

**UDC 65:005.52****RISK ASSESSMENT IN SYSTEM OF SMALL BUSINESSES CRISIS MANAGEMENT**

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*Ugrimova I., Kraivska I., Gryshchenko A. Risk assessment in system of small businesses crisis management*

*The paper deals with anticrisis management of enterprises in the conditions of significant influence of external factors. Anticrisis management system, the core of which is risk assessment in economic entities activity is considered. The state of small business and negative influence of outer environment changes on enterprises financial outcomes have been examined. Existing techniques of anticrisis financial management diagnostics, which often do not take into account sectoral characteristics and the size of an enterprise have been evaluated. The author's technique of an integral index of financial risk calculation has been proposed. Formation of an informative indexes system and the mechanism of their implementation, the hierarchies of a financial ratios system based on their factors loading, objectively reflecting both sectoral specific features of businesses and peculiarities of their financial activity, necessary for quantitative risk assessment of small businesses have been used in the process of the technique development. Gradation of a financial risk level, its qualitative evaluation and assessment of crisis level using a certain scale have been proposed. An algorithm for integral assessment of financial risk calculating has been formed. Proposed technique for assessing enterprises financial risk level will allow to identify the priorities for financial management of small businesses and prevent intensification of crisis processes. It takes into account the dynamics of internal financial processes, allows for monitoring and forecasting the magnitude of risk, has objective nature; its relationship with analytical and management processes is of utmost importance and urgency. Proposed technique is a key instrument for financial risk operational monitoring of a financial risk level and diagnosing of the basic problem situations using Excel program.*

*Угрімова І.В., Крайівська І. А., Грищенко А.О. Оцінка ризику в системі антикризового управління підприємствами малого бізнесу*

*У статті розглянуто питання антикризового управління підприємствами в умовах значного впливу зовнішніх факторів. Розглядається система антикризового управління, стержнем якої є оцінка ризику в діяльності суб'єктів господарювання. Розглянуто стан малого бізнесу і вплив змін зовнішнього середовища, що негативно відображається на формуванні фінансових результатів підприємств. Оцінено діючі методики діагностики антикризового фінансового управління, які часто не враховують галузеві особливості і розмір підприємства. Запропоновано авторську методику інтегрального показника фінансового ризику. В розробці методики використовувалось формування системи інформативних ознак та механізм їх реалізації, ієрархії системи фінансових коефіцієнтів з врахуванням їх факторних навантажень, яка об'єктивно відображає як галузеву специфіку підприємств, так і особливості їх фінансової діяльності та необхідна для кількісної оцінки ризику підприємств малого бізнесу. Показано градацію рівня фінансового ризику і його якісну оцінку та оцінку рівня кризовості за певною шкалою. Складено алгоритм розрахунку інтегральної оцінки фінансового ризику. Пропонована методика оцінки рівня фінансового ризику підприємств дозволить виявити пріоритети управління фінансами підприємств малого бізнесу і запобігти активізації кризових процесів. Вона враховує динаміку розвитку внутрішніх фінансових процесів, дозволяє проводити моніторинг і прогнозування величину ризику, має об'єктивний характер; її взаємозв'язок з аналітичними і управлінськими процесами набуває виняткового значення і актуальності. Пропонована методика є ключовим інструментом оперативного моніторингу рівня фінансового ризику та діагностики основних проблемних ситуацій з використанням програми Excel.*

*Угрімова І.В., Крайівська І.А., Грищенко А. А. Оценка рисков в системе антикризисного управления предприятиями малого бизнеса*

*В статье рассмотрены вопросы антикризисного управления предприятиями в условиях значительного влияния внешних факторов. Рассматривается система антикризисного управления, стержнем которой является*

*оценка риска в деятельности субъектов хозяйствования. Рассмотрено состояние малого бизнеса и влияние изменений внешней среды, негативно влияющей на формирование финансовых результатов предприятий. Оценены действующие методики диагностики антикризисного финансового управления, часто не учитывающие отраслевые особенности и размер предприятия. Предложена авторская методика интегрального показателя финансового риска. В разработке методики использовалось формирование системы информативных признаков и механизм их реализации, иерархии системы финансовых коэффициентов с учетом их факторных нагрузок, объективно отражающей как отраслевую специфику предприятий, так и особенности их финансовой деятельности, необходимой для количественной оценки риска предприятий малого бизнеса. Показано градацию уровня финансового риска, его качественной оценки и оценки уровня кризисности по определенной шкале. Составлен алгоритм расчета интегральной оценки финансового риска. Предлагаемая методика оценки уровня финансового риска предприятий позволит выявить приоритеты управления финансами предприятий малого бизнеса и предотвратить активизацию кризисных процессов. Она учитывает динамику развития внутренних финансовых процессов, позволяет проводить мониторинг и прогнозирование величины риска, имеет объективный характер; ее взаимосвязь с аналитическими и управленческими процессами приобретает исключительное значение и актуальность. Предлагаемая методика является ключевым инструментом оперативного мониторинга уровня финансового риска и диагностики основных проблемных ситуаций с использованием программы Excel.*

