

FINANCIAL IMPROVEMENTS OF THE ENTERPRISE AND RESTORATION OF ITS SOLVENCY IN THE CONDITIONS OF RISK MANAGEMENT

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Abstract. The goal of the article is to show how bankruptcy of an enterprise appears. Therefore, the generalised balance equation of financial and economic activity of the enterprise is considered. Graphs of two main characteristics of risk management are given. The conditions under which the income and expense curves can re-intersect are given. From this moment the bankruptcy procedure of the enterprise begins. There are four stages through which the company must pass until it is declared bankrupt. It is also indicated how zones of permissible, critical and catastrophic risks arise. On the basis of business speed and investment profitability, a table of SWOT analysis of financial improvements of the enterprise is built. Four strategies of economic security and possible risks are also considered. An example of one of the methods of financial recovery of the enterprise using intermediate risky activities is given. By means of calculations it is shown that long participation in risky business, can bring both the considerable income, and lead to almost complete loss of the capital. The conclusion is made: it is necessary to leave risky business in time.

Keywords: *Bankruptcy, Economic security, Financial stability, Restoring solvency, Risk management, Speed of business process.*

INTRODUCTION

Any business activity is aimed at obtaining maximum profit by the producer and satisfying demand for the made products. The ideal option is when the offer equals to demand. In this case there is no overproduction and demand for it is satisfied. At the same time, production is related to a large number of risks and dangers, the nature of which is sometimes unpredictable. For reduction and elimination of negative consequences of economic risks it is necessary to competently exercise control of economic security of the organization under the conditions of market uncertainty (Samodurov et al., 2010).

The goal of the article is to show how the bankruptcy of an enterprise appears. For this purpose, graphs of the main characteristics of enterprise risk management are given. Based on the mutual behaviour of these characteristics, it is possible to talk about the possible occurrence of bankruptcy. These graphs also show the critical and catastrophic risk zones and the main stages through which the enterprise must pass before declaring complete bankruptcy.

The article provides a table of SWOT- analysis or, as it is also called the matrix of economic security. This table shows four possible strategies for the development of the enterprise. Using the table of SWOT- analysis it is possible to carry out financial recovery of the enterprise.

At the end of the main part of the study, the algorithm of possible financial recovery of the enterprise with the use of risky business is given. According to the calculations, it is possible to restore solvency of the enterprise in a limited period of time (2 – 2.5 years). It is shown that further participation in risky business can lead to significant success, but it is also possible to lose almost everything.

The literature on the elimination of negative consequences of decisions taken under the conditions of market uncertainty contains different approaches to the analysis of risk management, for example, (Chabanov, 2009). The article (Kirjanen, Samodurov, 2014) assesses the speed of the business process, taking into account the solution of the profitability equation. In (Kirjanen, Samodurov, 2015) management resources of the company for restoration of its solvency are considered. The article (Buga et al., 2016) analyses the feature of evaluation activity under the conditions of crisis management. In the article (Kirjanen et al., 2016a) the management resources, ensuring the economic security of a company and its partners are considered. The article (Kirjanen et al., 2016b) deals with topical issues of ensuring the financial stability of the organization on the basis of the unity of many aspects of business. On the basis of the SWOT analysis table, the management resources, ensuring the economic security of a company and its partners are considered in the paper (Kirjanen et al., 2017).

1. BALANCE EQUATION AND DYNAMIC CHARACTERISTICS OF RISK MANAGEMENT

When compiling the balance sheet of the enterprise, the basic balance equation must be preserved. The essence of the balance equation is that the result of the active part is equal to the result of the passive part. This is a static balance equation. Below authors present a generalized balance equation of the financial activity of the enterprise in the dynamics.

Important characteristics of economic activity of the enterprise are the speed of business and the balance equation of financial and economic activity of the enterprise. The generalised balance equation of financial and economic activity of the enterprise was obtained in the study (Kirjanen and Samodurov, 2014). This equation takes into account the impact of business speed and its acceleration on the final result of the enterprise. This impact can be considered as a share of the activities of the main enterprise and its subsidiaries, and it is shown in Fig. 1.

