THE INFLUENCE OF INNOVATIVE COSTS IN MACHINERY CONSTRUCTION ON TAX PAYMENTS Sharifli I.E. (Republic of Azerbaijan)

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Abstract: the article explains the role of innovative development of oil engineering enterprises in the economy. Here, based on the statistical data of Azneftmash OJSC for 2010 - 2020, income and expenses were analyzed, and the level of profitability of the work and services of the enterprise was also studied. The article in the Eviews-12 software package assessed the impact of export costs and total income on the amount of taxes payable by Azneftmash OJSC and determined the predictive validity of the model.

Keywords: income, cost, profit, level of profitability, correlation, regression, model, innovative costs.

ВЛИЯНИЕ ИННОВАЦИОННЫХ ЗАТРАТ В МАШИНОСТРОЕНИИ НА НАЛОГОВЫЕ ПЛАТЕЖИ Шарифли И.Э. (Азербайджанская Республика)

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Аннотация: в статье разъяснена роль инновационного развития предприятий нефтяного машиностроения в экономике. Здесь на основе статистических данных ОАО «Азнефтьмаш» за 2010 - 2020 годы были проанализированы доходы и расходы, а также исследован уровень рентабельности работ и услуг предприятия. В статье в программном пакете Eviews-12 оценивалось влияние экспорта расходов и общего дохода на сумму налогов, подлежащих к уплате ОАО «Азнефтьмаш», и определялась прогностическая валидность модели.

Ключевые слова: доход, себестоимость, прибыль, уровень рентабельности, корреляция, регрессия, модель, инновационные затраты.

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Introduction. The economic returns from the introduction of information technology (IT) play a leading role in shaping the competitiveness and maximizing the company's profits [2]. However, in Azerbaijan, the share of industrial companies that develop and implement new technologies does not exceed 8%, which indicates an insignificant contribution of new innovative products to the world fund [4]. It should be noted that one of the traditional areas of the country's oil refining is oil engineering. From a conventional metalworking industry, it has evolved into a highly mechanized and multifaceted manufacturing industry. Currently, oil engineering plants continue to operate under the control of Azneftekhimyamash OJSC as subsidiaries [3]. These machine-building plants, which have lost traditional suppliers of raw materials and finished products over the years of independence, operate with low energy consumption, and the volume of production is reduced from year to year. About 80% of the products produced by oil refineries are sold on the domestic market [5].

Main part. The process of reproduction in the national economy occurs due to the innovative process of construction and installation activities [1]. Studies show that local engineering enterprises operating in the Republic of Azerbaijan do not provide the required level in the current situation. A significant part of the export of fuel and raw materials is spent on the import of machinery and equipment manufactured on the basis of innovative technologies in order to normalize the reproduction of the country's competitive economy. At present, in the production of oil engineering products in the Republic of Azerbaijan, engineering products manufactured by enterprises that are part of Azneftkimyamash OJSC actively participate in the reproduction process in our republic, are directed to the economy, to the equipment necessary for enterprises to create an active part of fixed capital oil engineering, created the conditions for reducing import dependence. It should be noted that the research and design institutes that are part of Azneftkimyamash OJSC play an important role in the introduction of innovative technologies at engineering enterprises, as well as in the organization of innovative production of Azneftkimyamash OJSC. The diagram below shows the dynamics of income and expenses from works and services of Azneftkimyamash OJSC for 2010-2020 [1, 5].



Fig. 1. OJSC "Azneftkimyamash" dynamics of income and expenses from work and services for 2010 - 2020., in thousands of AZN

Source: Compiled by the author on the basis of (1) data.

As can be seen from the diagram, the income of Azneftkimyamash OJSC in 2010-2012. increased, and in 2013-2015. developed at a declining pace. In 2018-2019, income increased and amounted to 755.1 thousand manats in 2019, which is higher than in all previous years. In 2020, the total income decreased to AZN 37.3 thousand due to the impact of the global COVID0-19 pandemic. this means a decrease of 95.1% or AZN 717.8 thousand compared to the previous year. In line with the dynamics of total revenues, there was also an increase in expenses. Due to weak innovation activities, the growth of costs also had a negative impact on the economic activity of Azneftkimyamash OJSC, as a result, in 2013, the cost of 1 manat of marketable products amounted to 1.01 kopecks. This means that economic activity results in a loss of AZN 3,000. The increase in costs led to a decrease in the level of profitability of business and services. This can be seen more clearly in the graph below.



