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# DIAGNOSTICS OF ENTERPRISE DEVELOPMENT AS A COMPONENT OF AN EFFECTIVE STRATEGY

*The paper offers a review of modern methods for enterprise development diagnostics which are based on working out the best structure of economic resources and sources of their formation, providing the appropriate level of profitability. The author analyzes existing approaches to enterprise development diagnostics, multidimensional rating models and methods for determining the integral index of diagnostics. The analysis shows that currently used methods of diagnostics have significant shortcomings. The author emphasized that at the present stage of development analysts mostly use methods of experts' reviews. The use of experts' experience is important for detecting most of the risks of qualitative analysis, which further requires the use of mathematical methods and tools. This study proves good use of Saaty analytic hierarchy method. In this case, the author was guided by the following pre-conditions that the analytic hierarchy Saaty method doesn't have drawbacks inherent to the existing methods due to the more advanced procedures of paired comparisons of objects and allows to receive important factors which cover normalization condition. The methods introduced in the study proved to be effective in the implementation of the enterprise ZKF plc.*

***Key words:*** *aggregated form of financial statements, enterprise development, paired comparisons, method of diagnostics, Saaty analytic hierarchy process.*

## I. Introduction

In the current economic conditions overall economic strategy should identify priorities and objectives of the company, which dominate all its components, including the financial strategy of the company. Prospects development diagnosis has significant impact on the development of an effective business strategy.

Indicators of diagnosis, through which the state of the entity is examined, in terms of statistics are the relative values of the structure, intensity or coordination [1, p. 342–348]. Directly or indirectly, but all diagnostic indicators characterize the structure of enterprises' reporting forms, or the ratio between the individual groups of items. Thus, solving the problem of managing the development of the company is equal to finding the best structure of economic resources, the sources of their formation, which are provided by an appropriate level of profitability. It is a relevant and topical task.

## II. Formulation of the problem

Input information of planning and forecasting enterprise development strategy is its financial statements report, in particular, the balance sheet and income statement. On the item level, it is impossible to define the need to make changes to structure of the specified forms by adjusting their components to improve the development of enterprises. This is due to the unpredictability of the many business environment factors, and consequently to the constant need to react.

However, it is necessary to maintain the necessary financial stability, the overall proportion in the structure of economic resources and their financing sources and the level of business activity and profitability [2, p. 244–251].

**The aim of the article**. The main objective of the study is to construct a diagnostic model of the enterprise, which must operate in items, which are aggregated forms of financial statements, which should be grouped on the basis of their economic substance and liquidity.

**Results.** To solve this problem, we introduce the following notation:

$a = \{a_i\}$, $i = 1..n$ – set of items of the financial statements for the current period, requiring the work out of their adjustment strategy;

$A = \{A_i\}$, $i = 1..m$ – set of aggregated items of financial statements based on the set $a = \{a_i\}$, $i = 1..n$ on the liquidity basis;

$X = \{X_i\}$, $i = 1..m$ – set of ratios, calculated as the ratio of the aggregated balance sheet items $A = \{A_i\}$, $i = 1..m$ to the balance currency. It characterizes the current aggregated structure of the financial statements forms.

Therefore, based on the set of aggregated items for the forms of financial statements: $A = \{A_i\}$, $i = 1..m$, we have calculated a set of appropriate ratios: $X = \{X_i\}$, $i = 1..m$.

This aggregated structure of financial reporting forms serves as a variable for the diagnostic model of enterprise development.

The next step is to assess the level of enterprise development, using methods of multidimensional rating analysis.

The structure of the multidimensional model of rating includes:

1. System of indicators for company development diagnostics;

2. Weighted values, which are determined by Saaty analytic hierarchy process, according to the preferences of the expert;

3. Optimal limits of development diagnostics indicators, etc.

Here are the details of these components.

$k = \{k_i\}$, $i = 1..z$ stands for the set of diagnostic ratios of the company, which is calculated based on the aggregate structure of financial reporting forms $X = \{X_i\}$, $i = 1..m$.

