

Studies in Systems, Decision and Control 158

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Economic Systems Analysis: Statistical Indicators

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Preface

A team of authors has prepared the textbook of social–economic statistics for university students studying “Economics” (bachelor’s degree program) in English.

Sibirskaya Elena—Doctor of Economics, Professor of Department of Statistics of Plekhanov Russian University of Economics. Author of more than 200 scientific and teaching and methodological works. Sphere of interests is conducting basic and applied research, carrying out the expertise and providing advice on statistical analysis problems of Russian economy.

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Lyapina Innara—Doctor of Economics, Professor of the Department of Marketing of the Orel State University. Author of more than 180 scientific and teaching and methodological works. Sphere of interests is national and regional economy, business, marketing, innovations, investments, statistics, and researches.

A knowledge of social–economic statistics, a system of economic indicators, and methodology for their calculation provides an opportunity to work in any sector of the economy. Professional foreign language proficiency for economics graduates is one of the conditions for successful work and career advancement. Russian business is more integrated into the global economy and a foreign language proficiency becomes the same basic skill as the ability to use computers. Besides, the enterprises and firms try to refuse the services of an interpreter and employ staff members with knowledge of foreign languages and ability to translate the specialized literature and documentation.

Often, the knowledge of common foreign language is not enough in business and professional sphere and for effective communication with foreign experts in economy and finance sphere. In a globalized economy, the foreign language, especially English, becomes an important information product. It helps to make an objective assessment of the situation in the world economy, to strategize about more effective economy for the enterprise. This explains the development of professional literature in foreign language and creation of this textbook for studying the economic statistics.

Statistical Indicators for Economic Analysis book is written with consideration that readers are familiar with the theory of statistics, which has formulated the general methods and principles of establishing the quantitative characteristics of mass phenomena and processes. This book describes the concepts, definitions, indicators, and classifications of social–economic statistics with consideration of the international standards and the present-day practice of statistics in Russia. Most of the chapters are described briefly, but the authors believe that, nevertheless, the book has plenty of material for studying.

The book has 10 chapters, and here is a brief description of each chapter.

Chapter 1. “Introduction to Economic Statistics” reviews the subject, method, and goals of social–economic statistics, main groupings, and classifications.

Chapter 2. “Population Statistics” describes the target, subject, and sources of data on population statistics, the indicators, and main groupings of population distribution.

Chapter 3. “Statistics of Living Standards of Population” reviews the concepts and systems of living standards indicators.

Chapter 4. “Statistical Study of Labor Force” describes the concept of labor force and the goals of labor statistics.

Chapter 5. “Statistics of Labor and Company Personnel” reviews the concepts of company personnel and its structure, the indicators of employees’ headcount turnover, the indicators of work time records and use, methods of studying the dynamics of labor productivity across a set of companies, and factor models in studying the dynamics of labor productivity.

Chapter 6. “Macroeconomic Indicators in SNA” describes the system of national accounts, GDP, and other macroeconomic indicators.

Chapter 7. “Statistics of Production” reviews the conceptual framework of production, the types of production by grade of its readiness in manufacture, the methods inventory of manufacturing and selling products, and the methods of statistical assessment of selling activity and production quality.

Chapter 8. “Statistics of National Wealth” reviews the concept and structure of national wealth, the indicators of fixed assets availability and inventory.

Chapter 9. “Statistics of Production Costs” reviews the concept and structure of production costs, the methods of studying the dynamics of production cost price and distribution costs.

Chapter 10. “Statistics of Financial Outcomes of Company Operations” reviews the concept of gross profit and the types of profit, the quantitative characteristics of monetary relations in terms of emergence, allocation, use, and analysis of companies’ financial resources.

The textbook is created for students in economic specialties (the academic bachelor’s degree program) and can be used as an auxiliary literature for the students in other programs.

Moscow, Russia
Moscow, Russia
Moscow, Russia
Orel, Russia
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Chapter 1

Introduction to Economic Statistics



After studying this chapter, you will be able to know:

The main definitions, the subject matter and method of social-economic statistics; the main goals, the theoretical and methodological foundations; the system of indicators, the key groupings and classifications used in economics and economic statistics;

Skills to be acquired:

The ability to characterize the role of statistics in the studies of social and economic phenomena and processes.

Key points:

1. *The subject matter, method and goals of economic statistics*
2. *The main groupings and classifications used in economics and economic statistics.*

1.1 Subject Matter, Method and Goals of Economic Statistics

Economic statistics is:

- (1) the area of knowledge—science encompassing a complex and multi-branch system of scientific disciplines (areas) which have a certain specificity, they study the qualitative aspect of mass phenomena and processes in inextricable connection with their qualitative aspect;
- (2) the area of practical activity—collecting, processing, analyzing and publishing mass data about the phenomena and processes of social life;
- (3) a set of digital data characterizing the state of mass phenomena and processes of social life or their totality;

- (4) the area of statistics applying the methods of mathematical statistics for studying social and economic processes and phenomena.

The target of economic statistics are mass economic and social phenomena taking place at the level of the overall economy of the country, the economy of regions or individual economic entities.

