

The Karol Adamiecki University of Economics  
in Katowice

Volume 4

2008

*Journal of*

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**Economics &  
Management**

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**METHODICAL AND THEORETICAL  
FUNDAMENTALS OF STABILITY  
OF THE ENTERPRISE**

## Introduction

The performance of Russian enterprises under the market conditions faced such phenomenon as bankruptcy for the first time. The probability of the crisis can lead to bankruptcy in case the factors negatively influences their activity are found timely.

In economic literature competitiveness and stability of the enterprises and anti-crises management are considered from the point of view of the financial management and securing financial stability of the enterprise. There is no doubt concerning the importance of the studying this aspect of the enterprise's performance.

Meanwhile the enterprise stability is determined by the material resources of all kind of planning economic activity and selling the final production.

At the same time, the most important factor of the security of competitiveness of the enterprise is stability of its structure and the staff and as the main basis financial stability and first of all financial solvency. Financial stability secure the possibility to acquire necessary resources and pay for all liabilities.

In our work we admit that to be competitive the enterprise should be stable.

### 1. Stability of the enterprise: conceptual approach

Enterprises to more or less extent depend on environmental changes that can hardly be predicted. Meanwhile the enterprise can be considered as a certain system "[...] as a stable unity of the society ties securing integrity and identity to itself that the preserving the main features under internal and external changes"<sup>1</sup>. According to Johnson and the others<sup>2</sup>, this is a well-organized complex unity, combination of subjects or parts forming the whole complex unity.

Quite a number of works of economists and mathematics research is devoted to the problem of stability<sup>3</sup>.

The attempt was made to consider stability of the enterprise and the components securing it is the most important factor of competitiveness. Only stable enterprise can produce competitive output (the goods) meeting the requirement and demand of the market.

Graphical interpretation of the enterprise stability can be seen on Figure 1, where the enterprise (A) is shown as a ball in a stable state being the space shown by the curve, meaning its outer environment (as the walls of a certain vessel). The disturbing influence of this environment is directed to the changing of the stable state of the

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<sup>1</sup> The Soviet Encyclopedic Dictionary. 4<sup>th</sup> edition. Sovetskoe encyklopedia, Moskow 1998, p. 1283.

<sup>2</sup> R. Johnson, F. Kast, D. Rozenzweig: *Systems and Control*. Sovetskoe Radio, Moskow 1971, p. 26.

<sup>3</sup> V.N. Afanasiev, V.B. Kolmanovsky, V.R. Nosov: *Mathematical Theory of Control System Designing*. 2<sup>nd</sup> edition. Moskow 1998, p. 574.

enterprise (B). At the expense of adaptive measures that is a self-regulation of the system. The enterprise returns to the point A and to the most stable state or transfer to the new lower levels of stability (2, 3).

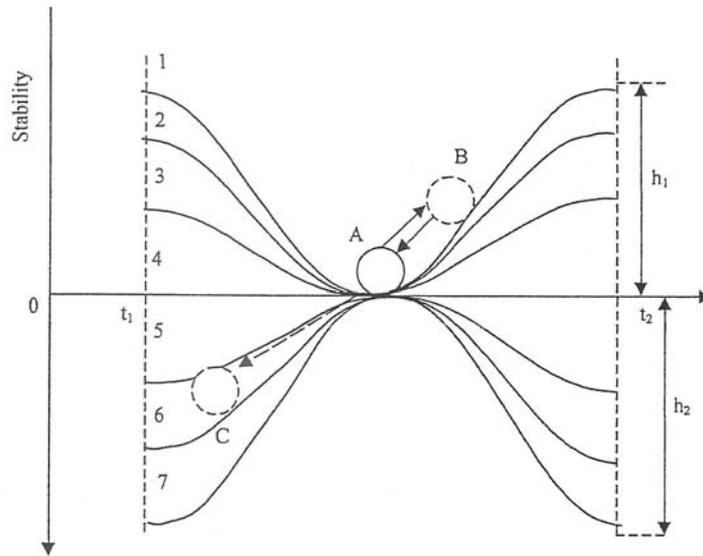


Figure 1. Graphical interpretation of stability of the enterprise

The stock of stability decreases during the transition from the state 1 to 2, 3, and 4. Those levels characterize such state of the enterprise when it retains its stability, but it is affected by the negative disturbing influence of the signals of external environment. If the adaptive measures don't give positive results in the time interval  $t_1$ - $t_2$  system will transfer to the unstable state (5, 6, 7), which is characterized by such negative phenomenon as insolvency.