While forming an indicator system of company development diagnostics, the following assumptions should be considered:

– as the chosen system of factors underlies the formation of an integrated assessment of the enterprise, it should fully display the ratio between aggregated items of financial statements forms. However, indicators that are functionally interdependent should be excluded from the calculation;
– it is advisable to conduct grouping of indicators based on their economic substance. Traditional methods of company diagnostics allocate liquidity, solvency, business activity and profitability. Grouping indicators can facilitate the process of determining their weight values while shaping general integrated assessment. Also, having a group of indicators makes it possible to conduct comparative analysis. Affiliation of *i*-th index to *j*-th group will be denoted as $k_i^{(j)}$.

We suggest that weight values of indicators are determined according to Saaty analytic hierarchy process. The general concept underlying the method is ”hierarchy”, which includes some abstractions of system structure intended for study of the functional interaction between its elements [3, p. 70–74]. In our case, when constructing a multivariate model of rating, the system of development diagnostics indicators, grouped into relevant groups, should act as the hierarchy object scorecard.

Hierarchy of company diagnostic indicators and their significance for the results of ZKF plc in 2013 are shown in Table 1.

Table 1 contains not only the system of company diagnostics indicators, but also their normalized values; methods of value calculation are also given below. Another component of multidimensional rating estimation model is the assessment of optimal (preferred) values of diagnostic development indicators, which ultimately influence optimal structure of aggregated financial statements reports.

Table 1

**Diagnostic Results of ZKF plc in 2013**

| Groups of indicators | Indicator value of the reporting period | Normalized indicator values |
|---|---|---|
| **Liquidity Ratios** | | 0,392 |
| Current Ratio | 1,26 | 0,840 |
| Quick Liquidity Ratio (urgent) | 0,96 | 0,642 |
| Absolute Liquidity Ratio | 0,01 | 0,029 |
| **Solvency indicators** | | 1,000 |
| financial pressure Ratio | 0,00 | 1,000 |
| Ratio of long-term receivables and to payables | +∞ | 1,000 |
| Ratio of long-term liabilities to non-current assets | 0,00 | 1,000 |
| **Indicators of business activity** | | 0,502 |
| Total capital turnover ratio | 2,41 | 0,482 |
| Duration of capital turnover, days | 151,57 | 0,482 |
| Turnover ratio of current assets | 5,20 | 0,520 |
| Duration of circulating assets turnover days | 70,23 | 0,527 |
| **Indicators of profitability** | | 0,183 |
| Profitability of company’s total capital | -0,06 | 0,349 |
| Return on equity | -0,08 | 0,423 |
| Operating profitability | -0,07 | 0,229 |
| Profitability of financing activities | 0,00 | 0,000 |
| Profitability of investment | 0,01 | 0,130 |
| Profitability of costs | -0,03 | 0,082 |
| Profitability of sales | -0,03 | 0,072 |
| **Indicators of financial stability** | | 0,777 |
| Ratio of financial autonomy | 0,66 | 0,834 |
| Ratio of current debt | 0,34 | 0,588 |
| Ratio of long-term financial independence (financial stability) | 0,66 | 0,909 |

The sources of information in this case may be:

– recommendations on the basis of company’s development diagnostic practice;
– relevant methods of financial analysis, approved by law;
– results of the best companies in the industry.

Enterprise goals are known to be numerous. They include increasing market share, sales, equity, profits, capital, profitability, enhancing competitiveness and the pace of product recovery [6, p. 42–43]. While planning the company development, it is sometimes impossible

to achieve an optimal level of performance considering the existing conditions. In this case, development indicators should vary within acceptable limits, or so-called “risk zones”.

Multidimensional rating estimation model aims to reduce all indicators to a single generalizing (integral) one, which acts as the objective function of company development management task. Thus, it is necessary to note that each of the indicators may have not only different units of measure, but the dimension of calculation. Therefore, the normalization procedure is performed to allow for comparison of indicators different in their economic content.

