“Management of enterprise’s financial sustainability and improvement of its methods”

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MANAGEMENT OF ENTERPRISE'S FINANCIAL SUSTAINABILITY AND IMPROVEMENT OF ITS METHODS

Abstract

The article is dedicated to the solution of the relevant issue, concerning management of enterprise`s financial sustainability. Financial sustainability assessment is one of the most important principles of enterprise`s activity, which provides information about financial capabilities of the company at the time of its evaluation and for the future. It is a requirement for the enterprise activity, which provides a high level of competitiveness, efficiency and intensity. Thus, the restoration and strengthening of financial sustainability is a priority task for the enterprise, a basic precondition for its effective functioning. The purpose of the research is to analyze financial sustainability and to improve the methods and approaches of its evaluation. The following methods were used in this research: financial and economic analysis, economic and mathematical modeling, analysis and synthesis, comparison.

The main results of the study are following: the theoretical and essential characteristics of enterprise financial sustainability has been determined; the financial status of PJSC "Turboatom" has been analyzed; the taxonomic index of financial sustainability has been calculated and the forecast of its significance has been made, the approaches to increase enterprise financial sustainability have been proposed.

Keywords financial sustainability, assessment, mathematical modeling, management, financial conditions

JEL Classification G30, C10

INTRODUCTION

In market conditions the basis of survival and stable position of the enterprise is its financial stability. Functioning as a business entity, each enterprise must provide such a state of its financial resources, which will maintain the ability to continuously fulfill its financial obligations before business partners, state, owners, employees, etc. It is the financial stability that represents a certain state of the entity, which allows freely maneuvering cash and ensuring the continuity of its activities achieved by a certain ratio of own and borrowed working capital and guarantee the solvency, economic independence and investment attractiveness within the permitted level of risk.

1. LITERATURE REVIEW

Important contribution to the study of financial sustainability was made by well-known scholars, such as Blank I. O., Brigham E. F., Dolan E. J., Sheremet A. D., Helfert E. and others. The solution of this problem was also reflected in works of Belikova T. V., Vaschenko L. O., Zabrodsky V. A., Kizim M. O., Kolesnikova V. M., Savitskaya G. V., Tereshchenko O. O., Miroshnik O. Yu., Azarenka G .M., Golovko O. G., Guryanova L. S., etc.

The financial stability of the enterprise is influenced by many external (socio-economic and political stability in the country, the level of effective demand, tax, credit and finance, accounting, investment policy, the market situation of suppliers, industry characteristics, type of market) and internal factors (size of enterprise, the level of control system flexibility; the level of conformity of products to consumer inquiries in quality and price, material and technological base of the enterprise, technologies, state of property and financial resources, dependence on foreign creditors and investors, the effectiveness of economic and financial operations, the level of management and supply of highly qualified personnel, corporate culture, business reputation of the company, the balance of internal capacity with the influence of external threats, etc.) (Gapak & Kapteshan, 2014).

A significant number of factors that affect the financial sustainability of the enterprise cause the lack of a single approach to its definition and assessment in the economic literature (Yalovy & Bakerenko, 2011).

The traditional methods of financial sustainability assessment can be divided into three groups. The first group includes the qualitative assessment of financial stability, the second one contains the quantitative assessment of financial stability, and the third group includes the assessment of financial insolvency of enterprises.

Among methods of enterprise`s financial state analysis and its` financial sustainability the following methods can be outlined: time series models, regression models, models of systems of interrelated variables, recursive systems, etc. (Zakharova, 2013).

2. METHODS

There are economic and mathematical methods, which can help to study the connections and influences between objects and phenomena, determine the homogeneous features in aggregates of objects and data, create models of behavior of individual enterprises based on the influence of various factors, determine the development trends for the forecasting.

Therefore, the use of economic and mathematical methods is the key to accurate and detailed assessment of financial sustainability of the enterprise, which provides the basis for optimizing managerial decisions and achieving the planned level of financial state.

Thus, financial sustainability of the enterprise is a key feature of its financial status, its strategic development. Timely analysis of financial sustainability creates new opportunities for the enterprise to identify reserves in order to enhance its competitive position, increase market share and fulfill other tactical and strategic goals.

3. RESULTS

For a deeper understanding of the mechanism of financial sustainability management using the above-mentioned methods, the Public Joint Stock Company "Turboatom" (hereinafter referred to as PJSC "Turboatom") was selected as the research base for carrying the practical calculations. It is one of the largest turbo-building enterprises in the world with a full cycle of production: design, manufacturing, supply, adjustment, firm maintenance of turbine equipment of all types of power plants.

The activity of the enterprise can be characterized by following characteristics: the degree of physical depreciation of fixed assets – 60.4%; the degree of moral deprivation – 38%; the degree of mechanization and automation of production – 66.8%; coefficient of utilization of production capacity – 64.5%.

The general indicators of economic activity of PJSC "Turboatom" for the period 2013-2015 were determined in Table 1.

