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INDUSTRIAL ENTERPRISES DEVELOPMENT EVALUATION

On the example of machine-building complex in Donetsk region is considered the practical use of different methods of evaluation of industry and industrial enterprise. A method is aimed to improve the ratio of integrated enterprise by adjusting the index of the industry.

Keywords: development, growth, index of demand, the industry index, complex index of industrial enterprise.

Problem. Ukraine's economy, its industries and enterprises continue to operate under the effects of the global financial crisis. A significant reduction in demand for domestic producers, production levels pose a serious threat to individual companies and for the national economy of Ukraine as a whole. Most of the industrial enterprises of Ukraine are stick to the traditional playing of economic activity, not paying sufficient attention to issues of innovation and development.

The problem of assessing the level of industrial enterprises in the modern terms of economy of Ukraine becoming important. Existing approaches to the evaluation of businesses do not always take into account industry features, businesses and the general trends of the dynamics of the economy.

Analysis of recent research. Today, for the evaluation of companies used two groups of models: models of quantitative and qualitative assessment. The first group includes multicriterion model estimation of the total gradation for each criterion [1] and can be used to determine the development vector of the company, but it doesn't allow you to aggregate assessment.

Methods of assessment of integrated development of OA were developed by Podsolonko [2, p. 257] using the parameters of quantitative results of production and

resource conditions to achieve the analyzed results, technical and socio-ecological conditions.

Model evaluation of the proposed enterprise Pogorelov S. [3] uses a combination of qualitative and quantitative evaluations of changes that have occurred in the company, but does not consider the impact on the environment of an enterprise.

Among the second group of models special attention should be given to quadrants model changes, the model of chaos in an organization that is based on the theory of chaos [4].

Thus, in assessing of the development of the enterprise made only some steps that, given the importance of development of enterprises should be continued. This identified the need to improve approaches to the development of industry in view of the nonlinear nature of the flow of economic processes.

The purpose of the article is to improve methods for evaluating the level of industrial enterprise.

The basic material research. Before you choose quantitative or qualitative approach to the assessment of the company, you should draw the line between such concepts as "development" and "growth." Development - the phenomenon of quality that reflects the features of the inner nature, state of the object, while growth - quantitative, designed for external comparative characteristics of objects and features of their interaction. The development appears to achieve an absolute measure, while growth - only shows relativity of existence. Development - the process that can't be calculated (no limit), growth - calculated (a threshold). Not always the processes of development and growth coincide, since the transition of quantity into quality occurs when you reach a certain limit of quantitative accumulation, which is quite rare for a very favorable set of circumstances.

Growth - a positive change in the system needs through self-organization, ie by increasing the efficiency of using their own capabilities, rather than by attracting resources from outside.

Development - it is always changing. However, not every change can lead to development.

Thus, a change that can be called development, must meet the following requirements:

- must be measurable, if the change can not be measured, the output changes are uncertain, vague, wide area, allowing arbitrarily many opposing points of view, each of whom has a right to exist;

- must be reliably measurable, that is expressed in terms of sustainable, universal values;

- must be sustained over time;

- be sustained in the selected strategy space (enterprise);

- should express development, not simply "better" growth or something else.

To assess the industry various indicators such as sales revenue index, composite index of prices, trade price indices, etc are used. But using the ratio of these indices to determine the quantitative or qualitative reasons due to increasing sales industry in monetary terms. The formula for the index demand (I_d) can be as follows:

$$I_d = I_{ES} / I_{PI} \quad (1)$$

I_{ES} - the index of earnings from sales;

I_{PI} - the price index.

In particular, for the analysis of the real demand for the products of mechanical engineering, in Donetsk region growth rates for the years 2001-2011 were analysed (Table 1).

Table 1

Index of demand for machine-building enterprises of Donetsk region [5]

Indicators	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Index of growth of sales,%	150,1	122,8	152,0	127,8	80,7	104,1	119,8	102,2	58,6	153,7	115,5
Price index for machinery,%	100,4	100,2	104,4	110,9	110,1	104,3	109,9	120,0	111,3	110,7	110,7
Index of demand	1,50	1,23	1,46	1,15	0,73	1,00	1,09	0,85	0,53	1,38	1,04

You can see that the growth in sales of machine-building enterprises associated with the growth of prices for these products. Increasing the index of demand in 2010

represents economic recovery after the global financial crisis of 2008. Only in 2001-2004 there was a small growth of machine building industry, but the qualitative changes that characterize the development of the economic system are out of language.

In addition, much of machine-building plant and equipment needs updating, they wear reaches 66.8%. We should take into account that the statements reflect only physical depreciation of equipment. Regarding obsolescence should be noted that the majority of machine-building enterprises of Ukraine have working equipment from third technological structure as a result - low competitiveness of products made.