Fig. 2. The level of profitability of works and services of Azneftkimyamash OJSC 2010-2020, in %

Source: Compiled by the author on the basis of (1) data.

As can be seen from graph 2, which shows the level of profitability of works and services of Azneftkimyamash OJSC in 2010-2020, profitability in 2011 was -2.51%, and in 2013 - 1.04%. In subsequent years, this figure varied between 0.17-6.29%, which is a very low figure. The low level of profitability also had a negative impact on the company's tax revenues. Expenses directed to the implementation of research works on the construction of OJSC "Azneftkimyamash" for 2010-2020. The total amount of income and taxes paid is presented in the table below [1, 5].

| 800 600 400 200 | | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | |
|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0 | 201 0 | 201 1 | 201 2 | 201 3 | 201 4 | 201 5 | 201 6 | 201 7 | 201 8 | 201 9 | 202 0 |
| Expenses for research, design and survey and development work | 0 | 0 | 0 | 0 | 1,01 | 0,9 | 0,8 | 0,87 | 1,9 | 3,2 | 0,4 |
| Income | 240,6 | 260,6 | 294,7 | 285,9 | 270,4 | 234,4 | 293 | 287,1 | 328,3 | 755,1 | 37,3 |
| Tax Payments | 0 | 0 | 0 | 48 | 55,1 | 49,2 | 43,1 | 44,8 | 57,5 | 71,3 | 12,9 |

Fig. 3. The total amount of innovative costs, income and paid taxes of OJSC "Azneftkimyamash" for 2010 - 2020, thousand. manats

Source: Compiled by the author on the basis of (1) data.

Using the data of the table, if we conduct a regression analysis of the relationship between the expenses aimed at scientific research work on the construction of OAO "Azneftkimyamash" for 2010-2020, the total income and the amount of tax paid, we will get the result shown in the table below.

Table 1. The result of the EViews software package

Dependent Variable: Y Method: Least Squares Date: 08/29/22 Time: 11:05 Sample: 2010 2020 Included observations: 11

| Variable Coefficient Std. Error t-Statistic Prob. X2 0.020382 0.055420 0.367777 0.0226 X1 23.34353 9.522579 2.451387 0.0399 C 21.54051 12.78805 1.684425 0.1306 R-squared 0.604061 Mean dependent var 34.7181 Adjusted R-squared 0.505076 S.D. dependent var 26.3111 S.E. of regression 18.51013 Akaike info criterion 8.90151 Sum squared resid 2740.998 Schwarz criterion 9.01003 Log likelihood 45.95833 Hannan-Quinn criter. 8.83310 F-statistic 6.102562 Durbin-Watson stat 1.03003 Prob(F-statistic) 0.024576 Schwarz criterion 9.01003 | | | | | |
|---|--|--|--|---|--|
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| | R-squared Adjusted R-squared S.E. of regression Sum squared resid Log likelihood F-statistic Prob(F-statistic) | 0.604061 0.505076 18.51013 2740.998 45.95833 6.102562 0.024576 | Mean dep S.D. depe Akaike inf Schwarz o Hannan-O Durbin-W | pendent var endent var fo criterion criterion Quinn criter. atson stat | 34.71818 26.31117 8.901514 9.010031 8.833109 1.030039 |

Source: EMiews-12 application was developed by the author based on the software package.

Based on the results obtained from the EViews application software package, the regression equation will be as follows:

 $Y = 0.0203823303202 \times X2 + 23.3435264006 \times X1 + 21.540513907$ (1)

As can be seen from the regression equation obtained from the software complex Eviews-12, the coefficients of the free term and dependent variables, reflecting causal factors and factor-effect, are greater than their standard errors. This characterizes the statistical significance of the obtained result [3, p. 310]. However, to ensure the adequacy of this result, it is necessary to check the statistical significance of the given coefficients.

