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АНАЛИЗ ВЛИЯНИЯ РАЗЛИЧНЫХ ФАКТОРОВ НА ОБЪЕМ НОВЫХ ЛИЗИНГОВЫХ ДОГОВОРОВ

Аннотация: *статья посвящена анализу факторов, влияющих на объем новых лизинговых контрактов. С использованием эконометрических моделей был проведен анализ различных факторов. Были проведены различные тесты и анализы с целью понять взаимосвязь между объемом новых лизинговых контрактов в России и такими факторами, как инфляция, зарплаты, налоги на международную торговлю и сбережения.*

Ключевые слова: *лизинг, рынок лизинга, эконометрический анализ, регрессионный анализ, корреляционный анализ.*

THE ANALYSIS OF THE INFLUENCE OF DIFFERENT FACTORS ON THE VOLUME OF NEW LEASING CONTRACTS

Annotation: *the article is devoted to the analysis of factors affecting the volume of new leasing contracts. Using econometric models the analysis of different factors was made. Different tests and analyzes were conducted to understand the relationship between the volume of new leasing contracts in Russia and such factors as inflation, wages, taxes on international trade and savings.*

Keywords: *leasing, leasing market, econometric analysis, regression analysis, correlation analysis.*

THE ANALYSIS OF THE INFLUENCE OF DIFFERENT FACTORS ON THE VOLUME OF NEW LEASING CONTRACTS

Different analysis and tests were made to understand the relations between the volume of new contracts and factors which influence on the volume.

First step is to find out factors that could influence the volume of new contracts. Several indicators were taken into consideration such as: Final consumption expenditure (formerly total consumption) as the sum of household final consumption expenditure (private consumption) and general government final consumption expenditure, taxes on international trade, it includes import duties, export duties, profits of export or import monopolies, exchange profits, and exchange taxes, foreign direct investment, as the net inflows of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments, also investments in capital, inflation, gold production, savings, taxes on international trade (as a % of revenue), wages and foreign direct investments. However, during tests only several of them were included into the following analysis.

After choosing appropriate factors it is necessary to construct the correlation matrix (Table 1) applying for the special function in Microsoft Excel using initial data.

	Y	*X1*	*X2*	*X3*	*X4*
Y	1				
X1	0,89	1,00			
X2	0,33	0,67	1,00		
X3	-0,50	-0,54	-0,49	1,00	
X4	0,89	0,77	0,22	-0,52	1,00

Table 1. Correlation matrix

In this table:

Y stands for the volume of new leasing contracts, billion rubles;

X1 – savings, billion US $;

X2 - taxes on international trade, % of revenue;

X3 – inflation, %;

X4 - wages, rubles.

From Table 1 it can be seen that:

1. ρ_{YX_1} = 0,89. It means that there is a strong positive linear relationship between the volume of new leasing contracts and savings.

2. ρ_{YX_2} = 0,33. It means that there is a weak positive linear relationship between the volume of new leasing contracts and taxes on international trade.

3. ρ_{YX_3} = - 0,50. It means that there is an average negative linear relationship between the volume of new leasing contracts and inflation.

4. ρ_{YX_4} = 0,89. It means that there is a strong positive linear relationship between the volume of new leasing contracts and wages.

Then it is needed to construct the specification of the model. There are four principles of specification. According to the first principle it is necessary to use linear math equation. This model also has linear representation. According to the second principle, the number of equations in econometrics model should be equal to the number of endogenous variables. In this case there is one endogenous variable, so here is one linear equation.[1] According to the third principle of the specification all variables should be dated (in this model there are indexes t). According to the fourth principle of specification, each equation of the model should include stochastic (disturbance) term, in this model it is ε_t.So, the initial form of the model is:

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[1] Oliver Linton. Probability, Statistics and Econometrics. M.: Academic Press, 2017. - 291p.

$$\begin{cases} Y_t = a_0 + a_1 X_{1t} + a_2 X_{2t} + a_3 X_{3t} + a_4 X_{4t} + \varepsilon_t \\ a_1, a_2, a_3, a_4 > 0 \\ E(\varepsilon_t) = 0; \ \sigma(\varepsilon_t) = const \end{cases}$$

where, Y_t – the volume of new leasing contracts, billion rubles; (an endogenous variable)

X_{1t}– savings, billion US \$ (exogenous variable)

X_{2t}– taxes on international trade, % of revenue (exogenous variable)

X_{3t}– inflation, % (exogenous variable)

X_{4t}– wages, rubles (exogenous variable)

ε_t – disturbance term

In this model Y_t is an endogenous variable, because it is dependent and can be calculated using different factors and indicators, which have influence on it. The econometric model will explain this variable.

