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in discipline

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Theoretical and methodological principles of the general theory of international statistics

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3. Current state of the global statistical system.
4. International economic and statistical standards.
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1. Subject of international economic statistics.

International economic statistics is an important branch of knowledge and practical activity for the collection, processing, analysis and publication of statistical information about economic phenomena at the level of the world economy as a whole. International economic statistics are developed by the statistical services of international organizations after receiving initial information from national statistical bodies, brought to a comparative form, summarized in regional and world summaries, published for wide use in comparative analysis. It evaluates and analyzes data on the level and dynamics of development of the world community and is the basis for relevant forecasts. **The main function** of international economic statistics is the development of international recommendations for the unified calculation of the system of statistical indicators and their groupings according to standard classifications for all countries and territories based on international standards of accounting and statistics, built according to a unified methodology. The zones provide comparability of the composition and methods of calculation of the entire system of indicators for the analysis of trends and patterns of economic development of countries. This is what distinguished international economic statistics with its special subject, object and methods.

The subject of international statistics is the methodology of studying the quantitative side of the state and patterns of development of the world economy. It characterizes not only quantitative, but also qualitative aspects of the economic state and development of countries, their global economic relations, as well as regions and the world as a whole. Now it is represented by a wide network of relative autonomous and independent organizations.

So, if the *object of statistical observation* is the world economy and the economic phenomena that occur in it, then as a rule, a *separate country* is taken as the *unit of observation*. Statistical information about the world economy is based on a unified system of statistical indicators, which are calculated according to unified recommendations developed and approved by international organizations as international statistical standards. International economic statistics summarizes

the current experience of applying a single system of indicators in various countries and international organizations, produces and improves the system of international statistical information with the help of the activities of the UN Statistical Commission and statistical services of other international organizations of the UN system, the International Statistical Institute and other international organizations.

Statistical information of countries, as a rule, differs in the content of indicators, the methodology of their calculation, understanding of the object of statistical observation, periods and moments of observation, units of measurement, etc.

Therefore, international economic statistics faces a number of problems, for the solution of which it is necessary:

1) to coordinate all the most important statistical works of a global nature through the UN Statistical Commission (the highest body that unites the main statisticians from the UN member states from all over the world, founded in 1946) by developing appropriate programs;

2) to move from the development of international standards for individual statistical indicators to the development and improvement of their system for the versatile characterization of the world economy in its various forms;

3) develop and apply methodologies for calculating aggregate value indicators in the same monetary units, taking into account the real purchasing power of the currencies of different countries;

4) to construct reliable values of dynamic series of comparable indicators to identify world trends and make forecasts of the possible development of the world and individual countries for both short-term and long-term periods, developing the necessary models for this;

5) to achieve comparability of the content of national indicators in accordance with defined international standards. Promotion of the development of national statistics on the basis of the implementation of international standards in statistics and solving the problems of unification of collection, processing and distribution of statistical publications of international organizations.

2. **The main stages of the development of international statistics.**

The earliest developments in statistics can be traced in some preserved written and other sources of information from ancient times. However, the first attempts to systematize fragmentary data about other countries were recorded in Europe in the 16th and 17th centuries: these were the works of representatives of the "descriptive school" and especially "political arithmeticians".

The creation of national statistical services in many countries in the 9th and early 10th centuries. opened up the possibility of summarizing the results of their activities and developing general approaches to solving the problems and comparability of the collected data. Such generalizations were initiated by periodic international statistical congresses initiated by the Belgian statistician Adolphe Quetelet.

From 1853 to 1876, nine such congresses were held. The first session of the International Statistical Congress was held in 1853 in Brussels. He began his work with the development of the international classification of diseases - the first international classification (The modern version of this classification - the 10th edition - is a direct continuation of the work on this classification, adopted by the successor of the International Statistical Congress - the International Statistical Institute - in 1893 in Chicago).

A feature of the era of the International Statistical Congress was the introduction of statistical methods commonly used by participating countries.

At international statistical congresses, issues of methodology and content of demographic and criminal statistics programs, their unification in relation to methods of data collection and processing were considered. The subject of discussions was the development of rules for conducting censuses of population, industry, agriculture and trade. As a result of the activities of the congresses, the exchange of information began to be established, and the regular publication of materials on international statistics was started.

International Statistical Institute (since 1885)

The International Statistical Institute is an international professional association whose purpose is to improve statistical methods and promote their uniform application in different countries. The issue of international comparability of statistical data became an important direction of his recommendations, which, however, are not binding either for countries or for international organizations.

In 1913, a Permanent Bureau was established at the Institute of International Studies, which organizes the activities of this international organization and manages the work of the Institute of International Studies commissions. The bureau has been engaged in publishing since 1916. Publishes its International Statistical Yearbook, and since 1923 - a Special Bulletin. This opened a number of the first international regular statistical publications in which various statistical data were summarized.

In 1905, the International Agrarian Institute began to function in Rome, in which a statistics section was formed, its task was to summarize and analyze the data available by country, on land and its use, production of agricultural and forest products, etc. After 1919 this institute cooperated with the League of Nations, with its Statistical Section, and in 1946 it became a member of the UN specialized agencies, summarizing a wide range of information on agriculture, forestry and fisheries, trade in their products in the world, etc.

In 1919, two international bodies were founded: the International Trade Institute and the International Labor Office (now the International Labor Organization), which collected relevant information from countries and summarized it in their statistical directories and bulletins, which were widely used in the world. These organizations closely cooperated with the League of Nations, and after 1946 became part of the organizations of the UN system.

League of Nations (1919-1944)

The League of Nations was founded in August 1919 in London. An important stage in the formation of international statistics was the Conference on International Cooperation in the Field of Statistics convened by the League of Nations in 1919, as well as the creation of a section of economics and finance in the Secretariat of the League of Nations, which included a special division of statistics. This section, with the help of the International Statistical Institute, began developing a system of indicators of international statistics, formulated principles and recommendations for the uniform calculation of such indicators. Other international organizations in which statistical services functioned were also involved in the development of such a system of indicators.

In 1928, a conference on economic statistics was held, its task was to develop a list of statistical data for comparative characteristics and methods of calculating indicators of the development of individual countries and the world economy as a whole. The conference did not fully achieve this goal, but general principles were formulated for certain branches of statistics (statistics of foreign trade, industry, agriculture, fisheries, statistics of professions, methods of calculating wholesale prices and subsistence minimum indices). The statistical apparatus of the League of Nations together with the International Statistical Institute started the implementation of international comparisons of statistical indicators on a comparative basis (indices of the physical volume of industrial production, national income, as well as a number of natural indicators of production and population characteristics). But most of the statistical materials that were published were only a simple compilation of materials received from individual countries. Moreover, coverage of countries in League of Nations publications was often incomplete, although regular attempts were made to include data on a larger number of countries and indicators. Statistical publications under the auspices of the League of Nations, in fact, started regular issues of international yearbooks, directories, bulletins and various studies of the state of the world economy and individual regions. A significant part of such publications is still used in the analysis of long-term trends in the development of the world economy and humanity.

The UN and other international organizations (since 1945)

The modern system of international statistics was formed and developed after the Second World War. This system is much more advanced than the previous ones, but still very similar to them. Therefore, there is no need to describe the existing system even in general terms. At the center of the system are the statistical bodies of the UN. There are specialized agencies and other structural units under the auspices of the UN. In addition, regional organizations such as the SC and the OECD, which are not part of the UN, have been established. The UN

and some of its agencies have regional offices in all regions of the world, but they are best represented in Europe. The modern system of organizations for international statistics is more international than before, even despite the inequality of social conditions and the level of economic development of countries. The current stage of the development of international statistics differs significantly from all previous ones in its high methodological and organizational level due to the use of the previously accumulated experience of international statistics and national statistical bodies along with the practical activities of individual specialists.

According to the Charter of the United Nations, in 1946 the Economic and Social Council of the United Nations (ECOSOC) was established as one of the bodies of the world forum of countries. Its function included the study of international problems in the field of economy, social life, culture, education, health care and other similar aspects of the life of the international community of countries, the development of recommendations in these areas for the UN General Assembly, as well as member countries and interested specialized institutions.

Five regional economic commissions were founded under ECOSOC, at which regional conferences of statisticians began to work in Europe, in the countries of Asia and Oceania, Africa, and Latin America. In the secretariats of the last, statistical departments have been created as permanent executive bodies of regional statistical conferences to promote the implementation of international statistical standards and UN recommendations in relation to the conditions of these regions or to develop regional variants of international standards. Under ECOSOC, nine functional commissions were also formed, in particular the United Nations Statistical Commission (UNSC). Alongside these functional commissions, ECOSOC established a system of specialized institutions linked to the UN statistical department by special agreements. The UN cooperates with dozens of other international organizations directly related to its activities, functioning independently and not formally included in the UN system, but also having their own statistical services, which make proposals for the development and implementation of relevant statistical standards.

In 1993, the Department of Socio-Economic Information and Analysis of the Results of Development Policies and Programs Implemented by International Organizations was established at the UN Secretariat. Its task is to generalize and coordinate the activities of the entire UN information system (not only statistical) in the field of social problems and the economy. It is designed to integrate and improve all the relevant information in the world based on the concepts of SNR and databases of international computing centers of the UN system. This department is also entrusted with the responsibility of preparing the world economic and social survey.

Thus, the UN laid the foundations of a unique system of international statistics based on uniform methodological principles and coordination of the most important statistical works of both individual countries and international organizations. This system functions successfully and is being improved through the implementation in practice of an increasing number of countries and

international organizations of statistical standards developed by the UN, among which the standard of national accounting is of primary importance for the system of interdependent generalizing characteristics of the state and development of countries.

3. Current state of the global statistical system.

The basis of the global statistical system is the statistical services of the UN - the Statistical Commission and the Statistical Department in its Secretariat, as well as statistical units of specialized agencies and other bodies in the UN system. The *UN Statistical Commission* plays a key role in the organization of statistics not only in the UN system, but throughout the world. It is based on the decision of the first session ECOSOC in 1946 as a body that prepares drafts of all international recommendations in the field of statistics.

It is entrusted with the following *main tasks*:

- to promote the development of national statistics and their international comparability to coordinate the statistical work of organizations of the UN system;

- to improve the statistical service of the UN Secretariat;

- develop recommendations on general problems of collecting, processing and distributing statistical data in the world;

- to contribute to the general improvement of statistics and its methods; - advise international organizations on problems of collection, processing and distribution of statistical data;

- to serve as the central body for the collection, analysis, standardization and improvement of statistical data and their publication.

Currently, the UN SC consists of 24 members who are elected on a rotating basis for a term of 3 years, its sessions are held annually at the UN headquarters. International principles and standards are finally formulated by the decisions of the UNSC. The Commission also prepares reviews of countries' practices in certain fields of statistics. The results of each UNSC session are reported to ECOSOC.

The specialized agencies of the UN system include those that are associated with the UN by special agreements and have divisions for summarizing statistical information in their spheres of activity: Food and Agricultural Organization;

- International Labor Organization
- International Monetary Fund;
- IMF, Board of Data Dissemination Bulletin;
- International Telecommunication Union;
- International trade center;
- UN Institute of Statistics for Education, Science and Culture;
- United Nations Organization for Industrial Development;
- The World Bank; - International Civil Aviation Organization;
- World Health Organization;
- International Meteorological Organization.

The following international organizations with their statistical departments act as special bodies of the UN:
- Children's Fund;
- Commissariat for displaced persons;
- UN Development Program;
- Institute for Training and Research;
- International Financial Corporation;
- World Tourism Organization;
- Agency for assistance and assistance to displaced persons;
- Research Institute of Social Development;
- International food program and others.

Some of these organizations can be characterized. In particular, the food and agricultural organization is developing a system of statistical indicators of agriculture, fishing and related industries — forestry, trade in these products, livestock production balances, etc. It develops programs for censuses of these industries and other surveys, a methodology for calculating relevant indicators, and calculates indices of world production of agricultural products. The *International Labor Organization* develops and improves a system of indicators for various characteristics of the workforce, its use, wages, length of the working week, unemployment, living standards, labor productivity, consumer prices, strikes, etc. It also prepares projects of recommendations, classifications, surveys in this field of statistics, along with summarizing source information from countries and preparing the ILO statistical yearbook and various bulletins.

Based on the generalization of information on the activities of financial institutions in the world, the *IMF* (International Monetary Fund) prepares international recommendations on uniform accounting of financial transactions, registration of monetary and currency resources, exchange rates of national currencies, settlements between countries, assesses their economic condition to determine the size of possible international loans and the rates of use of such loans. The most important IMF methodological standard is the Balance of Payments Guide.

UNESCO (on issues of education, science and culture) developed and continues to improve a unified system of indicators and methodology of statistical accounting of the process of education, culture and science in the countries of the world, because before the formation of this international organization in 1950 such a section of international statistics did not exist. UNESCO carries out a wide variety of surveys of schools and other educational institutions, mass media, education of foreigners and other aspects of this field of statistics. A statistical yearbook, reports on conducted surveys, etc. are published.

The World Health Organization summarizes the experience of statistical observations in different countries on the state of health of people, their diseases and causes of death, develops classifications for such phenomena, also collects information about existing medical institutions, their staff, etc.

UNEP - the United Nations Environment Program - has recently become operational, and its employees have developed a number of international recommendations for assessing human impact on the environment. A system of indicators for the reproduction and use of natural resources has been developed and also a number of standards for maximum permissible concentrations of harmful substances in water, air, etc.

International standards for the statistics of the results of intellectual activity, developed by specialists of the *World Intellectual Property Organization*, have gained great importance. These standards regulate the same understanding of applications for patents registered in the countries of the world in various fields of human activity, issued patents within their single classification, date of issue and terms of validity of approved patents. The procedure for registering individual trademarks, samples and models of products, etc. is regulated in a similar way.

About five thousand international organizations are currently functioning, collecting, processing and analyzing various information. But far from all of them can be attributed to international statistics, because only about two thousand of them regularly collect and process the received statistical information and are data sources for international statistics. Among these international organizations, the following important groups can be distinguished based on the scale and nature of the statistical data they publish:

1) global organizations are organizations of the UN system that summarize the initial information of countries into regional and global totals according to a certain system of indicators and according to uniform methods of their calculation;

2) regional - these are organizations of certain groups of countries such as the EU, the CIS and hundreds of others, whose statistical services collect, summarize and publish data on these groups of countries, based on the tasks of these organizations;

3) professional organizations developing scientific problems of statistics and analysis of the most important socio-economic phenomena in the world. The International Statistical Institute, the International Association for the Study of Income and Wealth (IAWRI), the Pan-American Statistical Institute (PASI), and others actively participating in the discussion of problems at the UNSC play a significant role here. Along with them, there are hundreds of international professional institutions that, to varying degrees, develop problems related to the comparison of statistical indicators and other problems of international statistics;

4) narrowly professional - these are international organizations that summarize detailed information from countries for certain types of products or services. Among them, we can name international associations of producers of sugar, wheat, coffee, tin, rubber, cotton, jute and many similar raw materials. These organizations determine the amount of available product stocks (at the beginning and end of the year), production, consumption, trade, as well as prices for these goods and services. In other words, they make up the regional and world balances of hundreds of types of products.

A striking example of a regional statistical organization is Eurostat (Statistical Office of the European Community), a statistical service of the

European Union (EU), whose headquarters are located in Luxembourg. Founded in 1953, Eurostat works to meet the growing demand for statistical information in connection with the expansion of European integration; international trade and industry organizations; political figures; private and public institutions, universities and other educational institutions; mass media; private individuals. Every year, Eurostat makes more than 100 different publications, which come out at irregular intervals. Depending on the topic and its importance, they are translated into nine languages of the Union.

A number of publications have a *thematic nature*: general statistics; economy and finance; population and social conditions; energy and industry; agriculture, forestry and fishing; foreign trade; the balance of payments; services and transport; environment and others. Individual publications are *classified by series*: yearbooks, short-term publications, reports, reviews and statistics, research and analysis, methods and methodology, abridged reports. Eurostat produces and distributes statistical information also in the form of electronic products of varying frequency and volume. These can be diskettes, magnetic tapes, etc. Eurostat stores a large amount of information in various databases, some of which are available to the general public through commercial structures and can be obtained.

