

*Proceedings of the 9th International Conference "Reliability and Statistics in Transportation and Communication" (RelStat'09), 21–24 October 2009, Riga, Latvia, p. 45-54. ISBN 978-9984-818-21-4
Transport and Telecommunication Institute, Lomonosova 1, LV-1019, Riga, Latvia*

THE GENERAL CONCLUSION OF DIAGNOSING MODELS OF SHIPPING COMPANIES FINANCIAL STATE FOR THEIR FUNCTIONING RELIABILITY

Rostislav Kopitov¹, Natalja Dubko²

*Transport and Telecommunication Institute
Lomonosova Str. 1, Riga, LV-1019, Latvia*

¹Ph.: +371 67100585. E-mail: rkopitov@tsi.lv

²Ph.: +371 29164280. E-mail: dunata@inbox.lv

Steady development of business is impossible without delivery of the authentic diagnoses related to a specific financial condition during the specific period of time. The degree of reliability depends on the system of diagnostics at the enterprise. The basic lack of traditional systems of diagnostics is related to the use of the accounting reporting as the initial information. Thus the received end results of financial activity of the enterprise are inexact due to the brought errors and the accepted assumptions.

The purpose of this work is a development of the new approach of diagnostics of a financial condition in short-term outlook. At the preliminary stage a classification of models of diagnostics has been made. In the result the requirements for the offered approach have been defined. Firstly, it is necessary to consider specificity of the Latvian transport field. Secondly, it is necessary to provide methodical unity of estimated parameters. Thirdly, the approach should be based on the reconstructed business information that should affect quality of given out diagnoses positively. The complex of structural indicators is developed for performance of the requirements. Such complex considers the revealed factors influencing key fields of business.

The estimation of key fields of business on the basis of the balanced systems of parameters allows defining its financial condition. Set of diagnoses on all fields allows evaluating a financial condition of the enterprise. Tracking of the given out parameters in time enables to measure stability of the enterprise. The developed criteria of stability were a basis for an estimation of reliability of the business connected with a level of authentic diagnoses. The estimation of reliability is made on the basis of an offered technique of decision-making.

Approbation of a technique within the limits of the developed approach of diagnostics is carried out taking as an example a Latvian transport enterprise, in which transformation of the registration information in business has been made. The received results testify the efficiency of the approach.

Keywords: *classification, requirements, key fields, stability, technique of decision-making*

1. Statement of a Problem of Management by Steady Development of an Enterprise

Now a number of prominent features are evident in the activity of transport enterprises. Managers of the enterprises should make administrative decisions in conditions of uncertainty at the limited information, material, financial and time resources. Furthermore, almost all decisions are accepted in view of the environment requirements external to the enterprise. Usually, such requirements can not be always executed in relation to inefficient use of resources available at the disposal of the enterprise. Besides, the environment quite often influences essentially prospects of a survival of the enterprise. Therefore, modern enterprises are in complex conditions which are connected with the serious consequences, capable to cause, for example, loss of solvency or bankruptcy. In such cases the enterprise is in a crisis condition at which it is not capable to provide the effective activity. Any threat of crisis should be revealed, correctly estimated and correctly eliminated in time. In other words, in order to evade a crisis condition it is necessary to develop a number of the special measures connected with operation of business in special conditions. Such actions characterize a control system of steady functioning of the enterprise.

The given system includes the following system components: planning, organization, control and motivation. The processes connected with performance of these stages, consider sequence of actions from the moment of the definition of the basic purposes of the enterprise up to the moment of their achievement. During the performance of the basic stages of system the prompt escape of the enterprise from a crisis condition is provided. Thus it is supposed to support strong position of the enterprise in the market and stably conduction of financial activity of the enterprise at any economic, political and social changes. Hence the primary goal of business connected with increase of reliability of business is solved. The reliability of business is defined by a level at which the system of decision-making introduced in the

enterprise satisfies long-term and short-term objectives and is suitable at operation. [1]. It is necessary to notice, that it happens with the means of overcoming of various kinds of risk related to uncertainty of an environment. Presence of uncertainty strongly complicates acceptance of effective administrative decisions and their inefficiency can lead to bankruptcy. Therefore the modern management focused on reliability, includes various techniques of acceptance of administrative decisions. This kind of management demands constant updating and adaptation to concrete conditions. As soon as a management of an enterprise lags behind real needs of the market, it ceases to meet the requirements of time that, in the end of the day, rather dramatically affects the activity of an enterprise.

Multi-variant approach of decisions and courses of management, flexibility, eccentricity and unique character of administrative decisions demand preparation of a special professional category in an enterprise – managers of anti-recessionary management. Such experts make an emphasis on unusual decisions and on ability quickly and correctly estimate a financial situation and search of the unique approach. And the given approach, as a rule, should be optimum in concrete conditions. Therefore the managers related to problems of anti-recessionary management, should constantly search for new opportunities on decoding complex situations and making effective decisions. At this point they should be guided by the following rule: in order to manage enterprise activity successfully it is necessary to react constantly to changes in the general economic, legal, financial and political climate. With this purpose problems of anti-recessionary management demand a deep analysis in practice. It also allows managers of enterprises to estimate and predict complex situations correctly, to choose the best ways of the decision on their management.