The purpose of the normalization is to bring the actual values of diagnostics indicators to the scale [0, 1], where the largest of normalized values has the best value indicator.

As different by their economic substance development diagnostics indicators have different preferred direction of changes, they fall into three groups below:

1) indicators that should be maximized. The indicator is considered the better if its value increases. An example of this can be asset turnover, return on total capital, etc;

2) indicators that should be minimized. In this case, an indicator is considered better if its value decreases. Examples of such indicators are weighted average cost of capital or the duration of the working capital in the output;

3) indicators that should take some standard, or the most desirable, value. A deviation from this standard value in both increase and decrease is negative.

An example in this case could be autonomy ratio: a high ratio of equity to total amount results, according to the effect of financial leverage, in underestimation of the importance of funding for debt sources and loss of profitability of total capital. On the other hand, high levels of debt negatively affect the level of financial stability and solvency of the company.

Normalization of parameters of the first group is performed according to formula (1):

$$k_{i,норм}^{(j)} = \frac{k_i^{(j)}}{\max\left(k_i^{(j)}\right)}, \qquad (1)$$

where $k_{i,норм}^{(j)}$ - normalized value of the i-th index belonging to j-th group;

$\max\left(k_i^{(j)}\right)$ – the maximum possible value of the i-th index belonging to j-th group, which should be targeted at.

The second group of indicators is normalized by the formula (2):

$$k_{i,норм}^{(j)} = \frac{\min\left(k_i^{(j)}\right)}{k_i^{(j)}}, \qquad (2)$$

where $\min\left(k_i^{(j)}\right)$ – the minimum possible value of the i-th index belonging to j-th group, which should be targeted at.

There are current values of the food industry enterprises diagnostics at the input data of the formulas and their normalized values at the output.

The third (last) group of indicators is normalized using the following rules:

– if the actual indicator value prevails normalized one, the desirable changes should be directed towards minimization and normalization is performed using the formula (2), where the $\min\left(k_i^{(j)}\right)$ acts as the normative value;
– if the actual indicator value inferior to a normative one, the desirable changes should be directed towards maximization and normalization is performed using the formula (1) where the $\max\left(k_i^{(j)}\right)$ acts as the normative value as well.

According to Table 1 we can do calculations for ZKF plc using formulas (1) – (2). Thus, the current ratio equals 1.26 against the results in 2013.

Considering that the standard value should be 1.50, we can see that there is a significant lag for this indicator. Thus, the current ratio should be increased so we should calculate its normalized values by the formula (1):

$$k_{1,норм}^{(1)} = \frac{k_1^{(1)}}{\max\left(k_1^{(1)}\right)} = \frac{1{,}26}{1{,}50} = 0{,}84 .$$

Coefficient of financial autonomy (the group of financial stability coefficients) equals 0.66, which is the excess of the normative value which equals 0.55. Thus, the ratio of financial autonomy is recommended to be decreased. So we apply the formula (2) for normalization:

$$k_{1,норм}^{(5)} = \frac{\min\left(k_1^{(5)}\right)}{k_1^{(5)}} = \frac{0{,}55}{0{,}66} = 0{,}834 .$$

Similarly, we perform normalization for all other diagnostic indicators of ZKF plc. Normalized values for each group of indicators in general, the values of which are also given in Table 1, are calculated using the formula of arithmetic weighted average:

$$k_{норм}^{(1)} = \frac{1}{3}\times 0{,}506 + \frac{1}{3}\times 0{,}642 + \frac{1}{3}\times 0{,}029 = 0{,}392;$$

$$k_{норм}^{(2)} = \frac{1}{3}\times 1{,}000 + \frac{1}{3}\times 1{,}000 + \frac{1}{3}\times 1{,}000 = 1{,}000 ;$$

