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# EVENTS AND TRENDS CONTROL IN DIAGNOSTICS OF FINANCIAL CAPACITY OF TRANSPORTATION COMPANIES

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Investigating the impact rendered by financial capacity and its diagnostics efficiency upon the results of a company's activity is the most important problem of modern management. The standard conventional methods and tools of the financial analysis have remained in the past. The top management of a modern company ever more often reflects on the alternative approaches for an assessment objectively capable of reflecting both the current situation and the near-term threats jeopardizing the company's activity. One of such approaches is the business value appraisal method from the time perspective. The advantage of this approach is leading properties inherent in the indices.

This article studies the growth rate-related changes of activity, by separating the analysis of events and trends. The polarity of those categories has been considered as a fundamental principle of the analysis of growth rate, financial instability, and discounted cash flow.

**Keywords:** activity, financial stability, leading indicator, event, trend

## 1. Introduction

This paper focused on methodology reflects the procedure of investigation of the company's financial potential diagnostics and control principles. Business value has been acknowledged as the most important component of forming the company's financial potential within the framework of the study performed by the author. Therefore, the focus of this article is on the diagnosis and control of additional value of the company, which is possible to inspect and evaluate on the trend continuous data analysis. Those methods is not enough researched in the classical financial literature, which is orientated on analysis of events. That's why there is a need for a new approach in the financial theory, how to control the difference between discrete and continuous data, using leading values. This approach is stability-orientated and its task is to get the correct information about company's financial capacity for the successful development.

The purpose of this study is to compare the two intrinsically polar approaches to financial diagnosis, and to supplement the financial stability concept with new evaluating principles of the discrete and continuous data.

The main tasks is to carry out diagnostics of existing enterprises from the perspective of financial sustainability and financial stability, as well as yielding the result of comparison of the management approaches in terms of phenomena and trends, and identifying their influence upon the creation of intangible value of the company. The object of research is the activity of 6 operating enterprises from transportation sector of economy, within the period of non-stop working from 2001 to 2010. Those are well-known Latvian transportation companies from the official "Top 500" list. The scope of research is the efficiency of financial potential development on enterprise, which is possible to reach by using alternative financial diagnosis methodology.

In the course of the studies, the following has been used: monographic method, method of comparative analysis, method of induction and deduction, and some other mathematical and econometric methods. The basis of theoretical research is some papers of scientists in the field of financial management of enterprise, starting from the 80-ies of XX century. Empirical analysis has been carried out on the basis of official data received from some well-known Latvian enterprises and those financial reports. The results obtained are methodological and practical nature, since, when complementing the company's financial capacity management concept, the main differences between approaches applied by managers are presented at the same time. The conclusions and suggestions are guidelines for action when management solutions are taken at a company operating in the modern dynamic business environment.

## 2. Events and Trends in Process of Evaluation of Company's Activity

Activity of each company is a set of actions and operations performed with a view of turning the idea into end product. Process, in its turn, is a set of proceedings and acts setting some known standards

for activity through rhythms and tempos. The system of interaction between activity and processes functions according to definite principles. These principles are fundamental, i.e. they are elucidated on the basis of axiomatics, and they are rather primary justification of financial behaviour of a company than a product of simulated data which is secondary presentation of reality [20].

When examining a company's activity from the financial standpoint, one has to bear in mind that a lot of various procedures and tools exist for describing it. Most of these approaches are based on the analysis of historical records of financial statements of the company [4, 5]. Such an approach implies certification of previous facts, revelation of dependencies, analysis of events, generalization of results, and formalized conclusions and suggestions on certain changes. This approach is aimed at analysing, controlling, and forecasting phenomena. The second approach is based on evaluation and control of trends; at the same time, its goal is the evaluation and control of activity from the perspective of the lead of events [6, 7].

The complementarities of the approaches used makes financial examination more objective, since confirmation of criteria of the prototype system is made from various points of view, and by using various tools. The importance of a correct usage of such tools lies in fundamentality of description principles. In process of evaluation, the expert must understand that, depending on the approach and the tools selected, the investigated activity will be actually unchangeable anyway. Activity is a successful function Y of the investigation conducted, for the description of which, some definite independent parameters $X_n$ are used:

$$Y = f\left(X_1; X_2; ...; X_n\right). \tag{1}$$

These parameters are based on values of certain items included into historical financial statements of the company; however, they bear various semantic contents depending on the subject under review. In the course of investigation of phenomena, data being discrete by nature is used more frequently. By calculating financial ratios, experts establish the well-known generalized parameters of activity in the form of statement of facts at certain discrete time points. Furthermore, comparative analysis of the dynamics and structure of received parameters is carried out; the historical results are correlated, and recommendations for the future are given. In practice, however, results yielded by such an analysis quite often contradict to the actual situation; as a result, recommendations for activity improvement become vague and too generalized.

The main reason for that is the principle of polarity of parameter values of the financial analysis applied. Lack of a definite model of financial diagnostics urges experts to calculate a wider range of various financial ratios, in the hope of any of them eventually showing the demanded result to confirm the preliminary opinion of the expert and the wishes of the top management. This is one of the extremities of subjectivism. The second extremity is preferences of experts, with each of them counting on certain coefficients only, neglecting the other ones. Consequently, there is a risk of missing an important aspect and come to false conclusions. The two situations imply quite a low probability of yielding an objective result [14].

To yield a more objective result of diagnostics, it is necessary to divide equation parameters according to the principle of polarity, since the investigated items of financial statements are not uniform and have a different vector of influence. As an example, we may regard ownership capital and loan capital of a company, its revenue and expense, current assets and short-term obligations where changes of a single parameter inevitably involve changing of the oppositely directed parameter. In process of analysis of such variables, one should apply the method of polar evaluation of opposites rather than the indices balancing method. The mean type method does not apply in this case, since the averaging of values having different directionality vectors will lead to loss of economic essence of the calculated rate.

The phenomena measurement parameters (formula 1) are the main financial data as follows: ***A*** – assets, ***S*** – sales, ***D*** – loan capital, ***E*** – own (joint-stock) capital, ***Pr*** – retained earnings, ***Pn*** – the net profit, ***CL*** – short-term obligations, ***CA*** – current assets, ***EBIT*** – earnings before interest and taxes, and other items of financial statements.

