have already considered the question of improvements of the technique of production. Here we have to examine the ways of utilising these new techniques.

At first we must learn, what amount of internal reserves can be mobilised in the existing plant by better organisation of the labour, perhaps more shifts, better utilisation of capacities, by reducing the frequency of repairs of the machines or by the removal of bottlenecks in order to get an optimal utilisation. Of course, this may require a small initial investment. Then we should know what amount of new capacities we have to create; we get this amount by dividing the production by the co-efficient of optimal utilisation of the capacities. Having got this we have to decide in which way to cover this requisite increase of capacities, by reconstruction (modernisation) of the existing plants or by constructing new plants. To reconstruct an

existing plant is often cheaper, because it is sometimes possible to use the old buildings while changing the equipment. To decide this, it is necessary that for each plant of importance there should be a "plan of reconstruction" revised from time to time. (These plans we have to know in order to be in a position to decide this question). The rest of growth of capacities has to be covered by new construction. For this purpose we need "type-projects" of plants of the branches, and if there are various levels of techniques, then for different sizes of plants and techniques as well. These projects are rough technico-economic calculations showing the technical pattern of the process of production and all figures mentioned above in para 3.1 (at the end of that para).

The development of capacities in "balances of capacities" take the following form :

BALANCE OF CAPACITY

	Product : Briquette	Physical unit '000	Total capacity in the whole nat. economy	Capacities in the branches. .....
1.	Capacity at the beginning of the year		10000	
2.	Co-efficient of (average) utilisation in p.c.		85	
3.	Loss of capacity during the year		400	
	(a) in connection with replacement (reconstruction)	1st Apr.	400	
	(b) Others		—	
4.	Proportional value of this loss related to the whole year		300	
5.	Co-efficient of (average) utilisation in p.c.		85	
6.	Increase of capacity during the year		1000	
	(a) by new built plants	1st Oct.	500	
	(b) by replacement (reconstruction)	1st July	500	
	(c) by changing the number of shifts		—	
	(d) Others		—	
7.	Proportional value of this increase related to the whole year		375	
8.	Co-efficient of (average) utilisation in p.c.		95	
9.	Capacity at the end of the year		10600	
10.	Co-efficient of (average) utilisation in p.c.		85.0	
11.	Average value of this capacity related to the whole year		10075	
12.	Co-efficient of (average) utilisation in p.c.		85.9	
13.	Output during the year		8500	

As a rule the co-efficient of (average) utilisation of the remaining capacities (given at the beginning of the year) is improving.

Now we have to calculate the investment necessities for the development of each branch. For this purpose we get from the balance of capacities in relation to the technique chosen and the decision about creating the capacity by reconstruction or by new plants (using the above-mentioned figures of investment cost per unit of capacity and using the plans of reconstruction) the amount of investment for these two kinds of investment. Other kinds are the "simple replacement" (replacement of single machines and accessories worn out or destroyed, by identical ones) and "general repairs". From the experience of recent years we have to calculate the share of general repairs in the amount of depreciation. It depends mainly upon the rate of actual depreciation (vide chapter II, section 3.1) which shows the (average) wear and tear of the stock of fixed capital. Furthermore, we have to take into consideration the period of maturity of the new investment i.e. the difference of time between the beginning of the construction and its end at which moment the capacity (the plant) begins to produce (this latter moment is fixed in the balance of capacity).

Lastly we have to calculate the amount of "current repairs" in accordance with the results of our investigation concerning the development of the "rate of current repairs".

A special problem is to find out the development of the "annual rate of depreciation". For this purpose it is necessary to have knowledge about the average life of the new plants and their rates of depreciation. The most important figure is the amount of "net investment", having got this figure we are able to compare it with the figure got from the balance of national economy, so that we can see, if our "plan" is feasible.

3.7. The analysis of the supply of raw material, energy products, investment goods etc., is based on the structural figures shown in section 2.3 ("b"), and other figures, showing the composition of the used up C_p (productive consumption), shown at the end of section 3.1 ("d"), the demand of investment goods we get from the "balance of fixed capital stocks", in terms of value, in "groups of products"; in order to get the demand of equipment goods in physical terms we need the "type-project" of the most important new buildings and the plans for reconstruction of plants. The "rest" of the branch we have to estimate in accordance with the tendencies in the past.