$$k_{норм}^{(3)} = \frac{1}{4}\times 0{,}482 + \frac{1}{4}\times 0{,}482 + \frac{1}{4}\times 0{,}520 + \frac{1}{4}\times 0{,}527 = 0{,}502;$$

$$k_{норм}^{(4)} = \frac{1}{7}\times 0{,}349 + \frac{1}{7}\times 0{,}423 + \frac{1}{7}\times 0{,}229 + \frac{1}{7}\times 0 + \frac{1}{7}\times 0{,}130 + \frac{1}{7}\times 0{,}082 + \frac{1}{7}\times 0{,}072 = 0{,}183;$$

$$k_{норм}^{(5)} = \frac{1}{3} \times 0,834 + \frac{1}{3} \times 0,588 + \frac{1}{3} \times 0,909 = 0,777 .$$

Considering that the normalized values of indicators should be closer to 1 to improve their values, we can make conclusions about strengths and weaknesses of ZKF plc:

– according to solvency indicators position of the company is positive due to the total absence of long-term liabilities;
– according to financial stability indicators position of the enterprise is more or less satisfactory;
– according to business activity indicators there are significant problems for enterprise due to low asset turnover;
– according to liquidity indicator there are also significant problems for enterprise s due to the high level of short-term payables;
– according to profitability indicators position of the enterprise is unsatisfactory, the company is unprofitable.

The last part of multidimensional rating estimation model is to determine the weighted values of indicator groups. At the present stage of development analysts mostly use methods of expert opinion in their work. The use of experts' experience is important for detecting most of the risks of qualitative analysis, which further requires the application of mathematical methods and tools [7, p. 100]. In this study the author offers to use Saaty's analytic hierarchy method. In this case, the author is guided by the following pre-conditions:

– the importance of aims should be determined by the expert, that is, the problem of determining the weight values of development diagnostics indicators is the expert choice task;
– in this case, the traditional decision-making method is based on pairwise comparisons procedure [4, p. 89–96 , 5 p. 11–21]. This method allows to pair the sets of objects with a numerical weight values on the basis of their qualitative ordering. But it doesn't take into account the degree of difference between objects. As a result, two almost opposite situation are unable to affect the results of calculation, for example: if "object A is slightly more important than object B" and "object B significantly inferior than object A" – both of the objects A and B will receive the same numerical weight value;
– Saaty's analytic hierarchy method doesn't have shortcomings of previous methods due to more sophisticated paired comparison procedures and is widespread in the scientific literature and practice of Western countries. It allows to receive important factors which fall by the normalization condition (the sum of the importance coefficients of a facilities hierarchy level equals one).

The results of a qualitative comparison of two different development diagnostics indicators of the same hierarchy level are assessed by the following point system:

– if group A of indicators is compared with itself, it scores 1;
– if group A and group B are equally important, they score 1 and is referred to as $A \approx B$ ;
– if A is slightly more important than B, it scores 3 ( $A \approx\succ B$ );
– if A is much more important than the B it scores 5 ( $A \succ B$ ) ;
– if A is clearly more important than the B it scores 7 ( $A \succ\succ B$ );
– if A is completely dominated by B it scores 9 ( $A \succ\succ\succ B$ ).

The results of paired comparison are presented in a matrix $\beta = \{\beta_{i,j}\}, \quad i,j = 1..z$ whose elements are equal to:

$$\beta_{i,j} = \begin{cases} 1, & if \quad i = j \\ \lambda_{i,j}, & if \quad j > i \\ 1/\lambda_{i,j}, & if \quad j < i \end{cases}, \qquad (3)$$

where $\lambda_{i,j}$ is scores received from paired comparisons of i-th and j- th objects.