Here there is still opportunity to return the enterprise to a stable state at the expense of anticrisis management (level 5 and 6). The curve 7 characterizes such the stage of bankruptcy, when the enterprise rolls down along the curve quickly enough to ruin itself. Quantity  $h_2$  is considered as *the depth of the crisis*. The line 4 characterizes so called indifferent equilibrium, when measures of managing influence can return stability to the enterprise or if they are in effective, it will transit to unstable state.

Such equilibrium is very untypical and very short. The modern evolution of the system theory interpretation says: the influence of the factors promoting the nearing movement of the system to equilibrium practically always overcovered by more powerful influence and the most important one inner powers leading to the endless process of changes and development in the system of intensity. On the whole we agree with such statement, but we should note: we cannot deny the influence of inner factors,

i.e. the efforts of the system itself (the enterprise) directed to the retaining of stability (the upper part of the Figure 1) or overcoming the crisis situation (the low part of the Figure 1).

Considering the stability of the enterprise we can point out its 3 states, 3 levels of stability:

1. *Adaptive stability* when the enterprise is a system without changing of technological productions forms (technological alternatives) and only at the expense of organizational measures and managing decisions retains its positions on the market then the enterprise should have differentiation in its reaction to demand. Differentiation increases the possibility of the organization to adapt to the local violation of performance to reach relatively slow, but stable adaptation to the changing of the environment.
2. *Intermediate short term stability* when measures of anticrises management, directed to the banning of the transition to the 3d level of stability are needed.
3. *Crisis state* – unstable state of the enterprise (the system) when it is difficult to take the enterprise out of the crisis only organizational managing efforts. Though we do not deny such opportunity, this instability is of temporary character. Technological novelties are necessary at this stage. It is possible to solve the problem only at the expense of marketing and logistic measures. More often it is financial instability.

All mentioned above allows to make the conclusion that the enterprise as a system should possess an adaptive stability that is to have a special mechanism of compensation the external negative disturbance to adapt to new conditions, or to have an opportunity to escape, to go to a new space at the expense of marketing logistic and other measures.

Let's consider the factors, but only the ones can influence the stability of the enterprise (Figure 2) who can be predicted to a considerable extent by the enterprise itself.

It is not our aim to enumerate all the factors we point out only those part, that to great extent or at least sufficiently can be managed with the help of logistics and marketing levers.

We think that *financial stability* and solvency – as the most important indicators of the financial-economic performance is the basis of stability of the enterprise. Financial stability and solvency are the main opportunities to buy all necessary material resources, to carry out production activity and to pay wages to the workers and other participants of the process providing the enterprise with material resources. In other words, in case of solvency and financial stability the enterprise may need logistic and marketing activity.

