PRACTICAL MEANS TO FORECAST POTENTIAL BANKRUPTCY AND FINANCIAL INSOLVENCY OF COMPANIES

MEDIOS PRÁCTICOS PARA PREVISIÓN DE QUIEBRA E INSOLVENCIA FINANCIERA DE EMPRESAS

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ABSTRACT

The actions of companies are a multifaceted and complex procedure. The company communicates with several factors at various levels, from state to the suppliers. At the same time, in the course of the organization's whole operation, both internal and external ever-changing circumstances impact its actions and performance. That kind of ever-changing ambiance places organizations at risk of an financially unstable position. A company's bankruptcy is a regarded as crisis that needs particular approaches of financial management to surmount that. It appears greatly significant to evaluate the status of the company, take steps to restore solvency, and define the likelihood of bankruptcy. Analysis and assessment of the likelihood of bankruptcy supply an overall evaluation of the company's monetary stability, and a prediction for the future. This study aims to analyze some practical means to forecast companies' potential bankruptcy and financial insolvency. To gratify that aim, monographic, economic-statistical, and abstract-logical methods are considered. Based on the results obtained, to raise the effectiveness of the company's capital, working capital should be normalized through planning the lowest requirement for working capital for all the constituent factors vital for the company's uninterrupted, and normal operation.

Keywords: Altman's model; bankruptcy probability assessment; Beaver's model; accounting statements; bankruptcy.

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RESUMEN

La actuación de las empresas es un procedimiento multifacético y complejo. La empresa se comunica con varios factores en varios niveles, desde el estado hasta los proveedores. Al mismo tiempo, en el curso de toda la operación de la organización, las circunstancias en constante cambio, tanto internas como externas, impactan en sus acciones y desempeño. Ese tipo de ambiente en constante cambio coloca a las organizaciones en riesgo de una posición financieramente inestable. La quiebra de una empresa es una crisis considerada que necesita enfoques particulares de gestión financiera para superarla. Parece muy importante evaluar el estado de la empresa, tomar medidas para restaurar la solvencia y definir la probabilidad de quiebra. El análisis y la evaluación de la probabilidad de quiebra proporcionan una evaluación general de la estabilidad monetaria de la empresa y una predicción para el futuro. Este estudio tiene como objetivo analizar algunos medios prácticos para prever la posible quiebra e insolvencia financiera de las empresas. Para satisfacer ese objetivo, se consideran métodos monográficos, económico-estadísticos y lógico-abstractos. Con base en los resultados obtenidos, para elevar la efectividad del capital de la empresa, se debe normalizar el capital de trabajo a través de la planificación del mínimo requerimiento de capital de trabajo para todos los factores constitutivos vitales para el funcionamiento normal e ininterrumpido de la empresa.

Palabras clave: Modelo de Altman; evaluación de probabilidad de quiebra; modelo de Beaver; estados contables; quiebra.

INTRODUCTION

In today's challenging economic circumstances, the financial investigation of the company's actions is deemed as an indispensable stage of managements. The function of companies in contemporary circumstances means the development of management procedures. Among the most substantial duties of contemporary companies is the development and search of financial tactics, and management processes' coordination (Lvova, 2019).

The steady state of Russian organizations is the subject of comprehensive scientific investigation and perpetual study. The company's stable existence is attained by examining the prevailing financial status and analyzing probable bankruptcy in the future (Karpova, 2020).

The major causes of the worsening in the financial status of the company can be (Aksinina, 2020):
– economic (alterations in market prices, collapse of market);
– informational (lack of confidential information and client base data, computer information manipulation);
– physical (loss, damage or destruction to fixed assets);
– human resources (key specialists outflow, qualified labor force lack in the labor market);
– reputation (intellectual property theft, spreading false rumors regarding the company);
– natural catastrophes (fires, earthquakes, floods, man-made ones).

Let's regard the utilization of foreign and Russian patterns to assess the likelihood of bankruptcy on the example of financial statements of a notional production company.

METHODOLOGY

The methodological and theoretical foundation of the research is the foreign and domestic scientific studies on financial analysis, management, and economic analysis.

In order to attain the aim and resolve the issues raised in the procedure of preparing and conducting this study, the next approaches have been utilized: abstract-logical, monographic, economic-statistical, and so forth (Sheremet, A2016; Baryshnikov et al., 2019; Kazakova, 2018).

Table 1 demonstrates the major indicators of the outcomes of the financial statements.

Table 1. Financial statements results (In thousand rubles)

Items	2018	2019	2020
Revenues	1,905,122	2,018,453	2,079,895
Sales' cost	(1,205,728)	(1,310,143)	(1,562,974)
Profit or loss on sales	397,636	388,270	155,202
Profit or loss prior to taxation	361,986	310,191	101,978
Overall profit or loss	286,094	235,258	78,661

So as to assess and predict the bankruptcy risk, the study uses Russian financial pattern associated with various classifications of bankruptcy forecasting techniques (Table 2).