Sources of obtaining this information are: the balance sheet, the report on profits/losses, the report on cash flow, and other documents included into the annual report of the company. In most cases, the analysis carried out is based on the annual report of the company only, since the report submission is obligatory for each company; as a rule, it is published in official state registers and is freely available to third parties. Enterprises less frequently publishing data on their activity – i.e., presenting quarterly or monthly reports – are major companies as a rule. However, since such information is published by a part of companies only, such a sample can not serve as a basis for formulating a judgment on the entire assembly (parent universe).

The trend measurement parameters are expected data based on pace-related changes of the corresponding item of financial statements. For example, the forward-looking data of an item can be expressed as the sum of value of this item over the current period and the current value increment with respect to the previous period:

$$X^* = X_0 + \Delta X, \text{ wherein}$$
$$\Delta X = X_0 - X_{n-1}. \tag{2}$$

Thus, the studied item takes a new, model form according to which it is possible to assume its planned value in the next period, based on its historical values. However, just as the model-based value of a single item of financial statements can't be used as a description of the entire activity, in this case there is no infinite number of separate coefficients, as it takes place in the analysis of phenomena.

The trend analysis is carried out by an approach implying the trend assessment from a perspective of growth and from a perspective of recession. Therefore, a goal to be pursued by expert is the assessment of two objective functions with the subsequent interpretation of their values.

$$Y_1 = f\left(X_1^*; X_2^*; ...; X_n^*\right),$$
$$Y_2 = f\left(Z_1^*; Z_2^*; ...; Z_m^*\right). \tag{3}$$

In this case, the function parameters will be coefficients polar by nature, pursuing the opposite goals of the company. But unlike those parameters which describe phenomena, the trend-assessment parameters are based on planned or expected variables.

One of such indicators was offered by R. Higgins as early as in the 80-ies of the 20$^{th}$ century. The essence of the sustainable growth indicator was calculation of planned sales volume based on the current data. This indicator will be considered as the first objective function of estimated probability of a trend growth.

The second indicator which will be considered as the second objective function of estimated probability of a downturn trend is the future financial instability index simulated and suggested by the author.

Thus, in view of the fact that planning data is used in process of trend assessment, the expert receives leading values of activity in process of the analysis. At a certain point of time, this allows one to state both a recession that has already started at an upsurge and on peak of values of phenomena and an upsurge that has already started at a recession and on the bottom of values of phenomena.

## 3. Company's Financial Potential Evaluation Principles

Financial potential of a company is a result of coordinated functioning and interaction between structural elements of the company in question. At the same time, the term "structure" should not be construed as a hierarchical scheme of job responsibility, but rather as a definite linking system of activity components supporting the company life permanently. The structure of the company's financial potential is examined in terms of interaction between two main elements, i.e. activity and process [14, 18].

Moreover, financial potential should be considered from the time perspective. The necessity of the above-mentioned division is determined by the nature of the tools used for diagnostics of the potential in the short and the long run. The essence of the tools and the nature of data analysed by them are divided into two groups accordingly – the discrete and the continuous ones.

The notions of activity investigated in this study [Schedrovitsky, Prigozhin, Niv, Novikov, Cummings, Litvak, Teslinov] lead to the fact that not only a clear-cut division and a plain definition of financial potential elements are necessary in process of financial potential diagnostics from a perspective of systems approach, but also the management of some definite principles. At that, the principles can not be temporary and adaptive to a definite situation; instead, they should be solid and fundamental. Those principles are formed in terms of axiomatics of certain phenomena and tendencies of the system investigated; exactly for that reason, it is not necessary to change them in process of the system investigation. By superposition of some laws of Deming, Cummings, Nikanorov, Solntsev and Teslinov upon the company's financial potential in the long term, the author, taking into account the above-listed requirements, had formulated the main principles of its system and functioning structure. The principles referred to below within the framework of this paper are presented on Figure 1.

The first principle without which the evaluation of any system is impossible in essence is the principle of polarity. The main mistake connected with the reception of a distorted and inconsistent result

of financial diagnostics is related to non-compliance of this principle by the expert. The author believes that the financial system polarity lies in antagonistic behaviour of the elements of this system within a certain objective corridor of properties preset by the system. The first polar couple of elements should be regarded as the functioning of activity and process within the framework of the preset system. Any set of sequential operations forms a separate action. A set of actions is an activity which is continuous by nature. At the same time, any set of doings forms definite actions in parallel. A set of doings is a process which is discrete by nature. If those elements have been analysed without observation of this rule, the expert will eventually yield a certain mathematical average of the target ratio reflecting calculation of data which is inconsistent by nature. At the same time, should any of the polarities prevail essentially, the entire process finds itself in a dangerous area if its properties or states.

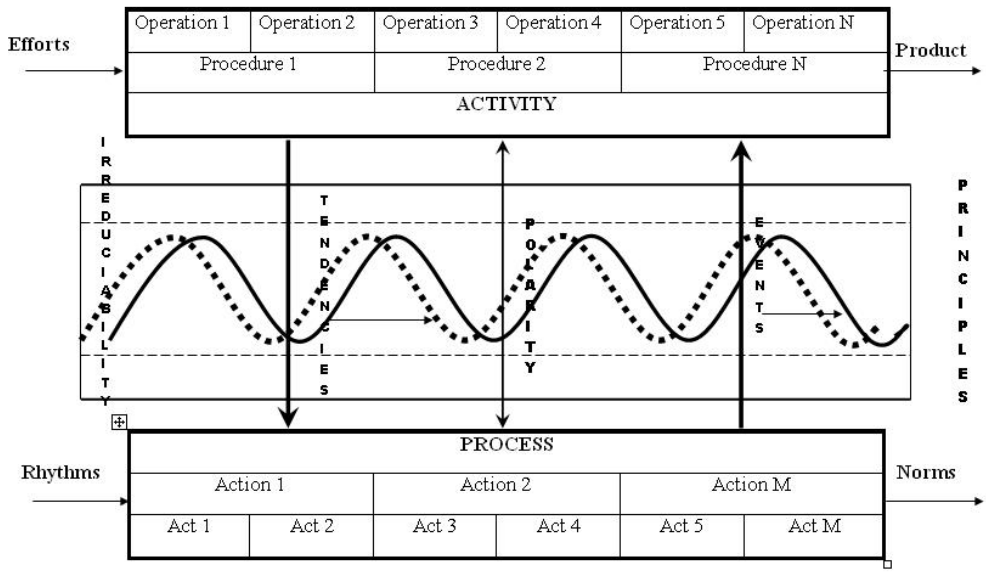


*Figure 1.* The unity of company's financial potential evaluation principles

The second principle of diagnostics of financial potential as a system is the one of irreducibility (saturation). Irreducibility in this case is considered as a law according to which, approximation to any limit of properties is prohibited by nature. Any natural process has a certain limit of variability which is never attained; if it is, the integrity is lost. The actual and full approximation to the variability limit is destruction of integrity, extinction of process, and the end of existence [19, pp. 54–55].

