

**DIAGNOSTICS OF THE ENTERPRISE'S FINANCIAL POSITION
BASED ON THE DYNAMICS STANDARD****Buhai V.Z., Horbunova A.V., Urusova Z.P.***Zaporizhzhia National University,
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diagnostics, working assets, accounting liquidity, dynamics standard, current liabilities, net working capital, solvability, enterprise's financial position.

Supporting of enterprise's proper financial position is one of the key conditions of business sustainability. Nowadays, both scholars and business experts often use traditional methodical approaches to analyse and assess the business' financial position based on mostly relative indicators. It has been found out that it is impossible to define the objective level of enterprise's financial position using financial statements' data at a certain date. That is the main assessment problem. It has been proved that financial coefficients used to determine business' financial position have some disadvantages as they are static (these indicators are calculated based on balance data, which characterize the property status of an enterprise at a certain date); there is a lack of information to forecast future financial inflows and payments; potential liabilities are excluded from coefficients calculations; future pay-outs that could affect future cash outflows are neglected. It has been illustrated that any managerial decision is reflected in the dynamics of economic indices. Therefore, it is expedient to use their dynamic measures – the growth rate as the characteristic of indices' ranking. The best dynamic financial position of an enterprise correlates with standard ranking of indices flow reflecting the business' financial position. Scientific approach to execution of the business' financial position diagnosis based on dynamics standard using standard growth rates compared to real adjustments has been proved. The proposed method's application as a practical matter will imply a higher objective diagnosis of enterprises' financial position aimed at sustaining proper business solvency.

**ДІАГНОСТИКА ФІНАНСОВОГО СТАНУ ПІДПРИЄМСТВА
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діагностика, оборотний капітал, ліквідність балансу, норматив динаміки, поточні зобов'язання, власний оборотний капітал, платоспроможність, фінансовий стан підприємства.

Однією з основних умов життєздатності підприємств є забезпечення фінансового стану на належному рівні. Зараз науковці й практики для аналізу і оцінювання фінансового стану підприємств часто застосовують традиційні методичні підходи, які ґрунтуються на використанні переважно відносних показників. Установлено, що основна проблема оцінювання фінансового стану підприємства полягає в тому, що практично не можливо встановити його об'єктивний рівень, використовуючи дані фінансової звітності на певну дату. Доведено, що фінансові коефіцієнти, які використовуються для діагностики фінансового стану підприємства, мають низку недоліків: статичність – вказані показники розраховуються на основі балансових даних, які характеризують майновий стан підприємства на конкретну дату; недостатня інформативність для прогнозування майбутніх грошових надходжень і виплат; наявність потенційних зобов'язань, які не враховуються при розрахунку коефіцієнтів; ігнорування перспективних виплат, здатних вплинути на відтік грошових коштів у майбутньому. Показано, що будь-яке управлінське рішення відображається в динаміці економічних показників, тому як ознаки упорядкованості показників доцільно використовувати міри динаміки – темпи росту. Кращому динамічному фінансовому стану підприємства відповідає нормативний порядок руху показників, що відображає фінансовий стан підприємства. Обґрунтовано науковий підхід щодо проведення діагностики фінансового стану підприємства на основі нормативу динаміки, використовуючи еталонні темпи зростання показників із подальшим порівнянням із фактичними змінами. Застосування запропонованого підходу на практиці сприятиме підвищенню об'єктивності діагностування рівня фінансового стану підприємств для підтримання платоспроможності на необхідному рівні.

Statement of the problem

Assessment and diagnosis of enterprises' financial position are important for internal and external users of business information. For business owners, enterprises' financial position shortfall means lower profitability, partial or full capital loss.

For creditors, debtor's low liquidity may indicate high probability of interest and payment delay of principal amounts. Current financial position of an enterprise affects its interrelationships with business partners. Thus, the level of financial position indicates business' financial opportunities and acts as an important factor of its sustainability.

Analysis of the present legal framework in Ukraine regarding financial and economic diagnosis of business activities shows that there is low agreement between the drafters of regulatory documents of methodologies, diagnostic criteria and identical item names in the context of regulatory documents. Mentioned above cause double standards of efficiency, differences in interpretation of financial indicators' standard values, accepting economically meaningless methodologies for calculation of indicators.

Analysis of recent research and publications

The scholars like M.Y. Averina [1], A.E. Kuzmin [2], O. G. Melnyk [3], V.V. Hotra, V.V. Ripych, A.V. Dyachok [4], L.O. Ruban, Y.S. Ovcharenko [5], I.A. Marynych, Ya.T. Pakholchak [6] and other studied the diagnosis of enterprises' financial position.