2. Generalization of Tools for an Estimation of a Financial Condition

At the moment an aspect of business dealing consists in necessity of consideration of the phenomena and the processes from the future viewpoint. Thus elements of the past and the present are projected on elements of the future.

Real conditions of functioning of transport enterprise cause necessity of carrying out of the objective and all-round financial analysis of economic operations, which allows to define elements of its activity, defects in its work and the reasons of their occurrence, and also, on the basis of the received results, to develop concrete recommendations on optimisation of activity. The analysis of a financial condition is the mechanism of management of the internal environment of an enterprise.

The express analysis allows the enterprises to find out the "painful places". However, in order to understand the reasons of their occurrence, it is necessary to use the expanded set of financial data. On the basis of the analysis of the expanded data set it is possible to prepare recommendations on decrease in the cost price of products and need for a turnover capital, improvement of parameters of fund feedbacks and solvencies of an enterprise, etc. Its results also can be used in production management and implementation of products and services, in development of business-plans for investment projects. The need for an estimation of a financial condition of an enterprise can arise at the enterprise while analysing the expediency of new emission of shares or at the creditor while estimating the risks of project financing in the enterprise.

Diagnostics of the enterprises represents the analysis of not only their current financial condition, but also its change in time, i. e. revealing of relevant tendencies.

The most widespread methods of the analysis of a financial condition of an enterprise are the following:

1. Method of comparison of parameters, in other words, their comparisons to parameters of the previous period with the purpose of revealing a difference or comparison of parameters of the accounting period to scheduled values (norms, specifications, limits). The technique of carrying out of the method of comparison of absolute parameters is very simple and is usually represents data presentation in the analytical table

2. A method of creation of vertical and horizontal balance. The vertical analysis influence of inflationary processes smoothens, which can deform absolute parameters of the reporting, and allows making a comparison with other enterprises, whose accounting data essentially differ from parameters of the analyzed enterprise. For creation of vertical balance it is necessary to accept the result of a passive (or an active) balance both at the beginning, and at the end of the accounting period as a base (as 100 %) and to calculate a percentage share of each balance article to the general result. The presented table evidently reflects advantages of the vertical analysis - comparability of relative parameters of the enterprise, despite of a possible difference of a price level at the beginning and at the end of the accounting period. The horizontal analysis allows not only to reveal speed of change of each parameter but also to predict its

change in the future on the basis of the received data. In order to create the horizontal analysis it is necessary to accept data under each balance article at the beginning of the accounting period as 100 percent and to calculate a gain (decrease) in each parameter in comparison with base. Value and correctness of conclusions of the horizontal analysis essentially depend on influence of inflation, but obvious dynamics of each parameter allows to see existing tendencies of their changes.

3. A method of the coefficient analysis of accounting reporting. In the financial analysis the formalized the widely used criteria are the factors and the parameters counted under certain formulas. The received values are analysed both by absolute size, and by dynamics (i.e. the tendencies of their growth or decrease are defined), making their comparison with the normative factors (standards) given for the last periods, average parameters on field or group of the similar enterprises. The formality of such approach is expressed in the fact that the certain value of the calculated parameter or factor testifies to quite concrete state of affairs at the enterprise.

The most often used in the financial analysis of the reporting are the parameters and factors which characterize negative tendencies at the enterprise and they are given also the greatest attention.

Special interest among numerous developments in sphere of the analysis and the forecast of activity of the enterprises arouse methods of calculation of a degree of remoteness from firm bankruptcy and degrees of their reliability.

It is necessary to accent two important approaches:

- The First is based on financial data and all systems of forecasting the bankruptcies based on this approach, without dependence from an accessory of the developer to this or that nationality, in other words to this or that "market", include certain (from two up to seven) quantity of key, from the point of view of the author, parameters describing a financial condition of an enterprise. On the basis of the given parameters in the majority of the offered techniques the complex parameter of probability of bankruptcy is calculated with indicators' weight factors. The methodology of the given approach is based on quantity indicators, on what can be calculated, and the financial philosophy – a position of a management, conformity of its actions to financial opportunities of a firm – is analysed only partially.

- The Second starts with data on bankrupt companies and is based on comparison of attributes of the studied company with corresponding data of already gone bankrupt companies. The majority of lists of the gone bankrupt companies is not ordered with parameters on a degree of importance though many of them contain the description by dozens of parameters. A method of a mark estimation (A-count Argenti) – an attempt of indemnification of these lacks.

The following summaries can be made of the research of known models of a prediction of bankruptcy of enterprises.

The advantages are undoubtedly the wide recognition of methods on all continents and continuation of wide use in the financial analysis. Complex models allow predicting bankruptcy within five years with accuracy 70 %, one year prior to bankruptcy accuracy of some of them reaches 98 %.