**Introduction.** In conditions of economic, social and political volatility, which are typical for Ukraine now, business managers, regardless of business entities scale, have to adapt, take risks actively, make rapid operational and financial decisions based on principles of crisis management and allowing to identify negative tendencies in problematic crisis situations, strengthen positions of current activity and contribute to the development of the enterprise in future. From this perspective, scientific and methodic approaches to diagnostics with assessment of financial risks and taking into account the scale and sectoral specific features of the enterprise as an instrument of anticrisis management are of theoretical and practical interest and requires improvent.

**Background of study.** While researching and developing of enterprise crisis management system a complex of issues (including methodical issues), connected with crisis management and economic entities' risks assessment, was determined. General conceptual statements concerning the authors' approaches to risks analysis and assessment methods are provided in scientific papers of native and foreign scientists [1-5], but they have been mainly observed excluding sectoral peculiarities of enterprises; a difference of theoretical, methodical and practical approaches to risks assessment application in financial anticrisis management takes place; existing techniques of risks assessment are generally adapted to management of large-scale enterprises and don't take into account specific features of small-scale enterprises, such as mobility, orientation on current liabilities financing and others.

**The purpose of the paper.** Taking into account that small business is more risky than large-scale business, the problem of theoretical and practical argumentation of anticrisis management system using, which includes development of scientific and methodical risk assessment instruments and identifying the priorities concerning taking a complex of measures on preventing crisis situations development, acquires urgency in conditions of social and economic instability. To reach the set goal the state of the small business in Ukraine has been researched and recommendations for development of methods of integral assessment of financial risks for small business and appropriate correction of their activities have been argued and proposed.

**Summary of results.** Oficial statistic data, despite of its incompleteness, imperfection and insufficient comparability shows a low effect of small business on general financial and economic outcomes of the country, which doesn't correspond the role and importance of small business. Since the beginning of 2014 small business viability decrease has been pointed out which is connected with limited (in comparison with large-scale enterprises) access to financial and monetary markets, availability of problems with solvency, money investments for their development and others, as a result of temporary occupation of Crimea, Luhansk and Donetsk regions and conducting military actions on the territory of Donbas, unconsiderable state policy and development of economic crisis in the country, decrease of small business support with appropriate intensification of economic problems and social strain.

However, as it is shown in the table 1, in 2014-2015 – the period of the economic crisis development, the part of enterprises with unprofitable outcomes was the smallest in small business, that affirm its flexibility and ability to adapt rapidly to external challenges:

Creation of the anticrisis management system for small business entities gets complicated as a result of limited staff of small enterprise, where the owner who, as a rule, is the manager, considers, that he has a sufficient comprehension on risks in his business and is usually oriented only on the risks connected with the operation activity based on guaranteed sales and does not give a proper assessment of other risks, which requires using a simple but the most efficient assessment for the diagnostics.

Table 1 – Part of enterprises, which gained losses (financial outcomes before taxation), %

Enterprises	2010	2011	2012	2013	2014	2015
All enterprises	41	34,9	35,5	34,1	33,7	26,3
large-scale enterprises	31,7	30,8	30	31,4	48,2	44,3
middle enterprises	36,6	33,7	33,8	35	37,4	28,9
small enterprises	41,4	35	35,6	34	33,5	26,1

Table is formed based on [7]

Nowadays the methods of coefficient analysis of financial state and bankruptcy diagnostics are most frequently used in the subsystem of financial management crisis diagnostics [7-11]. However, the existing methods do not often take into consideration the sectoral peculiarities and the enterprise scale. Some of them require using of special computer programs; the level of set up normative ratios is problematic, multicollinearity criteria is ignored; assessment of an integral index, the system of indexes selection and estimation of their influence on the general analysis results is proved insufficiently, which leads to different assessment results of the financial state of the enterprise depending on the selected set of indexes. The method of cash flows analysis can give more transparent information on researched enterprises' financial state, but it is not still fully developed and requires a specific approach to small business, based on the absence of cash flows reports.