The calculated results make prove that PJSC "Turboatom" is a leading domestic turbine-building enterprise competing at the world level, characterized by high quality and reliability of manufactured products, which closely cooperates with international enterprises. The analyzed period demonstrates the stability of property status of the enterprise, the tendency of increasing net profit and net income. Also the decrease in the amount

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Table 1. General indicators of activity of the PJSC "Turboatom" in 2013–2015

№	Indicator	2013, ths. UAH	2014, ths. UAH	2015, ths. UAH	The ratio 2014 to 2013	The ratio 2015 to 2014
1	Net income (revenue) from sales of products (goods, works, services)	1741261	1842387	2694253	105,81	146,24
2	Net profit	582944	637397	1632751	109,34	256,16
3	Equity	2161308	2579448	3770326	119,35	146,17
4	Non-current assets	599600	682189	605625	113,77	88,78
5	Long-term liabilities	0	161748	45160	–	27,92
6	Current liabilities	1559722	1274130	999674	81,69	78,46
7	Receivables	1684306	454585	266584	26,99	58,64
8	Stocks	1582875	3474634	3197124	219,51	92,01

of payables and receivables shows that the company is undertaking measures to optimize the structure of its capital.

Among the versatile methods of financial stability assessment of the company the analysis of absolute indicators is distinguished, which includes a generalized three-dimensional indicator of the type of financial stability (Table 2).

According to the three-dimensional index of financial stability PJSC "Turboatom" had an unstable type of financial stability in 2013. This indicates a situation where stocks and costs exceed normal sources of financing, so the company is forced to attract additional sources of funding. In this situation, there is a possibility of restoring equilibrium by replenishing sources of own funds, reducing receivables, accelerating the turnover of stocks. In 2014 and 2015, the company improved its three-component rate of financial stability from an unsustainable state to absolute financial sustainability. This type of financial stability is characterized by the fact that all stocks of the company are covered by its current assets, that is, the enterprise does not depend on external creditors. Nowadays the company aims to support and fully ensure that the type of financial sustainability is maintained at the highest absolute level.

A general analysis of the financial state of the enterprise makes to conclude that the company has a satisfactory stable financial state, showing a high level of liquidity, profitability and business activity. Moreover, the PJSC "Turboatom" demonstrates a high level of efficiency and intensity of use of available property and financial resources.

Table 2. Three-dimensional index of financial stability of the PJSC "Turboatom"

Indicators	2013, ths. UAH	2014, ths. UAH	2015, ths. UAH	Relative changes 2014/2013, %	Relative changes 2015/2014, %
Sources of own funds	2161308	2579448	3770326	16.21	31.59
Non-current assets	599600	682189	605625	12.11	–12.64
Availability of own working capital	1561708	1897259	3164701	17.69	40.05
Long-term loans and borrowed funds	0	161748	45160	100.00	–258.17
Availability of own and long-term loan sources for stock formation and costs	1561708	2059007	3209861	24.15	35.85
Short-term loans and borrowings	1559722	1274130	999674	–22.41	–27.45
The total value of the main sources of stock formation and costs	1582875	1737317	1598562	8.89	–8.68
Total inventory and cost	3142597	3011447	2598236	–4.36	–15.90
Surplus (lack) of own working capital	–21167	159942	1566139	113.23	89.79
The surplus (lack) of own and long-term borrowed sources of formation of stocks and expenses	–21167	321690	1611299	106.58	80.04
The surplus (lack) of the total value of the main sources of formation of stocks and costs	1538555	1595820	2610973	3.59	38.88
Three-dimensional indicator of financial sustainability	(0;0;1)	(1;1;1)	(1;1;1)		

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The economic and mathematical modeling is the main methods of financial sustainability analysis. Based on the conclusions of a general analysis of financial state of the PJSC "Turboatom", a simulation of the dynamics of financial stability of the PJSC "Turboatom" was conducted.

The integral taxonomic level of development level allows assessing the average level of the attributes characterizing the phenomenon that is sufficient in a certain period or at the time of the assessment.

The first stage in the process of constructing a taxonomic index is the definition of elements of the matrix of observations.

The second stage consists of the differentiation of the characteristics of the matrix of observations. The reason for the division of signs into two groups is the effect of each of them on the level of development of the objects under study, which is the basis for constructing of so-called development standard.

The third stage is the transposition of the received matrices of coefficients with the further calculation of the distance matrices. The obtained distances serve as output values for calculating the level of use of local potentials.

The interpretation of the taxonomic index is as follows: the closer its value to one is – the higher the level of development activity is.

The analysis of financial state of PJSC "Turboatom" for the period of 2013–2015 revealed the following objectives for increasing financial sustainability of the enterprise:

- to analyze the factors of the unstable type of financial condition of the company in 2013 in details;
- to analyze the causality between the rapid increase in the size of long-term debt capital in 2014 and its reduction in 2015;
- to offer reserves for improving maneuverability of own funds and own working capital.