The scholars point out that diagnosis of financial position is tangled by the key problems:

- different definitions of the "enterprise's financial position" concept in academic literature by experts and in the regulatory and legal framework;
- the presence of numerous regulatory methodologies grounded on different approaches to ranking and order of financial indices determination. Moreover, the static approach is typically used which does not meet expectation;
- there are profound differences in standard values of financial indicators;
- the absence of one-for-all approach to determine business financial position in a certain economic field
- the presence of a big variety of indices in the research literature to analyse financial position, which cannot be used in business activity as they do not have any economic sense and others.

Objectives of the article

The purpose of the article is the development of the methodological approach to the assessment and diagnosis of business' financial position based on standard dynamics of building indices.

The main material of the research

At the present day all market players (creditors, investors, suppliers, consumers, owners, state authorities and more) constantly monitor position and performance of business partners. This is explained by the stakeholders' efforts to identify existing tendencies in enterprises' functioning in order to prevent a variety of

risks and provide dynamic response to potential problems.

It should be noted that the mechanism of financial diagnostics of modern enterprise's development and security should be built in such a way that even in the early stages, due to systematic verification of purposefully introduced functional components, it would be possible to identify and, as soon as possible, eliminate the negative impact of various types of destructive factors. We consider that the dynamic approach can be used for this purpose.

Management activities aimed at the diagnosis and improvement of financial position formation can be described by stating relevant target facilities. The facilities can be stated on the basis of two or more indices' ranking that characterize the effectiveness of previous management decisions made by enterprise's managers. The purpose is to maintain this order.

Direct structure and control of indices dynamics do not only identify tendencies of business environment development, but run this movement to reach the set target.

The best dynamic position of business financial indices corresponds to standard or etalon measure's order of their movement. This standard order is a starting point in the assessment of the analysed indices' real dynamics, i.e. the model of dynamics' formation and diagnosis of business' financial positions.

The process of the model building in the form of dynamic indices comprises the following stages: building time series; calculation of sustainability, variability and stability estimates; factor analysis of sustainability measurement [7].

Step 1. Building of indices' time series is done by the following way:

- 1.1. Argumentation of the index set;
- 1.2. Economic analysis of the indices' growth rates of ratios;
- 1.3. The standard order of indices pairs according to their growth rates;
- 1.4. Indices' ranking and formation of indicators' benefits graph as per growth rates.

Argumentation of the index set. The indices, which, according to scholar sources characterize the efficiency of the management process of business financial position formation (then the process), have been selected for the analysis, alike: non-current assets (NA); working assets (WA); inventories (I); current receivables (CR); monetary assets and short-term investments (MA); assets, total (A); equity capital (EC); long-term liabilities (LL); payables (P); sales revenue (SR); cost of goods sold (C); gross profit (GP); net working capital (NWC); net profit (NP).

Economic analysis of the indices' growth rates of ratios. Ratios of the above-named indices indicate key financial coefficients: working assets turnover (SR/WA); receivables turnover (SR/CR); payables turnover (C/EC); monetary assets turnover (SR/MA); receivables-payables ratio (CK/P); return on working assets (GP/CA); return on assets (NP/A); return on equity capital (NP/EC); net working capital to working assets cost ratio (NWC/WA);

working assets to non-current assets ratio (WA/NA); equity-to-assets ratio (EA/A).

The standard order of indices pairs according to their growth rates. The coefficients mentioned above set not only absolute ratios of the develop indices, but provide real time analysis, characterize positive and negative dynamics of business functioning. The idea of the coefficient growth as a positive trend is set by the standard indices' ratio, in which index in the numerator should grow faster than index in denominator.

The rising first coefficient is considered to be a favourable tendency. For example, dynamics model

illustrates that sales revenue growth rate must outstrip working capital growth rate (T): $T(SR) > T(WC)$.

We set standard indices' ratios based on the approach: $T(SR) > T(WA)$; $T(C) > T(I)$; $T(SR) > T(CR)$; $T(C) > T(P)$; $T(SR) > T(MA)$; $T(CR) > T(P)$; $T(GP) > T(WA)$; $T(NP) > T(A)$; $T(NP) > T(EC)$; $T(NWC) > T(WA)$; $T(WA) > T(NA)$; $T(EC) > T(A)$.