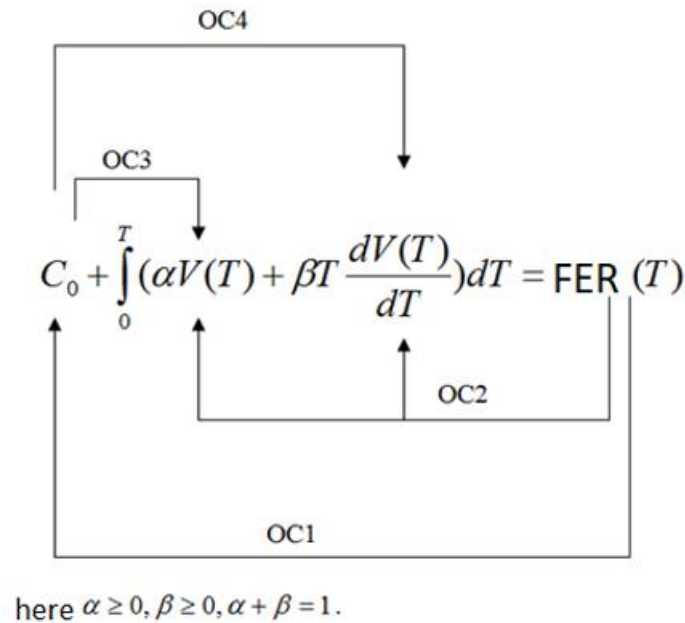


Fig. 1. The generalised balance equation of financial and economic activity (developed by the authors).

Here C_0 – the initial bank capital; V – the speed of the business process which is a derivative of income, authors will consider this speed as an indicator of business development. The second term under the integral characterizes the acceleration or slowdown of the business process. This may be the activity of subsidiaries. The right part of the equation $FER(T)$ is the financial and economic result of the enterprise as a function of time.

There are several capital flows. The first OC1 flow is the feedback of the business process dynamics with its own financial resources. The second flow determines the partial transfers to finance the main enterprise and its subsidiaries. In Fig. 1, these flows are identified by OC2 and play the role of feedback of business process dynamics. OC3 is the self-financing main enterprise, while OC4 is self-financing subsidiaries.

The generalised balance equation is a scheme of capital movement of the enterprise. This chart shows both direct and reverse capital flows. However, in this scheme it is not clear in what case there is a bankruptcy of the enterprise.

Let us consider the causes of bankruptcy and liquidation of the enterprise. Its closure may be voluntary by the decision of its owners and compulsory at the request of other persons in accordance with the court decision. The final stage of the cycle of movement of the enterprise is its closure. It can take place in the form of liquidation and bankruptcy. It should also be noted that there are ways to avoid the stage of closure through various types of business development of the enterprise, such as reorganization.

Liquidation of the company is carried out in accordance with the decision of its owners and is associated with the following reasons: insufficient efficiency of the company or the completion of the enterprise's tasks. As for bankruptcy, it is caused

by financial insolvency of the enterprise and is regulated by the Law of the Russian Federation “On Insolvency (Bankruptcy) of Enterprises” (2002).

One of the dynamic characteristics of the economic activity of the enterprise are the curves of cost and income. Authors of the article will analyse the behaviour of these curves and on its basis authors will determine how critical zones and even bankruptcy zones appear. Figure 2 presents the possible behaviour of the cost and income curves and marks four stages that must be passed before the final announcement of the enterprise bankruptcy.