The analysis of financial sustainability aims to calculate the indicators of maneuverability, autonomy, coverage, and others. In this case, the analysis of the abovementioned indicators is not enough to formulate and confirm the assumptions about the level of financial stability of the individual entity. Financial stability of the enterprise is a broad concept; its essence is not only in ensuring the financial independence of the enterprise from borrowed funds and its solvency, but also in ensuring a sufficiently high level of profitability and turnover of available property and financial resources. That is why for constructing the integral index of financial stability the main indicators of all blocks of analysis of financial state of the enterprise (liquidity, profitability, solvency) were calculated:

- The coefficient of profitability of operational activity as a measure of financial stability characterizes the possibility of obtaining an enterprise profits to cover the cost of production and sales of products, as well as the possibility of its rational use to build assets, settlements under the obligation and development of the entire enterprise.
- The turnover rate of working capital characterizes such an aspect of financial stability of the enterprise as the ability to use all the possibilities of rapid response to changes in the market environment, the possibility of releasing additional funds for future development of the company. Also, it should be noted that the PJSC "Turboatom" has a mobile structure of assets (the share of current assets in the total value of the company's assets at the end of 2015 was 87.4%), therefore, financial stability in terms of intensity was considered from the circulating assets.
- The coefficient of absolute liquidity characterizes the ability of the enterprise to pay off its obligations, this is one of the main aspects of financial stability of the enterprise, since the rational use of the distribution of available both borrowed and own resources will allow the company to stay at a solvent level, not to lose opportunities, to prevent and minimize the risks of bankruptcy. Today, during the economic crisis and the insolvency crisis, most domestic enterprises that not only work at a loss, losing high profitability rates, but also do not have the ability to make pay-

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ments on loans, take steps to restructure debt. It is the company's liquidity that is the key to maintaining financial stability at an adequate level. According to preliminary analysis of the PJSC "Turboatom" for 2013–2015 years, it is absolutely liquid, while liquidity research in previous years is also appropriate.

- The coefficient of autonomy as an aspect of financial sustainability – is the search for opportunities to reduce dependence on borrowed capital, increasing self-financing. It is clear that in the current conditions, only enterprises that properly developed their borrowing policies and policies to rationalize the use of not only their own, but also borrowed funds, can successfully compete in the market.

- The coefficient of financial stability as a relative indicator that characterizes the company's stable sources of financing is one of the conditions for maintaining financial sustainability at a sufficient level in the long run. The preliminary analysis by the PJSC "Turboatom" has shown that for the period 2013-2015 this factor did not reach the normative value. This may be due to the specifics of the industry, as well as the fact that the company uses more short-term borrowed capital than long-term.

The information base for calculations is the quarterly financial reports of the PJSC "Turboatom" for 2007–2015.

The first step in determining the integral index is the calculation of the given coefficients for the period under study. The results obtained are presented in Table 3.

The preliminary analysis of the raw data for modeling proves that the company has improved its financial state over time, which is a positive moment, while determining the causal relationship of this growth is highly expedient. For example, the

Table 3. Calculations of relative indicators of financial state of the PJSC "Turboatom"

Indicator	Profitability ratio	The turnover rate of reversible funds	Absolute liquidity ratio	Coefficient of autonomy	Stability factor
2007					
I	0.098975657	0.112258908	0.83547953	0.82826739	0.83553175
II	0.156864465	0.256134642	0.51763347	0.80635153	0.81329131
III	0.124011998	0.430820096	0.36186374	0.79468544	0.80149064
IV	0.10434103	0.584472436	0.3198159	0.77736565	0.7835728
2008					
I	0.237951578	0.201464476	0.39289936	0.80713847	0.81336886
II	0.123704799	0.379805055	0.35946848	0.75443554	0.76033829
III	0.104285693	0.50470951	0.2269247	0.65028647	0.65028647
IV	0.33570401	0.660370511	0.16153817	0.69915153	0.70241893
2009					
I	0.141376858	0.24507702	0.28683994	0.69584372	0.7000087
II	0.158260756	0.421764073	0.16005703	0.67854677	0.68270436
III	0.191072598	0.571723912	0.19553594	0.68709041	0.69115816
IV	0.183953852	0.866877867	0.25919423	0.71479371	0.71850997
2010					
I	0.291195618	0.364982246	0.30594521	0.76658058	0.77037007
II	0.241368088	0.600058129	0.46906504	0.74580579	0.74939917
III	0.198877564	0.800921402	0.53300438	0.7157409	0.71913715
IV	0.200333429	1.015108197	0.38615425	0.71078117	0.71408681
2011					
I	0.241227565	0.24093683	0.49784687	0.66433684	0.66736529
II	0.345675034	0.504572603	0.60927083	0.68506035	0.68785361
III	0.344214719	0.70311002	0.71838321	0.66849877	0.67103281
IV	0.336997276	0.942828026	0.5122803	0.65564139	0.65757887