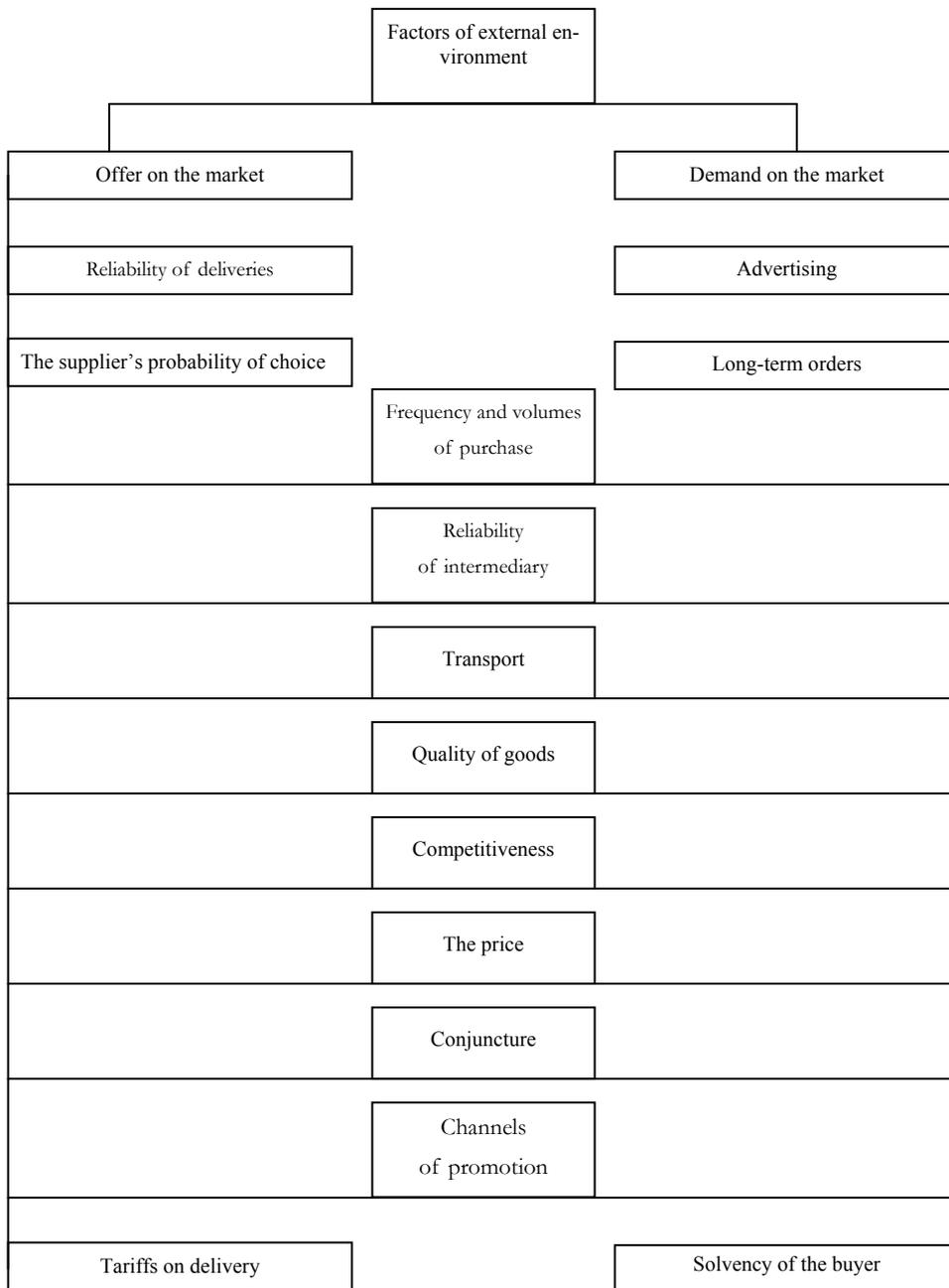


Figure 2. Factors of external environment in the system conception of stability of the enterprise

The practical experience shows that selling more than 70% of output through the constant economic ties secures high competitiveness of the enterprise and such situation can be evaluated as ideal from the point of view of stability by the given indicator must be in the limit of 1.0 to 0.5.

*Stability of its structures* is not less important feature of the enterprises stability. According to J. Lomm, the structure of the given economic social total combination – is the state of relations (external and internal, qualitative and quantitative) which define the given total combination: the period of time to period terms, in space to space-places. We think that the enterprise should be considered as total social and economic combination, the staff and main assets, united by the unity of interests of the institutions leaders and the staff.

At the same time the statements mentioned above that the enterprise as a system should possess adaptive stability require the additional thesis that to structure should be flexible. Otherwise, it will not be able to adapt to another situation. Flexibility here means first, the opportunity of necessary changes in the management of economic structures and, second, in technical and technological complex of the enterprise.

At the same time, stable ties with the consumers and manufactories, regular monetary inflow to the accounts of the enterprise. Both these aspects of the stability of the enterprise are provided with well organized marketing-logistic work. The result of the work means meeting of market demand, the interests of the stuff through the profitability of the enterprise and quality of its production.

So, it is quite understandable that the next component of the stability of the enterprise is the *stability of the staff*. Without detailed dwelling upon the role of the staff we think that all mentioned above allow formulate the rule 5S providing the stability of the enterprise and its competitiveness.

The enterprise is stable when it is characterized by financial stability and stable economic ties with the supplies and users stable structure and the staff that is corresponds to 5 indicators of stability:

1S – financial stability,

2S – stability of the structure,

3S – stability of economic ties with the suppliers of material resources,

4S – stability of economic ties with the buyers and users of the production of the enterprise,

5S – stability of the staff.