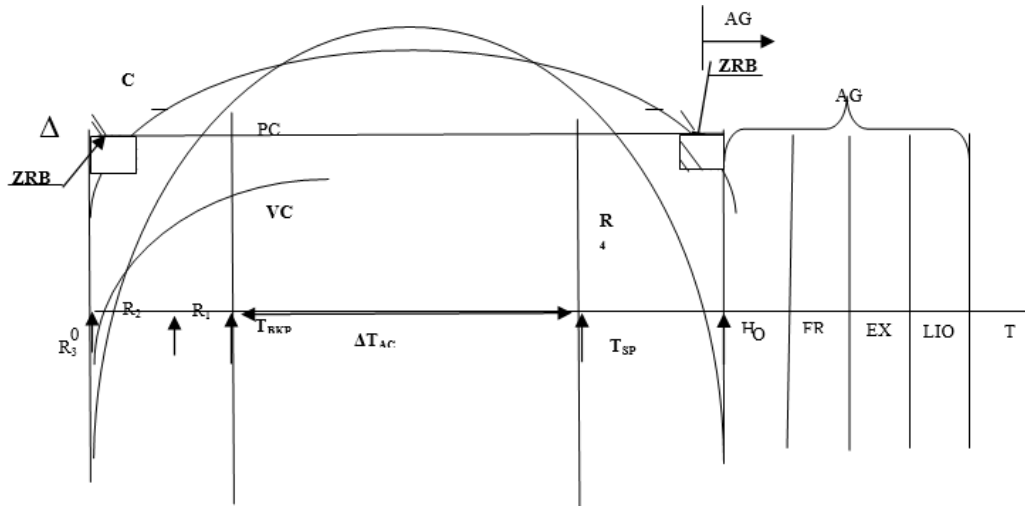


Fig. 2. Characteristics of the company’s risk management in dynamics (developed by the authors).

Here C – a cost curve; I – an income curve; PC – constant cost; VC - variable costs; T_{BKP} – a breakeven point; T_{SP} – a shutdown point; R_1 – admissible risk; R_2 – critical risk; R_3 – catastrophic risk; R_4 – insolvency risk; R_5 – bankruptcy risk; ZRB – zone of bankruptcy risk or zone of risky business; ΔT_{AC} - the active sales range which is a range from breakeven point to the point of unprofitability (shutdown point); T – time of economic activity; AG - zone of amicable agreement.

Let us analyse the cost and income curves. The cost curve starts at point (0; PC) because fixed costs are always present. In the initial period, production is more of a piece character, which causes an increase in the cost curve. Gradually, production becomes serial and the rate of growth of the cost curve decreases, reaching at some point the maximum value. In mass production, the cost may even be reduced, which is reflected in the graph. The reduction occurs to a certain limit and it is possible to obtain a horizontal asymptote with a sufficiently long production.

The income curve starts at point (0; 0) and grows faster than the cost curve. Otherwise, production is unprofitable. Until the income curve reaches the level of PC, it is a zone of catastrophic risk. Then the critical risk zone is located to the break-even point. At this zone income is less than cost and business activity in this zone is very critical. Having passed the break-even point, where cost is equal to income, to get into the zone of acceptable risk. In the future, the income curve can reach a maximum value at the point when the market will be saturated with this type of product. The decline of the income curve may be steeper than the cost curve

and there may be a new intersection of these curves. There is the point of loss, after which the zone of risk of bankruptcy begins.

At this point, the enterprise is not yet declared bankrupt. After this point, there is an attempt to remove enterprises from the zone of bankruptcy. First there is the observation area, which is followed by the zone of financial recovery. If it is not possible to get out of the crisis, then external management is introduced. If there is no success, the enterprise is declared bankrupt and its liquidation takes place.

2. INCOME AND THE FINANCIAL POSITION OF THE ENTERPRISE

The income of the enterprise or investment return is calculated by formula:

$$P(T_2) = P(T_1) + V \cdot (T_2 - T_1), \tag{1}$$

where $P(T)$ – the income at time T and V – the speed of the business process, which authors will consider constant in the considered period of time.

If on the plane $(T; P)$ authors mark the points $P(T_i)$ and connect them with a broken line, then the speed of business V will be the slope of the line segment. The financial position of the enterprise can be described using the table of SWOT analysis or the matrix of economic security (Fig. 3).

	O (opportunities)	T (threats)
S (strong)	SO S1 $V > 0$ $P_0 > 0$	ST S2 $V < 0$ $P_0 > 0$
W (weakness)	WO S3 $V > 0$ $P_0 < 0$	WT S4 $V < 0$ $P_0 < 0$

Fig. 3. SWOT analysis of financial position of the enterprise (developed by the authors).