Table 3 (cont.). Calculations of relative indicators of financial state of the PJSC "Turboatom"

Indicator	Profitability ratio	The turnover rate of reversible funds	Absolute liquidity ratio	Coefficient of autonomy	Stability factor
2012					
I	0.346655103	0.181997472	0.56513774	0.60508379	0.60674706
II	0.25604672	0.350524579	1.94670407	0.59680905	0.5984962
III	0.244530739	0.494397642	0.45581230	0.57941294	0.58098314
IV	0.238145429	0.60169865	0.46741656	0.50890184	0.50890184
2013					
I	0.22392005	0.10253821	0.45326454	0.51863304	0.51975856
II	0.260536459	0.227528788	0.41519977	0.52119408	0.52119408
III	0.312253073	0.378328073	0.38795683	0.56059093	0.56059093
IV	0.334782666	0.500516538	0.50557087	0.58083595	0.58083595
2014					
I	0.801347837	0.129110597	0.56563474	0.65705157	0.65705157
II	0.651999726	0.269100855	0.53704870	0.65749572	0.65749572
III	0.535581136	0.398126557	0.64112798	0.69094047	0.69094047
IV	0.345962602	0.476293232	0.7448251	0.64240064	0.6826833
2015					
I	1.045223085	0.153280747	1.22037299	0.72050003	0.75726963
II	0.64754856	0.302566843	1.20039607	0.65485643	0.69266132
III	0.620190574	0.478183258	1.76799638	0.73366475	0.7697173
IV	0.606012501	0.609956664	2.26039089	0.78301157	0.79239028
Average value	0.369474629	0.461861037	0.68101546	0.65714654	0.66453294
Standard deviation	0.218824128	0.24443252	0.52460427	0.07392303	0.07837372

situation when the currency of the balance sheet increases is not always positive, because the size of financial resources may increase due to an increase in debt and, consequently, a decrease in financial independence.

The next step was to standardize the data and differentiate the characteristics of the matrix of observation of stimulants and non-stimulants. The results of differentiation have shown that all of the parameters are stimulants. The division of indicators into stimulators and non-stimulants is the basis for constructing a development standard, representing a point with coordinates

$$P_0\left(z_{01};z_{02};\ldots z_m\right), \qquad (1)$$

where $z_{0s}=max\ z_{rs}$; z_{rs} - is the standardized value of the sign s for the object r.

The distance between the individual points and the point of the standard is calculated on the basis of the Euclidean distance (Table 4).

It should be noted that the constructed taxonomic index D_t has the following interpretation: the closer the value of the indicator to one – the higher the level of financial sustainability of the enterprise is.

Thus, according to the results of taxonomic index calculations the integral indicator of financial stability of PJSC "Turboatom" for the quarters of 2007–2015 is obtained. The dynamic analysis of financial sustainability makes it possible to make the right conclusions and offer approaches to increase and maintain it at the highest level. The graphical interpretation is given in the Table 5.

The analysis of the obtained results allows to make the following conclusions:

- the dynamics of the taxonomic indicator is not stable;
- the lowest values of the integral indicator of financial stability were observed in the following periods: 2007–2009 and 2012–2013;

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Table 4. The process of calculating of the taxonomic index of financial stability

Year	Quarter	Euclidian distance	(Cio–C0)	Taxonomic Dt
2007	I	6.56242244	0.134289856	0.217107369
	II	6.38539977	0.035884913	0.238226055
	III	6.35089083	0.024001506	0.242342949
	IV	6.27345488	0.006004429	0.251581006
2008	I	6.4252039	0.052549726	0.233477448
	II	6.53788678	0.116909388	0.220034456
	III	7.11732879	0.848908222	0.15090741
	IV	6.05772574	0.019110545	0.277317349
2009	I	7.08086361	0.783042653	0.155257682
	II	6.9714515	0.601376785	0.168310473
	III	6.57135237	0.14091445	0.216042034
	IV	6.09722835	0.009749248	0.272604714
2010	I	6.12068976	0.005666607	0.269805783
	II	5.72593872	0.220926243	0.31689932
	III	5.71605149	0.230318544	0.31807886
	IV	5.86052821	0.112518933	0.300842883
2011	I	6.77152783	0.33127069	0.192161235
	II	5.72939617	0.217687998	0.316486848
	III	5.4584547	0.543923847	0.348809985
	IV	5.69413565	0.251834332	0.320693404
2012	I	7.04548266	0.721677483	0.159478605
	II	6.0960725	0.009978838	0.272742606
	III	7.08379033	0.788230912	0.154908526
	IV	7.72372258	2.334038221	0.078565035
2013	I	8.41215141	4.911474977	–0.003564068
	II	8.11303074	3.675134802	0.032120829
	III	7.36764119	1.372821264	0.121045307
	IV	6.80157161	0.36675739	0.188577031
2014	I	6.03052062	0.027372383	0.280562902
	II	5.88189926	0.098638317	0.298293332
	III	5.40897838	0.619350506	0.354712477
	IV	5.80907247	0.149687095	0.306981519
2015	I	4.55464816	2.693926344	0.456633505
	II	4.95522351	1.539443501	0.408845132
	III	3.47981311	7.377489968	0.584860611
	IV	2.78324877	11.64664318	0.667960273
Average value		6.19596663	1.194987614	
So			1.09315489	
Co			8.382276413	