4. International economic and statistical standards.

Differences between accounting and statistics systems used in individual countries of the world create difficulties for the development of foreign economic relations of countries and their cooperation with international organizations, integration into international cooperation. The processes taking place in the economy of Ukraine have strengthened the need for closer approximation of the current statistical methodology to international standards. Data on the availability and content of current standards for statistics and accounting is, obviously, a primary condition for ensuring the transition to these standards. Such standards were developed at different times by experts of the UN and international organizations that are part of the specialized bodies of the UN system. They are built on certain principles. Among the possible *principles of activity* in the field of economic statistics, the accuracy, timeliness and importance of economic statistics, degree of computerization, coverage when collecting information about economic processes, quality and efficiency of statistical information are important. Among the statistical standards of the UN, the following can be distinguished: *international standard classifications in the field of statistics*; international provisions on the calculation of statistical indicators; international recommendations on building a system of national accounts of the balance of payments, state finance statistics, monetary statistics; international handbooks on statistics and various technical regulations. The classifications of indicators of the fields of statistics, developed in the system of the UN organization, constitute an important section of the international standards in the field of statistics after the SNR. These documents were largely taken into account when creating similar classifications used by Ukrainian statisticians, but they are not implemented enough.

The use of the principles of double entry of all accounting transactions in the SNR required the UNSC to agree on the principles of accounting entries for the reflection and balancing of transactions in the national accounting. Specialists of the Committee on International Financial Reporting Standards and the International Securities Commission were involved in such reconciliation of primary and national accounting systems. The result of this work was the emergence of International Financial Reporting Standards (IFRS). These standards regulate only the most important provisions of accounting, which ensures the same content of accounting operations and their comparability.

The next section of international standards in the field of statistics should be considered the provisions agreed by the UN on the methodology of calculations of many statistical indicators and their systems. They also contain separate classifications for statistics of individual industries. Among these provisions, we can single out the "Interim International Guidelines for National and Industry Balance Sheets" (1979) and "Guidelines for Statistics of National Wealth" (1979), which proposed a methodology and classification of indicators of national wealth. Programs for regular world censuses of population and housing, industry, agriculture, which are issued periodically, numerous regulations for surveying family budgets, households, population registers and similar accounting systems, conducting sample surveys, as well as energy and social security statistics attract attention, employment, unemployment and workforce, cases of mutilation at work.

The most important international statistical standard is the *System of National Accounts* (SNA). Its first version was developed in 1951, approved in 1953 by ECOSOC. The second version was approved by ECOSOC in 1968 and the third version in 1993. (The national accounts of Ukraine are prepared according to the new versions of the international standard SNR-2008 and the European standard ESA -2010). The use of the principles of double entry of all accounting transactions in the SNR required the UNSC to agree on the principles of accounting entries for the reflection and balancing of transactions in the national accounting. Specialists of the Committee on International Financial Reporting Standards and the International Securities Commission were involved in such reconciliation of primary and national accounting systems. The result of this work was the emergence of International Financial Reporting Standards (IFRS). These standards regulate only the most important provisions of accounting, which ensures the same content of accounting operations and their comparability.

IFRS can become a globally recognized system of financial reporting rules. This can contribute to the improvement of the quality of the aggregated indicators. IFRS standards can be grouped in the following areas:

- general methodological; - standards characterizing commercial associations; - standards characterizing certain types of activity; - standards that take into account state subsidies and social measures. International statistical reference books published by the SC can be allocated in a separate section. Among them are "Handbook of International Weights and Measures" (1955, 1966), "Nomenclature of Geographical Regions for Statistical Needs" (1950, 1960), "Handbook of Conversion Factors for Data on Agricultural Products" (1968),

"Names of Countries and Nationalities" (1966), "Customs zones in the world" (1950), etc. Currently, Ukraine is implementing a program to improve domestic statistics, as well as accounting and financial accounting in accordance with international standards in this field. In addition, there are also standards of other organizations that are not part of the UN system, but are based on the principles of UN standards, as well as on the recommendations of specialists working in the UN system.

The *main task of such international standards* is to ensure the same construction of national systems of statistical information, comparability of indicators according to their content and calculation methodology; facilitating the comparative analysis of the development of countries in comparison with regional and world phenomena. It is very important to adhere to such standards when publishing data in statistical yearbooks, directories, bulletins, UN analytical reports, etc. International professional organizations also participate in the development of international standards, among which the Committee on International Standards and Financial Reporting (since 1973), the International Federation of Accountants (since 1977), the European Federation of Chartered Accountants (since 1983) play an important role).

Since 1982, international standards have been summarized and coordinated by a special Intergovernmental Working Group of UN experts, which makes proposals for improving current and implementing new standards, starting from primary accounting to consolidated financial indicators by country. These accounting standards are aligned step by step with the methodology of national accounting, especially based on the principles of the international standard SNR-93. The UNSC also summarizes the experience of countries in the improvement and unification of statistical information in the world in order to make appropriate corrections in the system of international standards of accounting and statistics. For this purpose, working groups of specialists are created, which study all innovations in various fields of statistics and prepare draft proposals for improving current or developing new UN international standards. Approved international standards, recommendations, classifications, technical manuals, handbooks and other UN documents in the field of statistics are published in two main series: *Methodological notes* (Series P) - standards and recommendations. *Statistical reports* (Series M) – instructions on the procedure for conducting statistical surveys, handbooks and other documents. These international standards and recommendations are the basis of the developed special questionnaires, which the UN sends to all countries for each type of statistical indicators to collect information from countries. Data from the questionnaires returned to the UN organization are summarized. National data collected in this way are used in UN statistical publications. Most of the international statistical standards of financial reports are periodically updated and supplemented as countries accumulate experience and improve their statistical information systems, as well as increase the reliability of the developed indicators of international statistics.

6.   Critical problems of economic statistics.

Considerable conceptual, methodological, and practical work in the field of international statistics is currently being conducted in the area of so-called critical problems in economic statistics. Many of them were resolved with the participation of national and international statistical organizations of various purposes on a voluntary basis.

In 1995, the UN Statistical Commission, when discussing critical problems in economic statistics, recognized that effective work on problems related to the development and dissemination of absolute, relative and temporal economic indicators, as well as their interpretation and use, supported the integrity of statistics. Responding to the concerns of statisticians of four countries (Australia, Canada, India, USA), the UN Statistical Commission and the Organization for Economic Cooperation and Development created the *Expert Group on Critical Issues in Economic Statistics*. The purpose of the work of the Expert Group was to systematize publications and reports of the UNSC at the 1997 meeting. Decision-making by the UN Statistical Commission attracted the serious attention of international agencies on the problems of economic statistics. An expert group of the United Nations Statistical Commission reported on progress on the so-called critical problems of economic statistics in 1997. The issues were considered to have the potential to affect users of economic statistics if they were sent to the wrong address.

The problem became acute thanks to the joint efforts of many national and international statistical agencies. The expert group focused its attention on problems that concern users of economic statistics. Among them, the following were recognized as the main ones: 1) insufficient data; 2) distrust of users in statistical data; 3) a mismatch between the supply of statistics and the demand of users. The group recognized that the solution to these problems lies within: - coverage, periodicity and timeliness of data; - its integrity and public access; - data quality and relativity. Integrity, clarity and public access have been proven to be fundamental principles of official statistics. The expert group formulated six questions regarding the processing of critical problems and specifically identified new methods. In addition, progress was noted in the case of critical problems over the past few years - this is the quality work of national statistical services. In 1999, it was agreed with the UN Statistical Commission that a document should be promoted that would improve understanding of the fundamental principles of official statistics, promote awareness and help their implementation. The UN Statistical Commission has been working on a website that will showcase this document and act as a cross-reference system for relative government practices. The expert group noted that environmental issues are relevant for national statistics programs. The expert group determined that this issue is also important for international organizations.

The results of balancing data needs at the regional, state, and national levels were recognized by the Expert Group as a growing factor in the limited resources

of statistical activities. Regional accounting was taken under special attention, which is laid out in the 3-volume " *Handbook Regional Accounts* ".

Statistical assessment of the informal sector is an important part of economic statistics. The Delhi-based group, set up by the Indian Bureau of Statistics, deals with informal sector statistics at a conceptual and practical level.

Another problem is the statistical consequences of the globalization of the world economy. In recent years, it has been the focus of international and national statistical agencies. In addition to theoretical problems, there are many practical problems in the study of capital markets and cash flows. Attention was paid to the rise in demand in natural resource markets, expressed in physical and monetary units. The London Environmental Accounting Group is responsible for the draft UN handbook on the system of integrated environmental and economic accounting. Statistical calculations of the so-called intangible product were also recognized as quite problematic, that is, one of the main critical problems.

The expert group identified many directions for solving methodological problems of price indices. An important result of her work was the preparation of manuals on the statistics of consumer and production price indices. The expert group was authorized to develop proposals for further revision of international standards. The expert group noted that due to the clarity and timeliness of the international comparison of prices, a significant advancement of international statistics was achieved. The IMF's role in the development of the special data dissemination standard and master data dissemination systems was noted. Implementation of this standard in national statistics has become mandatory for every country.

7. The role of statistics in the formation of the information infrastructure of the world economy.

International and foreign information systems are integrated with the information infrastructure of a separate state. The state does not act in isolation from the foreign economic, public and information environment. Political contacts, economic interaction forces the merging of infrastructural information systems of different countries. The international community realizes this goal by approving information standards and information systems. They are dealt with by the UN and specialized organizations operating within the framework of the UN. This activity is known only to specialists. UN commissions, first of all the statistical commission and statistical departments of the UN, FAO, WHO, UNESSO, UNDP, UNIDO, ILO, WIRO and many others, in addition to political activities, are engaged in collecting information and developing information standards. Countries that are members of these organizations, in addition to the very fact of membership, are obliged to adhere to these standards. These are the following systems:

1. Information structures of international organizations of which the country or its government bodies are members, for example, the UN statistical systems.

2. Specialized information systems of international activity, which are a component of the country's infrastructure, for example, the Reuters economic service - a source of information about currency rates and stock exchange quotations, official data of statistical publications of countries and international organizations; DERWENT patent information system; information system of the international standardization organization ISO, etc.

3. International sources of mass information, with which the infrastructure systems of this country systematically interact.

From the point of view of connections of domestic systems with international systems, the following can be distinguished:

a) information systems of official international organizations, before which each country has obligations to transmit information. These tasks are assigned to the relevant information systems of the state, which, thanks to constant connections with such foreign systems, acquire the appearance of infrastructure. For example, Ukraine is a member of the UN, which requires Ukrainian statistics to provide information to the UN statistical services. The process of Ukraine's integration into the EU structures imposes an even greater information obligation. Ukraine's membership in most international organizations is associated with obligations to transmit information;

b) information systems of official international organizations from which this country has the right to receive information; ordinary information systems of international organizations provide information to their members on the principles of exclusivity or preferential treatment;

c) specialized international information systems that offer information to everyone. For example, patent information system (DERWEN);

d) specialized international information systems that do not have an official status. They operate on a commercial basis or are financed by scientific, public or economic organizations. Examples of such systems are systems of scientific and technical information in the field of medicine (MEDLINE), chemistry (CAC), electronics and electrical engineering (INSPEC);

e) international organizations that describe information standards, such as EAN (interoperability in the field of barcodes), UNEDIFAKT (organization that processes information for the electronic transmission of documents), FID (international federation for setting standards for library catalogs, descriptions, documents, ISBN numbering and ISSN, classifications, including UKD), and, finally, ISO, which conducts extensive activities in the field of information standards.

Organizations initiate and coordinate cyclical or one-time processes on a global scale. For example, censuses of the population, housing conditions, food conditions, level of agricultural development, including the issue of the complexity of natural conditions for agriculture, must be conducted in all UN member countries. These censuses must be carried out according to uniform methodological standards. The important function of standardization of information on a global scale is performed by the WTO, the World Bank and the International Monetary Fund. The UN uses the works of such specialized organizations in the field of

standardization as ISO, UN/EDIFST. For many elementary and typical data, there are standards in the global range. Analyzing the practice of annual countries, we consider the following models of institutionalization of the information infrastructure of the state:

1. The European model, which is characterized by the principles of balance between the rights and information obligations of the state, as well as individual citizens. This model is commonly used in most European countries. Hence the proposed name of this model. A feature of the European model is also the regulation of the information infrastructure of the state with the help of legal acts (ehr), which reflect the specifics of the rights and information obligations of citizens, state bodies and other organizational units. Regarding the information infrastructure of this model, we are faced with the so-called deep intervention of the government on a national, regional or even global scale.

2. American model. Its characteristic feature is that citizens have a priority right to information. The state and non-state economic and public formations are entrusted with the duty of providing information to citizens. In addition, a characteristic feature of this model is the balance between rights and obligations regarding the information of state bodies and non-state economic and public formations. This model operates in a rather imperfect form in the USA and other countries with similar public administration functions. Hence the name of the model.

3. Asian model. The essence of the Asian model is that the state reserves the right to accumulate, classify and prohibit access to information. At the same time, citizens and non-state economic and public formations are obliged to provide information to state bodies and receive information through the same bodies. The costs of implementing these duties are borne by citizens, companies, and non-state public organizations. They are obliged to collect and store information in the form and according to the technology determined by the state. Citizens and other non-state formations are responsible for the refusal and non-fulfillment of these duties. It can be financial or even criminal responsibility. Citizens, other non-state associations are also charged for errors arising from ineffective or poor functioning of information systems imposed by the state. This model existed in a modified form in the Soviet Union. It takes place in states with a strong influence of the state apparatus on public and economic life. It should be remembered that this model existed in most European countries until recently, and in some its characteristic features are still present. According to the Asian model, the state has the exclusive right to form the information infrastructure of the economy and the public. Already now, most countries have abandoned the development of their own information scientific and technical systems and use international information services, as a rule, in English. Some information services are created by groups of countries. Such international institutions in some cases replace their own information services. Intensive creation of international information structures is observed in the EU. This is an important feature of the integration of EU member states, which is the basis of integration in other aspects, including those in which the EU receives funds from the Union budget. The influence of individual countries, and

especially small and medium-sized countries, on the formation of information infrastructure segments is limited. Limitations arise primarily because the administrations of these countries do not fully realize the importance of the functioning of external information systems for small and medium-sized countries. Most information systems of international organizations are created and managed by countries or representatives of countries that dominate economically or politically.

International statistical classifications of economic activity

1. International classifications of types of economic activity (KVED).
2. International product classifications.

3. International functional classifications (expenditure by purpose).
4. International classifications of occupations, professions and education.
5. International experience of building a system of statistical registers.

1. International classifications of types of economic activity. Classification in international statistics is the distribution of elements of the population according to a certain characteristic or several attribute characteristics, which is considered as a standard and approved by the UN commission. The UN Statistical Commission registered the following classifications of types of economic activity at the international (world) and national levels1.

Recommended:

— International standard sectoral classification of all types of economic activity (International Standard Industrial Association of All Industries ISIC Reu.3). Recommended in 1989;

— International standard industry classification of all types of economic activity (ISIC Keu.2). Recommended in 1968;

— International standard industry classification of all types of economic activity (ISIC Keu.1). Recommended in 1958;

— International standard industry classification of all types; of economic activity (ISIC) - Original version. Recommended in 1948.

Analogue:

— general sectoral classification of all types of economic activity in the European Community (General Industrial Classification of All Activities within the European Communities NAC Reu.1). Recommended in 1970.

Related:

— North American Industrial Classification System (North American Industrial Classification System NAICS-Санада);

— North American Industry Classification System (NAICS- Mexico);

— North American Industry Classification System (NAICS-USA);

— Australian and New Zealand Industrial Classification (Australian and New Zealand Industrial Classification ANZSIC).

Statistical classifications of types of economic activity, products and goods are also used at the European level (Eurostat classifications).

Table 2.1.
INTERNATIONAL SYSTEM OF ECONOMIC CLASSIFICATIONS

Level	Types of economic activity	Product	Goods
World level	ISIC	CPC	HS
Level ЄC	NACE	CPA	CN
National level	КВЕД	СКП	УКТЗЕД

For developing the European system of statistical classifications, the structure and description of the UN International Standard Sectoral Classification of all Types of Economic Activity (ISIC) was adopted as a basis.

International standard industry classification of all types of economic activity (ISIC)

ISIC is intended for the description of institutional units according to their main classification feature - the type of economic activity. It is used in the system of national accounts, accounting, tax accounting and other branches of economic science, in statistical practice, when identifying enterprises according to types of economic activity. ISIC is also used as a basis for developing classifications of types of economic activity at the national and international levels.

Attempts to create an international standard classification of all types of economic activity date back to 1853, 1895, 1925, and 1938. Its initial version was adopted in 1948. Since then, the CIS (corporate information system) has been widely used both at the national and international levels when classifying data by type of economic activity in the field of population, employment, production, national income, as well as other economic and social statistics. In a number of developing and transforming countries, the international standard classification of all types of economic activity is used as a basis for developing their own classifications of all types of economic activity. For example, it was implemented in Ukraine in 1996. A significant degree of comparability was achieved between the classifications of individual countries and the international one. At the same time, the correspondence of the categories at the levels of detail adopted in the national classifications to the international one was ensured. Now more and more countries are constructing their statistical series of indicators in accordance with the international standard classification of all types of economic activity. These are the United Nations, International Labor Organization, FAO (Food and Agriculture Organization of the United Nations), UNESCO and other international organizations that use this classification for the publication and analysis of statistical data.

