

Optimization model of product supplies for supplying enterprises

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Organization of finished goods sales on the manufacturing and purchasing enterprises requires work with a number of consuming enterprises that have a variety of characteristics which define the degree of efficiency of using them as their counterparts. Thus, in case of a large number of contractors, correct distribution of product volumes supplied by them, increases the effectiveness of the company. In modern financial mathematics deterministic analysis of yields is determined by the combined influence of many random factors. In most cases, yields of any financial transaction and the resulting benefits, according to the central limit theorem, are regarded as random variables with normal distribution. A number of authors use only one characteristic for the description of the risks associated with investing – variance. In this paper usage of all three scalar characteristics as numerical estimates for the analysis of enterprise profitability (expectation $M(k)$, variance $D(k)$ and standard deviation $\sigma(k)$ with certain limits) allowed building an accurate mathematical model that takes into account the slightest fluctuations of random factors.

From the mathematical and economic points of view the task is to build the system of supplies, which would take into account fluctuations in profitability of individual operations.

These fluctuations can arise in particular due to the irregular payment of goods delivered and are random. Therefore, economic and mathematical model of the prob-

lem should take into account random disturbances and minimize the risk of loss due to random factors.

For the evaluation of the random factors affecting the profitability of the enterprise, the optimization model is built. At the same time, for the evaluation of a random variable with unknown distribution sampling numerical characteristics are used. Taking into account the limiting conditions, we obtain estimates for which the $\sigma(k)$ can be regarded as a measure of the reliability of the partner.

The results of the proposed method are presented for the company, which delivers perfumes and cosmetics to a network of small wholesale customers, consisting of six shops Kyiv and Kyiv region.

Results for the one of them, which delivers perfume and cosmetics online small wholesale customers, are listed in this article. Calculators are made in MatLab and decision task is got, taking into account the real statistical data of the enterprise (parameters $M(x), D(x)$).

The conditions under which the company will yield the maximum and minimum are analysed. Presented model allows us to calculate optimally profitable for the firm supplies a structure that provides the greatest return.

In accordance with the stated approach, measuring the risk analysis was conducted by standard deviation of return from the expected value. It is shown that the larger this value, the more likely a significant deviation from the expected.