$X_{1t}, X_{2t}, X_{3t}, X_{4t}$, are exogenous variables, they can explain variable Y_t.

The next step of investigation is to is to cover the regression analysis so that the estimated form of the econometric model can be seen. To do that it is necessary to apply for the special function in the Excel program: Data – Data Analysis – Regression – input of X, Y. After analyzing the tables, the estimated form of the model can be obtained

$$\begin{cases} Y_t = 147,75 + 2,67X_{1t} - 26,32X_{2t} - 1,82X_{3t} + 0,01X_{4t} + \varepsilon_t \\ \quad (145,35) \quad\quad (0,4) \quad\quad (7,85) \quad\quad (2,39) \quad\quad (0,01) \quad (138,97) \\ R^2 = 0,93 \ \ F = 67,6 \ \ F_{crit} = 2,36 \ \ t_{crit} = 1,75 \ \ df_1 = 4 \ \ df_2 = 15 \end{cases}$$

Now instead the parameters *a0, a1,a2, a3 , a4* their estimates are presented in the equation. Besides that, the system includes the standard deviation of parameters and disturbance term, the values of R^2, F and Fcrit.

According to R-test, test if R^2 is close to 1 means that specification is constructed very good because this parameter shows x variable influences the y variable by linear regression[2]. In this case R^2=0,93 and it means specification is rather strong.

This test requires calculating Fcrit and comparing it with F that is given in regression analysis.

The function to apply is: «FINV». It considers three parameters in order to calculate Fcrit $(\alpha, df1, df2)$.

• α -probability of mistake or level of sign ()

• First degree of freedom

• Second degree of freedom

Back to F-test, results are presented below:

F_{crit} = 2,36

F = 67,6

This test checks the whole specification whether its quality is high or low and if is random variable or not.[3] the quality of specification is low and is random. Otherwise, vice versa. In this particular case according to the calculation, it can be concluded that the quality of specification is high and is non-random variable. The sense of t-test states that if the absolute value of t statistics of each parameter is more than obtained above:

	$|t_{stat}|$	t_{crit}	Significance
a0	1,02	1,75	No
a1	6,01	1,75	Yes
a2	3,35	1,75	Yes
a3	0,76	1,75	No
a4	1,75	1,75	Yes

Table 2. T-test

[2] Aaron D. Smith, J. Edward Taylor. Essentials of Applied Econometrics. M.: University of California Press, 2017. – 27p.
[3] Jeffrey M. Wooldridge. Introductory Econometrics: A Modern Approach. M.: Cengage Learning, 2013. – 76p.

Despite the fact that the test shows the insignificance of inflation on the volume of new leasing contracts, it is economically known that it can influence it. Such difference in the t-test can be explained by the information, that is available for users, in fact there can be different figures. And the second thing is that the theory is sometimes differ from the reality.

After t-test it is necessary to interpret the coefficients. If savings rise by 1 billion of US $, the volume of new leasing contracts will increase by 2,67 billion of rubles. If taxes on international trade increase by 1% of revenue, the volume of new leasing contracts will decrease by 26,32 billion of rubles. If inflation increases by 1%, the volume of new leasing contracts will decrease by 1,82 billion of rubles. If wages increase by 1 ruble, the volume of new leasing contracts will increase by 0,01 billion of rubles.

It is necessary to estimate the adequacy of the model. For that it is necessary to construct confidence interval. Confidence interval consists of two boundaries: low and upper boundary. First of all theoretical point is calculated. . Interval is calculated: *y^= a0 + a1X1 +a2X2+ a3X3 +a4X4.*

y^=1387,89

Interval is calculated: *(y^ - tcrit*σ ; y^ + tcrit*σ)*

Where Y^ - estimated Y, t crit– is taken from t-test, σ – standard deviation of the model. According to the calculations the interval is [1144,27; 1631,51]. Y_{real}= 1620, so it belongs to the confidence interval. This means that then with probability 98% the model is adequate.

References

1. Oliver Linton. Probability, Statistics and Econometrics. M.: Academic Press, 2017. - 291p.
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3. Jeffrey M. Wooldridge. Introductory Econometrics: A Modern Approach. M.: Cengage Learning, 2013. – 76p.