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ECONOMETRIC ANALYSIS OF FACTORS AFFECTING ENSURING ECONOMIC STABILITY OF CHEMICAL INDUSTRY ENTERPRISES

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Article history:		Abstract:		
Received: Accepted: Published:	4 th January 2023 4 th February 2023 8 th March 2023	In this paper have been investigated problems of ensuring the economic sustainability of industrial enterprises, developed a methodology for assessing the economic sustainability of industrial enterprises, analyzed the current state of the economic sustainability of industrial enterprises in our country, developed a methodology for ensuring the economic sustainability of industrial enterprises of the Republic of Uzbekistan, especially chemical industry enterprises, based on a deep study of the experience of advanced foreign countries, scientific proposals and practical recommendations for improvement are substantiated.		

Keywords: Chemical industry, enterprises, economic processes, industrial complex enterprises, stability of industrial complex.

1. INTRODUCTION

The globalization of economic processes, the integration of the economy into the international economic space has led to the fact that positive and negative trends in the development of industry markets are not only studied at the level of one country, but are becoming common and interrelated for all countries. Under conditions of intensifying competition in the world, the pressure exerted on enterprises by foreign competitors seeking to enter the sales market of new, especially developing countries, is increasing. The process of increasing competitive pressure creates the need to look for new sources of competitive advantage. Increasing attention to the problems of strategic management of the sustainable development of market entities is particularly evident in the context of the world economic crisis, the recession in the development of industries and enterprises. [5]

According to experts, the most serious crises at the international level are global or international crises, and at the level of a separate country, national and sector crises are the most serious crises. [6]

The world experience has proven that increasing the competitiveness of industries and enterprises through the formulation of a sustainable development strategy and management of economic efficiency is becoming one of the main means of business development today. Increasing the strategic stability of industrial complex enterprises implies the acceleration of innovative processes and the development of entrepreneurial initiatives, and at the same time, the formation of multi-level and diverse effective mechanisms of production and goods movement management, in accordance with the requirements of the times, the active attraction of local and foreign investment resources and effective use of them. requires use. In the global crisis, these tasks become more urgent, but their solution becomes more complicated. Positive development of the situation in the field of innovation-oriented entrepreneurship is one of the important and urgent tasks of economic reform. [7]

Ensuring the stability of business structures in the industry allows overcoming the stagnant situation observed in the economy due to the crisis and can be a catalyst for the development of the entire national economy.

2.LITERATURE REVIEW

The problem of economic stability B. Venturi, P. Gerstner, F. Leitner, S. Pozani, L. Probably, I. Aleshina, A. Borodina, E.M. Korotkova, D. Kovaleva, T. Sukhorukova, Z.V. Korobkova, A.D. Sheremet, Y. Schumpeter, Yu.V. Maslenko, N.A. It has been studied in many scientific studies by Kulbaka and other economists of the West and our country. Based on the analysis conducted on the basis of existing studies, it was concluded that until today, a unified apparatus of concepts regarding the terms "economic stability", "competitive advantage", "competitiveness" has not been formed. There is no unified classification of internal and external factors that affect the stability and competitiveness of enterprises, there is no single methodological approach to the assessment of economic stability and its interrelationship with competitiveness, it has not been quantitatively evaluated, and the methodology of economic stability management has not been developed.[8]



The mentioned theoretical and practical problems related to the economic stability of the enterprise determine the relevance of this article. E.M. Korotkov [1], D. Kovalev and T. Sukhorukova, Z.V. Korobkova, A.D. Sheremet [2], Y. A number of authors such as Schumpeter [3] equate the economic stability of the enterprise with its financial condition. Many economists believe that economic stability is related to the state of economic resources at the disposal of the enterprise and the influence of many destabilizing factors in the external environment. Including N.A.

According to Kulbaka, economic stability is characterized by the same balanced state of economic resources. [4]

3.ANALYSIS AND RESULTS

In order to determine the exogenous factors affecting the economic stability of enterprises in the industries of our country, the following factors were selected: resulting factors - Y1, Y2, Y3, Y4, Y5, Y6, Y7, and as influencing factors - X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12.

Table 1 Descriptive statistics of selected factors on the economic stability of industrial enterprises operating in the Republic of Uzbekistan

Covariance Analysis: Ordinary Date: 03/01/21 Time: 01:20 Sample: 2016Q1 2019Q4 Included observations: 16

	Y1	X1	X2	X3	X4
Mean Median Maximum Minimum Std. Dev	11.72570 11.55685 13.03037 10.54847 0.835319	7.535463 7.324869 8.833608 6.368530 0.888309	8.300180 7.487437 9.513485 7.381315 1.063641	4.163697 4.194180 4.420318 3.931228 0.144765	7.329360 7.270674 8.078378 6.723832 0.440847
Skewness Kurtosis Jarque-Bera	0.35519 0.240417 1.742961 0.905675	0.888309 0.280961 1.654438 1.063146	1.003041 0.335678 1.116246 1.999624	0.021322 2.197328 0.323050	0.313426 1.886459 0.816459
Probability Sum Sum Sq. Dev.	0.635822 140.7084 7.675333	0.587680 90.42556 8.680029	0.367949 99.60215 12.44466	0.850845 49.96436 0.230526	0.664826 87.95232 2.137805
Observations	12	12	12	12	12

Based on the information of the State Statistics Committee of the Republic of Uzbekistan, before creating a multi-factor econometric model, descriptive statistics were conducted using the Eviews 10 program. The results are presented in Table 1 below.

The average value (mean), median (median), maximum and minimum values (maximum, minimum) of each factor can be seen from the data in Table 1. In addition, the standard deviation of each factor (std. dev. (Standard Deviation) – the coefficient of standard deviation shows how much each variable deviates from the average value) is presented. Graphs of normal distribution functions of the selected factors are presented in Figure 1 below.