The third principle of diagnostics is continuity. Since any activity run within the framework of the system is a continuous notion, its evaluation tools should also be continuous. The fundamental theory of financial stability set forth in papers of Kovalev, Blank, Altman, Kaplan, Norton, Gilyarovsjaya, Olivier, Roy, and Arnolds, mainly represents the evaluation tools which are discrete by nature and created to describe notions. Financial stability explained through the notions of liquidity and solvency implies the usage of momentary values from accounting statements as input data reflecting the specific condition of financial stability on a specific day – as of the end of the financial year. To be able to analyse continuous data, it is necessary to use tools reflecting growth-related changes of financial potential on a long-term horizon to describe tendencies.

The fourth principle to be used when estimating activities is the efforts which turn resource into end product. Any efforts rendered by a set of operations and actions within the framework of a system are connected with waste of a resource. The efficiency of the activities is determined by lack of "heating" of internal environment that may be caused by speed and efficiency of operations conducted by the company. Should the activity speed be strained to the limit, the system is jeopardized since the heating of its structure is so high that some individual elements can not resist the load and come out of action.

The fifth principle is regularity of pace. Since nature is rhythmical in its integrity, the elements of the financial potential system are no exception. Experts running diagnostics should discriminate between phenomena and tendencies which struggle between themselves throughout the entire life cycle of the company. Phenomena which are discreet in essence describe a process or a state as of a specific point in time, lagging behind tendencies. As to tendencies describing continuous activities, they are capable of showing changes in financial potential with a definite time lead, thereby giving the top management a

chance to receive early warnings as to about possible financial turmoil. In the course of this study, it was found that tendencies are pointed against phenomena. This means that the phenomenon of booming should warn experts about a forthcoming recession.

Should tendencies be equal to zero – still there is inertia anyway, i.e., the velocity of the yesterday's changes is retained, and harmony or stability comes. The limit point of such a state is the absolute financial stability expressing a point of ambiguity, harmony, or quietude, wherein there is no development at all.

To develop financial potential, one has to leave the absolute stability area and trespass beyond welfare and harmony. Within the framework of the preset system, this task is solved by ensuring a growth of time-related changes and trailing the business value as a successful index. This enables the company's financial potential to rise above stability in the long run, thus creating value through a positive departure of the growth vector. This condition is the state of financial stability of company.

## 4. Financial Potential of Enterprise from the Perspective of Time

In order to obtain objective knowledge about the company's activities, the managerial staff use various data generated by various divisions and departments of the company. As a rule, in order to determine a current state of performance, all the tasks are reduced to evaluation and comparison of the past and the current potential of activities. Practice shows that experts' opinions differ because different methodologies involve an analysis of various, and often multifaceted components of financial capacity. When a calculus tool is focusing on efficiency, while another one – on productivity and the third one is focusing on variability, no homogeneous result can be obtained. As regards interpretation of such a distorted result, conclusions and recommendations are distorted even to a greater extent, as a rule. Ultimately, the company management not only fails to receive necessary information in support of decision making, but is being mislead since there is no more way to check exactly which specific component of financial potential was analysed by expert.

Therefore, taking into account the absence of a unique general theory, the author's idea to be used when estimating the financial potential of a company is a definite system-level division of the investigated structural elements of the company. This approach enables one to reveal some latent correlations between structural elements from time perspective, which will practically allow one to extend the application domain and represent the activity and the financial potential of the company in future, based on current data.

Within the framework of the research performed by the author, a financial model of enterprise should be presented as a system of interaction of activities and processes, (formula 3). The model in question enables one to make parallel investigations of the activities run by the company under the influence of many different processes. At this point, one can identify the stability of the activity itself, not excluding the essence of the impact rendered by processes. If the activity is stable, there is no point of subjecting it to the impact from processes. But, if the activity is unstable, it is necessary to identify the extent of the impact rendered by processes, which would enable one to find and determine compensatory mechanisms capable of stabilizing the activity [16, 18, 19, 20].

Stabilization of activity is reflected in the financial potential of enterprise over time. Therefore, a model is required that could trace the financial potential of enterprise in the long run. Such a model cannot be developed on a one-sided concept of financial position or financial sustainability; as a must, the model should include the trends of changing the key parameters of activity with respect to future periods.

Thus, the financial potential of enterprise should be assessed from the perspective of time, – in the short and long term, respectively. As regards the financial stability approach the methodology of which enables one to analyse continuous performance results, the theory of financial sustainability analyses only moment quantities of financial condition at the given moment. Consequently, the methodology of ratio analysis of financial sustainability determines discrete variables from the perspective of time, whereas the methodology of financial stability enables one to identify trends based on the analysis of continuous variables.

**Table 1.** Financial potential analysis methodology time-orientated comparison

| Financial potential from the perspective of time | Short-term prospects | Long-tern prospects | Pattern of result | Recommended approach |
|---|---|---|---|---|
| **Assessment of past activities** | Very efficient | Efficient | Continuous | Stability |
| **Assessment of current activities** | Efficient | Inefficient | Discrete | Sustainability |
| **Assessment of future activities** | Inefficient | Very efficient | Continuous | Stability |

Discreteness and continuity of findings obtained by these approaches is a core principle of the analysis where identifying and forecast of continuous data come to the fore. Discrete data in this task enables one to set some known standards for the basic criteria of stability of activities, the control of which enables one not only to state an accomplished fact but to perform a discrete valuation of a model scenario of the activity development in future, where usage of data in advance is a compulsory requirement.