The weights for each of the parameters for viability indicator are calculated based on the procedure of averaging the normalized columns. That is, first normalization for the matrix $\beta = \{\beta_{i,j}\}, \quad i,j = 1..z$ is performed as follows:

$$\beta_{i,j,норм} = \frac{\beta_{i,j}}{\sum_{i=1}^{z} \beta_{i,j}} . \qquad (4)$$

And then the weights are calculated:

$$\alpha_i = \frac{\sum_{j=1}^{z} \beta_{i,j,норм}}{z}. \qquad (5)$$

So, the matrix of paired comparisons is at the input of the formulas 3–5. It determines manager's quality preferences, due to the importance of enterprise development diagnostics. At the output of the formula there are numerical values that define the importance of these indicators to ensure universal, sustainable development level.

We demonstrate this method of calculating weighting indicators for ZKF plc. We mark the groups of indicators as

P (profitability)
BA (business activity)
F (financial stability)
S (solvency)
L (liquidity).

While designing the system of benefits we take into account the real state of the investigated companies. This means that the worse the development level is (by any group of ratio) the more attention is required. Thus, the system

of benefits looks like $P \approx\succ L \approx\succ BA \succ F \approx S$. This means, that the effectiveness indicators are slightly more important than liquidity ones which slightly dominate over indicators of business activity. Indicators of business activity are much more important than indicators of financial stability, which are equally important to the group of solvency indicators.

According to formula 3, paired comparisons matrix looks as follows (Table 2).

Table 2

**Paired comparisons matrix for ZKF plc**

| | L | S | BA | P | F |
|---|---|---|---|---|---|
| L | 1,000 | 7,000 | 3,000 | 0,33 | 7,000 |
| S | 0,143 | 1,000 | 0,200 | 0,111 | 1,000 |
| BA | 0,333 | 5,000 | 1,000 | 0,200 | 5,000 |
| P | 3,000 | 9,000 | 5,000 | 1,000 | 9,000 |
| F | 0,143 | 1,000 | 0,200 | 0,111 | 1,000 |
| Total | 4,619 | 23,000 | 9,400 | 1,756 | 23,000 |

Based on the constructed matrix of paired comparisons, Table 2, and formula (4) we complete the valuation of the resulting values, Table 3:

Table 3

**Normalized values of the paired comparisons matrix for diagnostic indicators of ZKF plc**

| | L | S | BA | P | F | total | The weights, $\alpha_i$ |
|---|---|---|---|---|---|---|---|
| L | 0,216 | 0,304 | 0,319 | 0,190 | 0,304 | 1,334 | 0,267 |
| S | 0,031 | 0,043 | 0,021 | 0,063 | 0,043 | 0,202 | 0,040 |
| BA | 0,072 | 0,217 | 0,106 | 0,114 | 0,217 | 0,727 | 0,145 |
| P | 0,649 | 0,391 | 0,532 | 0,570 | 0,391 | 2,534 | 0,507 |
| F | 0,031 | 0,043 | 0,021 | 0,063 | 0,043 | 0,043 | 0,040 |

As you can see from the table 3, indicators of profitability and liquidity, according to the accepted system of advantages, generated the highest values of weight indicators: $\alpha_4 = 0.507$, $\alpha_1 = 0.267$. The business activity indicators are the next most important groups of factors. Their weighting is: $\alpha_3 = 0.145$. The indicators of financial stability and solvency turn out the least important: $\alpha_5 = \alpha_2 = 0.040$. We unite groups of financial indicators into one integral index according to their weighting coefficients.

In practice of development diagnostics the multidimensional rating assessment of enterprise state models are represented by linear multivariable discriminant models [9, c. 679–683], including well-known models of Altman, Lis, Taffler and others. It means that the integral indicator that characterizes general development of the subject under study linearly depends on the changes in each factor. So the best level of enterprise development meets the highest integral indicator value.

However, the existence of a linear relation between the integral indicator and the chosen development diagnostics indicators system in this case is unacceptable, because it contains a number of significant drawbacks:

1. If one of the factors gets significantly worse (normalized value approaching zero), the resulting score, according to the redistribution of weights, can maintain its high level due to other factors, which indicates a reasonable level of development.