As the experience of using the international standard classification of all types of economic activity shows, it is necessary to periodically review the structure and define its categories and basic principles, since changes are taking place in the organization of economic activity and new types of economic activity are gaining strength. Some aspects should be expanded, clarified or improved. For this purpose, in 1956, 1965 and 1979, the CSI was revised and revised by the UN Statistical Commission. In each of the cases, the commission maintained (to the extent possible) comparability between the revised and previous versions of the classifications, despite the changes, modifications and other improvements made.

The international standard classification of all types of economic activity is based on one of three features:
- the purpose of the products being produced;
- unity of production technology;
- homogeneity of the raw materials used.

Object of classification — types of economic activity of economic entities.

ISIC consists of such 17 sections:

A. Agriculture, hunting and forestry.

B. Fishing.

C. Mining industry (mines and quarries).

D. Processing industry.

E. Production of electricity, gas and water.

F. Construction.

G. Wholesale and retail trade; repair of cars, motorcycles and household appliances.

H. Hotels and restaurants.

I. Transport, warehousing and communications.

J. Financial activity.

K. Real estate transactions, leasing and business services.

L. Public administration.

M. Education.

N. Health care and social assistance.

O. Collective, public and personal services.

R. Private home service.

Q. Extraterritorial activity.

Institutional units are classified according to activity criteria. If the share of one of the types of activity in the total amount of added value is more than 50 percent, then this type of activity determines the classification of this unit. In other cases, classification rules should be applied. Classification is carried out in degrees from top to bottom, from the highest level of aggregation, which corresponds to the section code (1 letter), to the subclass (5 digits); between them are subsections (2 letters), sections (2 numbers), groups (3 numbers) and classes (4 numbers). The grouping at each level must be compatible with the classification at the previous level.

Production or economic activity (hereinafter - activity) is determined depending on the interaction of the means of production (equipment, labor force, technology, information network, types of products) that encourage the production of certain goods or services. If the same unit carries out several types of activities, then the types of activities that are not auxiliary are grouped depending on their added value. There are *primary and secondary types* of activity.

If value added data are not available, other criteria such as employment, wages and salaries, sales volume, equipment value, etc. should be applied to achieve as close as possible to a value added classification.

Auxiliary activities are connected with the main and secondary activities. For example, the activities of administration, accounting, computers, canteens, purchasing, selling and marketing, warehousing, repairs, transportation, etc. This auxiliary activity within the unit is performed to ensure or facilitate the production by that unit of goods intended for sale to the party. The products of auxiliary activities are not released to the side.

2. International classification of products.

The UN Statistical Commission has registered the following product classifications:

Recommended:

— Central Product Classification (CPC), Version 1.0;

— Preliminary classification of the main products;

— Harmonized Commodity Description and Coding System (HS). Analogue:

— International Standard Trade Classification (Standart International Trade Clasefication – SITC Rev.3);

— Classification of the most common economic categories defined in terms of S1TC Rev.3 (CIassification by Broad Economic Categories Defined in terms of SITC Rev.3 - BEC);

— Classification of products by types of activity (Classification of Producd bu Adivity - CPA).

The international standard sectoral classification of all types of economic activity cannot be used to measure the volume of production at any detailed level, because it is impossible to establish an unambiguous correspondence between types of activity and production. For this, a separate classification was developed - Classification of main products (CPC).

Classification of the main products (CPC).

The purpose of creating the CPC is to lay the methodological foundations for the international comparison of statistical data on products. The classification of the main products is the basis for countries that develop a new or adapt an existing similar classification according to international standards. CPC is used in the statistics of agriculture, industry and other sectors of the economy, the system of national accounts, foreign trade statistics. The purpose of CPC is to describe the economy in terms of produced and consumed products. The term "Product" means goods and services.

The CPC is recommended as a basic classification for the development of certain product classification rules for international and national levels. It is related to ISIC by a transitional key due to the correspondence between the types of economic activity and the results of this activity - products.

The CPC coding system is built on the basis of a ten-digit system, while each level of the five hierarchical levels corresponds to a code consisting of a maximum of five digits. The first digit is intended to identify the section. If we add one more digit, we define the unit, one more – the group, then – the class, and all five digits characterize the subclass. The classification of the main products covers all types of products that can be the object of a domestic or international agreement or serve as a reserve, including movable and immovable goods and services, property values of a non-productive nature, including land plots and intangible assets, values (patents, licenses, trademarks and copyrights). Another important feature of the CPC is that it provides a description of the services.

CPC covers the entire range of products of industries that produce a wide variety of services, and such that would serve the various analytical needs of various areas of statistics. The acceleration of technological progress in many

industries has given rise to new services such as financial, computer, consulting, maintenance and other commercial services. To collect and compile data on such services, it is very important to develop the main concepts of assigning services to one or another type of activity.

CPC is built on certain methodological principles. Homogeneity within categories approaches maximum. The CPC categories for transportable products are based on the physical characteristics and internal nature of the products. These features are characteristic of the product itself, for example: raw materials from which it is produced; the stage of production at which it is located; the possibility or impossibility of its preservation; method and purpose of its production; its purpose or category of users for which it is intended; the prices at which it is sold, etc. The criterion of sectoral emergence of products is used (connection with KIS). The production method of the product does not necessarily correspond to its species origin, although very often they coincide. In some cases, one type of activity produces completely different products. The same problems regarding species origin arise in cases where the products of some activities are both goods and services. It should be understood that the nature of certain services may differ significantly from the nature of products, and as a result, these products and services are included in different parts of the SRS. A separate section is devoted to these services.

The distinction between products and services is important from a theoretical point of view and may be necessary when processing and analyzing individual economic statistics data. If the object of any operation does not fall under the category that refers to products, then it should be assigned to another category of CPC.

A type of classification in international statistics is commodity nomenclature. In the nomenclature, all products are assigned appropriate product codes and assigned appropriate places. The most widespread in the practice of foreign trade is the nomenclature of the Council of Customs Cooperation, developed in 1976 on the basis of the Brussels customs nomenclature, which was used since 1951. In addition to the function of international trade classification, it performs the role of a classification scheme in the construction of national customs tariffs. The main grouping characteristic, laid down in the basis of the Brussels customs nomenclature, was the nature of the materials from which the goods were made. However, in the future, a regrouping was made, and the basis of the nomenclature of the Council of Customs Cooperation was the indication of the degree of processing and the origin of the goods. The nomenclature of the Customs Cooperation Council became the basis for the development of the main international foreign trade classification of the 90s - the Harmonized System of Description and Coding of Goods (HS).

In 1973, the Harmonized System Committee was established within the framework of the Customs Cooperation Council. Experts from the General Agreement on Tariffs and Trade (GATT), the International Trade Center (UNCTAD), the International Cake Chamber (ITC), the International Organization for Standardization (ISO), the UN Statistical Office and other non-governmental

and intergovernmental economic organizations participated in its activities. On June 14, 1983, the International Convention on the Harmonized System was signed. At the end of 1987 it was signed and ratified by 53 countries, which enabled the Customs Cooperation Council to announce that it entered into force on January 1, 1988. The Annex to the International Convention is the Nomenclature of the Harmonized System (HS) - a multipurpose classifier of goods on the world market.

In Ukraine, the Harmonized System has been used to maintain foreign trade statistics and develop an effective customs tariff since January 1, 1991. According to the general rules of the World Customs Organization, the Harmonized System of description and coding of goods is changed once every five years. The updated version of the Harmonized System is formed by introducing a number of amendments and changes that take into account changes in trade volumes and scientific and technological progress, which in turn causes the appearance of new goods with new properties that need to be reflected in the Harmonized System of description and coding of goods. The new sixth edition of the Harmonized System of Description and Coding of Goods of the World Customs Organization, which is used by 207 countries of the world, entered into force on January 1, 2017 (GS-2017)3. As for Ukraine, the current edition of УКТЗЕД is built on the basis of the 2012 version of the Harmonized System of Description and Coding of Goods of the World Customs Organization4. The State of Ukraine is obliged to ensure that the national УКТЗЕД (UKTZED) is brought into compliance with the current edition of the Harmonized System of Description and Coding of Goods GS-2017 as soon as possible.

According to its structure, the NHS is divided into classification systems and coding.

Classification system
he object of classification is all goods circulating in international trade, they are grouped into six subdivisions: 21 sections, 96 groups (in addition, group 77 is a reserve), 33 subgroups, 1241 product items, 3558 subheadings, and 5019 subheadings.

The construction of the NGS is based on a set of different characteristics of goods. Sections are formed according to the following characteristics: 1) the origin of the material from which the goods are made; 2) purpose of the product; 3) chemical composition of goods.

The groups were created according to the principle of sequence of goods processing: from raw materials, semi-finished products to finished products. This facilitates the use of the Harmonized System when determining customs tariffs. When building product positions and sub-positions, 4 main features are taken into account: - degree of processing; - assignment; - the type of material from which the product is made; - the value of the product in world trade.

At the same time, the principle of unambiguous assignment of goods to classification groups is strictly observed, applying the mutual exclusion method with the help of the following basic rules of classification of goods:

1. The names of sections, groups and subgroups are given only for ease of use in work. For legal purposes, the classification is determined according to the names of commodity items and notes to sections and groups of goods, unless such names and notes require a different interpretation.

2. Any reference in the name of the product heading to a specific product should be understood as including incomplete or unprocessed goods. In this case, if it is presented incomplete or unprocessed, the product has an integral distinguishing feature of a complete or finished product. This reference shall also be understood to include a reference to the same product (complete or processed) under this rule, but presented unassembled or disassembled.

3. If the goods can be assigned to two or more commodity headings (prima facie), the classification will be as follows:

a) preference is given to that commodity heading that contains a specific description of the goods compared to a general description. However, when each of two or more headings has only a reference to part of the materials or substances contained in mixed or complex goods, or only to part of the components of a complex good intended for retail trade, such headings should be considered as specific for such goods even when one of them gives a more complete and accurate description of them;

b) mixed and complex goods, which are made of different materials or components, as well as goods packaged for retail sale, which cannot be classified according to rule 3a, must be classified according to those materials or components (if known) which determine essential characteristics of goods;

c) goods that cannot be classified in accordance with rules 3a and 3b must be classified under the last of the headings under consideration.

4. Goods, the classification of which cannot be determined in accordance with the specified points, should be classified by the commodity item corresponding to the goods closest (related) to the goods being determined.

5. The following rules are additionally applied: a) covers and cases for cameras, musical instruments, guns, drawing supplies, ties and similar containers (packaging) that have a specific shape and are intended for storing specific items (or their sets) for a certain time are classified together with the subjects for which it is intended. However, this rule does not apply to packaging that gives the whole a significant feature; b) in accordance with the provisions of rule 5a, packaging material and packaging containers presented together with the goods should be classified with them, if they are of a type that is usually used for packaging such goods. But this provision does not apply to packaging materials or packaging containers that are reused.

6. For legal purposes, the classification of goods in the subheadings of any heading shall be determined in accordance with the conditions of such subheadings and the notes connected with them, as well as "mutatis muandis" (of the rules mentioned above), considering that only subheadings at the same level can be compared . In addition, appropriate explanations and notes to sections and groups may be applied, unless the subtext stipulates otherwise.

Almost all chapters and groups, and in some cases subheadings, have developed notes that have the same legal force as the NHS. Notes are used to determine the exact scope and boundaries of each classification grouping. This is achieved with the help of: 1) definitions that establish the boundaries of groupings; 2) a list of goods that are excluded from the section, group, product heading or subheading; 3) an incomplete list of typical examples that are included in one or another classification grouping; 4) determination of the limits and scope of each classification grouping, a combination of two or all three of the above-mentioned methods. In order to have a uniform understanding of the classifications and to speed up the search for the necessary goods, it was developed:

1. Provisions to the Harmonized System (Ekhranatory Notes to the Harmonizet System) in four volumes with a total volume of 1,620 pages.

2. Alphabetical Index to the Harmonized Commodity Description and Coding System and its Explanatory Notes (Alphabetical Index to the Harmonized Commodity Description and Coding System and its Explanatory Notes) in two volumes with a total volume of 1120 pages.

The Harmonized System is the most detailed classification system in the world. It significantly facilitates the uniform interpretation and definition of terms, the correct interpretation of classification groupings, which is necessary when determining the size of the duty, when comparing foreign trade data of different countries and conducting economic and statistical analysis.

Coding system

The coding system was created to obtain information about goods that are classified in a convenient form for collection, transfer and processing. The NGS uses a mixed method of coding, when the registration method is used at the highest level of detailing, and at all subsequent levels, preliminary classification of goods based on a set of accepted features. At the same time, Roman numerals are used to designate sections and subgroups, and Arabic numerals are used for commodity groups, items and sub-items. A digital code is not provided for commodity sub-items, they are marked with a hyphen "–", which is also placed before their name in the NGS.

The six-digit code consists of the codes of the group, item and sub-item (each has two digits), built according to the decimal system. For example, a telephone set is classified as 8517.10, where 85 is the group "Electronic machines and equipment; sound recording equipment; equipment for recording and reproducing television image and sound; their parts and belonging"; 8517 – telephone and telegraph apparatus, including apparatus for current systems of frequency communication; 8517.10 - telephone sets. A zero two-digit code at the end of a six-digit code is used for those subheadings that completely coincide in content and name with the corresponding product headings, for example, sewing machine 8452.00. If there is one "0" at the end of the six-digit code, it means that the item is not detailed.

Goods in the NGS are classified either to a separate type of product (nails, tea, acetone), or to groups of goods (machines and mechanisms for processing meat), and sometimes to an assortment type of goods (rolled steel sheet of a certain thickness), they are placed parallel to groups of goods. At the same time, one or more types of products are distinguished from the group of goods, which are widely represented in world trade, and other types are classified under the "Other" group. The latter are usually located at the end of the group. In connection with the fact that the world is rapidly updating products, the NGS has reserve groups - 77, 98, 99. At the level of items and sub-items, the reserve is more than 80%. It can be used not only to expand the nomenclature of goods when reviewing the system, but also in the national practice of individual countries to highlight specific goods.

A harmonized system has a number of advantages:

1. A relatively more accurate description of the goods, which makes it easier to fix them during customs control.

2. Avoiding errors in the classification and coding of goods, as export and import documents have a unified nature.

3. Improving the comparability of foreign trade statistics, which makes it possible to take into account the movement of commodity flows across national borders, conduct business negotiations, study the current situation and make forecasts.

Table 2.2.

SCHEME OF THE HARMONIZED DESCRIPTION AND CODING SYSTEM OF GOODS

Section	Name of section	The number of chapters and their ciphers
I	Live animals and products of animal origin	5 (1-5)
II	Products of plant origin	9 (6—14)
III	Fats and oils of animal and vegetable origin, their cleavage products, ready edible fats, waxes of animal and vegetable origin	1 (15)
IV	Food industry products: beverages, alcoholic beverages and vinegar, tobacco and its substitutes	9 (16—24)
V	Mineral products	3 (25—27)
VI	Products of the chemical industry and related industries	11 (28—38)
VII	Plastics and plastic products, rubber and rubber products	2 (39-40)
VIII	Hides, skins, fur and products thereof; saddlery, travel accessories, bags and similar goods	3 (41—43)
IX	Wood, charcoal and wood products; cork and cork products; wickerwork	3 (44-46)
X	Wood pulp and other cellulose fibrous substances; paper and cardboard waste; paper and paper products	3 (47—49)

XI	Textiles and textile products	14 (50—63)
XII	Footwear, headgear, umbrellas, sticks, stacks, whips, feathers and articles thereof	4 (64—67)
XIII	Articles of stone, plaster, cement, asbestos, mica and similar materials, ceramics, glass and glass articles	3 (68—70)
XIV	Natural and cultured pearls, precious and semi-precious stones, precious metals, articles coated with precious metals and articles thereof, costume jewelry, coins	1 (71)
XV	Precious metals and products from them	12 (72—83)
XVI	**Machines and mechanisms, electrical equipment and their parts, devices for recording and reproducing television images and sound, their parts and accessories**	2 (84—85)
XVII	Transport equipment	4 (86—89)
XVIII	Optical, photographic and cinematographic instruments and apparatus, medical and surgical instruments and appliances, clocks, musical instruments, their parts and accessories	3 (90—92)
XIX	**Weapons, ammunition, their parts and accessories**	1 (93)
XX	Art, collectibles or antiques	3 (97—99)

International Standard Trade Classification (SITC)

The basis of comparative economic analysis of foreign trade of different countries is the International Standard Trade Classification of the United Nations (ISTC), which is used by most countries of the world. The SITC was first adopted in 1950. Currently, the SITC operates in the third edition, which was adopted in 1985. It groups goods according to the degree of their processing, purpose and a number of other features, consists of 10 sections, 67 groups, 261 subgroups, 1033 commodity items and 3118 sub-items (see Table 2.3).