## 5. Discrete Data Analysis When Evaluating Events

Financial sustainability of an enterprise is a definite set of criteria the values of which lie within some definite preset ranges. From the standpoint of research performed by V. Kovalev and L. Gilyarovskaya [15, 11] financial sustainability of any profit-making company is its solvency, i.e., the availability of a mortgage debenture with respect to the company's assets. The investigation performed by Kaplan and R. Norton [13] has expanded this object domain to system presentation. The authors have come to the conclusion that provided this principle is observed within the framework of the preset system, it would seem inexpedient to consider each criterion individually or to try to unite all possible sustainability criteria into a single set.

Taking into account the statement mentioned above, a single individual value of a criterion can not fully describe an activity, while any attempts to unify all of the known sustainability criteria of the enterprise into a single set lead to heterogeneity of results with respect to the samples that also often contradict to each other.

While interpreting these results reflecting a definite period of time, experts face with the problem of discreteness of extracted values. Since financial sustainability criteria are based on such a form of financial reporting as accounting balance sheet and the annexes enclosed thereto, one must reckon with the fact that the economic sense of the received result is discrete, i.e. it reflects the situation as of the current moment – the end of the financial year.

The problem solution in terms of division of the study timeframe is to present the financial potential of companies in two time prospects – short-term and long-term ones. The use of criteria in this case, from the perspective of time, is pre-conditioned by two different approaches and toolsets.

Within the framework of the author's study, financial sustainability of the company is assessed according to a respective rating developed. The main components of sustainability are liquidity and solvency. By graphically combining the two components, "sustainability quadrants" are formed, whereon the obtained values, characterizing the standard-meeting level with respect to received indices, are marked. Thus, rating A, B or C is formed with respect to each component, depending on the indicator scale received. Financial sustainability is formed by 9 main coefficients generalized in the Table below:

**Table 2.** Financial potential discrete data analysis instruments

| No | Name | Designation | Indicator most affected | Parameters used when calculating indicator | Recommended value |
|---|---|---|---|---|---|
| 1 | Current assets of company's own | *Wcap* | Solvency | *CL, CA (Inv, AR, C)* | *Wcap>CL* |
| 2 | Current liquidity ratio | *Kcl* | Liquidity | *Inv, AR, C, CL* | *≥2* |
| 3 | Liquidity turnover ratio | *Kfl* | Liquidity | *AR, C, CL* | *≥1* |
| 4 | Absolute liquidity ratio | *Kal* | Liquidity | *C, CL* | *0,5 – 1,0* |
| 5 | Current assets coverage ratio | *Kwc* | Solvency | *Wcap, CA, (Inv, AR, C)* | *≥0,1* |
| 6 | Working capital share in stock cover | *Ws* | Solvency | *Inv, Wcap, (Inv, AR, C)* | *≥0,5* |
| 7 | Stock cover ratio | *Wjsc* | Solvency | *Wcap, JSC (Inv, AR, C, BL, CR)* | *No recommendations* |
| 8 | Manoeuvrability of the equity ratio | *Me* | Solvency | *E, Wcap (Inv, AR, C)* | *No recommendations* |
| 9 | Manoeuvrability of the company's own circulating assets | *Mwc* | Solvency | *C, Wcap (Inv, AR, C)* | *0,0 – 1,0* |

wherein:
*CL – current liabilities*;
*CA – cash reserves (current assets): CA = Inv + AR + C*;
*Inv – stock*;
*AR – accounts receivable*;

*C – cash resources*;
*JSC – logically substantiated stock cover sources;*
*JSC = Wcap + BL + CR*;
*BL – bank stock loans*;
*CR – accounts payable for raw materials*;
*E – shareholders' equity.*

Financial sustainability substantiated by the discreteness of essence of results, shows the state of the company under investigation in the short term. The values in question are useful for financial analysts both analyzing the past and the current activities and assessing the sustainability of future development scenarios. However, one should bear in mind the fact that these values characterize the time-related control points of future scenarios rather than tendencies which are continuous in essence.

## 6. Continuous Data Analysis When Evaluating Trends

Continuous data obtained in process of analysing trends, are quite fit for assessing financial potential in the long run. Such data is capable of reflecting the potential-changing dynamics both with respect to a period of the last activities and when simulating the future activities. The main purpose of the analysis of continuous data within the framework of the author's study is to identify and formalize financial stability criteria.

The methodology of research of continuous data and analysing the company's finance in the long run is revealed in the works by R. Higgins, T. Copeland, T. Coller, J. Murrin, A. Dolgoff, and I. Ivashkovskaya [10, 9, 8, 12]. Within the framework of a system-based presentation, from the perspective of the long run, the development of integrated indicators is coming to replace the system of financial ratios.

The enterprise growth theory proposed by R. Higgins [10] in the 80-ies of the 20$^{th}$ century, originally anticipated calculation of planned sales growth in a subsequent period based on current data. At present, the sustainable growth pace also requires formation of a balance between all many-sided objectives of a company. The parameters of this equation include, for example, the planned capitalization of profits and the level of dividends, the planned level of turnover and capital coefficient of assets, the planned leverage of company-owned and borrowed funds, and some other purposes. These goals are difficult to be agreed among themselves, since, according to Pareto principle, achieving one of the goals, to a certain extent, prevents one from achieving another. Ultimately, the goals may be balanced in such a way that the result is absolutely stable and equal to zero. It is exactly in this situation that financial sustainability is achieved. But as soon as the growth rate becomes positive as a result of interaction of the parameters, this suggests possible development of activities in future by way of using the current financial potential.

If the available potential is sufficiently used, a number of changes concerning criteria supporting the increase of business value take place in the company. In the opinion of T. Copeland, T. Koller and J. Murrin [9] who had generalized the theory of cost estimate of a company for the first time, the discounted cost index of a free cash flow is an integrated indicator of company's activities. This index includes all the business activities – from the smallest incoming payments to the largest outgoing ones; the included business activity is corrected with due consideration for depreciation deductions and changes in current assets. Therefore, within a number of years a general wave of positive and negative financial flows is formed. This value, depending on the purposes of analysis, may be given, i.e. discounted, with respect to weighted average capital cost at any given time. At this point, discreteness of the value and continuity of trends come into contact.