The disadvantages of use of known methods for diagnostics of the enterprises in Latvia can be the insufficient accuracy of Two-factorial model which does not provide an all-round estimation of a financial condition of an enterprise with possible significant deviations of the forecast from a reality; statistical heterogeneity of sample of events of statistics, which was used by Altman; calculation of value of weight factors and threshold values of complex and private parameters in the offered models on the basis of American analytical given in 60s-80s; absence of stability Z – Altman's methods to variations in initial data – weight in Z – convolution and a threshold interval ($Z1$, $Z2$) strongly differ from country to country and year to year within the limits of the same countries; and also that Altman's Model assumes presence of an stock exchange, actively operating, secondary commodity market of shares on which their price is defined; In Latvia, and also in Russia in which territory attempts of application of the given model were made, the secondary commodity market of shares is not developed, therefore the fourth parameter « Z count » of Altman becomes a nonsense. In our opinion absence of data about share price of an enterprise is not an obstacle, since modern estimated tools do not arouse complexities of calculation of market cost.

In Latvian transport field numerous attempts of application of import models of forecasting of bankruptcy have low productivity. We have carried out a research of three insolvent transport enterprises. The received estimations showed their steady development that testifies the incorrectness of such techniques.

In this relation development of the techniques for an estimation of an inconsistency adapted for the Latvian transport market and bankruptcy of enterprises is put forward.

The resolution of the task demands a development of the requirements to similar techniques.

3. The Requirements to Methodical Maintenance for an Estimation of Anti-Recessionary Financial Condition of Latvian Transport Enterprises

Specificity of allocation of transport enterprises in special group is defined by a number of features.

Firstly, in multifactor models the findings of market cost are required. For transport enterprises it is required to consider the level of non-material actives, calculation of the rate of discount, amortization, image, etc. It is caused by absence of cost history. For obtaining of the objective business information it is necessary to use special methods of transformations, definition of base of reduction.

Secondly, average market specifications and admissions for estimated factors are absent.

Thirdly, unavailability of management to use existing tools has been observed.

The final structure of system depends on the one who is the director of the requirements to a system of estimation of a steady finance administration. In the general view, a system, which should provide the set requirements, can be presented in the form of an integrated scheme (see Fig. 1).