In its turn, businesses practice in market conditions shows that the complete absence of one of the key factors of financial success results in bankruptcy. Thus, the unbalanced structure of economic resources and sources of funding which results in a loss of liquidity or solvency, even with an acceptable level of business activity and profitability is critical to the enterprise. Otherwise, unprofitable activities in terms of liquidity balance will eventually lead to the deterioration of development.

2. Limit efficiency of diagnostic indicators (which are part of the integral one in the case of a linear dependence) is a constant.

In practical terms this means that if weight coefficients are equal it doesn't matter what aspect of diagnosis of enterprise is improved: the one that adequately meets the financial standards or the one with significant problems.

The famous Ukrainian scientist V. Vitlinskiy also studied possible solutions to the problem of multidimensional rating evaluation [10, p. 188–199]. In his work, he suggested various modifications of evaluation function, conducting a critical analysis of their possible application in the field of economic and mathematical modeling.

In our view, it is advisable to use power multiplicative function as integrated assessment of the development level that takes into account and eliminates these drawbacks:

$$I = k_{1,норм}^{\alpha_1} \times k_{2,норм}^{\alpha_2} \times \ldots \times k_{z,норм}^{\alpha_z} = \prod_{i=1}^{z} k_{i,норм}^{\alpha_i} \rightarrow \max. \quad (6)$$

With this formula we calculate the synthesis, integral indicator that reflects the level of company development in all aspects by way of multiplying the normalized values of the development diagnostics indicators and their weights that determine the extent of importance for ZKF plc:

$$I = 0,392^{0,267} \times 1,000^{0,040} \times 0,502^{0,145} \times \times 0,183^{0,507} \times 0,777^{0,040} = 0,295.$$

This integral indicator serves as the objective function for diagnostics model of company development. In its turn, a set of variable ratios of aggregated items of financial statements forms to the balance sheet act as the model

variables: $X = \{X_i\}$, $i = 1..m$. By improving the structure of economic resources, sources of funding and improving financial performance through individual performance development the given approach allows to improve the integrated assessment of enterprise development. By the result of managerial actions we assume the set that characterizes the optimal aggregated structure of financial reporting forms: $X_{opt} = \{X_{opt,i}\}$, $i = 1..m$.

The intensity of the proposed changes in the structure of the balance sheet can be measured with a linear or quadratic coefficient. The latter is most sensitive to changes in the structure, so in this study we take it as a basis:

$$\sigma_X = \sqrt{\frac{\sum_{i=1}^{m}\left(X_{opt,i} - X_i\right)^2}{m}}. \qquad (7)$$

Using ratios patterns that reflect the current and optimum items of aggregated financial statements (formula 7) we calculate the quadratic coefficient of variation, reflecting the deep structural changes required for the transition from the current state to the optimal development. The greater the value of this parameter, the more significant structural changes are necessary. Bringing objective function to the best value results in a double effect:

– A slight improvement in integrated assessment I of company viability is offset by a moderate value of index $\sigma_X$;
– Further improvement of the target results in more significant structural changes.
– The more significant structural changes are necessary, the harder it is to put them into practice.

Therefore, restrictions of this problem should be as follows: $\sigma_X \le \sigma_Д$, where $\sigma_Д$ – acceptable level of structural changes, which is the average structural changes in recent years. Economic objective of the restriction is to ensure that the development of changes in the structure of economic resources and sources of funding can be put into practice.

Also, there are others additional limitations of the model, including acceptable limits, within which indicators of development diagnostics may be.

Recommendations about the ways to adjust forms of financial reporting are formation by comparing the current set of aggregated forms of financial statements items $A = \{A_i\}$, $i = 1..m$ against their optimal values:

$$\Delta A_i = A_{opt,i} - A_i, \quad i = 1..m, \qquad (8)$$

where $A_{opt,i}$ $i = 1..m$ – the best value and the i-th aggregated item of financial statements which is calculated on their optimal aggregate structure $X_{opt} = \{X_{opt,i}\}$, $i = 1..m$.