Despite of essential differences on the list, importance and classification of financial indexes in different normative and scientific sources [7-11], it is supposed, that assessment of financial position should take into account such indexes as: financial stability, liquidity, profitability and turnover indexes. As financial position of enterprise reflects capital state in the process of its circulation, ability of enterprise for self-development for a constant period of time and potential financial ability for providing a certain level of current activity financing, ability to pay off liabilities before the state and partners, it is the reflection of financial risks displaying. Reinterpretation of existing approaches for financial position assessment in point of their activity financial risks level, presumes the development of approach, which is more acceptable to the requests of economic practice, allows to determine available gap between possible and factual small business economic growth path and to observe measures directed on maximal realization of their financial potential (which in the most general form is considered to be an economic system real perspectives totality).

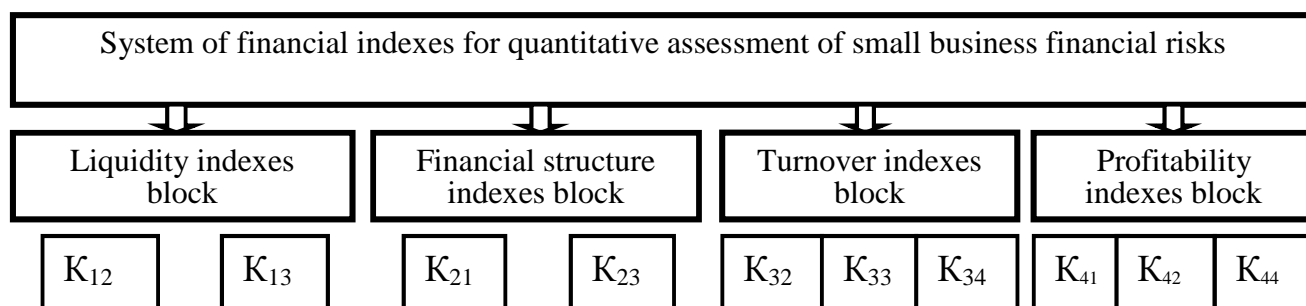
Forming of informative features system is the first step in development of financial risk assessment index, which includes selection of financial ratios based on frequency of their mentioning in normative and scientific sources and analysis of financial reports of Kharkiv city retail enterprises (which take the highest part in small business of the city) by algorithm given in Table 2.

Assessment of homogeneity and multicollinearity enterprises' financial indexes features gave the possibility to choose and form the hierarchy of small business financial indexes system taking into account both factorial loading of indexes (the second figure in ratio index) and blocks (the first figure in ratio index), which is given on Figure 1, for determining the complex assessment of index importance in view of every block.

It is considered, that such method of assessment objectively reflects peculiarities of small business retail enterprises, which mainly focus attention on indexes of profitability and turnover for maintenance of proper self-financing level (set of indexes determined in approach can vary depending on size and branch of enterprises).

Table 2 –Mechanism of informative features realization [Authoring]

Stages	Essence
Gathering of accounting and analytical information and calculation of financial indexes	System of indexes includes indicators of financial position, which are calculated on base of financial reports by unitary techniques, are related (because absolute indicators depend mainly on enterprise size, but not on the effectiveness of its activity, directed on conservation and development of financial potential), have identical direction, give the possibility of their comparison in time, are present in majority of methodical treatments and reflect both resources possibility and activity outcomes
Assessment of informational content features of indexes system	Assessment of indexes features multicollinearity (with the use of Microsoft Excel: data analysis – correlation), taking into account their features importance and links tightness.
Forming of chosen financial indexes hierarchy by blocks (capital structure, liquidity, profitability, turnover)	Chosen indexes are used for assessment of financial potential and evaluation of risks level in the process of economic entities dynamic development
Determination of sample indexes parameters, chosen for quantitative assessment of financial risk	Any indexes, which can be comparable with factual indicators in dynamics and level of which can ensure optimal level of financial position can be chosen as sample indicators (for example, average, maximal, purpose-oriented, recommended by branch researches of scientists or normative and instructional documents or determined by experts).
Development of scale and areas of financial risk	While scale development scientists opinions concerning risks areas division on unriskey area, area of allowable risk, areas of critical and catastrophic risk, which are met in economic literature more frequently, were observed.