In the studies performed by I. Ivashkovskaya [12], a number of cost dynamics-tracking models have been developed, that demonstrate this figure as the most objective and successful indicator of activities. Consequently, the financial stability of the enterprise implies the use of the existing financial potential in the long term in order to create value. The author considering growth rapidity indicators as predictor of possibilities, and considering value as a result of realizing them, forms "sustainability quadrants", whereon the obtained values, showing the standard-meeting level with respect to received indices, are marked. Thus, rating A, B, or C is formed with respect to each component – depending on the indicator scale received. The main indicators of growth rapidity change and creation of value are generalized in the Table as follows:

**Table 3.** Financial potential continuous data analysis instruments

| No | Name | Designation | Indicator most affected | Parameters used when calculating indicator | Recommended value |
|---|---|---|---|---|---|
| 1 | Sustainable growth ratio | *SGR* | Growth rapidity changes | $Pr, P_n, S, E, D, A$ | $SGR > 0$ |
| 2 | Sustainable growth ratio under changing conditions | $SGR_g$ | Growth rapidity changes | $E, div, S/A, D/E, P_n/S, b, S_0$ | $SGRg > 0$ |
| 3 | Future cash flow | $FV_t$ | Cost | $P_n$, Dept, A,NI, ROIC, g | $FV_t > 0$ |
| 4 | Current cash flow | $PV_t$ | Cost | $FV_t$, d, $P_n$, A,NI, ROIC, g | $PV_t > 0$ |
| 5 | Total present value integrated | *PV* | Value | $C_0$, N, $PV_t$, $FV_t$, d, $P_n$, Dept, A, NI, ROIC, g | $PV > 0$ |
| 6 | Weighted average cost of capital | *WACC* | Value | $w_S$, $R_c$, $w_D$, $d_D$, $t_s$, $R_f$, $R_m$, $\beta$ | $WACC < g$ |
| 7 | Further present value at the end of forecast period | $PV_{term\_N+1}$ | Value | $FV_{term\_N+1}$, N, $FV_{N+1}$, WACC, g, $P_n$, Dept, A, NI, ROIC, $w_S$, $R_c$, $w_D$, $d_D$, $t_s$, $R_f$, $R_m$, $\beta$ | ROIC> WACC ROIC>g |
| 8 | Enterprise value | $PV_{project}$ | Value | PV, N, $PV_{term\_N+1}$, $FV_t$, $FV_{N+1}$, WACC, g, $P_n$, Dept, A, NI, ROIC, $w_S$, $R_c$, $w_D$, $d_D$, $t_s$, $R_f$, $R_m$, $\beta$ | ROIC> WACC ROIC>g |
| 9 | Further value in an indefinite term | $PV_{term\|g=const}$ | Value | NOPLAT, $ROI_g$, g, WACC, $w_S$, $R_c$, $w_D$, $d_D$, $t_s$, $R_f$, $R_m$, $\beta$ | $PV_{term\|g=const} > PV_{term\_N+1}$ |

wherein:
$P_r$ – *increase in retained profit;*
$P_n$ – *net profit;*
*S – target sales volume;*
*E – ownership capital as of the beginning of the current period;*
*D – borrowed capital as of the beginning of the current period;*
*A – Company's assets;*
$S_0$ – *sales volume within the current period;*
*Dept – depreciation;*
*NI – investment rate;*
$T_{DO}$ – *period of time preceding the pay-back period;*
*N – prediction period;*
*NOPLAT – net operating profit after deduction of adjusted taxes;*
$ROI_g$ – *incremental profitability of new investment capital;*
$w_S$ – *ownership capital share within the general capital structure;*
$R_c$ – *earning power (profitability) expected by shareholders;*
$w_D$ – *gearing (borrowed capital share within the general capital structure);*
$d_D$ – *lending interest rate;*
$t_s$ – *profit tax rate;*
$R_f$ – *risk-free rate;*
$R_m$ – *expected return of the market;*
$\beta$ – *systematic risk ratio;*
*ROIC – Return on Invested Capital;*
*g – expected growth rate for an indefinite term.*

The financial stability determined by the continuity of the essence of results shows the state of the investigated company in the long term. The values in question are useful for financial experts both when analysing the past activities, where they prove their efficiency, and in process of assessing alternative development scenarios in future.

## 7. Two Trend Assessment Models Based on Leading Values

In the course of econometric research of the essence of diagnostics of trends, dependence was established between the intangible value of the company expressed by values of discount cash flow, and the leading indicator of financial instability. The model of financial instability is constructed according to the principle of expected values of a sustainable growth model, the main distinguishing feature of which is the essence of independent parameters. In the first model, value-adding variables are used, while in the second one – value-destroying variables. Let us consider the two models from the mathematical point of view.

Initially, the sustainable growth rate model was suggested by Robert Higgins; it was based on a determination of internal potential of all activities of a company within the preset period – to be able to forecast the expected growth rate within the subsequent period. The growth rate in question mathematically corresponds to and is often calculated by Western analysts as the ratio between gain in retained earnings and equity capital. It is accepted to take the equity capital size as of the beginning of the period $E_0$.

$$SGR = \frac{S^*}{S_0}, \tag{4}$$

$$SGR = \frac{P_r}{E}. \tag{5}$$

The index characterizes the amount of profit reinvested by the company within a calendar period as a per cent to the ownership capital owned by the company as of the beginning of the prior period. Despite the simplified type of calculation, use of such treatment of SGR coefficient in practice can entail incorrect decisions

Quite often the actual SGR value corresponds to the planned standard – notwithstanding, for example, the actual cases of asset turnover violation and/or reduction of the preset profitability level. The reason of such discrepancy is the conflict of values of target parameters, one of which does take the high growth into consideration, the second – moderate use of borrowed funds, the third – low dividend payments, etc.