The normal distribution function is defined by the following formula:

$$p(x) = \frac{1}{\sqrt{2\pi\sigma}} \cdot e^{\frac{-(x-a)^2}{2\sigma^2}}, \quad -\infty < x < \infty,$$

It can be seen from Figure 1 that the studied factors Y1, X1, X2, X3, X4 all do not obey the normal distribution law. Therefore, it is necessary to create separate combinations of factors.



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Figure 1. Graphs of normal distribution functions of selected factors on the economic stability of industrial enterprises operating in the Republic of Uzbekistan

Since the asymmetry coefficients of most of the selected factors are positive, the right "tail" of their graphs is shifted to the right of the theoretical normal

distribution graphs. In some years, some factors had a sharp increase, while others did not change significantly.

Prob.

0.0041

0.0000

Table 2

Calculated parameters of the multifactor econometric model based on the data of the chemical industry (Y5) enterprises operating in the Republic of Uzbekistan

24

Dependent Variable: Y5 Method: Least Squares Date: 03/01/23 Time: 18:37 Sample: 2010 2021 Included observations: 12 Variable Coefficient Std. Error t-Statistic X2 0.037922 3.970145 0.150556 X9 1.048408 0.055126 19.01825



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X12	0.310258	0.139222	2.228516	0.0564
C	-7.223493	0.701653	-10.29497	0.0000
R-squared Adjusted R-squared S.E. of regression Sum squared resid Log likelihood F-statistic Prob(F-statistic)	0.996236 0.994824 0.065673 0.034504 18.08226 705.7927 0.000000	Mean de S.D. dep Akaike in Schwarz Hannan- Durbin-V	pendent var endent var ifo criterion criterion Quinn criter. Vatson stat	8.847062 0.912875 -2.347043 -2.185407 -2.406886 1.965800

From the table above, we construct the equation of the regression model:

$$Y_5 = 0.15X_2 + 1.04X_9 + 0.31X_{12} - 7,22 \tag{1}$$

If we interpret regression equation (1) linguistically, ceteris paribus, an increase in the number of people employed in industry (i.e., the number of employees, labor force) in our country by 1,000 people will increase the investment in fixed capital per capita, the volume of production of chemical products by 0.15 billion soums. 1 million soums increase in the volume of completed scientific research and experimental design developments, 1.04 billion soums increase in the products, and 1,000

more specialists who graduated from higher education institutions, 1.04 billion soums increase in the volume of chemical products production while serving.

We check the results of the autocorrelation of the model using the Breusch-Godfrey test.[9]

We make sure that the values of both lags (resid(-1) and resid(-2)) in this table are free of autocorrelation of random deviations. We also check the heteroskedasticity of the model by White's test.

Another way to check the absence of multicollinearity between influencing factors is to calculate the coefficients of VIF (Variance Inflation Factors - effect of multicollinearity). Estimated VIF coefficients for each factor were calculated.

Table 3
Model results for autocorrelation via the Breusch-Godfrey test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

	4 704057	Pro 6 5(2.0)	0.0400
F-statistic	1.701857	Prod. F(3,8)	0.2433
Obs*R-squared	4.674871	Prob. Chi-Square(3)	0.1972
Scaled explained SS	2.324762	Prob. Chi-Square(3)	0.5078

Test Equation: Dependent Variable: RESID^2 Method: Least Squares Date: 03/04/23 Time: 12:18 Sample: 2010 2021 Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C X2 X9 X12	-0.041651 -0.004602 0.007606 -0.003535	0.043974 0.002377 0.003455 0.008725	-0.947176 -1.936521 2.201392 -0.405172	0.3713 0.0888 0.0589 0.6960
R-squared Adjusted R-squared S.E. of regression Sum squared resid Log likelihood F-statistic Prob(F-statistic)	0.389573 0.160662 0.004116 0.000136 51.32039 1.701857 0.243334	Mean depend S.D. depende Akaike info cr Schwarz crite Hannan-Quin Durbin-Watso	dent var ent var iterion rion in criter. on stat	0.002875 0.004493 -7.886731 -7.725096 -7.946575 2.404461



Fisher's F-test is used to test the statistical significance of multivariate econometric models. Fisher's calculated F-criterion value is compared with its value in the table. If Fcalc > Ftable, then the multi-factor econometric model (5) is called statistically significant, and the resulting indicator Y5 can be used to forecast production volumes of chemical industry enterprises for future periods. It was used in the development prospects of the enterprises within the "Uzkimyosanoat" association until 2030.

4. CONCLUSIONS

Management within the organization, the economic mechanism of ensuring the economic stability of the enterprise should be carried out on the basis of general and private principles and using certain methods. The organizational and economic mechanism of ensuring the economic stability of the enterprise requires an effective support system, the main elements of which are:

- legal support (laws, decrees, regulations, instructions of state bodies and institutions regulating enterprise activity);

- financial support (justifying the increase of the company's own financial resources, attracting sources of borrowed financial resources (bank loans, financial leasing, commercial loans), investment funds, state financing);

organizational support (creating an organizational structure for managing the economic of the enterprise, instructions stability and methodological materials for ensuring the economic stability of the enterprise); - information supply (accounting, management and statistical data of the enterprise, reporting data of the enterprise, internal regulatory documents, references, analytical data, orders, regulations and other official documents of the enterprise);

- provision of labor force (recruitment, training, retraining, adaptation, professional growth of personnel, promotion and motivation of employees).

An important criterion for keeping "financial cushion" funds is to keep the funds in a way that allows for quick access and use of the necessary amount of funds in the event of an emergency.

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