As a result we receive recommendations on the changes in the structure of funding and economic resources of the company. If $\Delta A_i > 0$, this means the i-th aggregated financial statement item should be increased by $\Delta A_i$; if $(\Delta A_i < 0)$ – should be reduced; if $(\Delta A_i = 0)$ – left unchanged.

Correlation between $A_{opt,i}$ $i = 1..m$ and $X_{opt} = \{X_{opt,i}\}$, $i = 1..m$ is defined by the desired amount of total assets (balance sheet total). That is, the proposed changes financial reporting forms depend not only on their optimal aggregate structure, but the desired final result. In other words:

– If you are planning to substantially increase the amount of total assets in the company's turnover, it is recommended to increase each aggregated item non-uniformly in order to adjust them;
– If you are planning a significant reduction in total assets, it is recommended to decrease each aggregated item non-uniformly in order to adjust them;
– If you are not planning to substantially increase the amount of total assets there may be both positive and negative changes in $\Delta A_i$.

We offer to study the practical use of this model, according to the objective function (6) by the example of the aggregated financial statements of ZKF plc in 2013:

Table 4

**Recommended changes to forms of ZKF plc financial statements to ensure the planned development dynamics, thous**

| Aggregated items of financial statements forms | At the end of 2013 | Recommended changes | At the end of the planned period |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| Non-current assets, including: | 20 755,0 | +1715,7 | 22 470,7 |
| - Construction in progress | 4568,0 | -1649,4 | 2918,6 |
| - Fixed assets, net | | | |
| - other | 15 716,0 | +2059,4 | 17 775,4 |
| | 471 | +1305,7 | 1776,7 |
| Current assets, including: | 19 100,0 | -1715,7 | 17 384,3 |
| - Inventories | 4189,0 | -2474,1 | 1714,9 |
| - Work in progress | 286,0 | 744,6 | 1030,6 |
| - Finished Products | 1118,0 | -499,7 | 618,3 |
| - Accounts receivable | 13 302,0 | -2783,3 | 10 518,7 |
| - Cash and cash equivalents | 201,0 | 3298,8 | 3499,8 |
| - other current assets | 4,0 | -2,0 | 2,0 |
| Pre-payments | 1368,0 | 0,0 | 1368,0 |

Continuation of table 4

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Total comprehensive asset | 41 223,0 | 0,0 | 41 223,0 |
| Shareholder equity | 27 200,0 | 0,0 | 27 200,0 |
| Reserves for future losses and payments | 0,0 | 0,0 | 0,0 |
| Long-term liabilities | 0,0 | +4122,3 | 4122,3 |
| Short-term liabilities | 14 023,0 | -4122,3 | 9900,7 |
| Deferred income | 0,0 | 0,0 | 0,0 |
| Total liabilities | 41 223,0 | 0,0 | 41 223,3 |
| Revenue from product sales | 109 238,0 | +39 449,2 | 138 072,2 |
| Net profit | -2299,0 | +4685,6 | 2386,6 |

Recommended changes are calculated by the formula (8). As can be seen from Table 4, the recommended changes in the structure of the balance sheet asset are to reduce current assets with a simultaneous increase in the amount of non-negotiable by 1,715.7 thousand.

The reduction in current assets should take place at the expense of excessive inventory, finished goods in stock and receivables for goods, works and services. At the same time, to improve the liquidity of the balance it is recommended to replenish cash and cash equivalents with part of the released funds, as long as short-term bill payable in the balance sheet structure is significant and amounts at 14,023.0 thousand hryvnas. As for the structure of the passive part of balance, it should be in favor of long-term borrowings, which need to be increased by 4122.3 thousand at the expense of short-term obligations, including reduction in accounts payables.

Increasing profitability and business activity to meet the industry average levels is expected to provide additional revenue of $ 39,499.2 thousand hryvnas. These changes will affect the dynamics of ZKF plc development in the following way.