Thus, each of the parameters is focused on achievement of the desirable purpose which turns out to be incompatible with other purposes. To exclude the shortcomings noticed and to form a stable condition by means of balance of internal forces of the company and coordination of goals, the formula of sustainable growth ratio can be presented as follows after some permutations:

$$SGR = \frac{P_r}{P_n} \times \frac{P_n}{S} \times \frac{S}{A} \times \frac{A}{E} = K_1 \times K_2 \times K_3 \times K_4, \tag{6}$$

wherein:

*$P_r$ – growth of undivided profit within the running period;*
*$P_n$ – net profit of the current period;*
*S – target sales volume (comprising gross sales within the running period S0 and the increment of anticipated sales within the period delta S);*
*A – the company's assets;*
*E – equity (ownership capital) as of the beginning of the running period;*
*$K_1$ – net profit capitalization ratio;*
*$K_2$ – net profit ratio of sales of products;*
*$K_3$ – asset turnover ratio;*
*$K_4$ – leverage ratio of assets.*

As a result, the sustainable growth model (formulas 4, 5 and 6) can be considered as a complex regulator of development of company and the most important indicator of stabilization of finance. On the one hand, the examined model implies regulation of optimum rates of development of operating activities which are characterized by an increase in sales volume growth rate. On the other hand, financial development of the company is regulated at the expense of balance observance within the system of the ratios examined. The four of these ratios are parameters of the company sustainable growth model; those parameters have different target-oriented directions. Proceeding from the assumption of the author that the balance of opposite forces of the system represents a stable condition of the company, one can draw a conclusion that the value of this ratio shouldn't be lower than 0, and shouldn't trespass beyond certain limits of critical values. In such a case, the system is stable [7, 10, 14].

In process of simulation and assessment of alternative scenarios of development in the turbulent environment, it must be kept in mind that mechanisms of creation of stability are effective where there are preconditions for that. In this regard, the main obstacle for development of a company operating in the competitive environment is financial instability of financial potential.

In other words, when creating a scenario of development of activity for the future, it is necessary to formalize those instability processes which are most likely to occur. Besides, the possibility of occurrence of these formalized processes misbalancing the activity should be detected before they occur. To ensure early notification of the management, this problem should be solved by simulation and proof of effectiveness of the leading indicator.

Within the author's study, this indicator is expressed by the financial instability index and reflects future unbalance between the various goals of the company. When modelling this indicator, the principles of advancing, polarity, irreducibility, harmony and adequacy are applied [19].

Based on information on the current activity, the index in question is a complex indicator of destruction of stability and growth in future period which, after some transformations, is expressed according to the following formula:

$$FFI = w_1 \frac{A_0}{S_0} + w_2 \frac{D}{A_0} + w_3 \frac{Exp}{S_0} + w_4 \frac{CL}{CA}, \quad (7)$$

wherein:
*FFI (Future Financial Instability) – the future financial instability index;*
$A_0/S_0$ *– current capital-output ratio;*
$D/A_0$ *– planned collective insolvency ratio;*
$Exp/S_0$ *– planned profit loss ratio;*
*CL/CA – planned net capital intensity ratio;*
*w – share percentages of general index parameters.*

Recommended values: $FFI < 0{,}8$; $A_0/S_0 < 1$; $D/A_0 < 1$; $Exp/S_0 < 1$; $CL/CA < 1$.

By assessing unbalance of goals and destruction of the current financial potential, this indicator is capable of showing the planned degree of financial instability of the subsequent period. The indicator polarity principle is unipolar one; moreover, it is set within 20% according to the irreducibility law and consequently, the approach to the set limit means launching the most powerful forces of destruction of financial potential. Warning about a high probability of occurrence of the phenomenon in question is exactly the essence of the indicator. Since the prediction of occurrence of a definite phenomenon reflects the essence of tendencies in these phenomena, the indicator in question has been recognized as a reflection of development trends of a company's financial potential.

In the initial model *FFI,* specific weights of *w* parameters are defined as fixed, with the value of each of them equalling 0, 25 for standardization of a successful indicator towards 1. In such a case, if the parameter numerators do not exceed the denominators, the index may take on values from 0,0 to 1,0. However, should the numerator values exceed the denominator values, *FFI* value may exceed 1, which attests to a forthcoming downturn trend. A forthcoming upsurge is attested to by *FFI* values from 0,0 to 0,80 according to the precautionary principle. Moreover, not all of the variables included into the parameters are simulated, which also complies with the above-stated principle.

Only variables with a negative vector have been simulated according to the precautionary principle – like expenses, loan capital, and short-term obligations. As regards variables with a positive vector, they have not been simulated – with a view of assessing them at a lesser value which influences the index quality. An exception is current assets only, the variable of which has been simulated according to the condition of coherence of numerator and denominator of the fourth parameter.

To check the adequacy of the model suggested, the author has performed econometric analysis by using the method of multi-factorial multivariate regression. The number of observations covering 18 Latvian companies operating in 3 different sectors within 10 years – from 2001 to 2010 – came up to 180 – 18 = 162 accordingly. With respect to each observation, the value of successful indicator and four independent parameters was calculated. In general, the equation quality has been acknowledged acceptable; the Fisher test value was vastly superior to $\boldsymbol{F >> Fcr}$ critical value at significance level $\boldsymbol{\alpha = 0{,}05}$, – which attests to the fact that the hypothesis of non-significance of regression can not be accepted. The quality indicators (characteristics) of independent variables have been checked by Student's test; all the four parameters have been recognized significant at significance level $\boldsymbol{\alpha = 0{,}05}$; consequently, the hypothesis of non-significance of independent variables can not be accepted. The regression model reshapes; the beta factors with their standardization are shown in Table 4.

**Table 4.** The parameters multiply regression beta-values of the basic model

| No. / Regression | Parameter | Beta factor (β) | Standardized beta-weight (*w*) |
|---|---|---|---|
| 1 | Parameter 1 *($A_0/S_0$)* | 0,287 | 0,139 |
| 2 | Parameter 2 *($D/A_0$)* | 0,582 | 0,282 |
| 3 | Parameter 3 *($Exp/S_0$)* | 0,402 | 0,195 |
| 4 | Parameter 4 *(CL/CA)* | 0,793 | 0,384 |
| **Total** | | **2,064** | **1,000** |

Therefore, when considering leading values of trend indices of activity at different stages of their cycles, it is expedient to use both of these tools. On the basis of the carried-out calculations, it was confirmed that, at the stage of the forthcoming surge, SGR indicator is acknowledged as dominant, whereas at the crucial point stage, FFI indicator values prevail.