Table 2.3.

INTERNATIONAL STANDARD TRADE CLASSIFICATION

Section	Name	Amount			
		groups	subgroups	positions	subpositions
0	Food and live animals	10	36	132	344
1	Beverages and tobacco products	2	4	11	22
2	Raw materials (except food	9	36	123	267

	and fuel				
3	Mineral fuel, lubricants, etc	4	11	25	37
4	Animal and vegetable fats	3	4	21	44
5	Chemical products	9	33	126	474
6	Products of the manufacturing industry, which are classified mainly by the type of materials	9	52	233	829
7	Cars and transport equipment	8	50	214	653
8	Various products of manufacturing industry	9	31	144	442
9	Goods not classified in other subpositions	4	4	4	6
Total		**67**	**261**	**1033**	**3118**

If necessary, commodity subheadings can be detailed for national use. On the basis of SITC, another UN classification was compiled, which was named *Classification of the most common economic categories* defined in terms of SITC Rev.3 (WEC). It has been used since 1986 when compiling aggregate indicators of international trade. In the VES, all goods listed in the SITC are divided into 7 sections also according to the purpose of the products, and in the group - according to the degree of their processing.

3. International functional classifications (expenditure by purpose).

The UN Statistical Commission registered the following classifications of expenditures by purpose. Recommended:

— Classification of functions of state administration bodies (Classification of the Function of Government (COFOG);

— Classification of Individual Consumption according to Purpose (СОИСОР); — Classification of purposes of non-commercial institutions that serve households (Classification of the Purpose of Non-Profit Institution Serving Households (СОРНИ);

— Classification of Ouylays of Producers according to Purpose (COPP).

The Classification of Functions of Government Management (COFOG) is used to classify expenditures by functions performed by government bodies and was recommended by the 20th session of the United Nations Statistical Commission for international use instead of the target classification of government bodies. In the main documents of the IMF, in particular, in the Manual on State Finance Statistics of 1986, the name "Classification of functions of public administration bodies" is used, and in materials on the problems of functional classifications - "Classification of functions of administration bodies". In the

recommendations of the UN, the classification according to COFOG is given in the edition of the official edition of the UN "Statistical documents", series M, No. 70 (R.80.XyiI.17). The classification is used in solving the tasks of financial statistics of the public sector by grouping current transactions (consumer expenditures, subsidies and current transfers) of capital expenditures and acquisition of financial assets by public administration bodies.

The *objects of classification* are the functions of state administration bodies, which are classified according to the most significant aspects of government activity and are consistently detailed at three levels of distribution. Structurally, the classification consists of 2 blocks: identification and naming. The identification block has four numerical decimal digits and is constructed using a hierarchical classification method and a sequential coding method. *Code notation formula*:

$$XX + X + X,$$

where the 1st level is the main groups (the first two characters); 2nd level - groups (first three characters); 3rd level - subgroups (four characters).

Two-digit main groups are aggregated into the main functions of state bodies:

01 - State services of general purpose;
02 - Protection and related services
03 - Public order and security;
04 - Education and related services;
05 - Health care and related services;
06 - Social security and guardianship and related services;
07 - Housing and communal services;
08 - Services in the field of recreation, culture and religion;
09 - Services in the field of fuel and energy;
10 - Services related to agriculture, forestry, fishing and hunting;
11 - Services that belong to the mining industry and mineral resources, except services that belong to the fuel and processing industry and construction;
12 - Services related to transport and communication;
13 - Other economic services.

The main groups can be used in the development of national budget classifications, in particular, the creation of a functional structure of expenses, taking into account their further detailing.

4. International classifications of occupations, professions and education.

The UN Statistical Commission registered the following classifications of occupations, professions and education6.
Recommended:
— International Classification of Status in Employment (ICSE-93);
— International Standard Classification of Occupations (International Classification of Occupations (ISCO-88);

— International Standard Classification of Education (International Classification of Education (ISCED-1997).

Let's consider the main features and goals of the classification of occupations in general and ISCO-88 in particular. To study this question, you need:

a) characterize the main areas of use of the International Standard Classification of Occupations;

b) describe the main features of ISCO-88;

c) describe further work on ISCO-88 at the national level and in the Bureau of Statistics of the International Labor Organization (ILO).

The 14th International Conference of Labor Statisticians (ICSP) in November 1987 adopted the revised International Standard Classification of Occupations (ISCO-88), which is based on the proposals of the ILO Bureau of Statistics.

From these positions, the issue of the need to introduce an international standard classification of occupations was discussed for the first time in 1921. But only in 1949, the work on creating CSR was initiated by the 6th ICSP. As a result, the 7th ICSP (1949) approved a temporary classification for migration and employment with a detailed description of 1727 occupations, which are based on the national classifications of eight industrialized countries. At the 8th ICSP (1954) a priority list of groups on the 3rd step of the classification was agreed, and at the 9th ICSP (1957) the work was completed with the approval of higher groups of the first ISCO. The classification was published in 1958 (ISCO - 58) and contained, in addition to the definition of groups, descriptions of occupations and professional groups on the 4th step of the classification. At the 9th ISCO, it was recognized that ISCO-58 would require revision after some time, and a new, revised edition of ISCO was published in 1968 (ISCO-68) with an expanded number of occupation descriptions. The result of the second and later revision of ISCO was published in 1989 as ISCO-88.

The classification of occupations is a tool for organizing all works at the enterprise, in the industry and in the country in the form of a clearly defined set of groups. As a rule, it includes two elements:

1) a descriptive element, which can simply be a set of names of occupations and professional groups, but mainly it is a description of duties and functions, as well as other aspects of work that are included in one or another group. These descriptions can be called a dictionary of occupations;

2) the classification system as such, which contains guidelines for assigning works to smaller groups of occupations with their subsequent aggregation into larger groups.

INTERNATIONAL SYSTEM OF NATIONAL ACCOUNTS

1. Stages of development of the international system of national accounts.

2. General characteristics of the UN SNR of 1993:
a) integrated economic accounts and their components;
 b) accounts of current operations;
c) accumulation accounts;
d) balances of assets and liabilities;
e) account of goods and services;
f) accounts of another world.

In 1953, the UN (United Nations) published a report entitled "System of National Accounts and Subsidiary Tables", which provided six standard accounts for three main sectors: "enterprises", "households and private non-profit organizations" and " state administration bodies". Each of these six accounts concerned one of the already familiar and important aggregates, such as, for example, national income. Classifications of flows occurring on these accounts were given in 12 standard tables. Their basis was the structure of accounts of production, income, transactions with capital and accounts of external transactions. The importance of harmonizing international statistical standards was emphasized. International principles of economic and financial statistics, on the one hand, and national accounts, on the other, had to be brought into line. It was noted that during the development of the SNR, considerable attention was paid to ensuring the compliance of this system with the definitions and classifications used or recommended by other organizations, primarily the IMF (International Monetary Fund) and the OECD (Organization for Economic Cooperation and Development).

These accounts provide an information base for assessing the direction of economic development and decision-making by the government, provide an opportunity to bring the supply and demand of production resources in line with their finances, ensure the satisfaction of certain common criteria, such as the stability of the economic system. It was also noted that this work contributed to the emergence of statistics of national income and national product, statistics of finances and statistics of prices. It should be noted that the SNR of 1953 did not pay attention to the methodological problems of calculating the indicators included in the accounts. In 1955, the United Nations issued an interim manual on methods of calculating national income, which paid special attention to the needs of developing countries. At the same time, the UN has developed a questionnaire to be sent to member states in order to regularly and systematically collect information on national accounts. It proposed to provide data for nine standard tables. Since 1958, such data, supplemented by information from national statistical authorities and statistical publications of the respective countries, have been published in the Yearbook of National Accounts Statistics. Data for 70 countries and territories.
In the second edition of SNR-1953, which saw the light of day in 1960, comments on the use of SNR-1953 in different countries were taken into account. In 1956, after analyzing these comments, the Statistical Commission came to the conclusion of introducing a number of amendments with the aim of maintaining or increasing

comparison with related international standards, as well as to clarify and otherwise adjust the text. Most of these proposals were formulated by the UN together with the IMF and the OECD. The Statistical Commission in 1958 proposed to create a broader system that would take into account the considerable experience accumulated in this area by countries with planned economies, as well as differences in the needs of countries at different levels of development. The 1960 edition provided for further expansion to include cash flow and expenditure-issue tables, and in a more long-term perspective, asset and liability balance sheets. It was recognized that eventually there would be a need to establish relevant international principles. In 1964, the third edition of SNR-1953 was made. It more fully corresponded to the IMF Balance of Payments Manual. In the same 1964, members of the UN expert group discussed the draft report prepared by Richard Stone7 and joint reports on certain issues prepared by the UN and the OECD. This became the basis for discussion within the Statistical Commission, as well as in the working groups formed by the UN regional commissions from representatives of national statistical bodies, improvement and changes of SNR. In parallel, the International Association for the Study of National Income and National Wealth worked on this issue. In 1966, as a result of these discussions, a second document was prepared, which was also considered by the Statistical Commission, and in 1967, at its third meeting, the group of experts considered a third document. In 1968, the Statistical Commission approved a revised version of the SNR.

The SNR of 1968 was significantly different from the SNR of 1953.

Indicators of net lending and borrowing were disaggregated into indicators of financial flows of individual sectors. Income and expense accounts were separated from accounts of operations with capital, balances of assets and liabilities were developed for individual sectors and the entire economy in general.

In the SNR of 1968, additional classifications were introduced for the activities of state administration organization and non-commercial organizations, as well as for transfers. It also provided for the inclusion of data on goods and services at constant prices.

The SNR of 1968 consisted of 20 accounts, which can be divided into three categories, and had the following form:

I. Consolidated accounts:
1. Gross domestic product and its use.
2. Available national income and its distribution.
3. Financing of capital expenditures.
4. External operations.

II. Accounts of production, consumption and capital formation:
1. Types of commodity products (goods and services that are sold).
2. Non-commodity products and services (those that are not sold).
3. Industries of the country's production.
4. Services of state institutions.
5. Services of private non-profit organizations serving households.

III. Income and expense accounts for financing capital expenditures:
1. Non-financial corporate and similar enterprises.
2. Financial institutions.
3. State institutions.
4. Private non-commercial organizations serving households.
5. Households taking into account private non-financial unincorporated enterprises.

Therefore, all accounts can be divided into three main classes (I, II, III). Let's consider in detail accounts of the 1st class (combined accounts):

In the left part of account 1 (see table 3.1.) the main elements of the value of the gross domestic product are displayed, and in the right part - indicators of its use.

All positions from the left side (debit), with the exception of consumption of fixed capital, are transferred to the credit of account 2 "Disposable national income and its distribution".

The total amount of wages in account 2 differs from wages in account 1 by the amount of wages received by workers from abroad (for example, wages of seasonal workers abroad) (see table 3.2.).

Table 3.1.

Account 1. GROSS DOMESTIC PRODUCT AND ITS USING

1. Salary including deductions for social insurance. 2. Profit. 3. Amortization of fixed capital. 4. Indirect taxes. 5. Subsidies (minus).	6. Expenditures for final consumption of state institutions. 7. Expenditures for final personal consumption. 8. Increase in stocks of tangible current assets. 9. Gross investments in fixed capital. 10. Export of goods and services 11. Import of goods and services (minus).
Gross domestic product at market prices.	Using of gross domestic product at market prices

Table 3.2.

Account 2. DISPOSABLE NATIONAL INCOME AND ITS DISTRIBUTION

1. Expenditures for final consumption of state institutions. 2. Expenditures for final personal consumption. 3. Savings.	4. Salary, taking into account deductions for social insurance. 5. Salary from abroad (balance). 6. Profit. 7. Profit from abroad (balance). 8. Current transfers from abroad (balance). 9. Indirect taxes. 10. Subsidies (minus).
Using of available income.	Available national income.

National income also includes other factor incomes from abroad (balance), in particular income from property abroad. The right column of the account also shows other current transfers from abroad (balance). Therefore, the sum of all components of this account column is available national income. Indicators of the use of national income are registered in the left column of account 2. According to the methodological principles of the SNR, it is divided into final consumption and savings. Savings are interpreted not as a real accumulation of capital, but as a source of financing capital expenditures. Therefore, the amount of savings is transferred to the credit of the next account 3 SNR, where capital expenditure financing indicators are used.

Account 3 is designed to characterize the process of real accumulation of assets (tangible, reproducible and non-reproducible, financial), as well as sources of financing the acquisition of these assets.

In the upper part of this account, there are sources of financing costs for the increase in stocks of tangible working capital, the purchase of fixed capital, for construction, for the purchase of intangible assets (patents, licenses, etc.). The excess of financing sources over the amount of the real accumulation of tangible and intangible assets forms a separate item of account 3, obtained by the balance method and called "the excess of purchased financial assets over the amount of assumed liabilities." This article characterizes the value of acquired financial assets (loans, increase of available funds in the bank, etc.) minus the value of accepted obligations (received loans, credits, etc.).

Table 3.3.
Account 3. FINANCING OF CAPITAL EXPENDITURE

1. Increase in tangible current assets. 2. Investment in fixed capital. 3. Purchase of intangible assets (except financial) abroad. 4. Excess of purchased financial assets over the amount of accepted liabilities.	5. Savings. 6. Depreciation. 7. Capital transfers (balance) from abroad
Gross investments.	. Financing of gross investments.
8. Purchase financial assets (saldo).	9. Excess of purchased financial assets over the amount of accepted liabilities. 10. The balance of assumed liabilities plus the excess of purchased financial assets over the amount of assumed liabilities. 11. The balance of assumed liabilities plus the excess of purchased financial assets over the amount of assumed liabilities.

In the lower part of the account, the purchase of financial assets by type (on the left side) and liabilities taken (on the right side) are indicated.

Consolidated account 4 (see table 3.4.) is intended for registration of external operations: exports, imports, receipts of income from capital abroad, etc.

This account provides, in addition to the allocation of exports and imports of goods and services, the distribution of factor incomes that come from abroad or leave this country, on the wages of employees (citizens of this country abroad and foreigners in this country), on the one hand, and on income from property and entrepreneurship (property of citizens of this country in foreign countries and property of foreigners in this country) - from the second.

Current transactions are registered in the upper part of the account, and capital transactions are recorded in the lower part.

Table 3.4.

Account 4. EXTERNAL OPERATIONS
CURRENT OPERATIONS

1. Export of goods and services. 2. Salary received from abroad. 3. Property income received from abroad. 4. Other current transfers that come from abroad.Інші	5. Import of goods and services. 6. Salary to foreigners. 7. Profit of foreign enterprises. 8. Other current transfers abroad. 9. Balance of current operations.
Current receipts.	Balance of current operations.

OPERATIONS WITH CAPITAL

10. Balance of current operations. 11. Balance of capital transfers of assets abroad. 12. The balance of assumed foreign assets obligations	13. Balance of acquired intangible assets from abroad. 14. Balance of acquired financial assets abroad.
Receipts	Payments.

The debit of the current subaccount records receipts of funds from abroad in the form of: export revenue, factor income from other countries. other receipts of current transfers. The credit of the current subaccount shows flows of funds abroad in the form of: payments for imported products and services, remittances, income at the cost of factors, other current transfers abroad. The difference between current receipts and their use is the active balance in the nation's current account. If its difference is negative, then the balance of payments was formed with a passive, i.e. negative balance.

The active balance of current payment operations, capital transfers from other countries, borrowed funds (from private and state banks of foreign countries) collectively represent a source for paying for the purchase of intangible assets (except financial) and the purchase of financial assets.

Class II accounts
are intended for the characterization of resources and the use of individual groups of goods, for recording the volume of production of individual branches of the economy and the structure of their costs.

An example of *Class III accounts* can be the account characterizes the current income and expenses of the population. The difference between them is reflected in the article "Savings".

INTERNATIONAL FINANCE STATISTICS

Subdivisions of international statistics of finance

International statistics of finances distinguish:
- statistics of state finances;
- monetary and credit statistics;
- financial statistics.

Public finance statistics cover the activities of the public administration sector and the broader public sector of any country.

The public administration sector is a set of units that carry out public policy through the provision of services of a mostly non-market nature and the redistribution of income and property, and both of these activities are mainly based on mandatory fees from other sectors.

The public sector includes the public administration sector and units controlled by public administration bodies - state corporations, the main activity of which is commercial operations.

Public finance statistics are used to analyze the scale of the public sector; its contribution to production, investment and savings; the impact of tax and budget policy on the economy, the situation in the monetary and credit sphere and the state's indebtedness; tax burden; tariff protectionism; as well as social security systems. The international standard in the field of public finance is coordinated with the corresponding standards of other international systems of macroeconomic statistics: with the system of national accounts, balance of payments and monetary statistics.