Thus, the rate of production area can not be used to evaluate the industry. Index reflects the demand for a more realistic picture of the state and prospects of the industry. However, quantitative indicators in a market economy with only auxiliary character.

As an indicator of the quality of the economic system can be used by development index system:

$$T_p = \sum_{j=1}^m \frac{a_{1j}}{a_{0j}} \cdot \beta_j, \quad (2)$$

β_j - weight of this parameter;

a_{1j} - j index value in the reporting period;

a_{0j} - j index value in the base period.

To assess the level of the industry as a socio-economic system I propose to use as the most important indicators productivity, investment in fixed assets, export share of profitable enterprises and the development of wages because they are objectively show how integrated each other factors of the economic system.

Weighted characteristics marked indicators should be determined by factor analysis of factors that most significantly affect the results of economic activities of the industry, namely the formation of value added. The analysis obtained the following results:

$$Y = 0,3 x_1 + 0,3 x_2 + 0,2 x_3 + 0,05 x_4 + 0,15 x_5, \quad (3)$$

x_1 - rate of productivity growth;

x_2 - growth in investment in fixed assets;

x_3 - growth in exports;

x_4 - growth in the share of profitable enterprises;

x_5 - wage growth.

The index of development, which exceeds the value 1 represents the possibility of the industry. Background for the evaluation of machine-building complex is shown in Table 2.

Table 2

Indicators of machine-building complex in Donetsk region [5]

Indicators	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
The volume of sales, million UAH	3073,4	5274,9	6477,6	11822,7	9484,3	10219,9	14220,6	18903,2	13770,3	21558,3	23743,9
Number of employees, thousands of people	104,0	99,7	98,4	99,1	99,9	98,0	92,2	87,1	72,1	79,8	82,1
Fixed assets, million UAH	5575,5	5553,2	5625,4	5856,0	6125,4	6456,2	7018,1	13504,4	105011,5	107584,7	111888,1
Labour productivity, ths. UAH / person	29,55	52,91	65,83	119,30	94,94	103,34	154,24	216,53	190,99	270,15	289,21
The volume of investments in fixed assets, million UAH	149,6	175,3	173	265,3	290,1	529,8	579,0	475,9	398,2	569,5	621,7
Exports, million dollars.	405,2	527,9	602,9	1140,8	721,4	857,6	1204,2	1520,0	874,2	1412,9	1752,4
Profits million UAH	414,4	204,8	125	280,3	501,4	428,5	975,7	353,4	-423,6	427,8	1616,8
The share of profitable enterprises,%	67,7	63,1	66,1	67,9	67,6	67	73,2	68,5	61,0	64,9	64,0
Average monthly wages, UAH	460,69	506,86	633,9	785,56	999,05	1287	1633	2006	1754	2492	2952

* - Preliminary data

The results of calculations (Table 3) compare the performance of the quantitative development of the industry, as that was used on the growth rate of production.

Development Index as opposed to indicators of output and demand of products is not only quantitative but also qualitative in nature, which allows not only to

determine the dynamics of the industry, but also to determine the factors of development and suggest ways to better use.

Table 3

Evaluation of machine-building of Donetsk Region

Indicators	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
The pace of growth in production	1,228	1,520	1,278	0,807	1,041	1,198	1,022	0,586	1,537	1,155
Index of demand	1,226	1,456	1,152	0,733	0,998	1,090	0,852	0,527	1,388	1,043
Index of the field	1,361	1,138	1,619	0,934	1,355	1,302	1,151	0,806	1,443	1,124

But the model estimates the industry in a summary nature and needs clarification in relation to specific industrial enterprises.

Ratio of industrial enterprises is proposed to calculate as a weighted sum of the factors that influence the development of industrial enterprise. The general formula of the complex ratio of the enterprise is:

$$R = (K^1 N^1) \cdot 0,5 + (K^2 N^2) \cdot 0,33 + (N^3 K^3) \cdot 0,17 , \quad (4)$$

K_1 - coefficient of economic growth;

K_2 - the coefficient of return on sales;

K_3 - ratio of fixed assets;

N_i - theoretically adequate value of the coefficient (for machine building enterprise: $N_1 = 1,06$; $N_2 = 7$; $N_3 = 0,4$).

Rate of economic growth is defined as geometric mean growth rate of the chain of added value:

$$K^1 = \sqrt[n]{T_1 * T_2 * \dots * T_n} , \quad (5)$$

$$T_n = \frac{DB_n}{DB_{n-1}}$$

DB - added value;

n - number of periods for which a factor (in the analysis of the industrial enterprise is suggested to determine this rate for 3 years).