As you can see from the table. 1, there is an average correlation (0.5-0.7) between variables Y and X (X1 and X2) according to Chadok's scale ($R = \sqrt{0.604061} = 0.7772$) [3]. According to the results of the application program package Eviews-12, the coefficient of determination $R^2 = 0.6041$ means that 60.4% of the variance of the corresponding regression equation is explained by the efficiency indicator, and 29.6% by the influence of other factors [3].

Since it is important to check the adequacy of the established model, this adequacy can be defined as one of the traditional methods using the Fisher criterion. F_{table} (a; m; n - m - 1) = F(0.05; 2; 8) = 4.46 since Fisher's F-test > F_(table) will be (6.1>4.46), which means the statistical significance of the constructed model (1). If we check the adequacy of the model according to Darbon-Watson statistics (DW=1.03) with a confidence interval of 95%, then we get the following result [3, p. 337].

$$d_l = 0,658, \qquad d_u = 1,604$$

 $d_l = 0,658 \le \text{DW} = 1,03 < d_u = 1,604.$

As you can see, the conclusion about the autocorrelation of residuals in the model is not specified.

After carrying out residual diagnostics and checking histograms by Q-statistics in the Eviews-12 application software package, we obtain the following results on the hypothesis of the statistical significance of the model.

Date: 08/29/22 Time: 11:57 Sample: 2010 2020 Included observations: 11

| Autocorrelation | Partial Correlation | | AC | PAC | Q-Stat | Prob |
|--|---|--------------------------------------|---|---|--|---|
| · ***. · · · ** · | · ***. · * · · ** · | 1 2 3 4 5 6 7 9 | 0.380 0.011 -0.292 -0.213 -0.317 -0.306 -0.192 0.164 | 0.380 -0.156 -0.284 0.014 -0.317 -0.250 -0.110 0.102 | 2.0694 2.0714 3.5916 4.5209 6.9233 9.6019 10.920 | 0.150 0.355 0.309 0.340 0.226 0.142 0.142 |
| · · · * · | · · · * · | 9 | 0.164 | -0.204 | 14.038 | 0.142 |
| . * . | . * . | 10 | 0.105 | -0.131 | 15.599 | 0.112 |

Fig. 4. Q-statistical autocorrelation test on expenses, total income and amounts of taxes paid, aimed at the implementation of research work on the construction of facilities of Azneftkimyamash OJSC for 2010 - 2020

Source: EViews-12 application was developed by the author based on the software package.

If we determine the forecast dynamics of taxes payable to Azneftmash based on the EViews-12 software package, then we will get the following result [3]



Fig. 5. Forecast dynamics of taxes payable to Azneftkimyamash based on the EViews-12 software package

Source: EViews-12 application was developed by the author based on the software package JSC.

As can be seen from the graph, if the funds allocated for spending on innovations at Azneftmash **JSC** do not increase in the future, then the amounts of taxes payable to the budget will develop with decreasing dynamics [3, 137].

$$E_{\text{innovation costs}} = \frac{\alpha \times \bar{x}}{\bar{y}} = \frac{0.8254545 \times 23.34}{34.71818182} = 0.5549285$$
$$E_{\text{Income}} = \frac{\alpha \times \bar{x}}{\bar{y}} = \frac{298.854545 \times 0.0204}{34.71818182} = 0.17560346$$

The result. As a result of the study, it was found that there is a high correlation, expressed by the regression equation Y = 23.343*X1 + 0.0204*X2 + 21.540, between the costs of R&D at Azneftmash JSC, the total income and the amount of tax paid. With an increase of 1% in the costs of research and development, the total amount of taxes calculated and payable to the state budget of Azneftmash JSC increases by 0.55%, and income from works and services increases by 0.176%. This suggests that, as in all industries, the growth of innovation-oriented costs in oil engineering plays an important role in regulating economic growth, influencing the optimal production management.

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