Conventional meanings:  $K_{12}$  – Quick ratio,  $K_{13}$  – Current ratio,  $K_{21}$  – Equity ratio,  $K_{23}$  – Flexibility ratio,  $K_{32}$  – Inventory turnover,  $K_{33}$  – Receivables turnover,  $K_{34}$  – Accounts payable turnover,  $K_{41}$  – Profit margin on sales,  $K_{42}$  – Cash flow to debt ratio,  $K_{44}$  – Net profit margin.

Fig. 1. Formed system of financial indexes for quantitative assessment of small business financial risks (retail trade) [Authoring]

Formation of sample liquidity and financial stability indexes (which have normative meanings) was observed systematically based on branch peculiarities, aggressive influence of external environment, reached factual levels of financial indexes, intervals of normative and average indicators included into blocks. So far as indexes of profitability and turnover blocks have no normative limit meanings, year

average turnover meanings were considered to be the same for turnover block, sample meanings for profitability block were set at minimal level equalled to "0", sufficient level of cash flows was considered the level enough for paying credit interests (inflation rate, NBU crediting rate and profit taxation rate have been taken into account).

Economic and mathematical model development was carried out, based on received initial informative features and simplification of financial indexes system description by selection of subsystems with determining of their hierarchy, for assessment of financial risk level by establishing dependence between initial parameters, putting final functions, goals and criteria, indexing model determining for financial risk assessment, which is the main stage in approach forming for risk evaluation in anticrisis management of economic entities.

To solve the problem of quantitative assessment of enterprise financial risks, including small business, integral function for multimeasurable dynamic objects potential assessment, proposed by Russian scientist M. Shalanov [12], has been used. Appropriateness of its use comes from the nature of small business, that changes dynamically, either its potential does, which means that it has a possibility to achieve optimal financial position in conditions of using possibilities for capital mobilization in size, enough for conducting effective investment activity, availability of owner's equity, which specify completing the terms of financial stability, liquidity, profitability of invested capital, sufficient turnover level and effective management system. Thus, financial potential is a quantitative measure of enterprise development level, assessed by complex of indexes, which describe it, and financial risk from this perspective is considered to be the possibility not to achieve purpose-oriented (planned, normative) potential level.

Algorithm of integral index calculation for quantitative and qualitative financial risk assessment and its further qualitative valuation with determination of crisis level by graduated scale is generalized on Figure 2. Investigated object is described by system of indexes  $x_1, x_2, x_3, \dots, x_n$  in dynamic for the period  $t_1, t_2, \dots, t_N$ , represented by matrix «time – indication». Elements  $x_{ij}$  characterize the meaning of  $j$  indicator at the moment of  $t_i$ , united into blocks ( $y_k$ ), which fragmentary determine the level of financial potential.

Range of financial stability potential level variation is in the following measures: 0 – 1 (financial risk also changes within these measures). Integrated risk assessment is calculated by all complex of chosen indexes, which reflects some fragment (block) of financial position and shows its proximity to the sample (purpose-oriented).

Two stages of integral index calculation are distinguished: complex assessment within blocks is performed on the first stage, the second one includes financial potential (potential of financial stability) and general level of enterprise financial risk assessment. Its quantitative rate, according to the scale given on Figure 2, allows to realize qualitative risk assessment and to evaluate the level of crisis. Analysis of indexes importance in potential function of financial potential integral assessment, and also in potential functions of appropriate block of indexes system (Figure 1) with their further ranking either by blocks or inside the blocks, determines the priorities in taking decisions concerning their activity risks minimization.



subjective judgements, which are possible only while samples establishment), its correlation with analytical and management processes is of great importance and actuality. Taking into account insufficient level of management personnel of small business, this technique application on base of Exe1, is a key instrument of financial risk level operational monitoring and diagnostics of main problem situations, which will increase informativity and validity in finding measures of anticrisis management concerning taking economic decisions on financing activity: changes in terms and conditions of credits and finding better and cheaper financing sources, finding chances for saving or increasing commercial credits etc.; putting emphasis on current assets management to help enterprise keeping solvency and profitability.

A lot of opinions concerning crisis management problem, including the author's one, are opened to questions, a great amount of aspects need to be solved and scientifically provided, but problems of small business anticrisis financial management can be successfully solved only within such discussions.

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**Ключові слова:** малий бізнес, антикризове управління, фінансові коефіцієнти, оцінка ризику, інтегральний показник, пріоритети управління.

**Ключевые слова:** малый бизнес, антикризисное управление, финансовые коэффициенты, оценка риска, интегральный показатель, приоритеты управления.

**Keywords:** small business, crisis management, financial ratios, risk assessment, integral index, management priorities.