In this matrix, the main characteristics are as follows: V - the speed of the business process and P_0 - the initial capital. They characterize the dynamics of the enterprise's business. Therefore, economic security strategies can be presented as follows:

Strategy 1. (SO): $P_0 > 0; V > 0$. The fulfilment of these conditions means maintaining the competitiveness of the enterprise. The enterprise has free capital and business is developing successfully. The main risk is the loss of competitiveness.

Strategy 2. (ST): $P_0 > 0; V < 0$. The enterprise maintains financial stability. There is free capital, but business is bad. Perhaps there is absence of modern equipment, poorly organized production, poor management, etc. The main risk is the risk of insolvency of the enterprise. Capital will be wasted without positive effect.

Strategy 3. (WO): $P_0 < 0$; $V > 0$. The enterprise requires innovative resources. There is a well-established production, but there are no resources for its full use. For production establishing, it is necessary to find sponsors or partners. In this case, the main risk is the loss of financial stability.

Strategy 4. (WT): $P_0 < 0$; $V < 0$. In this case, the main strategy is to find resources to restore solvency. For the further successful functioning of the enterprise, sponsorship or partnership injections are required. It is also necessary to buy modern equipment and establish competitive production. Otherwise, the main risk is bankruptcy.

The algorithm for restoring the solvency of the enterprise is to lead it to Strategy 1. In the next section, authors give an example of a possible restoration of the solvency of the enterprise using intermediate investment in a risky project.

3. RESTORING THE SOLVENCY OF THE ENTERPRISE

Let us suppose that the financial condition of the enterprise at the beginning of the year was determined by the amount $P_0 = € 170 000$. From that moment a decline in production began. After a four-month decline in production with an average rate of decline of $-10 000 €/\text{month}$ the enterprise management decided to suspend production and invest the balance in a new risky short-term project in order to restore solvency.

Due to the lack of free money to invest in a new project, the enterprise management issued securities in the amount $€ 100 000$ at 18 % per annum with a maturity of 2 years. In addition, in order to restore the solvency and positive business of the enterprise, its management needs to buy new equipment for $€ 50 000$ and debug it, as well as to pay constant annual costs in the amount of $F = 120 000$.

The terms of the new risky project are as follows: initial investment is $€ 200 000$, estimated positive business speed is $20 000 € / \text{month}$. Thus, for each year of participation in the project, the investor receives $20 000 \cdot 12 = € 240 000$. The conditions are quite attractive, but if to leave the project before reaching one year, then it is possible will get only the accumulated amount for participation in the business for the full number of months. In this case, the initial investment $€ 200 000$ does not return to investor.

If to participate in the project for more than one year and then to leave the project, it is possible to get the amount for the full number of months of participation in the business. Moreover, according to the formula of compound interest, the investor will get half of the invested capital, annually increasing by 10%. If the risky project collapses during our participation in it, which may well happen, it is not possible to get either for participating in the business in this year, or for the invested $€ 200 000$ capital.

The problem is to determine how many years or months it is necessary to participate in a risky project to restore the solvency of the enterprise? (The risk is that it is possible to lose $€ 200 000$ invested in the project and do not get money for participation in the business).

Now authors will review the financial condition of the enterprise before each new stage of decision-making.

Stage 1. Financial position of the enterprise after a 4-month decline in production before issuing securities (Equation 2).

$$P_{(4 \text{ months})} = P_0 + V \cdot T = 170\,000 - 10\,000 \cdot 4 = 130\,000 \quad (2)$$

Stage 2. The financial and economic result of the enterprise at the end of the first year.

To calculate the financial and economic result of the enterprise at the end of the first year, it must be remembered that the enterprise has not been in the new business for a whole year, but four months less. Therefore, the speed of a new business is multiplied by eight months, and the remaining part of the new equipment and the payment of fixed costs are deducted from the result obtained (Equation 3).

$$P_{(1 \text{ year})} = V_B \cdot T_1 - S_1 - F = 20\,000 \cdot 8 - 20\,000 - 120\,000 = 20\,000 \quad (3)$$

The financial situation is bad: there is almost no cash. But there is a participation in risky business with the money invested there, and the invested amount is more than the enterprise had a year ago. Now authors will calculate the financial state of activity of the enterprise at the end of the second year.