Table 5. Conditional distribution by periods of integral index of financial stability of the PJSC "Turboatom"

Years	2007–2009	2010–2011	2012–2013	2014–2015
Diagram				
Result	Unstable nature	A sharp decline in one of the quarters	Unstable dynamics, lowest results	Tendency to increase

- it is possible to distinguish four periods of development of the enterprise according to the level of financial stability:
    - 2007–2009 – the pre-crisis and crisis period, financial stability becomes an average of 0.22, which is a important sign for the enterprise to take measures for optimizing the structure of capital, reviewing borrowing policy and others;
    - 2010–2011 – the period of introduction of measures by the enterprise to increase financial stability, the average level of taxonomic index of financial stability is 0.297;
    - 2012–2013 – the period with the lowest indicators of financial sustainability in all its dimensions, according to a preliminary analysis of the financial condition of the company it was determined that during this period the enterprise had an unstable type of financial stability, the average level of the integral indicator is 0.125;
    - 2014–2015 – the period of increasing financial stability, the average level of the integral indicator is 0.42. The graphic illustration of conditional division is indicated in table 2.13;
- during the analyzed period, the financial stability of the enterprise gradually increased, reaching the level of 0.67 in 2015;
- conclusions on the stable financial status of PJSC "Turboatom" in 2015 are confirmed by the value of the taxonomic indicator for the quarters of 2015, while the company, in any case, has reserves to increase the level of financial stability in the future.

Based on the integral taxonomic index, it was decided to construct a forecast using a trend model. A software package for Statistica was chosen for this purpose. The taxonomic index for 36 periods (quarters of 2007–2015) was the starting point, and a variable t was introduced, which is defined as the serial number of the quarter. As an independent variable t was taken, the dependent variable is the taxonomic index Dt. The analysis of the dependence between the variables gives rise to the choice of the following options: the exponential function $D = a_0 \cdot a_1^t$, the second degree polynomial $D = a_0 + a_1 \cdot t + a_2 \cdot t^2$ and the index function $D = a_0 \cdot t^{a1}$.

The trend equation was constructed separately for each model. To estimate model parameters, the Nonlinear Estimation module was used, the type of estimation was the user-defined regression with the least squares method error, and the Leuenberg-Marquardt method.

According to the most mathematically grounded model, it was decided to build a forecast for the next 4 quarters. The model was evaluated using the following values: final value of loss function – the sum of the squared errors of the model, proportion of variance accounted for, R (Correlation ratio). The obtained model parity was estimated by statistical significance.

Results of the construction of the exponential model $D = a_0 \cdot a_1^t$: the percentage of the explained dispersion is 17.67%, the correlation ratio is 42.04%. We see that this model does not explain all the changes in the taxonomic index, therefore, according to preliminary conclusions, the forecast

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Table 6. Results of constructing an exponential trend model

Model is: $D = a_0 \cdot a_1^t$

	Estimate	Standard	t-value	p-level	Lo. conf	Up. conf
a0	0.164127	0.032446	5.0585	0.000014	0.098189	0.230065
a1	1.023420	0.008019	127.6313	0.000000	1.007125	1.039716
	Trend equation	$D = 0.164127 \cdot 1.02342^t$				

based on it will not be correct. The parameters of this model are determined in Table 6, the obtained coefficients are statistically significant, since the value of Student's criterion for the *p*-index for each parameter is less than or equal to 0.05 ($p \le 0.05$).

Trend models for adequacy are also estimated by the theoretical values of the dependent variable and the model error. The exponential function of theoretical values and errors confirms the conclusion that the model is not suitable for further prediction; therefore the following option for constructing a trend model has become an indicator function.

Results of the construction of the indicator function $D = a_0 \cdot t^{a1}$: the percentage of the explained dispersion is 7.4%, the correlation ratio is 27.2%. We see that this model does not explain all the changes in the taxonomic index, therefore, according to preliminary conclusions, the forecast based on it will not be correct. The indicator function model shows less adapted results than the exponential function. Table 7 defines the parameters of this model, the coefficient a0 is statistically significant, since the value of Student's criterion for the p-index for this parameter is less than or equal to 0.05 (*p≤0.05*), the coefficient a1 is insignificant.

Such results give grounds for concluding that the model is not suitable for forecasting. Therefore, the next step of simulation was the construction and analysis of the model of the second-order polynomial.