Indices' ranking and formation of indicators' benefits graph as per growth rates. Benefits matrix is the appropriate form to represent standard ratios. This matrix is a dynamic standard of business' financial position (Table 1)

Table1 – The dynamic standard of business' financial position

Indices	NA	WA	I	CR	MA	A	EC	LL	P	SR	C	GP	NWC	NP
NA	0	0	0	0	-1	0	-1	1	0	-1	0	-1	-1	-1
WA	0	0	0	0	-1	1	0	1	0	-1	0	-1	-1	-1
I	0	0	0	0	-1	0	0	0	0	-1	-1	-1	-1	-1
CR	0	0	0	0	0	1	0	1	1	-1	0	-1	0	-1
MA	1	1	1	0	0	1	1	1	0	0	0	0	1	0
A	0	-1	0	-1	-1	0	-1	1	-1	-1	0	-1	-1	-1
EC	1	0	0	0	-1	1	0	1	0	-1	0	-1	-1	-1
LL	-1	-1	0	-1	-1	-1	-1	0	-1	-1	0	-1	-1	-1
P	0	0	0	-1	-1	1	0	1	0	-1	0	-1	-1	-1
SR	1	1	1	1	0	1	1	1	1	0	1	-1	0	-1
C	0	0	1	0	0	0	0	0	0	-1	0	-1	0	-1
GP	1	1	1	1	0	1	1	1	1	1	1	0	0	0
NWC	1	1	1	0	-1	1	1	1	1	0	0	0	0	0
NP	1	1	1	1	0	1	1	1	1	1	1	0	0	0

Based on Table 1 we can build general indices' ranking, which is the dynamic model. For instance, net profit must outstrip most indices' growth rates, except monetary assets, gross profit and net working capital (neutral indices). Therefore, net profit has to be put in the beginning of standard series. Sales revenue must be put on the second place, according to standard growth rates (benefit in comparison with 8 indices), etc.

Standard indices' ranking as per growth rates can be illustrated as:

$$T(NP) > T(GP) > T(SR) > T(MA) > T(NWC) > T(CR) > T(EC) > T(WA) > T(P) > T(C) > T(NA) > T(A) > T(I) > T(LL). \tag{1}$$

Step 2. Calculation of sustainability, variability and stability estimates is made as follows:

- 2.1. Calculation of indices' growth rates for the studied period;
- 2.2. Indices' sorting according to actual growth rates;
- 2.3. Reversal calculation;
- 2.4. Calculation of sustainability measurement;

2.5. Calculation of variability estimates.

Motor Sich JSC was used as an illustrative example to calculate integral financial indices. Indices' growth rates are calculated as the index absolute value in the next period to the corresponding value in the previous period ratio.

According to the place in the model indices assign to a standard rank. The index with the highest actual growth rate in every quarter assigns to the first number (actual rank), the followings assigns to the second, etc.

Reversal calculation is based on identification of actual and standard rank closeness of indices' growth rates. The process sustainability is the overall measurement of the formation of the business' financial position. It characterizes the degree of standard compliance and does not depend on previous progress.

The indices are reversal if the index is compared to the indices, which have higher standard rank, and their actual ranks are lower than the first index rank.

Calculation of sustainability measurement of business' financial position's formation process is grounded on the number of reversals of actual ranking in dynamic series.

Calculation of variability estimates is made by calculating indices' reversals of two actual rankings in the second and third quarters.

Calculation of process variability characterizes the transition from one level of tasks' performance set in the dynamic model to another. It shows the correlation between incremental of sustainability measurement, caused by changes in the structure of indices flow, and the magnitude of structural changes themselves. This

estimate varies in the range from -1 (changes in the structure of indices flow reduce strength estimate) to $+1$ (the process of managing the formation of the business' financial position does not change, and all the ratios between the size and indices' structural dynamics remained the same); 0 estimate is obtained when the number of indices reversals, which ensure the improvement of enterprise performance, coincides with the number of reversals that deteriorate it or in case of the process' invariance.

Step 3. Factor analysis of sustainability measurement. Factor analysis is provided the following way:

3.1. Calculation of each index impact on increment (decline) of sustainability measurement;

3.2. Calculation of each index impact on valuation of financial sustainability measurement;

3.3. Problems identification by building the confusion matrix.

Measurement of the process' sustainability is a dynamic measurement, so it is possible to apply factorial decomposition of the increment and absolute value as well due to the application of ordinal scale. This approach allows to measure factors impact on sustainability measurement's deterioration in comparison with a standard one.

Problems' identification is made by building of the confusion matrix. Negative sign “-” is put to reflect lower actual rank than standard dynamics of the corresponding index, otherwise positive sign “+” should be put. Then the resulting confusion matrix is generated (Table 2).

