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SIMULATION OF DEMAND AND SUPPLY FUNCTIONS IN THE SINGLE-PRODUCT MARKET

Summary

In any market economy, supply and demand processes are actively developing and interacting with each other, influencing the functioning of the economy as a whole.In this regard, problems related to supply and demand are relevant for scientific research in both theoretical and applied aspects, since their deep justification allows for the development of adequate economic policy and appropriate regulatory mechanisms that contribute to the establishment of effective interaction between sub objects of supply and demand and their formation of quality market solutions.

Application of the method of conditional smoothing (conditional approximation) of data to build models of classic supply and demand functions with appropriate a priori properties based on observational data, which are characterized by violations of these properties.

One of the approaches to the modeling of continuous functions (curves) of supply and demand based on the data of observation (monitoring) of the dynamics of supply and demand is proposed.The specificity of these data lies in the fact that due to the influence of external factors on them, their measurement errors in the process of observing changes in supply and demand, they do not always agree with the theoretical regularities reflected in the supply and demand curves (observed demand values with price increases should belong to a descending and convex (downward) curve, and offers – to an increasing and concave (upward convex) curve).The implementation of the proposed approach is reduced to the conditional smoothing of the observation data, i.e., the replacement of these data with other data satisfying the predetermined properties of the supply and demand curves and are solutions to certain optimization problems. Models of supply and demand functions (curves) built in this way also allow determining the equilibrium values of price, demand and supply.

Both approaches to the construction of supply and demand functions, and these functions themselves have not only theoretical, but also important practical applications for the analysis of market phenomena and processes, in particular for establishing market

equilibrium, specifying its parameters, and developing appropriate solutions related to the researched market.In addition, the toolkit proposed in the work can be successfully used when modeling other types of economic behavior functions, such as expenditure and output functions, utility functions etc.The effective practical application of the developed toolset for simulation of functional models in the economy is also facilitated by sufficiently powerful software and modern information technologies.

The proposed models of supply and demand functions (curves) belong to the class of piecewise linear functions.On the basis of these functions, it is possible to develop a toolkit for constructing smooth (for example, twice continuously differentiable) supply and demand functions with the corresponding classical properties in supply and demand theory.The construction of such functions is the subject of further research and outlines their perspective.

Keywords: model, modeling, market, demand function, supply function.
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