The subject of economic statistics are the quantitative and qualitative characteristics of the specific results of an economic activity.

The main goals of economic statistics are as follows:

- providing government bodies with information required for them to make decisions on a broad range of issues related to the formation of economic policy, elaboration of various state programs and measures on implementing them;
- providing company CEOs, managers, officers who set up production facilities with information on the development of economy and social sphere, required for their better understanding of the macroeconomic environment where their companies operate, in particular, when making decisions on investments, expanding production, organizing sales, etc.;
- developing and constant refining of the indicator system of socio-economic processes;
- developing and substantiation of data sources;
- providing the characteristic of the socio-economic potential and its components: labor force, material and technological component, natural resource component and others.

The theoretical foundation of economic statistics is the economic theory which reveals the whole system of economic phenomena and processes in their mutual relations and interdependence via economic categories and laws.

The methodological foundation of economic statistics is the general theory of statistics which develops the statistical methodology, that is the statistical methods of collecting, processing, presenting and analyzing statistical data.

The statistical methods used for researching mass economic and social phenomena, are as follows: times series; groupings; calculating averages; balance method; correlation-regression analysis and others.

1.2 System of Indicators of Economic Activity Outcomes and Their Groupings

The key element of economic statistics is the *system of indicators* reflecting the numerical characteristic of various economic phenomena and processes, as well as of economics on the whole.

The term “system of indicators” denotes an ordered set of interrelated and mutually agreed indicators characterizing the key aspects of the economic process and the

Table 1.1 System of indicators

Indicators of resources of social-economic potential	Development indicators social-economic potential	Indicators of population income level
Indicators of labor force	Indicators of economic activity outcomes	Indicators of income differentiation
Indicators of national wealth	Indicators of costs	Indicators of nominal and real salary
	Indicators of effectiveness	Indicators of income dynamics and so on
	Indicators of foreign trade relations	Indicators of population consumption of material values and services
	Indicators of finance and prices	
	Others	

economy in general. The indicators agreement enables to use them in combinations, as well as to calculate various coefficients having major analytical importance.

The term “statistical indicator” has two meanings. First, it is a specific numerical characteristic of a certain phenomenon. Second, it is general outlining the content of a certain indicator, that is the elements to be included in the indicator. Outlining the content of an indicator and the methods of its assessment is called *developing the methodology*. It includes the following stages:

- identifying the phenomena and processes to be studied statistically (identifying the type of data requiring development), formulating the goals for the computation of indicators;
- identifying the content of indicators;
- identifying the methods of assessing individual indicators, that is, which of them should be used for the assessment of various types of economic assets in the computation of the national wealth, the population size and so on;
- identifying the main classifications to be applied for the distribution of the studied economic phenomena on the basis of certain criteria;
- identifying the main sources of the data required for the computation of indicators, as well as the procedures of processing the collected data in order to obtain generalized indicators.¹

Thus, the following groups are specified in the system of indicators (Table 1.1).

¹Economic Statistics. 2nd edition, revised: Textbook/Edited by Yu. N. Ivanov.—M.: INFRA-M, 2002—480 pp—(Series “Higher Education”).

1.3 Main Groupings and Their Classifications Used in Economics and Economic Statistics

Classifications and groupings are an important tool of studying social and economic phenomena and organizing information. Classification in economic statistics is a systematized distribution of phenomena and objects to certain sections, groups, classes, positions, types on the basis of their similarities and differences. An attribute (a criterion) or several attributes (criteria) serve as the basis for classification.

Classifier in statistics is a systematized list of units (industries, businesses, products, activities, fixed assets and so on), with each of them having a code assigned. The code substitutes the unit name and serves as the means of its identification, since the code is a mark or a set of marks adopted for identifying classification groupings and classification objects.

System of economic classifications is a condition for ranking, analyzing, storing and efficient searching for information. The main classifications which are obligatory for use, stand for standards. Classifications are usually agreed by statistical services with information consumers and are the subject of harmonization at the international level.

In order to identify the affiliation of phenomena and units to certain classes and groups, to the classifier, detailed guides and indices in the form of reference books, are compiled for the classifier. A classifier is added to and specified in *nomenclature*—a standard list of units and their groups (Fig. 1.1).

In today's conditions of Russia's integration with the international community, the Unified System of Information Classification and Coding which was established in Russia, is an important means of achieving the authenticity and comparability of indicators.

Classifications enable to establish quantitative characteristics of individual groups, their specific weight. Classifications of the branches of economy are necessary for allocating companies or their parts (divisions). Classifications of the economic activity types serve as a basis for analyzing the statistical data on manufacturing, factors of production and others.

There are close relations between sector classifications and classifications of commodities. The International Standard Industrial Classification of All Economic Activities is the classification of the types of economic activities having a hierarchical structure. Certain modification for taking into account the national peculiarities is possible.

Classifiers, with each of them describing its units of classification, are to ensure the interrelations of these units in information flows. A significant part of All-Russia classifiers are currently based on effective international classifiers.

Control Questions

1. Name the subject, method and goals of social-economic statistics.
2. Describe the indicator system of the economic activity outcomes and their groupings.