The results of constructing the function of the polynomial of the second degree $D = a_0 + a_1 \cdot t + a_2 \cdot t^2$: the percentage of the explained dispersion is 34.51%, the correlation ratio is 58.75%. So, this model explains the bigger value of all changes in the taxonomic index than the previous variants of the trend models. Table 8 defines the parameters of this model, the coefficient a0 and a1 are statistically significant, since the value of Student's criterion for the p-index for each parameter is less than or equal to 0.05 (*p≤0.05*).

Table 7. Results of construction of the indicator function of the trend

Model is: $D = a_0 \cdot t^{a1}$

	Estimate	Standard	t-value	p-level	Lo. conf	Up. conf
a0	0.151630	0.053982	2.808870	0.008181	0.041924	0.261335
a1	0.198132	0.119883	1.652705	0.107597	-0.045501	0.441764
	Trend equation	$D = 0.151630 \cdot t^{0.198132}$				

Table 8. Results of trend building on the basis of the second grade polynomial

Model is: $D = a_0 + a_1 \cdot t + a_2 \cdot t^2$

	Estimate	Standard	t–value	p–level	Lo. conf	Up. conf
a0	0.317730	0.058324	5.44763	0.000005	0.199068	0.436392
a1	–0.017997	0.007269	–2.47587	0.018595	–0.032785	–0.003208
a2	0.000613	0.000191	3.21792	0.002893	0.000226	0.001001
	Trend equation	$D = 0.317730 - 0.017997 \cdot t + 0.000613 \cdot t^2$				

Table 9. Results of calculation of theoretical values and errors on the function of the polynomial

Model is: $D = a_0 + a_1 \cdot t + a_2 \cdot t^2$

	Observed	Predicted	Residuals
1	0.217107	0.300347	–0.083239
2	0.238226	0.284189	–0.045963
3	0.242343	0.269259	–0.026916
4	0.251581	0.255554	–0.003973
5	0.233477	0.243076	–0.009599
6	0.220034	0.231825	–0.011790
7	0.150907	0.221799	–0.070892
8	0.277317	0.213000	0.064317
9	0.155258	0.205428	–0.050170
10	0.168310	0.199082	–0.030771
11	0.216042	0.193962	0.022080
12	0.272605	0.190068	0.082537
13	0.269806	0.187401	0.082405
14	0.316899	0.185960	0.130939
15	0.318079	0.185746	0.132333
16	0.300843	0.186758	0.114085
17	0.192161	0.188996	0.003165
18	0.316487	0.192461	0.124026
19	0.348810	0.197152	0.151658
20	0.320693	0.203069	0.117624
21	0.159479	0.210213	–0.050734
22	0.272743	0.218583	0.054160
23	0.154909	0.228179	–0.073271
24	0.078565	0.239002	–0.160437
25	–0.003564	0.251051	–0.254615
26	0.032121	0.264327	–0.232206
27	0.121045	0.278829	–0.157784
28	0.188577	0.294557	–0.105980
29	0.280563	0.311512	–0.030949
30	0.298293	0.329693	–0.031399
31	0.354712	0.349100	0.005612
32	0.306982	0.369734	–0.062752
33	0.456634	0.391594	0.065040
34	0.408845	0.414680	–0.005835
35	0.584861	0.438993	0.145868
36	0.667960	0.464532	0.203428

Also, the calculations of theoretical values of the dependent variable and model errors based on the function of the second degree polynomial are presented in Table 9.

In order to determine which of the calculated functions is most suitable, the main characteristics should be given to the investigated functions and the obtained results (Table 10).

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Table 10. Characteristics of used trend models

Characteristic	Exponential	Indicative	Polynomial 2nd degree
Brief description	Expresses the tendency of accelerated and still more accelerated growth of levels. With growth in the exponential the absolute growth is proportional to the achieved level.	Sufficiently widely used in economic analysis. often in situations when analyzing the variable Y with a steady growth rate over time.	Allows to confirm the existence of a spatial trend in data and to determine the general features of its distribution.
General formula	$D = a_0 \cdot a_1^t$	$D = a_0 \cdot t^{a1}$	$D = a_0 + a_1 \cdot t + a_2 \cdot t^2$
Research results			
Trend equation	$D = 0.164127 \cdot 1.023420^t$	$D = 0.151630 \cdot t^{0.198132}$	$D = 0.317730 - -0.017997 \cdot t + 0.000613 \cdot t^2$
Percent of explained dispersion	17.674592	7.408784	34.512427
Correlation proportion	42.04116	27.219082	58.75

And also, in Table 11 the received graphs are presented for illustration of the received results.