To calculate the ratio of industrial enterprises was used indicators of economic activity for the period 2005-2010 years (Table 4).

According to the results of calculations we can see that in the crisis period only LLC "Yasynuvata-Building Plant" and JSC "Starokramatorsk engineering plant" had rate of development greater than 1, suggesting the existence of opportunities for further development of industrial enterprises. The most difficult situation in OJSC "Novohorlivskyy Engineering Works", JSC "Kramatorsk Heavy machine" and JSC "Slovvazhmash" - companies do not have opportunities for development through their own potential.

Table 4

The development of industrial enterprises of the Donetsk region

Company name	A comprehensive index of economic development of the enterprise					
	2005	2006	2007	2008	2009	2010
JSC "Rutchenkivskyy plant" Hormash "	0,511	0,721	0,820	0,758	0,560	1,126
PJSC "Azovzahalmash"	0,956	0,864	0,828	1,012	0,751	1,494
Ltd. "Yasynuvata Building Plant"	1,893	1,720	1,195	1,002	-42,056	0,692
PJSC "Donetskhirnash"	1,074	1,142	0,126	0,843	-0,104	1,876
JSC "Machine-Building Plant Druzhkivskyy"	-0,558	0,661	0,753	0,750	0,335	1,835
PJSC "Energomashspetsstal" PJSC "Kramatorsk Heavy machine"	0,872	0,848	0,536	1,002	1,173	2,053
PJSC "Mariupolskyy Heavy Machine Building Plant"	0,999	-0,392	-0,899	0,837	0,154	-0,682
JSC "Machine-Building Plant Novohorlivskyy"	1,006	0,950	0,782	0,915	0,385	1,338
PJSC "Slovvazhmash"	-0,270	-0,70	-1,254	-0,809	-19,535	-12,732
JSC "Machine-Building Plant Starokramatorsk"	-0,198	-0,254	-0,313	-0,028	-1,952	2,644
JSC "Rutchenkivskyy plant" Hormash "	0,790	1,879	1,269	1,183	-0,421	1,731

The development of the industry in 2010 increased significantly in a number of companies that has less to do with qualitative changes in the company, but with an attempt to return to the crisis level of development. At the same time for such enterprises as JSC "Novohorlivskyy Machine Building Plant" and JSC "Kramatorsk

Heavy machine" global crisis was disastrous and led to bankruptcy. So, we can see that the crisis is the impetus for the development of businesses.

In order to improve methods of evaluating the complex ratio of enterprise, we need to complete its consideration environmental factors that affect the performance of the company. As one of the following adjustment factors indicator that reverts the index of the corresponding field can be used. Results of complex correction factor of enterprise development are given in Table. 5. The results are more balanced in nature and suggest the possibility of qualitative development of industrial enterprises.

Table 5

Adjusted level of industrial Donetsk region

Company name	A comprehensive index of economic development of the enterprise					
	2005	2006	2007	2008	2009	2010
JSC "Rutchenkivsky plant" Hormash "	0,547	0,532	0,630	0,658	0,694	0,780
PJSC "Azovzahalmash"	1,024	0,638	0,636	0,879	0,931	1,036
Ltd. "Yasynuvata Building Plant"	2,027	1,270	0,918	0,870	-52,156	0,480
PJSC "Donetskhirnash"	1,150	0,843	0,097	0,732	-0,129	1,300
JSC "Machine-Building Plant Druzhkivsky"	-0,597	0,488	0,579	0,651	0,415	1,272
PJSC "Energomashspetsstal" PJSC "Kramatorsk Heavy machine"	0,934	0,626	0,412	0,870	1,455	1,423
PJSC "Mariupolsky Heavy Machine Building Plant"	1,070	-0,289	-0,691	0,727	0,191	-0,473
JSC "Machine-Building Plant Novohorlivsky"	1,077	0,701	0,601	0,795	0,477	0,927
PJSC "Slovvazhmash"	-0,289	-0,517	-0,963	-0,703	-24,226	-8,825
JSC "Machine-Building Plant Starokramatorsk"	-0,212	-0,187	-0,240	-0,024	-2,421	1,833
JSC "Rutchenkivsky plant" Hormash "	0,846	1,387	0,975	1,028	-0,522	1,200

Based on the foregoing, here are the following conclusions:

- the effectiveness of the economic system of the high index of companies reflects the presence in its structure improvements;
- in a balanced and stable economic system development index is not a subject of significant fluctuations, its instability (oscillation) talks about violation of the structural balance;

- assessment of industrial enterprises is appropriate, considering not only the quantitative increase (growth rate) but also consider factors that reflect the quality potential of the enterprise (ratio of fixed capital);
- to reduce the quantity of external factors it's suggested to adjust the complex ratio of the index on the industry.

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