As the stability of the enterprise should be somehow, we offer the mechanism of appreciation of the components, of the enterprises stability.

## 2. The methods of evaluating of enterprise stability

The method is composed of combination of ways of defining the stability each of 5S.

### 2.1. Financial stability

The analysis of financial state of the enterprise is quite different depending on the reserve profits of its stability. From this point of view we define three possible states:

- steadily working enterprise,
- enterprise during the period of appearance of the signs of the insolvency,
- constant instability and crises state.

Considering the problems regarding financial instability of the enterprise we refer to the first stage as the other two refer to the anticrisis management. The aim of the analyses can be defined as timely finding prerequisites and bankruptcy forecasting. The symptomatic signals may be the following: sharp decrease of cash on the accounts, the increase of creditor debt decrease of volume of selling. The oversee experience shows that such forecast is possible 1.5-2 years before the appearance of signs with the help of Altman's formula of the ex-works price through the profit capitalization.

$$V = P : K$$

where:

- V – is the expected price of the enterprise,
- P – expected profit less taxes loan interests, dividends,
- K – the value of liabilities.

However, under our conditions this method is hardly possible as the second share market, where the price is formed is under developed.

So, the so-called *express-analysis* is more widely used that it characterizes the general trend of financial economic performance enterprise financial ability (solvency) by the indicators coefficient of the absolute liquidity, showing which part of current debt can be liquidated not only by cash but the expense of future inflow.

$$Cal = F : Ap$$

where:

- Cal – coefficient of the absolute liquidity,
  - F – funds and bank securities,
  - Ap – account payable.
- Recommended meaning 0,2-0,3.

Adjusted coefficient of the liquidity characterizes the possibility of repaying not only by cash, but also by other expected profit:

$$ACI = (F + Dd) : Ap$$

where:

Dd – debtor's debt and other expected profit.

Recommended meaning 0,6-0,7.

General coefficient of liquidity (GCI) characterizes the possibility to define how many times all current debt.

Recommended meaning 2-3.

Solvency of the enterprise reflects tendencies in changing of indicators its liquidity, characterize the ability to fulfill current liabilities both obligations перед external counteragent and shareholders, and the staff of the enterprise.

The analysis of solvency gives us the opportunity to define the opportunity insolvency. Here is necessary define the type of insolvency: temporary, periodical, constant, steady, partial, complete.

It is also necessary to take into account not only formal insolvency at the moment of analysis, but also prospective solvency, reflecting financial state, and attractiveness of the enterprise for investments.

Prospective (long-term) solvency can be evaluated according to the following indicators the coefficient of autonomy characterizing the ratio between the own reserves of the enterprise and the balance currency:

$$Ca = OR : P$$

where:

Ca – coefficient of autonomy,

OR – own reserves of the enterprise,

P – passive of the balance.

Recommended meaning 0.6.

The analysis of the enterprise liquidity was carried on in some steps (Figure 3) and at every stage some violations of stability can be seen.

If the coefficient Cal is decreasing and nearing to zero cash is also decreasing. Here we can face the problem with some urgent means on current liabilities that will lead to the threat of insolvency. More exact coefficient of liquidity striving to zero notifies that liabilities cannot be paid out even with the help of debtors debts.

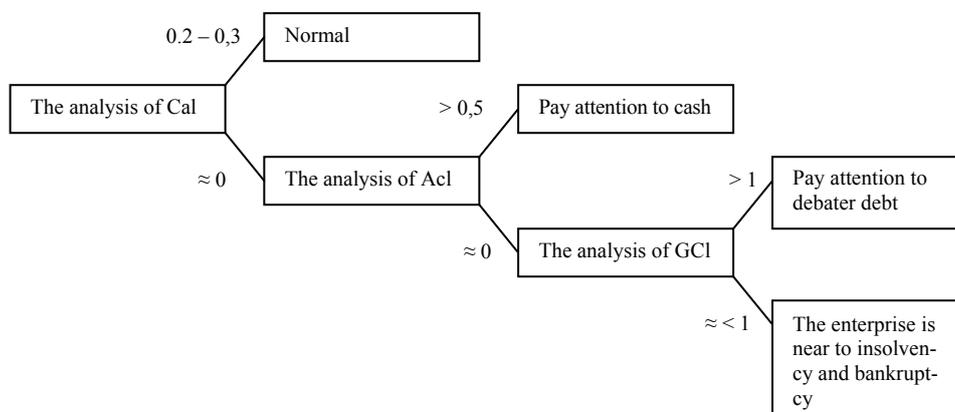


Figure 3. The analysis of the indicators of liquidity

ACI is almost equal to one and even less than it means that current assets are equal or even less short term liabilities which means current insolvency.

