

Application of statistical theory for mass product output mathematical models

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The main aim of this work is the development of the mathematical model, which describes the dynamics of mass product output on the manufactures. This model gives an opportunity to find out the conditions for stable work of manufacture and the conditions for optimal operation. At present in the scientific literature describing mass product output are absent reasonably sufficient, valid, and self-consistent mathematical models. These questions were considered only on the level of the problem formulation on the basis of particular and deficiency estimates. A theoretical foundation for constructing such models was absent. Methods of statistical physics let us build such a base for economical problems of mass product output description. Under consideration of socio-economic systems composed of a sum-total big number of individual elements, one can use well-developed kinetic theory methods of statistical physics. For the description of mass product output, it is necessary to introduce the distribution function of the base product, phase space in which it is defined, and write down the Boltzmann kinetic equation in terms of economical parameters that it satisfies. It gives an opportunity to define macroscopic parameters and to solve for dynamic equations, which they satisfy. These equations act the determinative part in finding out the conditions of stable work of manufacture, its most optimal superintendence, and others. Using widespread statistical physics aggregation methods of microelements for big systems, equations of industrial and marketing systems balance are written. It is shown that in the single-stage description, balance equations degenerate in well-known Forrester's level equation of industrial and marketing systems.