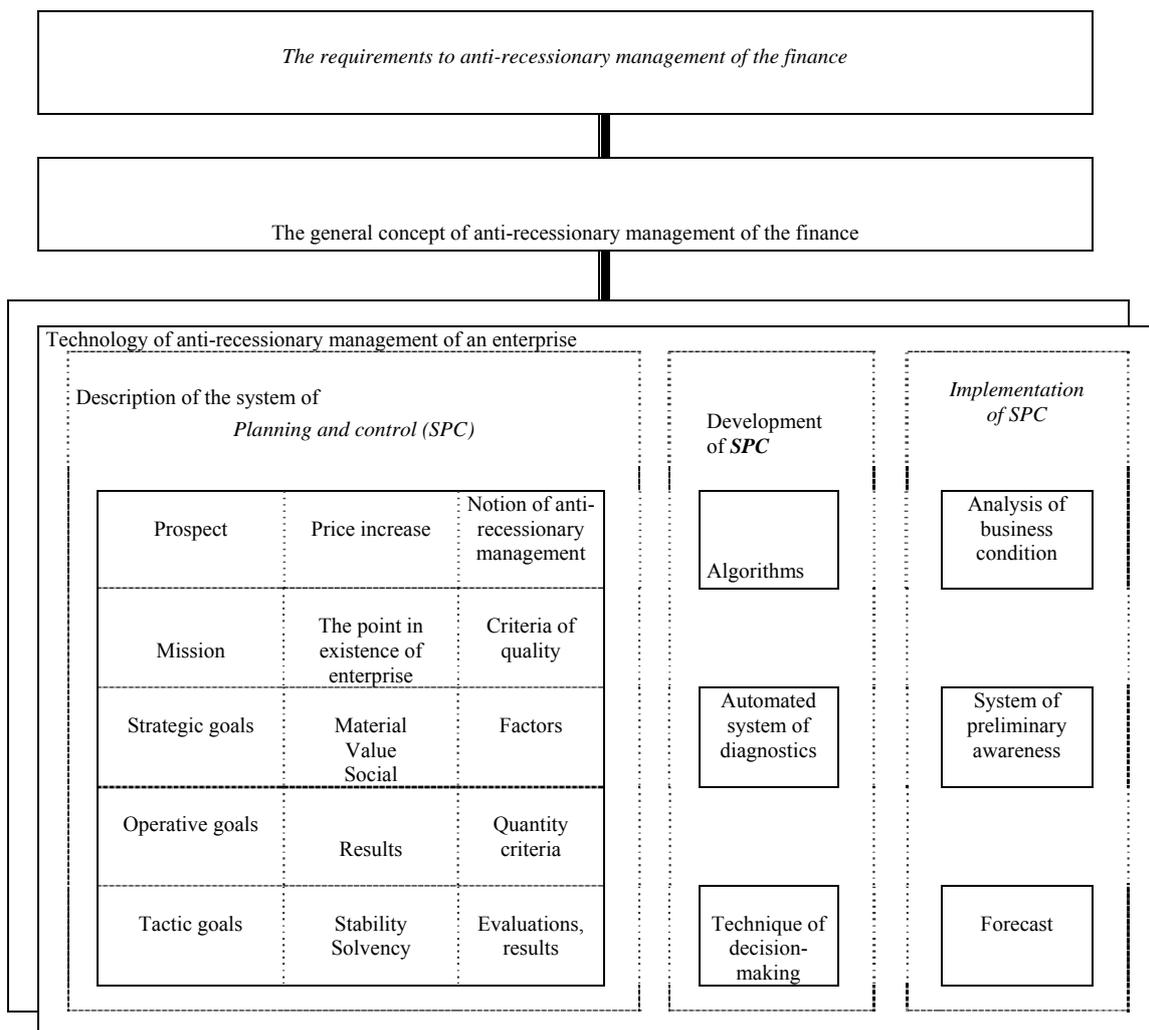


Fig.1. The integrated scheme of system of stable finance administration

After the core demands and parameters are made, which will characterize the set level of stability of a studied direction of business; it is necessary to describe process of creation of effective methods of planning and control, to carry out development of such methods and to introduce procedure of their use. Besides it is necessary to establish the amount of necessary financings, and also to prepare the qualified professionals who will provide the set level of stability at an enterprise. It is reached during development of special technological means.

4. Diagnostics of an Anti-Recessionary Finance Administration

Diagnostics of bankruptcy represents a system of the target financial analysis directed to revealing of parameters of crisis development of an enterprise, which cause threat of its bankruptcy during the forthcoming period.

Thus the development of a class of possible defects which can lead to bankruptcy is modelled, and also it is required to develop the formalized algorithms of diagnosing. The given algorithms should provide detection of defects from the set class with demanded completeness (a degree of ordering of defects); whereas detection of defects should be made with the preliminary set depth (quantity of levels of detailed elaboration). Depending on depth of the executed researches, corresponding to objects and methods of preliminary detection, two basic diagnostics of bankruptcy are distinguished (see Fig. 2):

- The express diagnostics;
- Fundamental diagnostics.

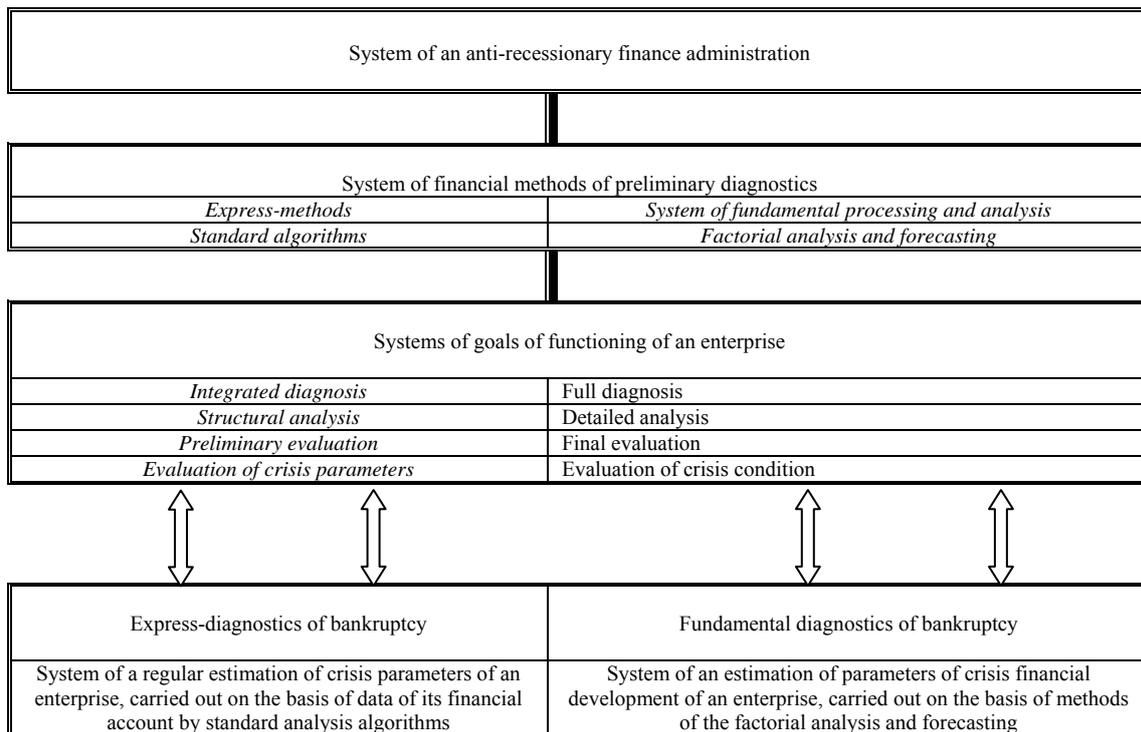


Fig. 2. Classification of systems of diagnostics of bankruptcy by the purposes and methods of preliminary detection

The basis of the above classification is the degree of research of algorithms of functional diagnostics of bankruptcy which will be defined by operating conditions of the means that implement these algorithms. Means of functional diagnostics of bankruptcy, usually, are the inbuilt means. The given means should develop corresponding recommendations depending on the received values of the established parameters or characteristics of the estimated financial condition of an enterprise. It is necessary to notice, that in system of diagnostics of bankruptcy of any enterprise corresponding values of parameters are analysed firstly (by means of the express-diagnostics), and then financial conditions (means of fundamental diagnostics) are analysed.