Table 5

**Normalized values of group development indicators, ZKF plc**

| Group indicators of development diagnostics | The weight value | At the end of the reporting period | At the end of the planning period |
|---|---|---|---|
| Liquidity | 0,267 | 0,392 | 0,743 |
| Solvency | 0,040 | 1,000 | 0,965 |
| Business Activity | 0,145 | 0,502 | 0,748 |
| Profitability | 0,507 | 0,183 | 0,330 |
| Financial stability | 0,040 | 0,777 | 0,816 |
| The integral development indicator | – | 0,295 | 0,501 |

Thus, the integral index of development through the proposed changes improves from 0.295 to 0.501. The high level of liquidity and financial stability is provided by a high proportion of equity in the structure of liabilities of the company.

However, in terms of profitability levels, the enterprise is losing its competitive advantage. Thus, excessive focus on the financial stability only has a negative impact on further development opportunities.

The depth of the structural change that provides for the specified transformation and is calculated by the formula (7) was limited to the level of 0.01.

**IV. Conclusion**

Thus, we have designed a model to manage the company development using the latest ideas and findings in the sphere of financial management, which allowed to build a model that provides, in the first place, the opportunity to form a set of strategic financial goals, and secondly, the opportunity to identify areas of use and the amount of revenue required to implement strategic financial goals etc.

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**Шмиголь Н.М. Діагностика розвитку підприємства як компонент ефективної стратегії**

*У статті запропоновано сучасні методи діагностики розвитку підприємств, які засновані на пошуку кращої структури економічних ресурсів, джерел їх формування, за умови відповідного рівня рентабельності. Проведено аналіз наявних підходів до діагностики розвитку підприємства; моделей багатовимірних рейтингових оцінок, методів визначення інтегрального показника діагностики, що виявило низку істотних недоліків у чинних методах діагностики. Зауважено, що на сучасному етапі розвитку в роботі аналітиків в основному використовуються методи експертних оцінок. Залучення досвіду експертів важливо для виявлення більшості ризиків якісного аналізу, що також вимагає застосування математичних методів та інструментів. Запропоновано використання методу аналізу ієрархій Саати, враховуючи попередні умови, за яких аналітична ієрархія Саати не містить недоліків чинних методів завдяки більш сучасній процедурі парних порівнянь об’єктів і дає змогу отримувати важливі фактори, що охоплюють умови нормування. Методи, запропоновані в дослідженні, показали свою ефективність у реалізації на підприємстві ПАТ “ZKF”.*

***Ключові слова:*** *агрегована форма фінансової звітності, розвиток підприємств, парні порівняння, метод діагностики, метод аналізу ієрархій Саати.*

**Шмиголь Н.М. Диагностика развития предприятия как компонент эффективной стратегии**

*В статье предложены современные методы диагностики развития предприятий, которые основаны на поиске лучшей структуры экономических ресурсов, источников их формирования, при условии соответствующего уровня рентабельности. Проведен анализ существующих подходов к диагностике развития предприятия; моделей многомерных рейтинговых оценок, методов определения интегрального показателя диагностики. Этот анализ показал наличие существенных недостатков в существующих методах диагностики. Подчеркнуто, что на современном этапе развития в работе аналитиков в основном используются методы экспертных оценок. Обращение к опыту экспертов важно для обнаружения большинства рисков качественного анализа, что также требует использования математических методов и инструментов. Предложено использование метода анализа иерархий Саати, учитывая предварительные условия, согласно которым аналитическая иерархия Саати не имеет недостатков существующих методов ввиду более продвинутых процедур парных сравнений объектов и позволяет получать важные факторы, охватывающие условия нормирования. Методы, предложенные в исследовании, показали свою эффективность в реализации предприятия ПАТ “ZKF”.*

***Ключевые слова:*** *агрегированная форма финансовой отчетности, развитие предприятий, парные сравнения, метод диагностики, метод анализа иерархий Саати.*