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ECONOMETRIC MODELS AND THEIR PRACTICAL SIGNIFICANCE

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Abstract: This article discusses the econometric model and their practical significance.

Key words: Econometrics, model, regression models, simultaneous equations, time series model, trend, seasonal, cyclical and random components.

Аннотация. В данной статье рассматриваются эконометрические модели и их практическое значение.

Ключевые слова. Эконометрика, модель, регрессионные модели, системы одновременных уравнений, модели временных рядов, тренд, сезонная, циклическая и случайная компоненты.

Econometrics is a science that uses statistical data to quantitatively characterize interdependent economic phenomena and processes [2].

The subject of econometric research is broad economic phenomena and processes.

The goal of econometrics is to quantitatively characterize economic patterns that economic theory identifies and defines only in general terms [1].

The primary tool of econometrics is the econometric model, whose factors are estimated using mathematical statistics. The model serves as a means of analyzing and forecasting specific economic processes based on real statistical information.

It should be noted that econometric models differ from other economic-mathematical models in that their construction is based on statistical data, and their validation is also based on the methods and criteria of mathematical statistics.

There are a large number of different econometric models, which differ in their content, mathematical representation, and application area.

Main types:

1. Single-equation regression models. These models are based

on a regression equation, or a system of regression equations, linking the values of endogenous and exogenous variables.

Regression models are divided into paired (with a single factor) and multiple regressions. Depending on the type of function, models are also divided into linear and nonlinear regressions [3].

2. Systems of simultaneous equations. These models are described by systems of equations. Systems may consist of identities and regression equations, each of which may, in addition to

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independent factor variables, include dependent variables from other equations in the system. In practice, such systems are typically converted to a recursive form. To do this, indicators (dependent variables) are first selected that depend only on the independent factor variables [4]. Then, an indicator is selected that depends on the independent variables and the dependent variables already defined.

Thus, each subsequent indicator depends only on the independent variables and the already defined dependent indicators of the given system. Systems of simultaneous equations require a more complex mathematical apparatus than simple regression models.

1. Time series models. A sequence of observations of an indicator, ordered in time, is called a time series. The numerical values of the indicator under study are called the levels of the series [5].

Time series models have only one independent variable, i.e., they are single-factor models. In the most general case, a time series of economic indicators can be decomposed into the following structural elements: trend, seasonal, cyclical, and random components [3].

A trend is defined as a stable, systematic change in a process over an extended period of time.

In time series of economic processes, more or less regular fluctuations may occur around a trend. If these fluctuations are strictly periodic or close to it and complete within one year, they are called seasonal fluctuations. If the fluctuation period lasts several years, they are called cyclical fluctuations [6].

The trend, seasonal, and cyclical components are called regular or systematic components of the time series. A time series does not necessarily contain all of these components.

Time series models also include many more complex models, such as additive forecasting models, autoregressive models, and others[6].

Econometric models can be used as an integral part of any technical and economic study. Assessing the accuracy and stability of technological processes, developing adequate methods for statistical control of technological processes, optimizing the yield of useful products, improving the quality and reliability of products, product certification, materials diagnostics, studying consumer preferences in marketing research, innovation, investment management, conducting marketing surveys, environmental and economic research in developing strategies for the production and sale of special equipment, and in many other areas.

Almost every field of economics and management deals with statistical analysis of data and therefore has some econometric methods in its toolkit.

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