Monetary and credit statistics reflect data on stocks and flows by assets and liabilities of the sector of financial corporations and its sub-sectors by means of drawing up balance sheets of assets and liabilities.

The financial corporations sector is divided into the central bank subsector, the other depository corporations subsector, and the other financial corporations subsector. The subsector of other financial corporations includes insurance corporations and pension funds, other financial intermediaries and auxiliary financial units. The subsectors of the central bank and other deposit corporations, taken together, make up the subsector of deposit corporations.

The classification in the balance sheets of assets and liabilities basically corresponds to the classification of the SNA financial account.

Financial statistics cover a wider spectrum of the economy compared to monetary statistics. It analyzes all financial stocks and flows between all sectors of the economy, as well as between these sectors and the rest of the world. Financial statistics are compiled on the basis of SNA.

5.2. Balance of payments statistics

A generalized assessment of the economic state of the country, the effectiveness of its global economic relations is carried out on the basis of the balance of payments.

The balance of payments is a statistical report in which total data on foreign economic transactions of residents of a given country with residents of

other countries (non-residents) for a certain period are given in a systematized form.

Functionally, the balance of payments plays the role of a macroeconomic model that systematically reflects the economic transactions carried out between the national economy and the economies of other countries of the world.

The purpose of drawing up the balance of payments is to develop and implement a reasonable exchange rate and foreign economic policy of the country, analysis and forecast of the state of commodity and financial markets, bilateral and multilateral comparisons, scientific research, etc. Based on actual data on the state of the balance of payments, international financial institutions, in particular the International Monetary Fund, make decisions on providing specific countries with financial assistance to stabilize the balance of payments and overcome its deficit.

The development and compilation of the balance of payments is a mandatory condition for all countries that are members of the International Monetary Fund and is based on a single methodology in accordance with the standard classification of components and the structure of consolidated information.

The information base of the balance of payments is: - data of the banking system on financial transactions with non-residents; - information from customs institutions on the movement of goods flows across the border; - statistical reporting of exporters and importers of products, investors and recipients of investments.

Rules for displaying transactions in the balance of payments

Credit operations (+)	Debit operations (-)
Export of goods and services	Import of goods and services
Income from the use of factors of production located outside the country	Payments for the use of foreign factors of production
Obtaining new loans by the country	Providing loans to other countries
Foreign investment income	Investment activity outside the country

Transactions, as a result of which foreign exchange funds arrive in the country, are recorded in the credit with a "+" sign. When funds are withdrawn abroad, transactions are registered with a "–" sign on the debit account.

In the balance of payments, as in the SNA, two groups of operations are distinguished:
- current;
- capital.

Transactions with goods, services, income from investments and one-way transfers are called **current**.

Operations related to credit and investment activities are called **capital operations.**

Accordingly, two accounts are separated in the balance of payments: - account of current operations; - account of capital transactions and financial transactions.

Theoretically, based on the principle of double entry, the balance of the current account should be offset by the opposite sign of the balance of the capital account. However, due to statistical inaccuracies, cost and time discrepancies, the balance of the balance is disturbed. Undocumented commodity flows, smuggling, provision of illegal services, export of foreign currency have a significant impact on the imbalance. These differences are reflected in the article "errors and omissions".

The current account includes all transactions with real values that take place between residents and non-residents, as well as transactions related to the free provision or receipt of values that are intended for current use. In the structure of the current account, four main components are distinguished: goods, services, income and current transfers.

The main source of data on foreign trade in goods is the State Statistics Service, which is based on cargo customs declaration data and enterprise reports on goods that do not pass customs declaration (fish caught in neutral waters and sold abroad, goods purchased in ports by carriers, etc.).

According to the methodology of drawing up the balance of payments, the cost of both export and import of goods is calculated at FOB prices, that is, the cost of goods includes the costs of their transportation to the customs border of the exporting country, as well as the cost of loading operations carried out at the customs border of the exporting country. According to the foreign trade balance methodology used by the State Statistics Service, imports are recorded at CIF prices. Therefore, in order to form the article "Import of goods" of the balance of payments, the total amount of imports is reduced by an amount equal to the cost of transportation through the territory of Ukraine and cargo insurance. The next most important group of accounts is related to the repair of goods. According to the methodology of drawing up the balance of payments, the cost of repairing goods is taken into account in the article "Goods" of the current account, while in the foreign trade balance, the State Statistics Service takes into account the repair of goods as services.

Exports and imports of goods are reflected at the time of transfer of ownership from non-residents to residents (or vice versa) at market prices. In most cases, this means that contract prices or actual prices at the time of transactions are used to value transactions.

The article "Services" consists of three main components: transport, travel and other services. The account "Services" is formed by the National Bank of Ukraine mainly on the basis of its own database, since the data of bank reporting for a long time are more detailed compared to the data of the State Statistics

Service of Ukraine regarding foreign trade in services (this statement is especially true for the import of services). Transport services include the transportation of passengers and cargo, as well as other services performed by sea, air and other modes of transport. The article "Travel" covers goods and services purchased by visitors, if the duration of their stay in the country does not exceed one year. Until 2004, the sources of information for the compilation of the article "Travel" were data from the quarterly statistical reports of the State Committee of Statistics, provided by travel firms and hotels, and bank statements on payments for traveler's checks, cards of international payment systems, travel expenses, purchase and sale of cash foreign currency by individuals persons, etc. Starting from 2004, the volumes of exports (imports) under this article were calculated according to a new methodology, which is based on quarterly data on the number of foreigners who entered Ukraine and citizens of Ukraine who went abroad (in terms of countries of the world and the purpose of the trip), average expenses of one traveler and average trip duration. The source of information on the number of people leaving or entering is the data of statistical observations of the Administration of the State Border Service of Ukraine, on average costs and duration - legislative acts of the Cabinet of Ministers of Ukraine on the rules for reimbursement of expenses for business trips within Ukraine and abroad, data of state statistical observations of the State Statistics Service of Ukraine, data from mass media and the Internet.

The account "Income" consists of wages and income from investments. Remuneration includes wages and other income received by residents of the country for work performed outside its economic territory (residents of border areas, seasonal workers, personnel of international organizations, etc.). Investment income includes income and payment of income from direct, portfolio and other investments, as well as income from reserve assets. The accrual method is used to display them. Current transfers characterize the transfer of material and financial values to residents from non-residents and vice versa, which does not involve compensation in the form of a certain value equivalent. Current transfers increase the recipient country's income and consumption of goods and services and reduce the donor country's income and potential.

The financial account reflects all transactions resulting in the transfer of ownership rights to external financial assets and claims of the country, or, in other words, the emergence and repayment of financial obligations between residents and non-residents. The financial account is divided into two classification groups covering transactions with financial assets (assets) and transactions with financial obligations (liabilities). Both groups, in turn, are divided into three functional categories: direct, portfolio and other investments. The composition of assets also includes such a category as reserve assets. Direct investments are divided into equity capital, reinvested income and other capital (loans to direct investment enterprises). Portfolio investments include equity securities and debt securities, which include bonds and other long-term debt securities, money market instruments and derivative financial instruments. Other investments include trade and bank loans, loans, including loans and advances from the IMF and

international financial organizations, financial leasing agreements, cash and deposits, and other short-term assets/liabilities.

Directions of analysis of the balance of payments

The balance of the trade balance is characterized by the ratio between exports and imports. The current account balance characterizes the country's international financial position. Consider the following situations:

The current account balance is positive, and the capital and finance account balance is negative. In this case, the export of goods and services, as well as income from capitals located abroad, provide foreign exchange earnings that exceed those spent on imports and interest payments to foreign investors. The remaining amount is spent on loans to non-residents and investments abroad, as well as on increasing foreign exchange reserves. Therefore, countries with a positive current account balance are, as a rule, net investors.

The current account balance is negative, and the capital and financial account balance is positive. This means that foreign exchange earnings from export operations are not enough to cover imports, and the country is a net debtor.

The balance of the current account is of primary importance in assessing the state of payment. The volume and structure of external borrowings and the state of official reserves depend on whether the balance of current payments is active or passive. Therefore, the ratio of the balance of current payments to GDP is the main indicator of the country's international financial position and one of the criteria for assessing state risk. If the balance is positive, the dynamics of the relationship is evaluated. A negative current account balance does not necessarily mean something negative for the country's economy. The length of the period during which the balance of the current account has a certain sign and a number of other characteristics of the country's economy is important.

A safe level of negative balance is considered to be 2-3% relative to GDP. A deficit at the level of 6-7% signals serious macroeconomic imbalances.

To cover payment imbalances, as already mentioned, loans and import of entrepreneurial capital are used, and, secondly, as a final alternative to balancing the balance of payments, official reserves. To settle external payments and cover the balance of payments deficit, foreign capital is attracted in the form of direct investments, portfolios, and long-term loans. The most profitable source of external financing of the deficit of current payments is direct investment, because they are determined by long-term economic interests, do not entail debt obligations, and do not worsen the balance of payments.

Indicators of foreign investment serve
1)   the ratio of growth in direct foreign investment (ΔPI) to GDP
2)   the ratio of growth in direct foreign investment to the balance of the current account.

Statistics of efficiency of international economic activity

TOPIC. METHODOLOGICAL BASIS OF INTERNATIONAL COMPARISONS

1. Stages of conducting international comparisons.
2. Requirements for international comparisons.
3. Indicators used in the Program of international comparisons
4. Main methods of international comparisons of gross domestic product: a) Method of EKSh. b) The Geary-Camis method. c) Gherardi and Walsh method.

1.   Stages of conducting international comparisons.

The need for comparable economic information reflecting the levels and trends of development, the structure and proportions of national economies, the standard of living of the population, has been noted for a long time, but it has increased sharply in the conditions of intensive development of integration processes in the world economy. Currently, the results of comparisons are widely used by international organizations (UN, IMF, IBRD, OECD, EEC, etc.), national state bodies and non-governmental organizations of various countries, scientists for analytical and practical work.

Comparison of indicators in value form began with the works of "political arithmeticians" (second half of the 18th century), in particular V. Petty, M. King. Thus, V. Petty compared the potentials of Great Britain, Holland, and France. At the same time, he concluded that Holland and France developed faster than England. M. King calculated the components of income and expenses in England, France and Holland in a single currency (pounds sterling). In Russia (the first half of the 19th century), D. A. Milyutin and other economists were engaged in statistical comparisons with other European countries.

In 1885, the International Statistical Institute was established, the main purpose of which was to obtain "comparative materials for different countries." In the second half of the XIX century. detailed international comparisons began (L. Levy, M. Melhall). At the end of the 19th century M. Melhall published the works "Development of the world economy" and "Balance of the world economy", which contained comparative data on the national income of different countries in a comparable currency (in pounds sterling). According to M. Melhall's calculations, at the end of the 19th century. Australia had the highest per capita income, the USA was in second place, and England was in third place.

L. Levy and M. Melhall calculated the economic indicators of individual countries using official exchange rates. From the middle of the 20th century. the

method of comparing national income with the help of the so-called consumer basket and worker rations became widespread (K. Jini, S. Strumilin).

K. Clark measured national income in "international units". An "international unit" was a set of goods and services that could be purchased in the United States for one dollar at prices between 1925 and 1934. This set of goods was valued in the currency of the matching country.

After the Second World War, detailed comparisons began on the basis of interstate agreements, as well as within the framework of such international organizations as the OECD, the United Nations, the International Economic Forum (the Council for Economic Mutual Assistance functioned until 1991). International comparisons of indicators of the system of national accounts (SNA) began to be carried out in the 1950s. And before that, international comparisons of summary indicators and the development of national accounting methodology (as international standards) followed parallel courses.

A significant milestone in the creation of works on international comparisons of SNR indicators was the publication in 1954. in Paris, the works of M. Jilbsrt and I. Krevis "International comparisons of national product and purchasing power of currencies", which summarized the results of research carried out within the framework of the OECD.

The comparisons covered the USA and 8 Western European countries: England, Belgium, Holland, Denmark, Italy, Norway, France and Germany. The comparisons are based on bilateral comparisons between each Western European country and the USA in 1950. In this classic comparison, the index method of calculating the purchasing power (power) of currencies, or, in other words, the real price ratio based on representative goods (services), was widely used for the first time.

Comparisons were made according to the gross national product indicator (see table 4.1.). For this, Gilbert and Krevis presented the specified indicator in the form of the sum of consumer spending on goods and services, gross capital investments (including changes in stocks of tangible working capital), current government spending, both civilian and military. 150 goods (services) - representatives with prices were selected by groups of consumption and capital formation. Goods (services) - representatives were divided into identical, similar and unique, special attention was paid to price adjustments due to qualitative differences between functionally similar goods and services produced by different countries.

Price indices were calculated using both the structure of the United States and the structure of the country being compared. The obtained two ratios (according to the structure of each of the compared countries) did not coincide with each other, just as the Paasche indices (weights of the reporting period) and Laspeyres (weights of the base period) do not coincide. The geometric mean of these ratios was found - type of Fisher indices. The results of the calculations, in addition, showed the inadmissibility of the use of value indicators of exchange rates in international comparisons, which, as a rule, led to a significant

underestimation of the position of European countries in relation to the USA and to each other.

International comparisons, like international statistics in general, received a serious boost with the creation of the United Nations. Since 1963, the indicator of the national income of various countries has been published, translated into a single currency according to one of the types of currency parities (import, export, average export-import, etc.).

In the early 1970s, the UN Statistical Commission together with the University of Pennsylvania (USA) under the leadership of I. Krevis carried out work with a detailed comparison of the gross national product of ten countries for 1967 and 1970 (USA, Great Britain, France, Germany (then West Germany), Italy, Japan, India, Colombia, Kenya, Hungary). The methodology of direct comparisons, based on calculations of the real ratio of prices, practically did not differ from the methodology used by M. Gilbert and I. Krevis in the comparison for 1950. What was new in the work was, first of all, that along with more thorough pairwise comparisons, experimental multilateral comparisons were conducted (the methods of Geary, Walsh, ECS (Eltete, Kevesh, Schultz), Van Iseren).

Modern programs of international comparisons are the product of the continuation and development of these comparisons, which the UN began to carry out in 1968. The first round in 1970 covered 10 countries of different continents and different levels of development, as indicated above. The comparisons of 1973 covered 16 countries, in 1975, 34 countries took part in them, in 1980 - already 60, and in 1985 - 64 countries of the world. Since 1990, the Program of European comparisons began to be implemented in parallel. Already 86 countries of the world took part in the 1993 PMZ.

As for Ukraine, it should be noted that every year the State Statistics Service of Ukraine prepares the "Statistical Yearbook of Ukraine", which contains a wide range of statistical indicators of the socio-economic state of the country compared to previous years. This collection contains a separate section "International comparisons", which compares the main indicators of the socio-economic development of Ukraine with the indicators of individual countries of the world. So, in particular, in the "Statistical Yearbook of Ukraine for 2017"9, section "International comparisons", the following information is provided (see table 4.2.) regarding such an indicator as "gross domestic product per capita".

2.   Requirements for international comparisons.

When conducting multilateral comparisons, the task of obtaining results (indices) that would be clearly agreed among themselves, that is, would meet the specified requirements, becomes more difficult. Failure to meet these requirements may lead to inconsistencies in the results obtained.

There are five the most important requirements in the practice of international comparisons.

1. The requirement of "characteristics" of scales. In the most general form, this requirement means that the weights used in the formulas for weighting the indexed quantities should be, to the maximum possible extent, characteristic of the economies of the countries being compared; this requirement is easier to satisfy in the case of an isolated paired comparison and much more difficult - in the case of a multilateral comparison, especially if the differences in the structure of the economy of the countries being compared are significant.

The famous Hungarian statistician L. Drexler, who at one time proposed the name of this demand, explained its essence as follows: "In the case of comparing the GDP of India and Pakistan, it would be wrong to use the prices of Belgium as weights, because they are completely uncharacteristic of the economy of these countries." In other words, when comparing the GDP of two countries (A and B), the requirement of "characteristic" of weights can be satisfied if either the price of country A, or the prices of country B, or the average prices of these countries are used as weights.

L. Drexler saw a well-known analogy between the requirement of "characteristics" of scales in international comparisons and the requirement of "relevance" of scales proposed for traditional dynamic indices (price and physical volume indices), according to which scales should not lag too far behind the current period and should be reviewed periodically (say, once every five years). Thus, according to L. Drexler, the Laspeyres and Paasche indices, as well as Fisher's indices, satisfy the requirement of the characteristics of scales (relevance of scales). However, the differences in the weight structure of different countries can be much greater than the differences in the weight structure in dynamic calculations, within which the weights change at least once every five years. Therefore, the problem of meeting the requirement of characteristic weights in international comparisons is much more acute.