For transport enterprises characteristic actions have been allocated on the basis of which it is possible to develop system of express-diagnostics of bankruptcy. For this purpose it is necessary to make some important remarks.

- 1) The crisis field is the minimal object of the strategic planning, described by a number of crisis attributes for which it is possible to develop a business-plan. Crisis fields can be united in larger formations: segments of business.
- 2) All aspects of financial activity of an enterprise can be sources of threat of bankruptcy.
- 3) Each crisis field is characterized by the volumetric indicator (absolute value of a key parameter).

- 4) Each crisis field is characterized by a set of structural indicators (a number of the interconnected factors).
- 5) Various demands are made to each crisis field.
- 6) There are key and special crisis fields. Key fields bring the essential contribution to mission of an enterprise; special fields are studied from a point of view of success achievement of key fields.

In Table 1 the basic kinds of crisis fields are specified.

Table 1. Types of crisis fields

1.	Crisis key fields	Clear cash flow of an enterprise
		Market value of an enterprise
2.	Crisis special fields	Structure of capital of an enterprise
		Structure of financial liabilities of an enterprise by promptness of payment
		Structure of actives of an enterprise
		Structure of running costs of an enterprise
		Level of concentration of financial operations in zones of high risk.

During performance of the given actions it is necessary to calculate a number of parameters. The given parameters are structural indicators. Between structural and volumetric indicators, there is certain dependence (See Table 2).

Table 2. Structural indicators of an estimation of bankruptcy threat for an enterprise

Volume indicator	Structural indicator
1. The sum of clear cash flow of an enterprise in total	1. Coefficient of sufficiency of a clear cash flow
2. The sum of clear cash flow of an enterprise by enterprise operational activity	2. Coefficient of liquidity of a cash flow
	3. Effectiveness ratio of a cash flow
	4. Coefficient of reinvestment of clear cash flow
3. The sum of clear actives of an enterprise by market value	5. Market value of an enterprise
4. <i>The sum of own capital</i>	6. Coefficient of autonomy
5. The sum of loaned capital	7. Coefficient of financial leverage
	8. Coefficient of long-term financial independence
6. The sum of long-term financial liabilities	9. Coefficient of a balance of long-term and short-term financial obligations
7. The sum of short-term financial liabilities	10. Coefficient of a balance of the involved financial and commodity credit
8. The sum of financial loan	11. Coefficient of urgent financial obligations by their total sum
9. <i>The sum of commodity loan</i>	12. A cycle time of creditor debts
10. The sum of inner creditor debts	
11. <i>The sum off turnover actives</i>	13. Factor of a manoeuvrability of actives
12. <i>The sum of turnover actives</i>	14. Factor of security of high liquidity actives
13. <i>The sum debtor debts</i>	15. Factor of security of ready means of payment
14. <i>The sum of monetary actives</i>	16. Factor of current solvency
	17. Factor of absolute solvency
	18. Factor of a balance of debtor and creditor debts
	19. A cycle time of debtor debts
	20. Duration of an operational cycle
15. <i>A total sum of current expenses</i>	21. A level of current expenses to volume of realization of products
16. <i>The sum of constant current expenses</i>	22. A level of variable current expenses
17. <i>The sum of financial consequences</i>	23. Coefficient of operational leverage
	21. Coefficient of capital investments in a zone of critical risk
	22. Coefficient of capital investments in a zone of catastrophic risk

The analysis of financial indicators on the basis of which the degree of bankruptcy threat of an enterprise is defined, goes in several directions:

- The analysis of structure of the financial reporting;
- The analysis of movement of money resources;
- The analysis of liquidity;
- The analysis of financial stability;
- The analysis of efficiency.

All kinds of the analysis should be made on the basis of the following standard methods:

- The horizontal financial analysis;
- The vertical financial analysis;
- The comparative financial analysis;
- The analysis of financial factors;
- The analysis of financial risks;
- The integrated financial analysis based on model of Dupont;
- Cost estimation.

5. The Complex Analysis of Crisis Financial Development of an Enterprise

In a general view performance of all above kinds of the analysis represents the complex analysis of crisis financial development of an enterprise (see Fig. 3). Such analysis also allows defining, finally, presence or absence of a crisis financial condition of an enterprise [7].

The crisis financial condition characterizes such condition at which the level of imbalance of separate structural components of actives and the capital of an enterprise is formed, and also a degree of their inefficient use. On the basis of values of these parameters the probability of bankruptcy of an enterprise is defined. Besides, a calculation of likelihood estimations is influenced also by rates of inflation, tax base, phases of a business cycle, specificity of business, etc. As a result a criterion of unstable position of an enterprise is calculated, which considers a coordination of the listed parameters.