3.8. We have now to consider the plan of the development of man-power and wages.

From the balance of national economy we know the development of the figure "π"—productivity of labour. From the projected development of the level of technique, capacities and investment we have got a more precise knowledge of the increase of the productivity of labour too. Now we may check up the earlier figures and correct them if necessary. We are now also in a position to see whether our new figures fit in with the frame of the development shown by the balance of national economy or whether there are too great differences. The figure "π" (productivity of labour) gives us only the total number of labourers, technicians etc. needed. The absolute demand

of manpower is bigger than the difference e.g. between two consecutive years, because there are workers, becoming 60 (women) or 65 (men) years old and leaving thef actories etc., and there are other fluctuations. In order to get the total number of new manpower we use a "balance of manpower" in the following form :

BALANCE OF MANPOWER

Branch :..... in "man-year"/man

	Total	Professions	
		Locksmiths	Electro-engineers
1. Workmen at the beginning of the year	5000		
2. Retirement during the year, total	200		
a) becoming 60/65 years	180		
b) becoming invalid	10		
c) others	10		
3. Proportional amount of this retirement related to the whole year (1.7)	100		
4. Addition (= demand) during the year, total+	600		
a) from professional education	500		
b) from technical ,,	80		
c) from scientific ,,	20		
d) others	—		
5. Proportional number of this addition related to the whole year (1.9)+	200		
6. Workmen at the end of the year	5400		
7. Average number of workmen available during the year	5100		
8. Increase of workmen (average of the year under contemplation—average of the year before)	—		
9. Productivity of labour	—		

In order to calculate the items "a" and "b" of 2 we need a table showing the composition of the workmen of all kinds in terms of age-groups (from year to year or in groups of "5 years"), and "tables of invalidity". The composition of professions we have to calculate from the development of each of these factors in accordance with the technical level chosen (vide para 3, 5), and from the trends of the "rest of the branch".

The development of the figure 'w' (average wage) we get from the alteration of the composition of workmen in the branch, starting with fixed or changing wage rates in each profession, when there are increasing wage rates with increasing age and similar factors. Later on, after having prepared the plans for all branches we have to implement the increase of wage rates in accordance with the wage policy in

general. But this would require a survey of the composition of total number of workmen in the whole national economy in professions etc. because the wages are different between the various professions.

3.9. A special investigation is required about the regional distribution of the plants belonging to a branch. The location of a plant depends (if we ignore military strategic consideration) mainly on the principle, that there must be an optimal combination between the cost of transport in getting raw materials etc. and that to bring the products of the branch to the place of their consumption from the point of view of the whole national economy. As a rule, branches requiring very voluminous raw materials (like soft coal, ore, and other non-ore minerals) are to be located near the mining industry; on the other hand branches producing consumer goods are mostly to be located near the centres of the consumers. But in each case it is worth making special enquiry to find out what may be the best way of solving this problem. Besides this principle of the minimum of transport costs we have to take into account the development of human settlements and the given distribution (location) of skilled manpower which is sometimes induced to move only with difficulty. The last mentioned reason does not apply to the case of heavy industry, but only in branches requiring less material and much and highly skilled labour.

To solve this problem we use a map, showing

a) the distribution of natural resources, respectively of the factories mainly yielding raw materials, energy etc. over the country,

b) the distribution of the centres of the consumers using the products of the branch,

c) the present distribution of skilled manpower needed in the branch,

d) the given transport facilities.

In larger countries it is advisable to subdivide the country into regions (economic regions, not administrative, which are to develop in an economically harmonious way) in order to investigate the main connection of supply between these regions (regional balances).

On the basis of this map and the calculations connected with the transport of goods we are able to decide preliminarily about the location of new plants or the expansion of existing plants.

Besides this general approach there is, in the branches producing electricity and gas, a special problem to solve : the construction of networks for the transport of both these products (grid system).

4. After all these are done we are in a position to decide about the most economic way of achieving the particular rate of growth. The rate of (annual) decrease in the cost of production is the most synthetic expression of the degree of the growth of economy of a certain product.

5. The long term plan targets arrived at by this procedure are not definitive ones, because:

a) they are not coordinated with the plans of all other sectors and branches concerning

i) the "material balances" (equalisation of supply and demand)

ii) the wage policy and the distribution of manpower,

iii) the balance of foreign trade, and

b) they are also not coordinated with regard to the economic proportions, ruling the development of the whole national economy (accumulation and consumption, faster development of means of production than consumer goods) which we have to do by the balance of national economy.

From this coordination will arise the necessity to correct figures which leads, sometimes, to the complete revision of a plan.