It should be noted that the mentioned definition of characteristic, formulated by L. Drexler, is quite general in nature and, apparently, is based on the assumption that the indicators of countries whose economic structures do not differ too much (for example, Holland and Belgium) are compared, and therefore it can be considered , that the indices of both Laspeyres and Paasche are a satisfactory requirement for the characteristics of scales. However, the situation becomes more complicated when the indicators of countries with significantly different structures are compared. In the modern period, the requirement of the characteristics of scales is formulated in a stricter form than that of L. Drexler; it assumes that the weights used are to one degree or another characteristic of both or even all of the countries involved in the comparison. With this approach, the Laspeyres and Paasche indices when comparing the GDP of, say, India and Sweden, do not satisfy the characteristic weight requirement, but the Fisher index looks better in this regard, since it, according to the supporters of a strict interpretation, supposedly cancels out the mutual deviations characteristic of the Laspeyres and Paash This interpretation is based on some postulates that have not yet been proven. It must be admitted that it is not easy to give a specific numerical characteristic to the characteristics of scales, and this leaves room for different interpretations and

paradoxical conclusions. For example, it is possible to recognize the Laspeyres and Paasche indexes in the comparison of the GDP of Sweden and Norway as not satisfying the requirement of the characteristic of the weights (according to the mentioned strict definition), and at the same time consider that this requirement is satisfied by the Fisher index obtained in the comparison of the GDP of India and Sweden. A comparison of the so-called spread (srgead) between Laspeyres and Paasche indices for different pairs of countries can be very useful for analyzing the characteristics or non-characteristics of the weights; the larger this "spread" (that is, the difference), the greater the discrepancy in the structure of the weights of the compared countries, the less the indices satisfy the requirement of the characteristics of the weights.

2. The requirement of independence from the choice of base country. The content of this requirement is that the result of comparing the indicators of countries (A and B) should not be affected by the decision about which country is considered in this comparison as the base one; this requirement presupposes, in other words, a symmetrical interpretation of the countries whose indicators are compared. This requirement can be represented in mathematical form as follows:

$$la/b * lb/a = 1 \qquad\qquad (4.1)$$

where *la/b* is an index showing the ratio of the indicator (prices, physical volume) of country A to the indicator of country B; *lb/a* - an index showing the ratio of the indicator of country B to the indicator of country A.

3. Requirement of transitivity. This requirement implies the need to clearly agree on the results of comparisons for all pairs of countries participating in the multilateral comparison. In mathematical form, this requirement can be written as follows:

$$la/b : lc/b = la/c \qquad\qquad (4.2)$$

where la/b is an index showing the ratio of indicators of countries A and B;
lc/b - an index showing the ratio of indicators of countries C and B;
la/c is an index showing the ratio of the indicators of countries A and C. Thus, the transitivity requirement says that the ratio between the indicators of countries A and C, obtained on the basis of a direct comparison (la/c), should be equal to the same value, obtained indirectly, that is, by dividing the index la/b by the index lc/b.

4. Requirement of factor inversion. This requirement means that the product of price indices and physical volume, obtained as a result of comparison independently of each other, must be equal to the value index. In other words, the following equation must be fulfilled: lq*lp = lqp (4.3) where lq is the physical volume index; lp - price index; ldp - value index.

It should be noted that in the practice of international comparisons, the index of physical volume is calculated indirectly, that is, by dividing the value index by the price index (Idr : Ir = Id). Thus, in practice, the requirement of factor inversion is usually fulfilled purely mechanically.

5. Requirement of additivity. This requirement means that the indices (of prices or physical volume) obtained as a result of comparisons must be internally consistent, that is, the indices calculated for the indicator as a whole and its individual elements (groups) must be clearly agreed with each other; for example, the average consumption expenditure index should be clearly aligned with the food and non-food purchase expenditure indices. This requirement primarily means that the GDP indicator of country A, estimated for comparisons in the prices of country B, must be equal to the sum of its items evaluated in the prices of country B.

On the one hand, not all known index formulas satisfy all these requirements, and on the other hand, some requirements are incompatible with each other by definition. Thus, there cannot be a formula in nature that would satisfy all requirements.

Multilateral international comparisons have had an experimental nature for a long time. Paired international comparisons are much more common. As for the requirements listed above, domestic specialists in international comparisons draw attention to the impracticality of contrasting them with the economic content of the index formula. The question of specific requirements for indices is decided depending on which aspects of the analysis are given priority, to solve which problems of economic statistics the results of the calculations will be used.

At the next stages of international comparisons, the circle of participants expanded, the methodology and organization of work were improved. For the first time, measurements began to be carried out according to the regional principle in comparisons for 1975, that is, each region has its own country - the center of comparisons (for example, in Europe, this role is played by Austria).

In the 1980s, a whole complex of works on international comparisons began to take shape, which included:

¬ creation of a system for carrying out full-scale comparisons of about 60 selected countries every 5 years;

¬ conducting abbreviated comparisons using a simplified method;

.¬ extrapolation of comparable data for intermediate years within a five-year cycle;

conducting research on improving the methodology of international comparisons.

In the 1990s, a whole system of works on international comparisons was formed.

Until 1991, international comparisons were carried out within the framework of Council of Economic Mutual Assistance. In 1994-1995, international comparisons between the countries of the Commonwealth of Independent States began to be carried out in close cooperation between national statistical services and the CIS Stats Committee.

The United Nations International Comparison Program (UNIPC) is a universally recognized global statistical standard in the field of international comparisons. Ukraine participates in one of the regional programs - the European Comparison Program (ECP).

The results of the comparison are the value volumes of GDP and its constituent components in a comparable currency and the purchasing power parity (PPP) of currencies, which allows comparison of both the levels of economic development of countries and their price levels. At the same time, the real share of countries in world production is determined.

The task of international comparisons of SNA (system of national accounts) indicators is reduced not only to comparing the volumes of the gross domestic product (GDP), but also its individual components, as well as the structure of GDP. This structure can be expressed in more detailed, so-called "aggregated indicators", such as bread and cereals, soft drinks, as well as "significant aggregated indicators" - food or household consumption.

International statistics use several criteria when distinguishing individual components of GDP. The breakdown begins with the main categories of expenditure, while distinguishing between: household consumption, government consumption, capital formation and net exports.

The next criterion is the purpose (scope) of the consumed products and services. Thus, they distinguish between food, clothing, transport and communication, such types of consumer value as products (goods) and services, items (goods) of long-term and short-term use.

A more detailed breakdown may be adopted for regional comparisons than for international comparisons. However, such a breakdown should be compatible with the one presented above, that is, it should always be possible to obtain the most detailed analytical categories of the world breakdown by combining the analytical categories of the regional breakdown.

The system of exchange rates since the 60s, especially after the collapse of the Bretton Woods agreement in the early 70s and the creation of floating and fixed exchange rates, ceased to ensure the accuracy of comparisons of macroeconomic value indicators, because the system of exchange rates began to serve only the sphere of foreign economic activity Current exchange rates can fluctuate throughout the year, month or day due to various political and economic reasons, and as a result, such fluctuations do not reflect real changes in the purchasing power of currencies. Therefore, since the mid-1950s, the conversion of indicators from national currencies to a single comparable currency is carried out by calculating purchasing power parities.

Systematic international comparisons, based on purchasing power parity and which are the forerunners of the work carried out under the auspices of the UN, covered:

-       comparisons carried out in the 1950s within the framework of the Organization for Economic Cooperation and Development (OECD), then the Organization for European Economic Cooperation (OECD;

- comparisons carried out since 1959 within the framework of the Council for Economic Mutual Assistance (REV);
- comparisons made in the early 1960s in the Latin American region;
- comparison between countries with a centralized planned economy and countries with a market economy, conducted in the 60s under the auspices of the Conference of European Statisticians.

Hilbert, Krevis, Page, Bombach, Siladi made a significant contribution to the methodology and practice of conducting international comparisons of the specified period, based on purchasing power parity.

3. Indicators used in the UN International Comparison Program.

The gross domestic product (GDP), which is the basis of the modern system of macroeconomic indicators, characterizes the country's production capacity in the field of final demand. In the global economic environment, the value potential of national production of individual countries is mediated by the purchasing power of their currencies. Expressing the value of GDP in a parity assessment, which would balance the price of manufactured goods and services on the one hand and the price of the national currency on the other, is the key to an objective comparison of the GDP of different countries. Such an analysis makes it possible to eliminate the distortion of the internal purchasing power of currencies that carry current exchange rates due to their dependence on the state of trade and payment balances and other non-production factors.

The simplest idea of purchasing power parity (PPP) can be obtained by simply comparing prices in different countries, when one of them can serve as an economic model. PPP measures how much of each currency is needed in the countries being compared to buy the same amount of goods and services. This is an indicator of the real price of the national currency relative to the country with which the comparison is made. Therefore, unlike exchange rates, purchasing power parities do not depend on the parameters of the financial system that affect exchange rate policy (orientation of foreign economic activity, demand for foreign currency as a means of accumulation, movement of international capital flows), but express only the generally recognized value of goods and services produced in the country.

The category of currency parity price is based on the economic law of one price, which states that the prices of the same good expressed in a common currency (that is, taking into account exchange rates) are the same in different countries. The law of a single price is implemented through the mechanism of foreign and domestic trade competition, equalization of prices for individual goods.

The term "purchasing power parity" was proposed by the Swedish economist G. Kassel in the 10s of the 20th century. Thus, G. Kassel believed that under normal conditions of international trade, such exchange rates are established in countries that correspond to the ratio between the purchasing power of the respective currencies. The very theory of purchasing power parity, as a theory of exchange rate formation, was put forward in the middle of the 16th century.

representatives of the Spanish school. Later it was studied by D. Ricardo, D. Hume, as well as I. Fisher, who connected the category of purchasing power parity with the quantitative theory of money.

In the modern interpretation, purchasing power parity is defined as a special case of the real exchange rate according to the formula

$$R = eP_f : P, \qquad (4.4)$$

where R - real (parity) exchange rate of the national currency;

e - the current exchange rate of the national currency;

P_f - prices abroad in foreign currency;

eP_f - prices abroad in foreign currency;

P - national prices in national currency;

$eP_f : P$ - price level.

The exchange rates of formula (4.4) are expressed in the reverse quotation of currencies. When entering into the analysis of the GDP category of the PCS and in direct quotation, this formula is transformed as

$$Y_e = Y_{nc} / e * ppp / ppp = Y_{nc} / ppp * ppp / e = Y_{ppp} * I_{np}, \qquad (4.5)$$

where Y_{nc}, Y_e, Y_{ppp} - GDP of the country, respectively, in national currency, in foreign currency at the exchange rate, and in purchasing power parity;

ppp - purchasing power parity;

I_{np} - the index of national prices to the prices of the base country (the ratio of the PPP to the official exchange rate).`

Identity (4.5) means that the GDP converted to base country prices at the exchange rate is equal to the product of GDP at purchasing power parity and the national price level index. This should be understood so that GDP in the parity calculation Yppp reflects the real value of final goods and services at the prices of the reference country, and the index of the national price level Inp is a deviation from these prices due to various factors related to exchange rates and pricing. Therefore, the measurement of GDP at the parity exchange rate is based on the assumption of the balance of international demand for domestic goods and domestic money, while the index of national prices records a violation of this balance. The parity assessment of gross domestic products of different countries best characterizes the comparative measure of the physical mass of goods and services included in GDP, the productivity of their economies and the amount of resources produced to meet final national needs.

It also follows from formula (4.5) that the value of purchasing power parity corresponds to the absolute value of the real exchange rate for the entire set of final goods and services, and the price level Inp corresponds to the relative level of the real exchange rate. If the PCS determines the need for a certain currency for the purchase of the same amount of goods or services in different countries, then the price level index is the cost of goods and services that can be purchased in these countries for an equivalent amount of each currency. Depending on whether this index is greater or less than 100%, the country being compared is considered expensive or cheap relative to the base, and its currency stronger or weaker.

Countries with lower national price indices have relative competitive advantages, but these advantages typically relate to the export of simple commodity goods that are price elastic (and this makes commodity exports vulnerable during economic crises). In the modern division of labor, developed countries consciously use disparities between high prices for knowledge-intensive goods of their own production and low prices for raw materials and standard mass goods produced mainly in developing countries. .

The theory of purchasing power parity assumes that the real exchange rate (meaning its relative level) should be constant in the long run. According to this postulate, exchange rates change mainly as a result of the formation of a price difference in two countries so as to keep the terms of exchange of goods unchanged.

Purchasing power parity is a kind of spatial "deflator", an analogue of dynamic price indices. If the dynamic price indices measure the change in the purchasing power of the currency of one country over time, then the CPI measures the difference in the purchasing power of the currencies of different countries in space. At the same time, there are some peculiarities of the purchasing power parity.

1)   countries with different national economies can be compared;

2)   comparison is made during the base year.

Currently, the index method is used for international comparisons of macroeconomic indicators based on goods - representatives, the prices of which are used to calculate the PPP. The initial indicator is divided into a large number of homogeneous primary groups, within which a certain number of products - representatives are selected by expert means; then, on the basis of national prices of selected goods - representatives, individual and group PPP of currencies are calculated, which are then aggregated by various methods into a consolidated PPP, which is used to re-evaluate the indicators into a comparable currency.

In the process of carrying out work on international comparisons, a two-fold task is solved: 1) PPP are determined to eliminate the impact of differences in price levels; 2) "real volumes" are determined. As mentioned above, the PPP is calculated based on price ratios of a kind of basket of goods and is a kind of deflator. Such a basket is a pre-prepared list of representative goods, which lists goods, services, objects selected from the entire set of goods and services that make up the final use of GDP (household consumption, investment goods (machines and equipment, construction works). The selection of representatives in the basket is one of the problems of conducting international comparisons in order to obtain reliable results of calculations of the PPP and real volumes.

Selection and assessment of representatives can be divided into several stages.

The first stage is the preparation of basic working materials (lists of goods, selection of specifications, design of forms); at the second stage, prices are monitored and information is collected on quality differences; the third stage - coordination of lists of representatives and their prices. Only after that, the fourth stage is the calculation of individual and group parities of purchasing power.

The basis for ordering the list of representatives is a detailed classification of GDP expenditures for the purposes of international comparisons. The lowest level of detailed disaggregation is called the primary group, which should contain homogeneous goods. The level of the primary group is the level of calculation of group PPP. In accordance with the general methodology, the basic approach of the European Matching Program was as follows:

- ¬Each country's GDP was broken down into a number of homogeneous commodity groups or primary groups according to its end-use components;

- ¬ price registration was made for selected goods within each product group and the average price ratio in different countries was calculated for each product group: these average price ratios were then weighted and purchasing power parities were calculated at all levels of aggregation, up to the level of GDP;

- national value indicators of these product groups were converted into "internationally comparable" indicators using the above-mentioned parities of purchasing power. The obtained indicators are called "real sizes" as opposed to "nominal sizes" expressed in national currency.

The first stage of work on determining the parity of currencies consists in the selection of representative goods that are similar in their quality characteristics to the corresponding samples of the compared country and are characteristic of the entire set of products assigned to a specific group of the listed goods nomenclature (hereinafter - the goods group). In this case, it is assumed that the prices will be formed on the basis of the principles common to the pricing of the products of this profile, that is, they will be both characteristic and typical for the entire aggregate being compared. Goods (services)-representatives must meet the following two basic requirements:

1) the requirement of comparability (comparability), which means that all factors influencing the formation of the actual price are identical in the compared countries;

2) the requirement of representativeness, which means that the selected goods are typical of the cost structure (frequently used and widely available in the domestic market) and that they account for a significant share of costs within the given primary group in the countries being compared.

There is a kind of trade-off between these requirements, since the most typical goods for one country are often much less typical for another, and most representative goods are incomparable.

The procedure for selecting and agreeing representative products was different in the two groups of countries. In general, it can be noted that in Group I the selection and coordination was done on a multilateral basis, and in Group II - on a bilateral basis.

According to the procedure used in Group I, within each primary group each participating country must select and specify at least one product that would be purchased frequently enough to be representative of the country's spending on the

relevant primary group. However, to be included in the final sample, each selected product had to also be approved by at least one of the other participating countries where the product is representative or at least sold in large quantities. As a result, selected products may not be available in all participating countries. Countries were required to submit price data for their selected products, while the share of products selected by other countries for the calculation of parities was determined either directly or indirectly between pairs of countries.

The basic list of products was prepared by EUROSTAT on the basis of consultations with the countries of the Community. The revised list was then expanded by the OECD in consultation with non-Community countries to ensure that the products were representative of all OECD countries. The final list of products contained about 3,200 items of consumer goods and services, 236 items of investment goods and 16 construction projects.