All coefficients should be considered all together to make the final conclusion about solvency of the enterprise, the financial stability.

If the value of the indicators is in the limits of recommended values then the enterprise is stable.

The indicators of financial stability (Cfs) calculated with the help of recommended significance of coefficient is in the limit of 0.85-1.15:

$$0.85 \leq Cfs \leq 1.15$$

The calculation was done by the formula:

$$Cfs = \sum Ci : 4$$

where:

Cfs – coefficient of financial stability,

$$\sum Ci = Cal + ACI + GCl + Ca$$

When calculating Ci the edging meaning of the recommended coefficient was taken as the components the average meaning of the coefficient Cfs is equal to 1, 2.

## 2.2. Stability of structure

The management of the structure is the parameter requiring constant attention because this huge structure not only economically unprofitable, but it makes the solving of economic and production problems very difficult. The mobile structure is of

management reacts very quickly to the changes of external conditions; let the enterprise come out of non standard situation with less loss.

However, the notion “structure” refers to not only to management, but also to the enterprise itself. So V. Dubrovsky writes that “[...] the enterprise is not commercial, but merely productive-technical structure”<sup>4</sup>.

Considering this interpretation quite correct we think that it is necessary to clarify the part “not commercial, but...”. Under market conditions any performance having got production-technical structure somehow is connected with the production. Thus, but the structure consumes material resources for this activity and the productive-technical structure itself is first place combination of means of production and in the second place the possibility to carry out the production process directed to the manufacturing of goods.

It is necessary to sell the good and look for the outlets and consumers. So, the enterprise is the seller and process of purchase and selling is trade. “Trade” in its turn is “commerce” and consequently the enterprise is (or can be) the commercial structure.

We interpret the enterprise as a stable social-economic organization of people (structure) having the means of production, used for manufacturing socially required goods and services, being the source of reproduction of consumer resources.

In our opinion, the evaluation of the structure’s stability should be carried out for the expired two years, as we think that structural changes are not so frequent phenomenon in the practice of the enterprise.

The stability achieved at the expense of the structural flexibility, i.e. changes in the management structure and economic production structures or technical-technological complex must be evaluated by the depth and complexity. It is very difficult to evaluate those changes in points. Nevertheless we inclined to characterize them as items from A5 when over 50% considered structural changes elements to 0.8 when changes are insignificant. So, the stability of structure (Cs) is in the limits according to these indicators:

$$0,8 \geq Cs > 0,5$$

If changes for the covered period occurs the stability of the structure is evaluated as 1 if it is the limits at the enterprise is stable.

### **2.3. Stability of economic ties with the suppliers**

This component is one of the most important conditions continuous of performance of the enterprise and provides the quality of planned activity with all necessary material resources.

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<sup>4</sup> V.J. Dubrovsky, B.I. Chaykin: *Economics and Operation of Business*. Yekaterinburg 1998, p. 28.

For common enterprise achieving 100% level of constant economic ties of all kind of consumed material resources is practically in available and not always economically profitable. So we should speak first of all of the stable economic ties with the suppliers of the main resources, constantly consumed in a considerable quantity.

The manufacturing enterprises and companies-intermediaries can be suppliers. The permanent economic ties in this case is the guarantee of the stable performing of the production and as a result the element of the stability of the enterprise the alternative approach to the evaluation of stability of the enterprise according to the indicators of stability of economic ties of delivery (Cd) is presented in Table 1.