Table 11. Graphs of the Forecast of Financial Stability for Different Trend Models

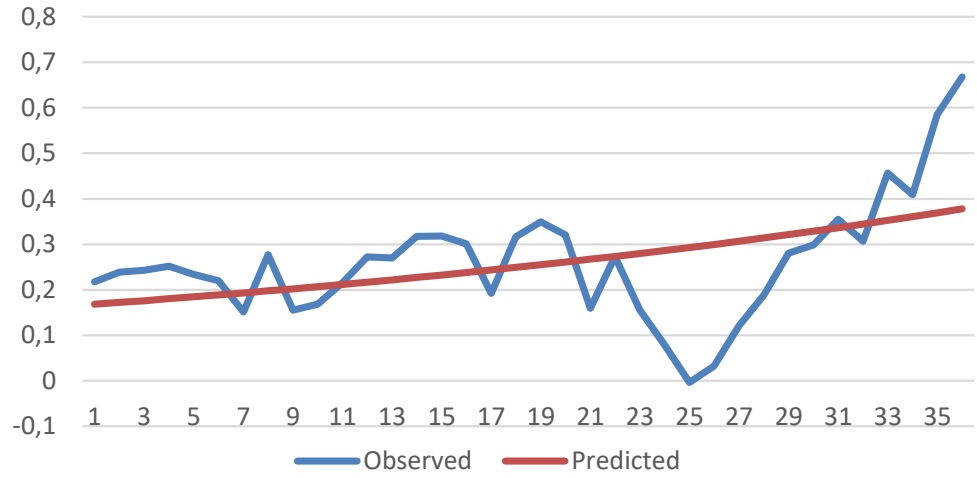
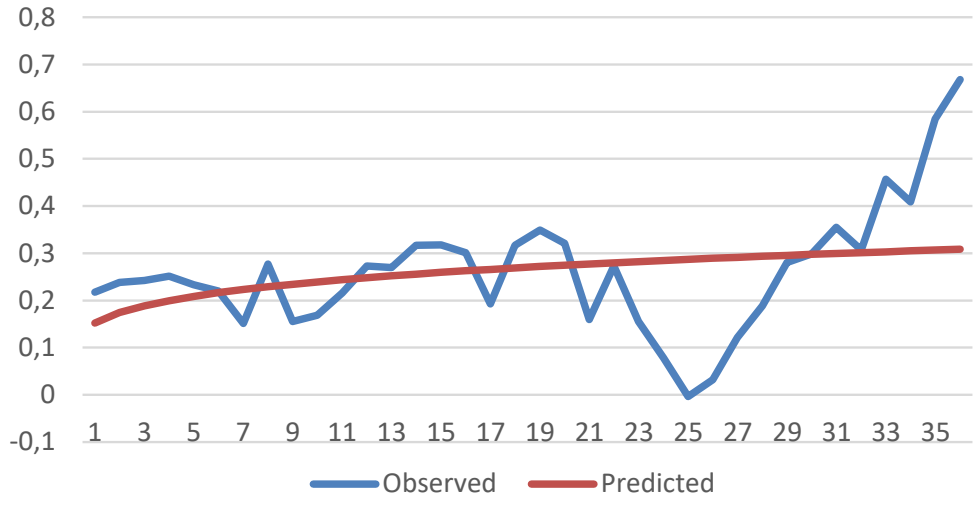
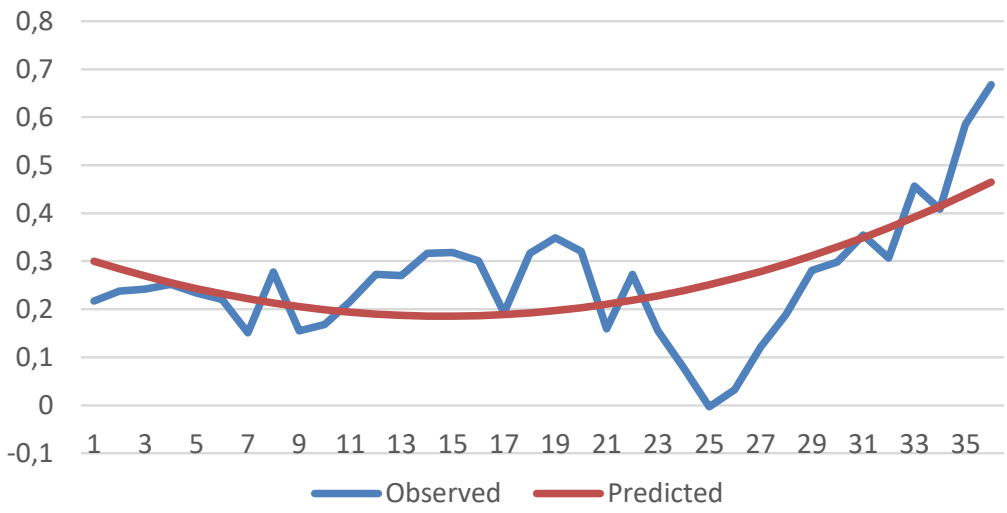
Function name	Diagram of the results
Exponential	
Indicative	

Table 11 (cont.). Graphs of the Forecast of Financial Stability for Different Trend Models

Function name	Diagram of the results
Polynom of the 2nd degree	

Thus, the function of the second grade polynomial is more adequate and statistically significant for constructing a taxonomic forecast for the next 4 quarters. For this matter the point forecast in the software package Statistica was used. The obtained results are presented in Table 12.