While positive value of SGR indicator testifies to the forthcoming development, values of FFI indicator have to be admissible. Should FFI values happen to be critical, it will be necessary to carry out SGR assessment, which will give one the chance to reveal inconsistency between parameters of these indicators. By carrying out such diagnostics through the usage of the two leading indicators polar by nature and consisting of polar parameters, it is easy to unveil tendencies of development of activity in the future.

To check the impact from a change in intangible assets of the company, the author has tried to introduce into the initial model the fifth parameter expressing the expected loss values of discounted cash flow. To eliminate the problem of negativity of values, the cash flow is correlated to total assets of the company. In such a case, the negative ΔDCF value will not influence the non-negativity of the fifth parameter. The corrected model is expressed by the formula as follows:

$$FFI^* = w_1 \frac{A_0}{S_0} + w_2 \frac{D}{A_0} + w_3 \frac{Exp}{S_0} + w_4 \frac{CL}{CA} + w_5 \frac{A_0}{A_0 + DCF}, \quad (8)$$

wherein:
*FFI* (Future Financial Instability) – the corrected index of the future financial instability;*
*DCF – planned value of free discounted cash flow;*
*wherein* $DCF = DCF_0 + \Delta DCF$, *wherein* $\Delta DCF = DCF_0 - DCF_{n-1}$
*Parameter 1.* $A_0/S_0$ *– current capital-output ratio;*
*Parameter 2.* $D/A_0$ *– planned collective insolvency ratio;*
*Parameter 3.* $Exp/S_0$ *– planned profit loss ratio;*
*Parameter 4.* $CL/CA$ *– planned net capital intensity ratio;*
*Parameter 5.* $A_0/(A_0+DCF)$ *– planned cash-flow loss ratio;*
*w – specific weights of the overall index parameters (in the new model – 0,20).*

Recommended values: $FFI < 0{,}8$; $A_0/S_0 < 1$; $D/A_0 < 1$; $Exp/S_0 < 1$; $CL/CA < 1$; $A_0/(A_0 + DCF) < 1$.

To check the adequacy of the model suggested, the author has performed econometric analysis again by using the method of multi-factorial multivariate regression. The test results have shown a sharp deterioration of the model quality. Despite the fact that the Fisher test value has exceeded the critical value $\boldsymbol{F > Fcr}$ at significance level $\boldsymbol{\alpha = 0{,}05}$, which attests to the fact that the regression non-significance hypothesis can not be accepted; according to beta factor of the fifth parameter, it was acknowledged as non-significant. At the same time, the author's attention was attracted by the occurrence of multicollinearity between independent variables.

By analyzing the relationship between the successful indicator FFI and the fifth parameter, a strong pair correlation between independent variables was detected. This fact attests to the impact rendered by changing the intangible value of the cash flow upon FFI value. The values of beta factors within the corrected model are generalized in Table 5.

**Table 5.** The parameters multiply regression beta-values of the alternative model

| No. / Regression | Parameter | Beta factor (β) | Standardized beta-weight (*w*) |
|---|---|---|---|
| 1 | Parameter 1 *($A_0/S_0$)* | 0,499 | 0,274 |
| 2 | Parameter 2 *($D/A_0$)* | 0,338 | 0,186 |
| 3 | Parameter 3 *($Exp/S_0$)* | 0,308 | 0,169 |
| 4 | Parameter 4 *(CL/CA)* | 0,676 | 0,371 |
| 5 | Parameter 5 *($A_0/(A_0+DCF)$)* | 0,000 | 0,000 |
| **Total** | | **1,821** | **1,000** |

Thus, the corrected model of financial instability (formula 8) has clearly demonstrated the interrelationship between intangible value and development of trends. This fact allows one to claim that the model is also a complex regulator of development, allowing one to reveal specific expected problems to be faced by the company, which are connected with someone or other parameter. On the one hand, the model examined provides for regulation of critical rates characterized by the destruction of intangible value. On the other hand, financial development of the company is regulated at the expense of detection of critical values, with the subsequent balance keeping in the system of coefficients examined. Another advantage of this model is objectivity, since the offered recommendations are based on some specific planning variables allowing one to fend off an imminent threat to activity immediately – before it actually occurs.

Financial stability caused by a continuity of the essence of results, shows a condition of the studied enterprise in the long term. The first model is a complex regulator of sales volume control, while the second one is a complex regulator of intangible value control. These values are extremely useful for financial experts both analysing the historical activities of a company as a proof of their efficiency and assessing alternative scenarios of development in future. The use of both models has been evaluated with respect to financial results of a well-known transport enterprise and a pharmaceutical company; therefore, the actual confirmation of effectiveness of these indicators is received.

## 8. Investigation of Trends in Process of Diagnostics of Company's Intangible Value

Diagnostics of financial potential by alternative approaches was carried out with respect to one of the most known transport and logistic companies of Latvia. After carrying out the analysis of financial condition [17] by some conventional methods of financial stability, the dangerous situation with liquidity and solvency was stated. As of the end of 2010, the company was rated "CC" in terms of financial sustainability, testifying to a very big insolvency in the field of liquidity of assets and solvency on loans. This situation testifies to probable insolvency coming already soon. However, after diagnostics of activity by stability methods was carried out, the admissible situation and almost full balance between growth rates and creation of value was stated. Some more detailed information on these ratings calculation is presented in Table 6.

**Table 6.** Results of diagnostics of *"TVA, Ltd."* financial potential by alternative approaches for the period from 2001 to 2010 [17]

| No | Sustainability approach | | | Stability approach | | |
|---|---|---|---|---|---|---|
| | **Tool** | **Criterion** | **Result** | **Tool** | **Criterion** | **Result** |
| 1 | Overall liquidity | Kcl ≥2 | Not fulfilled | Growth rate | SGR > 0 | Fulfilled |
| 2 | Current liquidity | Kfl ≥1 | Not fulfilled | Spread ROIC-WACC | ROIC-WACC > 0 | Fulfilled |
| 3 | Absolute liquidity | 0.5 – 1.0 | Not fulfilled | Present value | ΔPV > 0 | Most often fulfilled |
| 4 | Net working capital | Wcap >0 Wcap>CL | Not fulfilled | FFI indicator | FFI < 0.8 | Fulfilled |
| 5 | Asset coverage ratio | Kwc≥0.1 | Not fulfilled | | | |
| 6 | Reserves-to-production ratio | Wjsc≥1 | Not fulfilled | | | |
| 7 | Current assets to equity ratio | 0,0 – 1,0 | Not fulfilled | | | |
| | **Sustainability rating** | | **CC** | **Stability rating** | | **AB** |

The data shown in Table 6 reflects the different essence of the approaches used to perform financial diagnostics of activity. The alternative approaches used by financial managers for an assessment of activity of the company in the competitive environment, are based on two opposite approaches.