Table 2 – Resulting confusion matrix of indices standard dynamics of Motor Sich JSC during 2nd and 3^d quarters of the reporting period

Indices	Standard rank	Indices													
		NP	GP	SR	MA	NWC	CR	EC	WA	P	C	NA	A	I	LL
NP	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GP	2	2		0	1	0	0	0	0	0	0	0	0	0	0
SR	3	2	0		1	0	0	0	0	0	1	0	0	0	0
MA	4	2	0	1	0	0	0	0	0	0	2	0	0	0	0
NWC	5	2	1	2	1	0	0	0	0	0	2	0	0	0	0
CR	6	2	2	2	1	0		1	0	0	2	0	0	0	0
EC	7	2	2	2	1	0	1		0	1	2	0	0	0	0
WA	8	2	2	2	1	0	1	1		2	2	0	0	0	0
P	9	2	2	2	1	1	1	1	1		2	0	1	0	0
C	10	2	2	2	1	1	1	1	1	2		1	1	0	0
NA	11	2	2	2	1	1	1	1	1	2	2		2	1	0
A	12	2	2	2	1	1	1	2	2	2	2	2		1	0
I	13	2	2	2	1	1	2	2	2	2	2	2	2		1
LL	14	2	2	2	1	2	2	2	2	2	2	2	2	2	1

Thus, at the studied enterprise during the 2nd and 3^d quarters of the reporting period growth rates of sales revenue were higher than gross profit. This does not correspond to these indices' standard ranking. Hence, figure 2 is written at the intersection of the set indices in the resulting confusion matrix (Table 2). In case actual growth rates of analysed indices correspond to a standard value, figure 0 is put in the table. This indicates the absence of indices' dynamic ranking confusion.

The confusion matrix is the instrument to reveal and measure problems that have an impact on the process of formation of the business' financial position. First, it is necessary to study the unimplemented standard ratios, which have been fulfilled during previous periods.

Deep-rooted problems revealed by confusion matrices built over several periods should be subject to the particular analysis. If, from period to period, the

corresponding indices of the confusion matrix remain with negative sign “-”, then this indicates that the analysed index shows an unfavourable tendency. Therefore, it is necessary to develop measures to change it.

Conclusions

Analysis based on the proposed model allows unveiling key factors and problems, sorting them according to impact's rank on factors aimed at the problem solving and pre-empting new ones. The model of formation of the enterprise's financial position based on the standard of the indices ranking's dynamic regulation can serve as an effective tool for business financial diagnostics allowing to make more efficient managerial decisions.

The prospect for further research may be the building of a similar model taking into account sectoral peculiarities of doing business.

References

1. Averina, M.Y. (2012). Analiz ta otsinka finansovoho stanu pidprijemstva: shliakhy pokrashchennia [Analysis and estimation of the financial state of enterprise: ways of improvement]. Retrieved from <http://www.com.ua/index.php/ru/conference/the-content-of-conferences/arcives-of-individual-conferences> [in Ukrainian].
2. Kuz'min, O.Je., & Mel'nyk, O.G. (2010). Normatyvno-kryterialne zabezpechennia diahnostryky finansovoho stanu pidprijemstva [Normatively-criterion providing of diagnostics of the financial state of enterprise]. *Finansy Ukrainy - Finance of Ukraine.*, vol 8, 105-114 [in Ukrainian].
3. Melnyk, O. G. (2010). Metodichni polozhennia z analizuvannia system diahnostryky diialnosti mashynobudivnykh pidprijemstv [Methodological provisions for the analysis of machinery enterprises' diagnostics systems]. *Ekonomichniy prostir - Economic scope.* Kyiv, №34, 196 – 209 [in Ukrainian].
4. Hotra, V.V., Ripych, V.V. & Dyachok, A.V. (2017). Diahnostryka finansovoho stanu pidprijemstva ta shliakhy yoho pokrashchennia [The financial position determination of the company and new analytical ways to improve it]. *Ekonomika ta suspilstvo - Economy and Society.* Mukachevo., Issue №8, 219 – 224 [in Ukrainian].
5. Ruban, L.O. & Ovcharenko, Y.S. (2017). Pobudova systemy diahnostryky finansovoho stanu promyslovoho pidprijemstva [Construction of diagnostics system of financial state of industrial enterprise]. *Molodyi vchenyi. Ekonomichni nauky - Young scientist. Economic sciences.* Kyiv, № 5 (45), 709 – 715 [in Ukrainian].
6. Marynych, I.A. & Pakholchak, Ya.T. (2012). Deiaki pidkhody do diahnostryky finansovoho stanu pidprijemstva v suchasni ekonomitsi [Some approaches to the diagnosis of a financial enterprise in the modern economy]. *Naukovyi visnyk NLTU Ukrainy - NLTU Ukraine Scientific Bulletin.* Lviv, Issue 22.3., 302 – 310 [in Ukrainian].
7. Pohostynska, N.N. & Pohostynskyi, Y.A. (1999). *Sistemnyj analiz finansovoj otchetnosti [System analysis of financial statements]*. SPb.: Publ.house Michailov V.A. [in Russian].