Table 1

The evaluation of stability by the indicator of stability of economic ties with the suppliers

Activities	Specific proportion in delivery volume, %								
	100	90	80	70	60	50	40	30	20
Coefficient, Cd	1,0	0,9	0,8	0,7	0,6	0,5	0,4	0,3	0,2
Average, Cd	0,9			0,6			0,3		
Level of stability	High			Average			Low		
Evaluation of stability	Ideal			Normal			Low		

We think that really achievable stage of stability is the *average*, characterizing this enterprise stability as *normal*. If stable economic ties for deliveries turn out to the less percent, the stability of the enterprise should be evaluated as *low*. The *ideal* state is possible for narrow specialized enterprises, working in cooperation.

All mentioned above allows to conclude that the coefficient of stability Cd must be in the interval from 0,1 to 0,5, that is over 50% of material resources can be received by stable economic ties. The coefficient of stability must be the interval  $1 > Cd > 0,5$ .

#### 2.4. Stability of economic ties with the users

Users of goods are intermediary wholesale companies, buying those goods for further distribution can be the other users (consumers) for the enterprise. The stability of economic ties with the consumers means stable selling and naturally presupposes stable selling of goods that in its turn means the return of financial mean, expended for production purposes and probably of resuming of production.

In this case we do not speak about profit, as we consider the problem from the point of view of securing the competitiveness of the enterprise and as a consequence its profitable performance.

Unlike the considered earlier problem of stable ties with the suppliers when we discussed the extremely rare possibility or even or impossibility of achieving 100%

such ties, in the case of selling such indicator is achievable, if the product of the enterprise has stable or high demand and is most willingly bought by intermediaries of enterprises – users (consumers). A possible variant to approach to the evaluation of stability of the enterprise by the indicators of stability economic ties with the consumers (Cc) is presented in Table 2.

Table 2

The evaluation of stability by the indicator of stability of economic ties with the users

Activities	Specific proportion in sale volume, %								
	100	90	80	70	60	50	40	30	20
Coefficient, Cd	1,0	0,9	0,8	0,7	0,6	0,5	0,4	0,3	0,2
Average, Cd	0,9			0,6			0,3		
Level of stability	High			Average			Low		
Evaluation of stability	Ideal			Normal			Low		

Practical experience shows that supplying with more than 70% of material resources by stable economic ties provides high competitive ability of the enterprise and such position may be evaluated as ideal from the position of stability of the enterprise.

The coefficient of stability Cc must be in the interval from 1,0 to 0,5:

$$1 \geq Cc > 0,5$$

## 2.5. Stability of the stuff

Staff of different levels of qualification is the main component in the successful work of the enterprise, its stability, and quality of production. Concern for stuff stability and stuff training gives the opportunity of solving complicated strategic and tactical problems.

We think that of more than 20% of the workers of higher and average link of the management, enterprise workers of higher, and average link of the management, workers having problems quite a long period of time, skilled workers leave the enterprise. It may lead to the loss of stability.

Having analyzed the situation we can say coefficient of staff stability Ck must be more than 80%; consequently:

$$1 \geq Ck \geq 0,8$$

If Ck during the covered period is equal to 1, then there were no dismissals among the considering category of workers.

The meaning of the coefficient we have got let us determine stability of the enterprise as meaning of marginal quantities of stability:

$$C_s = \sum C_j : 5$$

where:

$$\sum C_j = C_{fs} + C_k + C_d + C_c + C_k$$

The coefficient of stability  $C_s$  calculated by the marginal meaning of recommended quantities can be in the interval from 0,7 to 1,1:

$$0,7 \leq C_s \leq 1,1$$

All these considerations let us make the conclusion that if the coefficient of stability is in the point limit the enterprise is stable, that in its turn secures stable competitive positions in investment attractiveness. Off quantity  $C_s$  decreases less than 0,7 it is necessary to find the reason of this undesirable phenomenon, analyzing the terms  $C_j$ .

Finding undesirable deviations at the early stage gives an opportunity to take correspondent measures of managerial pressure.

## Conclusion

The main principals described in our work substantiate the statement that competitiveness of the enterprise is determined by its stability on the market. It is quite natural to suppose that the product of the enterprise positions is determined by a number of parameters, which combination is presented as the rule 5S. The analysis carried out by our method seems to be complicated when it is carried out for the first time and requires working up a great number of data. In the future the constant monitoring of changing the parameters and control of their level is quite necessary. Finding the critical meaning of any parameter determines the direction of managing efforts at the initial stage of analysis and in the process of control.

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