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CORRELATION COEFFICIENT AS A MATHEMATICAL SOLUTION OF ECONOMIC ISSUES

Madraximova Maxfuza Axmedovna

Teacher of the Kokand State Pedagogical Institute

Turdaliyev Sodiqjon Muminjonovich

Teacher of the Kokand State Pedagogical Institute

Abduraxmonov Dilmurod Akramaliyevich

Teacher of the Kokand State Pedagogical Institute

Annotation. *This article provides information on determining the influence of factors of the production process in the economy through the correlation coefficients of mathematical statistics.*

Keywords: *Mathematical method, even and multiple correlations, coefficient, cost, factor, cost.*

Mathematics in our country is defined as one of the priority areas of science development from 2020 year. Although a number of systematic works have been carried out over the past period aimed at bringing mathematics science and education to a new level of quality, the existence of a number of issues that have not been solved in the field, especially the problems that require a mathematical solution of economic sectors and the development of research work on the basis of

One of the issues that awaits such a practical solution is the optimization of production costs at the enterprise. The cost for the operation of the enterprise plays an important role, since the lower the cost of production and sale of the product, the greater the profit and profitability of the enterprise. The cost of the product is the sum of the costs expressed in money, which is associated with the production and sale of the enterprise's product. With the reduction of the cost of capital, the monetary savings of enterprises will increase, providing additional funding for further expansion and improvement of production, reducing the retail price of productstirib thereby making it possible to increase the standard of living of the populationtirishga. A certain level of the product cost will depend on the result of the interaction of many production factors. The degree of correlation between them can be found in high accuracy by conducting an analysis through the correlation techniques of Mathematical Statistics.

Correlation analysis is used in economics, sociology and psychology, medicine, quality management, biometrics and other fields. The popularity of correlation analysis is explained by the fact that it is relatively easy to calculate the correlation coefficients, and their application does not require special mathematical preparation. On the other hand, correlation coefficients are easy to interpret.

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Correlation analysis this is a statistical method of studying the correlation between two or more random variables. In empirical research, there are values of variables as random variables, measured properties of observation objects. The essence of the correlation analysis is to calculate the correlation coefficients. Correlation coefficients, as a rule, can accept both positive and negative values. The sign of the correlation coefficient allows to interpret the direction of the bond, and the absolute value-the strength of the bond. The method of calculating the correlation coefficients depends on the measurement of the variables in which the correlation is studied. For variables that are measured on a quantitative scale (interval scale or ratio scale), covariance or correlation moment is calculated. Correlation coefficients of non-parametric levels are used to assess the strength and direction of the correlation between variables measured on an orderly scale. Also often used is the correlation coefficient of Fechner signs, the coefficient of multi-rank correlation (coefficients of conformity). Dichotomous there are measures to evaluate the correlation between variables.

However, there are specific features and methodology of correlation analysis. It is very important to apply this method only if the necessary conditions for calculating the coefficient of this or that correlation are met. The method of correlation analysis implies not only the calculation of the correlation coefficients, but also the mandatory verification of their significance, which is based on the printing of statistical hypothesis testing, the compilation of intermediate evaluations of the correlation coefficients. In the analysis of the correlation between quantitative variables in the case of "false correlation" (lojnaya correlation) [1], which leads to false conclusions, partial correlation coefficients are calculated and analyzed.

If the connection between the indicators is not strictly determined, then it is considered correlation. Correlation link-this is such an incomplete link, in which each value of factors corresponds to different values of the result in conditions of time and space. The exact number of factors in this case is unknown.[2]

Correlation analysis is widely used in the quantitative evaluation of two functions - determination of the density of dependence and the effect of factors on the resultant performance, and is summarized based on the table below.

(Table 1)

To evaluate the continuity of relations in different values of correlation ratio

Ratio amount	**0,1-0,3**	**0,3-0,5**	**0,5-0,7**	**0,7-0,9**	**0,9-0,99**
Communication integrity	**Weak**	**Imperceptibly**	**Noticeable**	**Elevated**	**Much higher**

In a straight-line connection, the correlation relationship is called the correlation coefficient and is denoted by the letter **r**. Correlation relationship (correlation coefficient) accepts values from 0 to 1. If r = 0, then there is no communication between the indicators, then r = 1, then communication –

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functional, **r** is an indication that the communication between the indicators is reversed when the negative quantity is received. The following is a way of determining the degree of correlation coefficient between the factors, based on the table of consistency of the product cost and material cost relationship given below.

Factories	Unit cost, sum, x_1	Unit costs, sum, x_2	x_1^2	x_2^2	$x_1^2 * x_1^2$
1	254	56	64516	3136	**14224**
2	230	50	52900	2500	**11500**
3	241	54	58081	2916	**13014**
4	251	56	63001	3136	**14056**
5	264	60	69696	3600	**15840**
6	270	62	72900	3844	**16740**
n=6	$\sum x_1 = 1510$	$\sum x_1 = 338$	$\sum x_1^2 = 381094$	$\sum x_2^2 = 19132$	$\sum x_1^2 * \sum x_2^2 = 85374$

here:

1. $x_1 * x_2 = \frac{\sum x_1 * \sum x_2}{n} = \frac{85374}{6} = 14229$
2. $\overline{x_1} = \frac{\sum x_1}{n} = \frac{1510}{6} = 251.667$
3. $\overline{x_2} = \frac{\sum x_2}{n} = \frac{338}{6} = 56.33$
4. $\lambda x_1 = \sqrt{\frac{\sum x_1^2}{n} - \overline{x_1}^2} = \sqrt{\frac{381094}{6} - 251.667^2} = 13.4$
5. $\lambda x_2 = \sqrt{\frac{\sum x_2^2}{n} - \overline{x_2}^2} = \sqrt{\frac{19132}{6} - 56.33^2} = 4.0$
6. $r = x_1 * x_2 - \frac{\overline{x_1} * \overline{x_2}}{\lambda x_1 * \lambda x_2} = \frac{14229 - 251.667 * 56.33}{13.4 * 4.0} = 0.98$

The result of the calculation shows that the cost of a unit of product depends on the material costs of 98%, while the percentage of other factors corresponds to 2% of its rate change.

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