Stage 3. Financial result at the end of the second year (Equation 4).

$$P_{(2 \text{ years})} = P_{(1 \text{ year})} + V_B \cdot T_2 - F = 20\,000 + 20\,000 \cdot 12 - 120\,000 = 140\,000 \quad (4)$$

The situation is better than a year ago. However, it is necessary to consider the debts to the holders of securities.

Stage 4. Calculation of the amount of debt to the holders of securities in 2 years.

$$S_d = S_0(1+i)^T = 100\,000 \cdot 1.18^2 = 139\,240 \quad (5)$$

Stage 5. Calculation with the holders of securities.

After four months, it is necessary to pay the holders of securities (Equation 6).

$$\begin{aligned} P_{(2 \text{ years } 4 \text{ months})} &= P_{(2 \text{ years})} + V_B \cdot T_{3,1} - S_d = \\ &= 140\,000 + 20\,000 \cdot 4 - 139\,240 = 80\,760 \end{aligned} \quad (6)$$

If at this moment (after two years and four months) authors will get out of the risky business, authors will obtain for the half of invested capital the amount (Equation 7).

$$S(2) = 100\,000 \cdot 1.1^2 = 121\,000 \quad (7)$$

After two years and four months on the account of the enterprise there will be the amount in € (Equation 8).

$$80\,760 + 121\,000 = 201\,760 \quad (8)$$

Thus, during two years and four months, the management will be able to restore the solvency of the enterprise, to pay all debts, to pay annual fixed costs and to debug new equipment.

Stage 6. Continuation of risky activities.

After three years and four months, it is possible to participate in risky business for exactly 3 years (Equation 9).

$$\begin{aligned} P_{(3 \text{ years } 4 \text{ months})} &= P_{(2 \text{ years } 4 \text{ months})} + V_B \cdot T_{3,2} - F = \\ &= 80\,760 + 20\,000 \cdot 12 - 120\,000 = 200\,760 \end{aligned} \quad (9)$$

If at this point to get out of the risky business, then after 3 years for the invested capital, it is possible to obtain the amount (Equation 10).

$$S(3) = 100\,000 \cdot 1.1^3 = 133\,100 \quad (10)$$

Thus, on the total account € of the enterprise there will be (Equation 11).

$$200\,760 + 133\,100 = 333\,860 \quad (11)$$

It seems fine, but if the risky project collapses during the third year of our participation, the is possibility not to get money either for participating in the business in the third year, or for the invested capital.

Therefore, the following alternatives are possible:

- To be engaged in risky business exactly for 2 years. Then on the account of the enterprise there will be the sum of $S = € 201\,760$. Solvency is restored with small excess.

- Successfully to participate in the risky business for 3 years, then on the account there will be the sum $S = € 333\,860$. It is great success.

- Crash during the third year of the risky business. Then on the account of the enterprise there will be the amount $S = € 80\,760$. Solvency is not restored. The invested money is gone. The state of the enterprise according to the table of SWOT analysis is C3: The enterprise purchased and installed new equipment, but there was no start-up capital for business development. All invested and accumulated capital in the collapse of the risky business was gone. The conclusion is obvious: it is necessary to run away from risky business in time.

CONCLUSION

1. The article states that important characteristics of the economic activity of the enterprise are the speed of business and the balance equation of financial and economic activity of the enterprise.

2. Section I presents the dynamic characteristics of risk management and shows how zones of risky business, as well as critical and catastrophic risks appear.

3. Section II shows a table of SWOT analysis, characterising the possible financial conditions of the enterprise. Risks and dangers are specified, which can wait for the enterprise in each financial condition. Using the table of SWOT analysis, it is possible to build an algorithm of financial recovery of the enterprise.

4. Section III provides an example of the possible restoration of solvency of the enterprise. This process is accomplished through financial investment in another risky business. The time required to restore solvency is calculated. It is shown that if one continues to participate in risky business, one can get significant income. However, if a risky business collapses, one can lose invested capital and business income.

5. It is concluded that it is necessary to get out of risky business in time.

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