The collected price data were used to calculate relative prices for individual goods and services, after which the relative prices were averaged to obtain parities at the level of primary groups. Two parities were calculated for each pair of countries. The first parity was an unweighted geometric mean index of the relative prices of goods representing the first country. The second parity was an unweighted geometric mean index of relative prices for goods representing the second country. The geometric mean of these two parities (Fisher's parity) was then used to calculate a single parity between the two countries.

Using this procedure, a matrix of bilateral parities was calculated for each primary group. In some countries, these matrices were incomplete because it was not always possible to calculate direct parity between each pair of countries. In addition, the parities were non-transitive (that is, the ratio of the parity between countries A and B to the parity between countries B and C was not equal to the parity between countries A and C). The completeness and transitivity of the matrix was ensured through the use of the so-called "ECS procedure".

In Group II, due to the star-like organization of the comparison, the representatives were selected on a bilateral basis, with the products being determined separately in each country on the basis of a central base list prepared by Austria. According to this scheme, the maximum possible number of representative goods for each primary group was selected. These items should be typical of the costs of both countries being compared. Then, in the form of a simple geometric mean of relative prices for the selected goods, the ratio of the country's prices to the base country A for this primary group was calculated.

The main criteria for the representativeness of certain types of products are the mass of their production and a high share in the value volume of the product group. In other words, these types of products should be the most characteristic representatives from the point of view of the place that deals with them in production and the channels of use of these products.

When selecting representative domestic products, the expert should, if possible, use information about similar or identical products produced and used in the compared country. If the products characteristic of a specific commodity nomenclature group in our country are unique, then instead of it, you should

choose another one, for which you can find analogues abroad. It is necessary to keep in mind that when comparing, for example, the indicators of our country and the USA, some characteristic types of products can be used, and when comparing the indicators of our country and, let's say, the Federal Republic of Germany for the same nomenclature product group, other representative products, although the preference more devoted to finding such types of products that would be common for the production and use of all or several compared countries.

When comparing representative goods of our country with other countries, three main types of goods may be encountered: identical goods (completely comparable), similar goods (partially comparable) and goods, in terms of their quality characteristics, which are not comparable. The degree of comparability is determined by experts on the basis of technical and economic parameters (characteristics).

Identical goods. These goods include such samples of products that are available in our country and in the corresponding other country and are characterized by the same technical and economic parameters. At the same time, it is worth taking into account only the main technical and economic (operational) characteristics that affect the consumption value. Insignificant differences in form or individual, secondary properties of the product are ignored, because it does not affect, or almost does not affect, the quality and, therefore, the price of the product.

Similar goods. These goods include such samples of products that are available in our country and in the corresponding other country and serve the same purposes, but differ in one or several important quality properties that affect the price of the product. From an economic point of view, a unit of such a product in one country is not equal to a unit of a similar product in another country. As a representative product, they can be used only with a subsequent price adjustment. Therefore, the inclusion of such goods in the list of representative goods is advisable in cases where the number of identical goods is not sufficient to determine price ratios for a given product group.

Non-comparable goods. These include such samples of products that are found only in the domestic economy or in the economy of the compared country. The inclusion of such goods in the list of representative goods should always be an exception and should be assumed only in those cases when this good, not produced in one of the two countries being compared, is of great importance in the production and use in the national economy of another country. For such a product, the price of the country in which this product sample does not exist should be roughly calculated.

The second stage of work on the calculation of currency parity (purchasing power) is the selection of prices for representative goods. At the same time, final consumption prices are applied:

 - wholesale prices ex-station of destination for representative goods used in comparison of costs for construction works;

¬wholesale prices ex-station of departure for goods-representatives, which are industrial products.

Wholesale prices for the imported product or equipment (including the cost of installation) for the importing country are taken in national currency, for the exporting country - taking into account the costs of export execution.

INTERNATIONAL DEMOGRAPHIC STATISTICS

1. Object, task and system of statistical population indicators.
2. Statistics of the number, placement and composition of the population.
3. Statistics of the natural movement of the population.
4. Population migration statistics.
5. Population reproduction indicators.
6. Sources of statistical information about the population.
7. Demographic forecasts.

1. Object, task and system of statistical population indicators.
People are the main producers and consumers of material goods and services, and therefore the trends of demographic processes and reproduction of the population as a whole directly affect the relations between individual states, especially in the area of labor migration, provision of production by the workforce, transformation of the parameters of national consumer markets, etc. p.

International demographic statistics, according to the level of research on the state and development of the population, have a number of features. The first feature boils down to the fact that the statistical analysis of demographic phenomena and processes must take into account three interrelated aspects: global, regional and international.

The global aspect of the study of demographic processes arises on the basis of problems affecting the interests of all inhabitants of our planet, regardless of their state affiliation (citizenship) and place of residence. First of all, it affects the issue of the growth of the population of the Earth as a whole, the parameters of its reproduction, as well as the ratio of the quantitative size of the human population with reserves of food, energy, resources, minerals, etc. This is due to the fact that the spatial boundaries and non-renewable resources of the globe are limited.

The regional aspect is to a greater extent connected with the analysis of the placement of inhabitants on the territory of the Earth, the consideration of intercontinental migration flows and the clarification of the peculiarities of the movement and reproduction of the population in different regions of the globe.

The interstate aspect assumes a comparative statistical characterization of the parameters of the number, location, composition, natural and migratory movement of the population of both individual states and their groups, formed from a wide variety of criteria. The relevance of this direction is due to the fact that the

specifics of the demographic situation in developed countries and the countries of the EU, CIS, OPEC, NATO and other political and economic associations seriously determine interstate relations in various fields of international life.

The second most important feature of international demographic statistics is that it is more focused not so much on the assessment of indicators of demographic processes in individual countries and their regional, political, economic and other associations, but on conducting interstate comparisons that allow understanding the place and role individual countries in the world economy.

The third feature of international demographic statistics is objectively related to a number of limitations of its information base. They boil down to the fact that not all countries of the world, of course, follow the recommendations of the UN, WHO, UNESCO, etc. aimed at the unification and standardization of statistical accounting, including in the area of population. For this reason, the approaches to the organization of censuses and current accounting, as well as the methods of conducting sample surveys of the population in different states do not fully coincide with each other. This situation has a noticeable effect on the comparability of demographic information (due to the mismatch of dates, terms and periodicity of censuses; differences in the interpretation of the natural and migratory movement of residents, etc.). Given the peculiarities of the internal situation in a number of countries, population statistics are incomplete or fragmentary, which greatly complicates, and in some cases makes it impossible to obtain statistical characteristics and make international comparisons of the demographic situation.

The fourth feature of international demographic statistics is that it is characterized by a long delay in the publication of data. If in the countries of the world, information about the demographic situation is generally available to specialists and the general public with a delay of six months to a year, then international statistical publications have a longer delay period. This is due to the problems of collecting demographic information, as well as collating and comparing. International demographic statistics are often forced to use not actual data, but expert assessments and forecast calculations, because only in this way is it possible to obtain up-to-date data on the population of hard-to-reach areas and countries affected by hostilities, epidemics, etc.

The object of demographic statistics is the population, that is, the totality of persons living in a certain territory. Depending on the coverage of the territory, three objects are distinguished in international statistical practice, directly related to the above-mentioned aspects of applied research of demographic statistics:

1) the population of the Earth as a whole;

2) the population of certain regions of the globe (the population of Europe, Australia and Oceania, Asia, America, Africa, or more narrowly - the population of Western Europe, the population of Southeast Asia, the population of North Africa, etc.);

3) the population of interstate associations (CIS, EU, etc.) or individual states, which are used in the process of statistical comparisons.

When analyzing demographic statistics data, it should be taken into account that only populated areas are compared. It is also necessary to take into account that the population of the Earth as a whole, as well as its regions and individual countries, is characterized by dynamic changes due to births, deaths, marriages, divorces and migration. Censuses are conducted as of a certain date. And this forces us to carefully operate the available information when conducting various international comparisons and comparisons. In addition, it should be noted that the population is characterized by significant heterogeneity. People living in the countries of the world differ among themselves in terms of race, nationality, language, religion, etc., which also seriously complicates international comparisons.

The subject of international demographic statistics are the quantitative regularities of changes in the number, composition, placement, movement and reproduction of the population at the international level.

International demographic statistics uses a system of indicators, which includes the following main sections:

1. Indicators of the number, location and composition of the population:
- The number and specific weight of different population groups living in a certain territory;
- Physical population density;
- Population distribution between regions of the country and types of settlements;
- Composition of the population by gender, age, marital status, nationality, language, religion, etc.

2. Indicators of natural population movement:
- Number of births, deaths, marriages and divorces;
- General rates of birth, death, marriage and divorce rates of the population;
- Age-related birth, death, marriage and divorce rates of the population;
- Coefficient of natural population growth;
- Special birth rate;
- Total fertility rate;
- Infant mortality rate;
- Vitality index, etc.

3. Indicators of population migration:
- Number of arrivals and departures;
- Migration balance;
- General coefficients of arrival and departure of the population;
- The coefficient of migration growth of the population;
- Efficiency of migration, etc.

4. Indicators of reproduction and results of the demographic development of society:
- Gross and net reproduction coefficients of the population;
- Average expected future life expectancy of the population;

- Total absolute growth (decline) of the population;
- Rate of population growth (increase);
- Economy of population reproduction;
- Coefficients of demographic and economic load of the population
etc.

The logic of the above system of indicators boils down to the fact that indicators of its first division are designed to reflect the actually achieved state of the population. The indicators of the second and third sections accumulate parameters that characterize the factors of the development of society due to the natural and migratory movement of the population. The fourth section covers indicators focused on the general assessment of the replacement of generations and the results of the interaction of demographic processes, which lead to changes in the number and composition of the population.

2. Statistics of the number, placement and composition of the population.

Population as a demographic indicator is a quantitative assessment of the totality of persons (human population) living in a certain territory. A distinction is made between the permanent population, which consists of persons who permanently reside in a given territory, including persons temporarily absent at the time of the population census, and the existing population as the totality of persons who were in the given territory at the time of the population census, including temporary residents. In addition, the concept of legal population is used as a set of persons registered, assigned or registered in this territory.

Calculations of the total population are made for the whole country and its separate administrative and territorial units, urban and rural settlements.

Analysis of the demographic situation in international statistics, as a rule, begins with the characteristics of the population of the globe, its regions and individual countries. The number of inhabitants is a momentary indicator that characterizes the size of the population as of a certain date (usually at the beginning or end of the year). To achieve comparability of information, international demographic statistics, when making comparisons, usually operate on the average population. This is an abstract, calculated value that reflects the number of residents for a period of time as a whole (for example, for a year).

Most often, the average annual population is calculated using the simple arithmetic mean formula

$$S = (S_n + S_k) : 2 \,,$$

where S is the average annual population; Sn - population at the beginning of the year; Sk - population at the end of the year.

If necessary and the availability of information for more accurate calculations of the average annual population in international statistical practice, the chronological average (for dynamic series with equal and unequal time intervals), the logarithmic average and other more complex formulas for determining average values are also used.

Population size, being an absolute indicator, does not allow us to judge what part of the Earth's inhabitants is in this or that region, in this or that country of the world. For this purpose, the specific weight of the population living in a certain territory is involved.

An additional idea of the degree of population of specific territories allows to obtain the physical density of the population (r), which is calculated as follows

$r = S: T$,

where S is the population living in the given territory; T - area of the territory (in square kilometers). Thus, physical population density makes it possible to obtain information about how many people per square kilometer of territory, and, accordingly, to make a real judgment about the population density of certain regions and countries of the globe.

To get an idea of the nature of population displacement, international demographic statistics use such indicators as the number of urban and rural populations, as well as the specific weight of urban and rural residents in the total population. In statistics, urban population includes people living in urban settlements, and rural population - people living in rural areas. In different countries, such criteria as the number of inhabitants, employment in non-agricultural work, features of the infrastructure, character of buildings, etc., are used to determine the type of settlement. For example, in France, a quantitative criterion is used, that is, a settlement is considered urban if the number of its inhabitants exceeds 2,000 people. The population is also considered as a set of individuals and as a set of households and families. In statistics, a distinction is made between non-institutional and institutional population, which is formed by non-institutional (private) households and institutional (collective) households, respectively.

A private household (household) is: - One person living in a separate residential premises or a part of a residential premises, and provides himself with everything necessary for life and does not combine funds for running a joint economy with any of the other persons living in this residential premises; - Two or more people who live together in a separate living space or a part of it and provide themselves with everything necessary for life by running a joint economy, fully or partially pooling and spending their resources (these persons may be related by kinship or relationships arising from marriage, or not being relatives).

Collective households are associations of persons living for more than one year in any institution (garrisons, monasteries, children's homes, homes for the elderly, hospitals, in prisons) and do not have independence of actions and decisions in economic matters.

All other persons form private households. Persons living in hospitals, shelters, dormitories of schools, universities, reservists who are called up for short-term gatherings are recognized as members of their outgoing private households, that is, they belong to the non-institutional population.

The family (family core) consists of persons connected by relationships arising from kinship, adoption or marriage. As an analysis of national censuses shows,

most households are family households, that is, they include married couples with children or one parent with children, as well as their relatives.

INTERNATIONAL TRADE STATISTICS

1. General notions, categories and definitions of international trade statistics

The international exchange of activity results is the basis of the functioning and development of the world economy, the way of existence, reproduction and growth of civilizations. The intensive development of global commodity and financial markets deepens the interconnection and interdependence of national economies. Currently, no country in the world can successfully solve its economic problems without full-scale participation in global economic problems.

Foreign trade is the exchange of goods and services between producers and consumers of different countries. **International trade** is the totality of foreign trade of different countries of the world.

The object of observation of international trade statistics is goods and services, the import and export of which increases or decreases the country's material resources.

Goods in international trade statistics mean any property, including currency, currency values, electrical, thermal, other types of energy and vehicles, with the exception of vehicles used for international transportation of passengers and goods.

The main **tasks** of the statistical analysis of international trade are the study of the dynamics of exports and imports, the study of the state of the trade balance, the analysis of the geographical, regional and commodity structure of imports and exports, the calculation of price indices, the physical volume of exports and imports, indices of trade conditions, the analysis of foreign trade efficiency indicators.

The main **source** of information about the exchange of goods between countries is the reporting of customs authorities.

System of indicators of foreign trade statistics

Total import is the entire volume of foreign goods imported into the country during the period, regardless of the further destination of these goods.

Total export - the entire volume of goods exported from the country during the reporting period.

Transit - import of goods into the country with the purpose of their further export. There is direct and indirect transit.

Direct transit is the transportation of goods from one country to another through the territory of a third country without storage. It is not included in the import of the transit country.

Side transit involves the passage of goods through the customs warehouses of a third country, followed by their export without processing. It is taken into account in the results of foreign trade.

Special export consists of

- exported goods of domestic production,

- goods of foreign origin that have undergone processing in the country with a change in their properties.

Special imports include imports for:

- domestic consumption,

- processing on the territory of the country. It is equal to the difference between total imports and side transit.

Re-export is the export of previously imported goods. With clear accounting, it is equal to a side transit.

Foreign trade balance (trade balance) is the difference between exports and imports. If it is positive, the balance is active, if it is negative, the balance is passive.

Net exports are obtained when the difference between exports and imports is greater than 0.

Foreign trade turnover is the sum of exports and imports.

World trade turnover is the sum of exports of all countries. It is not equal to the sum of imports of all countries, because according to international standards, imports and exports are calculated at different prices.

The world trade balance - total exports minus total imports - is always a negative value.

Analysis of the balance of foreign trade

Foreign trade is two opposite flows of goods and services - export and import. To characterize the degree of openness of the economy, its participation in the international division of labor, the ratio of the values of export-import flows to GDP is used.

Export quota (KE) - indicator of the openness of the economy, which characterizes the degree of participation of the country in the international division of labor and represents the percentage ratio of exports to GDP.

Countries with a relatively closed economy are those in which the export quota does not exceed 10%; with a relatively open economy – more than 35%; with average openness – from 10 to 35%.

Import quota (KI) is an indicator of import dependence. It represents the percentage ratio of imports and GDP.

A value of the indicator that does not exceed 15% is considered safe for the country's economy.

Foreign trade quota (KF) is a general indicator of real openness (dependence) of the national economy:

KF=((E+I)/GDP)*100%.

For small developed countries (Belgium, the Netherlands, Switzerland, Denmark, Sweden, etc.), this percentage can vary between 45% - 90%, for large developed countries (Germany, Italy, France, etc.) - 25%-35% . For Japan and the USA, this percentage is 11-13% (it was the same in the Soviet Union).

Since the income from exports must cover the costs of imports, for the stable development of the economy, it is necessary to ensure a certain proportion between them. The main statistical indicators of "balance" are

balance of the trade,
- the coefficient of coverage of imports by exports
- K=(E/I)*100%.

Its value can exceed 100% in the case of a positive trade balance, be less than 100% - in the case of a negative balance, that is, when a certain share of imports is not provided by exports.

