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Customs Fees And Revenues Factors Of Formation

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Abstract: This article describes the methods of correlation and regression analysis of the relationship between foreign trade turnover and customs duties.

Key words: foreign trade turnover, customs duties, correlation analysis, regression analysis, elasticity coefficient, Chaddock scale.

Introduction

It is known that every year, by the decision of the President of the Republic of Uzbekistan, a prospective plan for the revenues of the State budget of the Republic of Uzbekistan is determined[1]. Customs duties are the basis of indirect taxes. In turn, several factors affect the value of customs fees. Determining the hidden connections between these factors, as well as determining the perspective plan, is determined on the basis of specific scientific research. In addition, the full and effective implementation of the annual plan depends on the scientific basis of the forecast parameters.

Accordingly, foreign trade operations, which are the basis of the economy, and issues such as determining the impact of factors on the final indicator, evaluating it, and setting the perspective based on the methods of cause and effect analysis of the situations in it, are the main links of customs statistics. At the same time, the more detailed the collection of customs fees, i.e. the resulting indicator depends on one or another factors, the more accurate the analysis and assessment of the quality of the work of the customs authorities will be. Without a deep and comprehensive study of the interrelationship and influence of the factors, it will be impossible to make reasonable conclusions about the results of the activity, to determine the reserves, to justify the plan and management rules. Therefore, below we will consider correlational and regression analysis methods of the relationship between import value and customs fees.

Research methodology and analysis and results

Correlation analysis is one of the widely used methods in customs statistics. We will consider its practical importance in the analysis of data indicators of foreign trade statistics. For example, given the following database:

Table 1 Import value and customs duty values table by months

(Author development based on DBQ data)

Months	Foreign trade turnover, million US dollars.	customs fees, million soum.
January	27,068	172,17
February	29,889	200,90
March	34,444	231,83

April	33,158	232,10
May	37,755	233,40
June	37,554	236,99
July	37,299	246,53
August	40,370	253,62
September	37,909	256,43
October	38,348	261,89
November	39,137	259,36
December	46,298	278,87

In this case, the factor symbol: x - import value in millions of US dollars and the resulting symbol: y - customs fees charged to the budget in millions. let it be in soum.

In statistics, there are several ways to determine the existence of a correlation between two quantities[2]:

x	y
27,068	172,17
29,889	200,90
33,158	232,10
34,444	231,83
37,299	246,53
37,554	236,99
37,755	233,40
37,909	256,43
38,348	261,89
39,137	259,36
40,370	253,62
46,298	278,87

1) **a method of comparing data in parallel**.

Place the values of the x-factor quantities in ascending order, and then study the situation based on a visual comparison of them with the y-resultant quantities, respectively. In our example, the first 6 values of x are increasing as well as the first 5 values of y, so it is difficult to say that there is a direct relationship between the variables x and y (Table 1).

2) **graphical method -** it is a graphical representation of a correlational relationship. For this, n points whose coordinates consist of the values of the variables x and y should be determined on the coordinate plane x0y and connected by cross sections.

In our example, the relationship between the symbols x and y looks like a straight line going up (Chart 2).

and the amount of customs fees is the basis for putting forward the hypothesis that there is a linear relationship.

If the collection units are divided into groups and there is a straight line relationship between the factor trait and the outcome trait, the relationship density is calculated by the correlation coefficient. The correlation coefficient can be calculated using the following formulas.

(1) $$r_{x,y} = \frac{\left[\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})\right] \cdot \frac{1}{n}}{S_x S_y}.$$ or

(2) $$r_{x,y} = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

S_xS_y - is equal to taking the square root of the variance to determine the quadratic deviation from the mean:

$$S_x = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}} \quad (3)$$

Correlation coefficient was first proposed by English scientists Holton and Pearson. The correlation coefficient is from -1

It ranges from + 1. If the correlation coefficient shows a negative sign, the relationship is inverse, if it is positive, it is recognized that there is a linear relationship. It is with this feature that this indicator differs from other indicators, and this is its superiority over others. As the correlation coefficient approaches one, the bond strength increases and vice versa. Chaddock's scales are used in statistics to qualitatively assess the indicators characterizing the density of connections [3].

