CONSIDERATION OF SOME PROBLEMS OF PROBABILITY THEORY IN THE FIELD OF INSURANCE

Suslova O. S.
National Aviation University, Kyiv
Supervisor –V.Trofymenko, Ph.D, associate Professor.

Key words*:* probability theory, Muavri-Laplace theorem, the field of insurance.

In the economic sphere, which is one of the most important spheres of society, probability theory plays an important role and, therefore, is an integral part of the training of specialists such as economists and financiers. Probability theory techniques should be used where it is possible to create and analyze probabilistic models of actions or phenomena. One of the branches of the economy in which calculations allow combining different methods of probability theory is insurance.

Consider the solution of the problem in the field of insurance, using the integral theorem of Muavry-Laplace.

Example. The insurance company has concluded 800 property insurance contracts. The probability of loss, shortage or damage to property under each contract during the year is 4%. Find the probability that there will be no more than 40 such cases. Solution:

According to the condition $n = 800$ $k_1 = 0$ $k_2 = 40$ $p = 0.04$ $q = 0.96$

де $x_{1,2} = \dfrac{k_{1,2} - np}{\sqrt{npq}}$

$P_n(k_1 \le k \le k_2) = \Phi(x_2) - \Phi(x_1)$,

By the Muavri-Laplace theorem and the corresponding table, we find the required probability of 0.5-0.425 = 0.075.

It should be noted that to calculate the probability of repetition tests under the conditions of using the Muavri-Laplace theorem, it is expedient to use the corresponding functions in MS Excel. To simplify and automate analytical calculations according to the Laplace integral theorem, the following built-in functions are used: $\Phi(x)$ = NORM.ST.RASP (x; 1) and x = NORMALIZATION (k; λ; σ). To find the value of x, use the function "NORM.ST.OBR (1 + probability (2)). These functions allow us to investigate changes in probability values, build comparative graphs. As a result, we get important calculations for the company when planning and forecasting its work.

References:
1. Higher mathematics. Probability Theory. Random events. Method Guide to self study /I. O. Lastivka, I. S. Klyus V.I.Trofymenko – K. : NAU, 2018. – 48 p.
2. 2. Kuzmichov A.I. OptimIzatsIynI metodi I modelI: praktikum v Excel : navchalniy posIbnik / A.I.Kuzmichov. – KiYiv: VPTs AMU, 2013. – 438