Difference $(1 - K)$ characterizes the scale of deficit (-) or surplus (+) of the trade balance.

The coverage ratio as a relative characteristic of the balance of foreign trade is functionally related to the import dependence ratio and the export quota

$$K \cdot K^I = K^E \ .$$

Index method in foreign trade statistics

The most widespread among the statistical methods of foreign trade analysis is the index method. Using the index method in foreign trade statistics, the dynamics of export-import transactions is characterized; performance of contractual obligations is assessed; the impact on the development of foreign economic operations of changes in prices, quantity of goods, supply structure is analyzed; the efficiency of foreign economic operations is determined.

The change in the physical volume of foreign trade components over a certain period of time is assessed using the Laspeyres physical volume index. If the number of goods under study is limited (for example, for individual foreign trade firms), the aggregate form of the composite index is used

$$I_q = \frac{\sum p_0 q_1}{\sum p_0 q_0}$$

The change in export or import prices is evaluated using the Paasche index. The aggregate form of this index has the form

$$I_p = \frac{\sum p_1 q_1}{\sum p_0 q_1};$$

The index of the value of exports or imports has the form

$$I_{pq} = \frac{\sum p_1 q_1}{\sum p_0 q_0},$$

The state of the trade balance depends on the structure of exports (imports) and the ratio of prices for exported and imported goods (services), and the ratio of prices is determined by the state of the world markets of specific groups of goods. For example, an increase in oil prices will create favorable terms of trade for oil-exporting countries and worsen the terms of trade in oil-importing countries.

As a statistical indicator of terms of trade, the ratio of indices of export prices (I_{pE}) and import prices (I_{pI}) is used - index of terms of trade (I_t).

$(I_t) = I_{pE} / I_{pI}$

If the index is greater than 1, this indicates an increase in the purchasing power of the export unit, and vice versa. It can also be said that if □ is less than one, then the trading conditions in the current period were unfavorable, and if □ is more than one, the trading conditions are favorable compared to the baseline period.

Index of price ratios

This index is used to evaluate the efficiency of foreign trade of a specific country with another country or group of countries. Evaluation of the results of price ratios is carried out for

- - export to a certain country (group of countries);
- - imports from a certain country (group of countries);
- - foreign trade turnover with a certain country (group of countries).

Based on the index method, an analysis of the efficiency of foreign trade is carried out. The efficiency of foreign trade means the saving of public labor, which is formed due to different levels of costs for the production of the same goods in individual countries. Costs for the production of export goods are costs for the production of products for export, transportation to the border, loading. The necessary cost of producing an import in the country that buys it is the cost of producing the imported product,

including the additional economic effect obtained from the consumption of higher quality products.

As a rule, the value of imports at domestic sales prices is used.

To analyze the foreign exchange efficiency of exports, the coefficient of foreign exchange efficiency of exports is calculated. It shows, on average, how many dollars of foreign exchange earnings from the realization of exports account for one dollar of costs for the production of export goods.

To analyze the currency efficiency of imports, the coefficient of currency efficiency of imports is calculated. It shows how many dollars, on average, of the value of imported products at the prices of their sale within the country account for one dollar of costs for the purchase of imported products.

Export and import efficiency cannot be analyzed separately. A reduction in exports leads to a reduction in imports, which may have high efficiency and compensate for the low efficiency of exports. Therefore, for the final decision regarding the expediency of export or import of individual goods, the following stages of analysis are carried out

1.   Currency efficiency coefficients of exports are calculated for each product.

2.   The average coefficient of foreign exchange efficiency of export is calculated for all exported goods as a whole.

3.   Currency efficiency coefficients of imports for each product are calculated.

4.   The average coefficient of foreign currency efficiency of imports is calculated for all imported goods as a whole.

5.   The inverse indicator of the indicator of the average currency efficiency of exports is calculated.

6.   The inverse indicator of the indicator of the average currency efficiency of imports is calculated.

7.   Values It should be borne in mind that all of the above is important with a constant structure of exports and imports, without taking into account inflation, changes in domestic prices, changes in the product and geographic structure.of coefficients of foreign exchange efficiency of exports for each product are compared with the inverse indicator of the average foreign exchange efficiency of imports. They should not be lower than him. Goods with a lower export efficiency will not be covered by a sufficiently high average import efficiency. They should be withdrawn from foreign trade turnover.

8.   Values of coefficients of currency efficiency of import for each product are compared with the inverse of the average currency efficiency of export, they should not be lower than it. Goods with a lower import efficiency will not be covered by a sufficiently high average export efficiency. They should be withdrawn from foreign trade turnover.

It should be borne in mind that all of the above is important with a constant structure of exports and imports, without taking into account inflation, changes in domestic prices, changes in the product and geographic structure.

Statistics analyzes the dynamics and influence of foreign currency efficiency factors of exports. The factors of foreign currency efficiency of export are currency revenue per unit of production, production costs per unit of production, commodity and geographical structure of export. The analysis of the influence of factors is carried out on the basis of the construction of factor indexes of foreign exchange efficiency of exports using the method of chain substitutions. The initial information for calculating indicators of the budget efficiency of exports and the efficiency of export production are the costs of export production, the value of exports at domestic prices and foreign exchange revenue from sales on the foreign market. Statistics calculates the coefficient of budget efficiency of exports. This is the ratio of foreign exchange earnings from sales on the foreign market and the value of exports at domestic prices. The difference between the indicators will show the effect of exports for government and commercial intermediary organizations.

The export production efficiency ratio is the ratio of export value at domestic prices to export production costs. The difference between the indicators is the effect of exports for product manufacturers. The sum of the effects of exports for intermediaries and for producers will show the national economic effect. The product of the coefficients of budget efficiency and export production efficiency is the currency efficiency coefficient of exports. Statistics analyzes the impact on changes in the currency efficiency ratio of the two above-mentioned multiplier factors using the index method of analysis.

CONCEPT OF INDEXES AND THEIR TYPES

In statistical practice, indexes, along with average values, are the most common statistical indicators. Literally translated from Latin, "index" means "index". In the practice of statistical analysis, an index is an indicator of the relative change of a given level of any phenomenon compared to another level of it, taken as the basis of comparison.

The origin of the index method is attributed to the beginning of the 17th century, although index calculations, not translated into the language of mathematical formulas, are found in the works of J. Boden (dated 1568 and 1576) and T. Mann (1609). It was in 1738 that the French economist Duteau proposed to calculate the generalized indicator of price changes as the ratio of the sum of prices p for certain types of goods in the reporting period to the sum of prices for the same goods in the base period according to the formula:

$$I_p = \frac{\Sigma p_1}{\Sigma p_0}$$

For the same purpose, the Italian economist Carli in 1764 proposed a more complicated formula:

$$I_p = \frac{\sum \dfrac{p_1}{p_0}}{n}$$

With the development of statistical practice, it was proven that such methods of obtaining a generalized estimate of price level changes do not take into account the fact that in each of the compared periods different quantities of the same goods are sold. That is why the German statisticians E. Laspeyres and G. Paashe proposed to calculate price indices in aggregate form. In 1871, Laspeyres proposed such a formula:

$$I_p = \frac{\Sigma p_1 q_0}{\Sigma p_0 q_0}$$

where
p – prices for certain types of goods,
$_1, p_0$ respectively, in the base and current periods
q – the number of sold goods of each type
$_0$ in the base period.

In 1874, H. Paashe proposed such a form of aggregate price index:

$$I_p = \frac{\Sigma p_1 q_1}{\Sigma p_0 q_1}$$

where
q – the number of sold goods of each type
$_1$ in the current period.

The numerator and denominator of this index contain aggregates that have a defined economic essence. In contrast to the Laspeyres index, the Paasche index contains the actual value of the sold volume of goods in the current period (numerator) and its conditional estimate in the prices of the base period (denominator). The difference between the numerator and the denominator shows the real gain (loss) of buyers, which they received as a result of a decrease (increase) in prices for certain types of goods.

Since the results of index calculations according to previous formulas for the same initial data will be different, it was this circumstance that led Western indexology to the "ideal" form of the index proposed by I. Fischer in 1921, which

corresponded to the geometric mean of the index values, calculated on the basis of the formulas Laspeyres and Paasche. The formula of the "ideal" index looked like this:

$$I_p = \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \times \frac{\sum p_1 q_1}{\sum p_0 q_1}}$$

It should be noted that the use of the geometric mean in index calculations also dates back to the works of I. Fisher. Back in 1863 U.Jevons proposed to calculate the composite price index as a geometric mean of the price indices for individual types of goods, i.e. according to the formula:

$$I_p = \sqrt[n]{\prod_{i=1}^{n} \frac{p_{i1}}{p_{i0}}}$$

At the present stage, Laspeyres and Paasche indices are the basis of two equal index systems: base-weighted (Laspeyres) and current-weighted (Paasche).

Statistical indexes make it possible to solve such basic tasks:

- give a description of the general change of a complex economic indicator or individual indicators-factors that form it;
- highlight the influence of one of the factors in the change of a complex indicator by eliminating the influence of other factors;
- separate, highlight the effect of the change in the structure of the phenomenon on the indexed value.

With their help:

- the development of the national economy is characterized as a whole and its individual branches;
- the results of production and economic activity of enterprises and organizations are analyzed;
- the role of individual factors in the formation of the most important economic indicators is investigated;
- production reserves are revealed.

Indexes are also used in:

- international comparisons of economic indicators;
- determining the standard of living;
- monitoring of business activity in the economy, etc.

In the development of index theory in our country, two directions have developed: generalizing or synthetic and analytical.

The generalizing direction interprets the index as an indicator of the average change in the level of the studied indicator.

In analytical theory, indices are indicators of changes in the level of the resulting value under the influence of a change in the indexed value.

Individual, group (sub-indices) and general indexes are distinguished by the degree of coverage of the elements of the population. According to the method of

calculation and economic content, indices are aggregated, weighted average, indices of average values, territorial indices. Index systems can be two-factor and multi-factor.

Depending on the basis of comparison, when calculating indices, chain and base indices are distinguished, and according to the economic content - indices of dynamics, comparison, compliance with norms and standards, territorial indices, etc.

A special group consists of indices of average values, which combine indices of variable composition, constant composition and structural shifts.

The main element of the index is the indexed quantity. The indexed value is the value of a characteristic of a statistical population, the change of which is the object of research.

For ease of perception of indices in the theory of statistics, certain symbols have been developed. Each indexed value has its own symbolic designation. These quantities are divided into quantitative, qualitative and volumetric.

Qualitative values characterize the level of a feature in a unit of the population, namely:

p – unit price of the product;

c – unit cost of production;

f – salary of one employee.

Quantitative values characterize the size of the phenomenon or the number of the population and are indicated in this way:

q – the number of units of this type of product;

T – the number of employees.

Volumetric values represent the volume of a feature and are always the product of one qualitative and one quantitative indicator (if we are talking about a two-factor index model), for example:

$pq = p \times q$ – turnover or product value;

$cq = z \times q$ – production costs;

$fT = f \times T$ – employee salary fund.

In order to distinguish to which period the indexed values belong, subscript symbols are used: "1" - compared (current, reporting) level, "0" – the level with which we compare.

If indices are calculated for a number of periods, then serial numbers 1,2,3...etc. are used.

ECONOMIC CONTENT AND METHOD OF CALCULATING INDIVIDUAL INDICES

Individual indices characterize the change of only one element of the population, for example, the change in the production of passenger cars of a certain brand. The individual index is conventionally denoted by the Latin letter "i". The symbol of the phenomenon whose change is being studied is always placed at the base of the index. Individual indexes of qualitative indicators have the following form:

$$i_p = \frac{p_1}{p_0} -\text{ individual product unit price index;}$$

$$i_f = \frac{f_1}{f_0} -\text{ individual salary index of one employee.}$$

Individual indexes of quantitative indicators are calculated as follows:

$$i_q = \frac{q_1}{q_0} -\text{ individual index of the physical volume of products.}$$

Individual indexes can be calculated as an index series for several periods. At the same time, there are two ways of calculating individual indices: chain and base. With the chain method of calculation, the indexed value of the previous period is taken as the basis of comparison. At the same time, the basis of comparison is constantly changing. For example, for a price index, the chain indices for different periods are calculated as follows:

$$i_{10} = \frac{p_1}{p_0}, \; i_{21} = \frac{p_2}{p_1}, \; i_{32} = \frac{p_3}{p_2} \; \ldots$$

With the basic method of calculation, the constant indexed value of some one period is taken as the basis. For example, for the index of the physical volume of production, the base indices are calculated as follows:

$$i_{10} = \frac{q_1}{q_0}, \; i_{20} = \frac{q_2}{q_0}, \; i_{30} = \frac{q_3}{q_0} \; \ldots$$

INDEXES OF AGGREGATE FORM

Aggregate indices are the main form of general and group indices. Their name comes from the Latin word "aggrega", which means "to join". The numerator and denominator of the indices contain combined sets (aggregates) of the elements of the studied statistical populations.

In complex statistical aggregates, comparability of different units is achieved with the help of special coefficients of indexed values, so-called coefficients. They are necessary for the transition from natural measures of variable units of the statistical population to homogeneous indicators.

It represents the ratio of sums of products of indexed values and their sums. This means that the numerator and denominator contain the sums of the products of two interrelated indicators, one of which is qualitative, and the other is

quantitative. General indices are denoted by the symbol "I", and the subscript indicates the indicator whose change is characterized by this index.

In the aggregated data, the coefficients p, z, f can be indexed separately, the "weights" q or the aggregate as a whole can be indexed separately. If the scale is indexed, the weights are fixed at an unchanged level (basic or current). Similarly, the counter is fixed if the weights change.

Depending on the rules for building indexes, the index systems of E. Laspeyres, G. Paasche, and I. Fischer are distinguished. In Ukraine, a combined system of aggregate indices is used, which is built according to the following rules.

In the aggregate indices of qualitative indicators, the indexed indicator in the numerator is taken for the reporting period, in the denominator -

for the base, and the multiplier is fixed at the level of the reporting period (H. Paasche method). For example, when studying changes in turnover due to prices, the number of products should be fixed at the level of the reporting period. Under this condition, it is possible to determine the real savings, which are obtained in the case of a decrease in prices or overspending, if the prices increased. The general price index will look like this:

$$I_p = \frac{\sum p_1 q_1}{\sum p_0 q_1};$$

Similarly, the cost index $I_z = \dfrac{\sum z_1 q_1}{\sum z_0 q_1};$

So, the numerator of the aggregate index of the qualitative indicator contains the value of the volume indicator for the reporting period, and the value of the volume indicator in the denominator, provided that the value of the quality indicator remains at the level of the base period.

In aggregate indices of quantitative indicators, the numerator is the indexed indicator for the reporting period, the denominator is the base indicator, and the coefficient is fixed at the level of the base period (E. Laspeyres method). For example, to determine the change in turnover in the current period compared to the base period due to a change in the physical volume of sold goods, prices should be fixed at the level of the base period. In this case, the physical turnover index will look like this:

$$I_q = \frac{\sum p_0 q_1}{\sum p_0 q_0},$$

Thus, in aggregate indexes of quantitative indicators, the denominator contains the value of the volume indicator in the base period, and the numerator

contains the volume indicator for the reporting period, provided that the qualitative indicator remains at the base level.

In the aggregate indexes of volume indicators, the numerator contains both coefficients for the reporting period, and the denominator - the basic one, that is, both qualitative and quantitative indicators are indexed. For example, by multiplying the prices by the corresponding number of goods sold and summing up the products, we get the total turnover. To determine the change of this indicator in the current period compared to the base period, the turnover index should be used:

$$I_{pq} = \frac{\sum p_1 q_1}{\sum p_0 q_0},$$

Taking into account the multiplicative relationship between the indexed quantity (weight) and the effective indicator (summary), these indices are linked into the system:

$$I_{pq} = I_p \times I_q; I_{zq} = I_z \times I_q; I_{fT} = I_f \times I_T; I_{ys} = I_y \times I_s.$$

Within the framework of the system of interdependent indices, the role of each individual factor in the relative or absolute change of the volumetric index is determined.

The absolute change is defined as the difference between the numerator and the denominator of the corresponding index. For example, the absolute change in turnover as a whole:

$$\Delta pq = \Sigma p_1 q_1 - \Sigma p_0 q_0,$$

splits into two components:

➥ due to prices:
➥

$$\Delta pq(p) = \Sigma p_1 q_1 - \Sigma p_0 q_1,$$

➥ due to changes in the physical volume of goods

$$\Delta pq(q) = \Sigma p_0 q_1 - \Sigma p_0 q_0.$$

Aggregate indexes can be defined as chain and base indexes. In chain indexes, the indexed indicator is taken for adjacent time periods (next and previous), and in basic indexes, the base value of the indexed indicator is taken in the denominator.