Chaddock scales

Binding density	0,1-0,3	0,3-0,5	0,5-0,7	0,7-0,9	0,9-0,99
Binding power	empty	mediocre	significant	high	very high

It is known that the connection density between the factor sign and the resulting sign cannot be equal to one. If equal to one, there is a functional link between them, not a correlational link. If equal to zero, there is no relationship between them at all.

As can be seen from the Chaddock scales, the values of dependence

At an increase of 0.7, the correlation between the factor sign and the resulting sign is high, and at 0.9, it is very high.

Based on the formulas (1 and 2) given above, you determine the correlation coefficient of the indicator presented in Table 1. For this, a table is created as follows.

$$r_{xy} = \frac{\frac{1}{12} \cdot 1485{,}066}{4{,}784 \times 27{,}618} = \frac{123{,}756}{132{,}116} = 0{,}93672$$

The calculations show that there is a positive correlation between import value and customs fees. According to the Chaddock scale, the correlation is considered very high.

The second task, which is considered in the examination of the correlational connection, is to determine how much the second event changes depending on the change of one event. Unfortunately, the method of correlation analysis - correlation coefficients - does not allow us to think about this. Another technique known as regression analysis serves this purpose.

Regression analysis is important in solving practical problems. It makes it possible to assess the effectiveness of the characteristics affecting the resulting character with a sufficiently accurate accuracy for practical purposes. At the same time, with the help of regression analysis, it is possible to estimate the prospective amounts of economic events for future periods and determine their probability limits.

A univariate regression equation representing a linear relationship can be written as:

$$Y_X = a_0 + a_1 x \quad (4)$$

Here: a_0 – freedom; a_1 – coefficient of the regression equation. In the regression equation, the X-factor is in front of the sign a_1 coefficient is of great importance for economic analysis. Y is called the regression coefficient

and shows the efficiency of the X-factor: it represents how much the result increases (or decreases) on average when the factor increases by one unit. a0 and a1 are also called equation parameters. To determine these parameters, it is necessary to solve the following system of equations using the method of least squares [4].

$$n\,a_0 + a_1 \,{}_e x = {}_e Y \quad (5)$$

$$a_0 \,{}_e x + a_1 {}_e x^2 = {}_e yx$$

Based on the formulas (4 and 5) given

above, you determine the regression equation of the indicator presented in Table 1 and its coefficient. For this, a table is created as follows.

The coefficients of the system of normal linear equations can be determined using the data in Table 3. We put the data in the table into the system of equations:

$12a_0 + 439,229a_1 = 2864,09$

$439,229a_0 + 16351,44a_1 = 106317,7$

Dividing the terms of each equation by the numbers in front of the coefficient a0, we get:

$a_0 + 36,60a_1 = 238,67$

$a_0 + 37,23a_1 = 242,06$

If we subtract the first from the second equation, we get the following:

$0,63a_1 = 3,38$ from here $a_1 = \frac{3,38}{0,63} = 5,41$

a_1 put the value of the parameter into the first equation and calculate the value of a_0:

$a_0 + 36,6 * 5,41 = 238,67$ from here

$a_0 = 238,67-197,95=40,72$

$a_0=40,72$

Parameters a_0 and a_1 in the equation can also be determined by the following formulas:

$$a_0 = \frac{\sum y \cdot \sum x^2 - \sum yx \cdot \sum x}{n\sum x^2 - (\sum x)^2} = \frac{2864,09 * 16351,44 - 106317,7 * 439,229}{12*16351,44 - 439,229^2} 40,72 \quad (6)$$

$$a_1 = \frac{n\sum yx - \sum y \cdot \sum x}{n\sum x^2 - (\sum x)^2} = \frac{12*106317,7 - 439,229*2864,09}{12*16351,44 - 439,229^2} = 5,41 \quad (7)$$