The first approach is based on phenomena management and diagnostics of a discrete situation at a specific point of time. In most cases, such assessment can be made once or twice a year when summing up financial statements. Then the phenomena-controlling manager gains some insight into the situation as it is "at the moment" and takes a decision subsequently according to the situation.

The second approach is based on management of tendencies based on the historical background of the company's activities, enabling one to calculate planned figures of growth rates of turnover and cash flows and to perform diagnostics and comparison of indices polar by nature. In such a case, the tendencies-operating manager obtains not only statement of fact as of a specific moment but also planned indicators of growth rates and financial instability, thus receiving an opportunity of drawing comparisons and reveal the forthcoming problematic situations of various kinds connected with the company's finance.

**Table 7.** Analysis of FFI indicator sensitivity parameters for *"TVA, Ltd."*

| FFI indicator parameters | Early 2002 | Early 2005 | Early 2006 | Early 2010 |
|---|---|---|---|---|
| **CL/CA** | **1,37118473** | **0,999573025** | 0,9208041 | 0,80569436 |
| **$A_0/S_0$** | 0,347772598 | 0,419992195 | 0,415473349 | 0,382065813 |
| **$D/A_0$** | 0,90629601 | 0,820180076 | **1,035831135** | 0,763773186 |
| **$Exp/S_0$** | 0,2193307 | 0,208881437 | 0,338531628 | 0,363258282 |
| **FFI** | **0,7111** | **0,6122** | **0,6777** | **0,5787** |

On analysing the equation (formula 7) parameters with respect to key periods characterized by the highest variability, one can draw a conclusion on the main problem that had been solved by the company

successfully. Parameters of FFI indicator are presented in Table 7 for those years when critical values were observed; however, the problems connected with specific laws of finance were solved; therefore, the company was acknowledged as a financially stable one as of 2010. At the same time, some serious problems with liquidity and solvency were observed in terms of the classical theory of financial sustainability [17].

By assessing unbalance between the objectives and the destruction extent of the current financial potential, the indicator in question can show the planned degree of financial instability for the subsequent period.

The efficiency of the leading indicator has been tested in process of analysing the activities of 18 well-known Latvian companies from 3 different sectors of economy; developing a multi-factor regression model implies that all the four parameters are meaningful. In the course of checking observation of the model adequacy principles, it was found that correlation between dependent and independent variables is missing; furthermore, no autocorrelation, multicollinearity, and heteroskedasticity of residuals were stated. In this connection, the model adequacy was acknowledged, and it is possible to use the model in problems of financial diagnostic of the company.

In the process of ensuring financial stability, the indicator was recognized as a leading one, as it may show future continuous efficient value-cost when using current data of financial statements.

## Conclusions

The accomplished study has added to the concept of financial stability of a company and simplified problems of simulation of future activity by distinguishing between the analysis of phenomena and that of tendencies. In the course of the study, two new models of future financial instability indicator were suggested and the adequacy of the models was tested; furthermore, a strong dependence of FFI indicator dynamics and discount cash flow dynamics was detected. Thus, the model suggested is a complex regulator of financial capacity of a company, also enabling one to exercise feed-forward control of the intangible assets.

The carried-out fundamental analysis was checked by mathematical methods and confirmed some distinctions between the principles of control of phenomena and trends. Unlike statement of facts, trends show the expected values of activity to experts in advance. Therefore, from the perspective of the two approaches, the top management of a modern company manages the company's activity, based on either phenomena or trends. In the first case, it may happen as an alternative that the company has no problems with financial stability and financial solvency from the perspective of phenomena, but at the same time, a downturn in business value is already observed from the perspective of trends (see Figure 1). Alternatively, in the second case, trends are already directed upwards despite the ongoing phenomena crisis – due to positively directed vectors of the model parameters. Therefore, a modern top management of a modern company must pass over from phenomena control to trends control, which can be implemented by using the sustainable growth and the future financial instability indicator models.

Use of those indicators (formulas 6 and 7) allows the management of the company to receive early notifications about violations and misbalance in the company's activity at some time prior to their occurrence. The necessity of using this indicator is caused by a possibility of identification of latent threats to financial potential by means of the analysis of the four main parameters of the equation. The influence of each individual parameter bears in itself destruction of financial potential stability to a certain degree, and can be both assessed and forecasted by the sensitivity analysis method. In this case, each parameter changes by 1% in turn, while the rest of the parameters remain unchanged. Thus, it becomes possible to trace the greatest change in the successful value, and to reveal the most sensitive parameter at a required time point. In this way, the main task of strategic management – i.e., presentation of activity in future – is solved, since the model in question enables one to see several alternative scenarios of company development and preclude shocks that took place historically, by rendering an immediate impact upon the sensitive parameters of the model.

The quoted example with *LLC* "*TVA, Ltd.*" has clearly shown that the Riga transport enterprise faced the working capital funding problem early in 2002, and subsequently fixed the problem successfully already by 2005. The fact of a fast increase in the joint debt was also temporary; the company took a rather stable position on the market due to very good indicators of planned capital intensity and planned expected unprofitability (see Table 7). As a result, the FFI indicator slightly entered the critical zone only once within the period from 2001 to 2010.

This result isn't a contradiction, but rather an addition to the financial sustainability and financial stability concept, since within this study, by applying systems approach and some fundamental principles

of financial behaviour of a company, the evaluation was carried out from the perspective of a two-level division of financial potential. The evaluation of financial potential was presented from the perspective of events and trends and from the perspective of models polar by nature – pace-related changes of sales volume and business value of transportation company.

The usage of such models enables the top management of a modern transportation company to come down to trends control from phenomena control in process of evaluation and control of business value. This model and the formulated principles can be used in practice to simplify the company's finance stabilization procedure under the competitive environment by a possibility of timely obtaining some important information on future shocks; moreover, the model is fit for simulation of financial potential in the longer term.

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