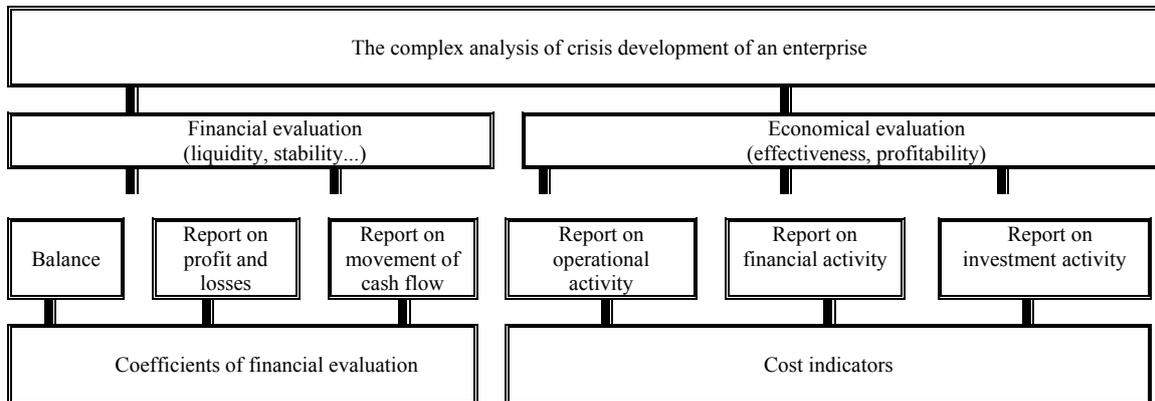


Fig. 3. The complex analysis of crisis development of an enterprise

In the basis of display of a possible crisis financial condition the following attributes are incorporated:

- Inefficient allocation of finances;
- Immobilization of finances;
- Bad payment readiness;
- The delayed debts against suppliers, the budget or credit institutions.

Besides, the identification of a crisis condition is defined on the basis of the analysis of structural indicators. For example, an estimation of debtor and creditor debts, and also their balances are factors of crisis of insolvency. Improving values of these parameters, it is possible to achieve the certain stability in maintenance of financial activity of an enterprise. It is necessary to notice also, that revealing attributes do not open the true reasons of insolvency. Such reasons, usually, are related to conducting inefficient management. During revealing the objective reasons of crisis, special procedures should be developed for diagnosing of bankruptcy on the basis of which amounts of a crisis financial condition of an enterprise are defined. Depending on the amount of possible losses there are three levels of the scale of financial crisis:

- Small;
- Deep;
- Financial trouble.

The scale of a crisis financial condition is shown at a level of crisis fields. In Table 3 some attributes of scale crisis factors corresponding to typical objects of crisis fields are considered.

Table 3. Characteristics of scale of financial crises

The object of crisis field	Scales of a crisis financial condition of an enterprise		
	Small financial crisis	Deep financial crisis	Financial trouble
1. Clear cash flow of an enterprise	Reduction in liquidity of cash flow	Negative value of cash flow	Strong negative value of cash flow
2. Market value of an enterprise	Stabilization of market value	Tendency of reduction of market price	Avalanche reduction of market value
3. Structure of capital of an enterprise	Reduction of autonomy coefficient	Increase of coefficient of financial leverage and reduction of effect of financial leverage	Extremely high coefficient of financial leverage and absence of effect of financial leverage
4. Structure of financial liabilities of an enterprise by promptness of payment	Increase of the sum and proportional value of short-term financial liabilities	High coefficient of prompt financial liabilities	Extremely high coefficient of prompt financial liabilities
5. Structure of actives of an enterprise	Reduction of coefficient of absolute solvency	Essential reduction of coefficient of absolute and current solvency	Absolute insolvency due to lack of finances
6. Structure of running costs of an enterprise	Tendency of increase of variable expenses	High coefficient of operational leverage with a tendency of increase of level of variable expenses	Extremely high coefficient of operational leverage with a tendency of increase of total level of running costs
7. Level of concentration of financial operations in zones of high risk	Increase of coefficient of capital investment in a zone of critical risk	Primary capital investments in a zone of critical risk	Significant share of capital investments in a zone of critical risk

6. Monitoring of a Crisis Financial Condition

The system of an anti-recessionary finance administration assumes constant tracking the major components of financial activity of an enterprise. Hence during the express -diagnostics the constant control of crisis fields should be carried out, and by performance of actions of fundamental diagnostics a complex supervision over crisis financial conditions is carried out. In other words during research of the crisis phenomena the constant estimation of crisis parameters should be made on the basis of which decisions on scale of crisis and measures on its neutralization are developed. The given decisions are developed by means of specially developed procedures which consist of a set of financial tools. Such tools form a system of the built- in monitoring of an anti-recessionary financial condition.