Thus, the linear equation of the correlation coefficient regression takes the following form:

$$Y_x = 40,72 + 5,41x$$

Using this equation, we determine all values of Y:

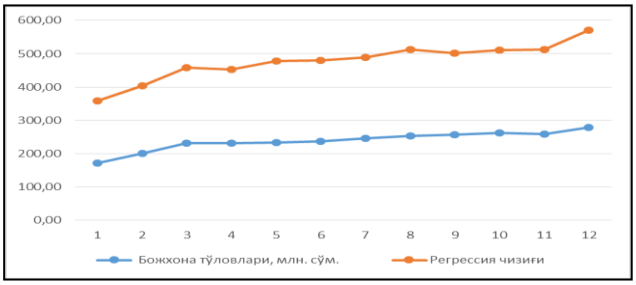
$Yx_1 = 40,72 + 5,41*27,07 =$ 187,16 million soums

$Yx_2 = 40,72 + 5,41*29,89 =$ 202,42 million soums

$Yx_3 = 40,72 + 5,41*34,44=$ 227,06 million soums

So, a_1 the regression coefficient determines the relationship between the outcome variable (U) and the factor variable (X). This answers the question of how many units the resultant sign increases when the factor sign increases by one unit. As can be seen from the results, 1 mln. The increase in the US dollar increased the customs fees by 5.41 million. leads to an increase of soum.

The regression line equation defined in Table 3 for the observational data takes the following form in the coordinate plane:



As can be seen from the plot, the differences between the empirical and theoretical lines are almost negligible. This means that general conclusions for empirical data can be drawn from the equation of the straight line of regression. Errors that can be observed in this are justified according to the Chaddock scale.

A method of determining the relationship between indicators based on the elasticity coefficient [5]. The coefficient of elasticity is: it shows by what percentage the u-result sign changes on average when the x-factor sign changes by 1%. It is determined based on the regression equation as follows:

$$E = \frac{\partial y_x}{\partial x} \frac{x}{y} \qquad (8)$$

in this $\frac{\partial y_x}{\partial x}$ - y is the first-order derivative of the regression equation with respect to x.

The coefficient of elasticity changes depending on the variable quantity, i.e. x - the factor variable.

For example, $y_x = a_0 + a_1 x$ The elasticity formula for a linear bond is:

$$E = a_1 \frac{x}{a_0 + a_1 x} \qquad (9)$$

The above-defined regression equation represents the dependence of customs duties charged to the state budget on the value of imports (y_x =5,407x+40,767). In this case, the coefficient of elasticity is according to the formula (9).:

$$E = \frac{5{,}407x}{40{,}767 + 5{,}407x} \qquad (10)$$

By putting different values of x in the expression (10), we determine different values of the elasticity coefficient. For example, x=40 at, the coefficient of elasticity

$$E = \frac{5{,}407 * 40}{40{,}767 + 5{,}407 * 40} = 0{,}84,$$

or x=50

$$E = \frac{5{,}407 * 50}{40{,}767 + 5{,}407 * 50} = 0{,}87$$

This means that the import value is 40 mln. 40.4 million from US dollars. to the US dollar (that is, by 1%), the amount of customs fees will increase by an average of 0.84% compared to the previous indicator, and x will increase by 50 mln. 50.5 million US dollars. The increase to the US dollar means that it will increase by an average of 0.87% compared to the previous indicator.

Conclusion

On the basis of the methods of analysis presented above, in the future, representatives of the scientific community can use them to increase the scientific value of their research work. In addition, determining the coefficient of elasticity on the basis of the regression coefficient in determining the forecast parameters for taxes, which are part of the income of the state budget, and thereby determining the perspective based on the change of the influencing factor, is the main indicator for the effective implementation of the plan. At the same time, the customs officials engaged in the research of the statistics database are important in evaluating the country's economy based on the analysis of foreign trade indicators, determining its position in the world market, and determining future plans.

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