A graphical interpretation of the results obtained for a more in-depth analysis of dynamics is demonstrated in Figure 1.

According to the forecast, it is possible to follow the dynamics of the adjusted taxonomic index by the function of the polynomial of the second degree. This adjusted indicator of the forecast shows a positive dynamic, that is, the financial stability of the PJSC "Turboatom" will be strengthened in the coming periods. In practice, this increase in financial sustainability can be achieved by reducing payables, optimizing the structure of accounts receivable and other measures to improve the efficiency and intensity of activities.

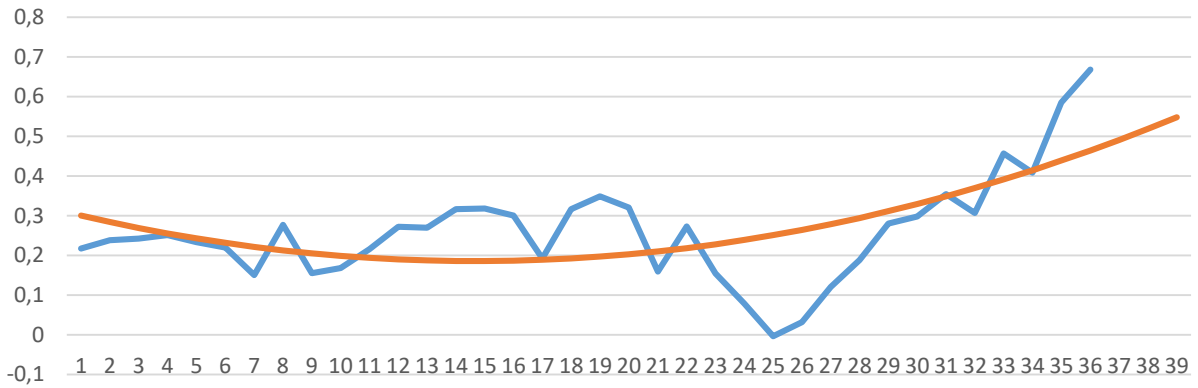


Figure 1. The actual and predictive values of taxonomic index of financial stability of the PJSC "Turboatom"

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Table 12. Predictive values of taxonomic index of financial stability of the PJSC "Turboatom"

№	t	D	D predict
1	1	0.217107369	0.300346
2	2	0.238226055	0.284188
3	3	0.242342949	0.269256
4	4	0.251581006	0.25555
5	5	0.233477448	0.24307
6	6	0.220034456	0.231816
7	7	0.15090741	0.221788
8	8	0.277317349	0.212986
9	9	0.155257682	0.20541
10	10	0.168310473	0.19906
11	11	0.216042034	0.193936
12	12	0.272604714	0.190038
13	13	0.269805783	0.187366
14	14	0.31689932	0.18592
15	15	0.31807886	0.1857
16	16	0.300842883	0.186706
17	17	0.192161235	0.188938
18	18	0.316486848	0.192396
19	19	0.348809985	0.19708
20	20	0.320693404	0.20299
21	21	0.159478605	0.210126
22	22	0.272742606	0.218488
23	23	0.154908526	0.228076
24	24	0.0785650347	0.23889
25	25	–0.00356406754	0.25093
26	26	0.0321208294	0.264196
27	27	0.121045307	0.278688
28	28	0.188577031	0.294406
29	29	0.280562902	0.31135
30	30	0.298293332	0.32952
31	31	0.354712477	0.348916
32	32	0.306981519	0.369538
33	33	0.456633505	0.391386
34	34	0.408845132	0.41446
35	35	0.584860611	0.43876
36	36	0.667960273	0.464286
37	37	Predict	0.491038
38	38	Predict	0.519016
39	39	Predict	0.54822

CONCLUSION

Thus, financial stability is a financial state in which the financial independence of the enterprise from external sources of financing is achieved, its solvency and long-term prospects of development are ensured. This general characteristic of financial and economic state of the enterprise is influenced by internal and external factors. The level of their complex impact on the financial stability of the enterprise depends on the stage of the company`s life cycle, the chosen strategy of operation and management, the financial management of the enterprise, as well as the overall level of economic development of the country, the choice of domestic and foreign policy and other socio-political and economic factors.

The main directions of financial stability strengthening of the PJSC "Turboatom" were determined, such as:

- replacement and modernization of fixed assets in order to reduce the high level of physical and moral depreciation;
- identifying of weak and strong points of the company with the help of SWOT-analysis to determine the further prospects for its development and increase of competitiveness of the enterprise.

The introduction of such recommendations will give the company a competitive advantage, increase profitability and enable to revise and minimize the negative impact of external and internal factors on the company's activities.

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