On Fig. 4 the scheme of anti-recessionary financial monitoring is presented.

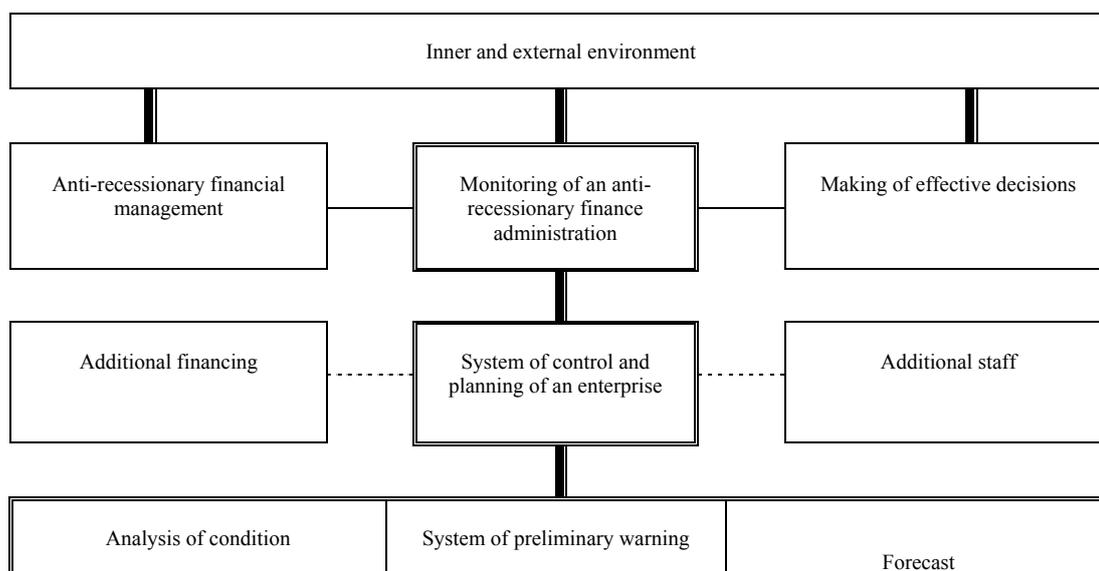


Fig. 4. The scheme of anti-recessionary financial monitoring

Mainframes of such system are the early warning system, the analysis of a financial condition of an enterprise and an estimation of long-term prospects, definition of reliability of developed decisions. Last block provides a feedback in system, i.e. on its basis algorithms of decision-making are improved.

7. The Non-conventional Scheme of Anti-Recessionary Management

Transition from the combined traditional form to a new one is carried out, taking into consideration features of Latvian transport field (see section 3). It allows interpretation of the business information by means of formation of individual management thinking. Such thinking is formed as a result of studying and use of the administrative approaches adapted for the concrete enterprise. In this case it is reached during development by managers of the enterprises of anti-recessionary self-organizational procedures. Such procedures should consider constant external influences which are parried by means of expansion of the saved up knowledge concerning a concrete financial crisis situation. Creation of procedures is executed according to a principle of step-by-step detailed elaboration: from above – downwards and from the left – to the right. Thus the basic emphasis is done on research of horizontal chains. The given chains should unite all parts of movement of all kinds of the resources used at the enterprise. Hence such resources should be considered at all stages of their reference in view of concrete phases of their display from the moment of the beginning up to the end. Such parts are referred to as chains of values as because of them the general value of successful development of the enterprise should be kept.

It is necessary to notice, that any self-organized anti-recessionary procedure introduced on Latvian transport enterprise, causes statement and realization of the certain self-management problems. Such statement is a formation at an enterprise of such relations, by which attitudes of workers to resources of the enterprise are optimised. The given circumstance should be shown in property of emergence. In this relation, considering the property of emergence, management efforts should be directed to the end result received by the application of self-organized anti-recessionary procedure. Thus on the basis of observable quantity indicators, formation of the subjective conclusion about the developed situation is carried out. In that way a transition from quantitative results to quality standards is made. In this case quantitative results represent resources of an enterprise, administrative decisions and end results, and qualitative aspects characterize qualitative features of crisis situations (see Fig. 5).

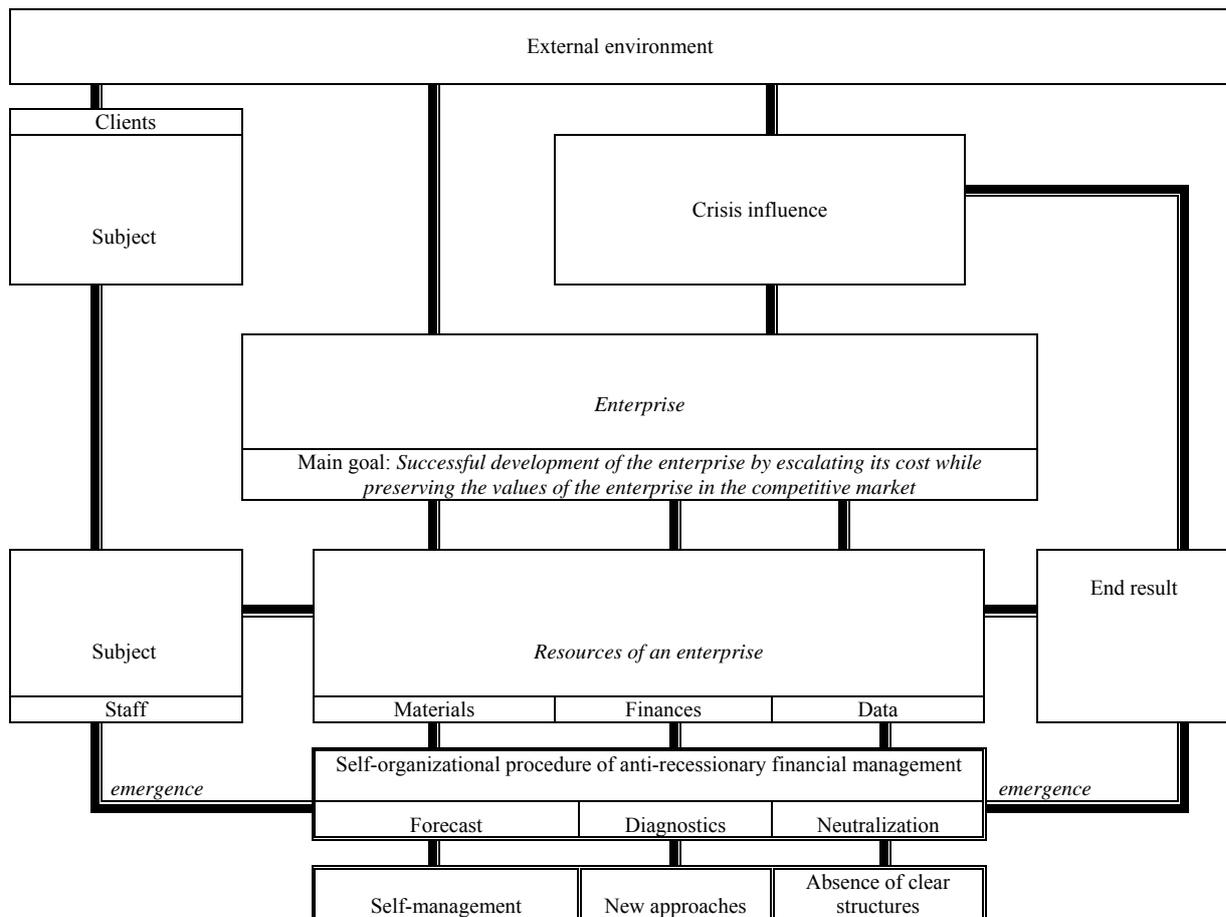


Fig. 5. New model of anti-recessionary financial management

The given features basically should be realized in new forms of horizontal schemes in which detailed crisis financial conditions of an enterprise are studied and the conclusions concerning its prospects of development are developed. Accuracy of the recommended conclusions is raised by using of non-standard generalizations and interpretation. Such methods should be focused on achievement of an ultimate goal of current anti-recessionary self-management, instead of on performance of existing rules of rigid and flexible management. Thus non-conventional algorithms, which have successfully been approved in adjacent fields, are quite often used.

Thus, at an estimation of a concrete crisis situation, direct transition from self-organizational system to individual self-improvement of an enterprise is observed. It is reached as a result of the application, not inherent approaches for the given enterprise, and also during studying of consequences of the executed actions on an escape from a crisis condition. In other words, to neutralize influence of the crisis phenomena without typical structures and actions, an enterprise should use non-standard mechanisms.

The considered technique, approved inside a Latvian transport enterprise, has allowed revealing a number of crisis preconditions. Their neutralization has reduced financial losses at a rate of 27 % from market cost of the enterprise that has allowed lifting a level of reliability of business.

References

1. Kopitov, R., Leonov, J. The safeguarding of business reliability from the position of practical monitoring, *Transport and Telecommunication*, Vol. 3 No 2, 2002. ISSN 1407-6160
2. Kopitov, R. *Management and Financial Management*. Riga: TTI, 2006.
3. Kovalev, V.V. *Economic analysis: methods and procedures* /Edit. by V.V. Kovalev. M.: Finance and Statistics, 2002.
4. Transport of Russia. 2007. Stat. collection. M.: Rosstat, 2007.
5. Fulmer, John G.Jr., Moon, James E., Gavin, Thomas A., Ervin, Michael J. A Bankruptcy Classification Model for Small Firms, *Journal of Commercial Bank Lending*, July 1984.
6. Altman, E.I., Haldeman, R.G., Narayanan, P. Zeta Analysis: A New Model to Identify Bankruptcy Risk of Corporation, *Journal of Banking and Finance*, June 1977.
7. Gershun, A.M., Nefedjeva, J.S. *The development of Balanced Scorecard*. Olimp-Business, 2004.
8. Zajcev, J.I. *Organization of production at automobile industry enterprises*. M.: Academy, 2008.