Table 2. Russian patters to forecast the financial insolvency of companies

Models	Forecasting methods
Saifulin & Kadykov (2020)	Rating technique
Kolyshkin (2020)	Rating technique
Evstropov (2019)	Logit technique
Deshko (2018)	Integrated technique
ISEA model (2018)	Multiplicative discriminant technique

So as to evaluate the likelihood of a company's bankruptcy, this study utilizes the five-factor discriminant pattern by Saifulin and Kadykov (Sybirtsev et al., 2020; Hushko et al., 2020)(Table 3). In case the last indicator (R) is under 1, the likelihood of bankruptcy of the company is considerable, and vice versa (Kachkova et al., 2020; Chernyavskaya et al., 2021).

Table 3. Evaluation of the bankruptcy probability based on the model by Saifulin and Kadykov

Coefficients	Numerators	Denominators	2018	2019	2020
K_1	Working capitals	Current asset	0.720	0.110	-0.010
K_2	Current asset	Short-term liabilities	4.20	2.70	2.20
K_3	Sales revenues	Balance currency	0.890	0.990	1.050
K_4	Sales profits	Sales revenues	0.150	0.120	0.040
K_5	Overall profits	Equity	0.150	0.170	0.050
R	$2\ X_1 + 0{,}1\ X_2 + 0.08X_3 + 0.45\ X_4 + X_5$		2.150	0.790	0.350

The year 2020 demonstrates a high likelihood of bankruptcy.

Let's make an evaluation on the basis of the model pf forecasting by Kolyshkin (Kovalenko et al., 2020) (Table 4).

Table4. Evaluation of the bankruptcy probability considering the pattern by Kolyshkin

Coefficients	Numerators	Denominators	2018	2019	2020
K_1	Working capital	Balance currency	0.3555	0.1898	0.1572
K_2	Net profit (loss)	Equity	0.1505	0.1239	0.0380
K_3	Net cash flow	Short-term liabilities	0.0568	-0.0500	0.0408
K_4	Current assets	Short-term liabilities	4.2236	2.6603	2.1948
K_5	Net profit (loss)	Balance currency	0.1308	0.1239	0.0380
K_6	Net profit (loss)	Net revenue	0.7195	0.6059	0.5068
Model 1	$Z = 0.47*K_1 + 0.14*K_2 + 0.39*K_3$		0.21	0.09	0.10
Model 2	$Z = 0.61*K_4 + 0.39*K_5$		2.63	1.67	1.35
Model 3	$Z = 0.12*K_2 + 0.19*K_3 + 0.49*K_4 + 0.19*K_6$		2.24	1.41	1.18

Given the above model, the bankruptcy probability is considerably low.

Next, we utilize the pattern by Evstropov (2019) to evaluate the bankruptcy probability (Table 5). In case Y>0.5, the bankruptcy probability is quite high.

Table 5. Evaluation of the bankruptcy probability based on the pattern by Evstropov

Coefficients	Numerators	Denominators	2018	2019	2020
R_1	Profits prior to taxes	Overall assets	0.070	0.030	0.060
R_2	Revenues in the reporting time	Revenues in the past time	-0.040	0.060	3.040
R_3	cash + short-term monetary investment	Short-term liabilities	0.060	0.020	0.060
Y	$Y = 0.250 – 14.640 * R_1 – 1.080 * R_2 – 130.080 * R_3$		-8.540	-2.860	-11.720

The outcomes demonstrate a low bankruptcy probability.

This time, we apply the ISEA model to evaluate the bankruptcy probability (Vochozka et al., 2020) (Table 6).

Table 6. Evaluation of the bankruptcy probability based on the ISEA model

Coefficients	Numerators	Denominators	2018	2019	2020
K_1	Working capitals	Balance currency	0.360	0.190	0.160
K_2	Net profits	Equity	0.150	0.170	0.050
K_3	Sales revenues	Balance currency	0.870	1.060	1.000
K_4	Net profits	Sales cost	0.240	0.180	0.050
R	$8.380X_1 + X_2 + 0.0540X_3 + 0.630\ X_4$		3.360	1.930	1.450

The bankruptcy probability in the investigated period is below 10%.

The patterns provided above have been adopted by the Russian economy. Nonetheless, the investigated patterns overlook the particulars of the company, and hence offer vague forecast outcomes. To a more precise forecast, this study intends to examine the selected company based on foreign models.

The study utilizes foreign financial patterns associated with various classifications of bankruptcy forecasting techniques (Vochozka et al., 2020)(Table 7).

Table 7. Western patterns to forecast the a company's financial insolvency

Models	Forecasting method
Springate's model (2020)	Analysis of Multiplicative discriminant
Argenti's model (2019)	Integrated technique
Beaver's model (2020)	Analysis of financial ratio
Altman's model (2018)	Analysis of multiplicative discriminant

Let's make an evaluation according to the Beaver's pattern:

– 2018 – 9.80;
– 2019 – 1.40;
– 2020 – 0.80;

The bankruptcy probability is low since КБ > 0,4.

The subsequent pattern to determine the rate of bankruptcy would be Altman's five-factor pattern for companies not listed on the stock exchange (Table 8).

Table 8. Evaluation of the bankruptcy probability based on the Altman's five-factor pattern

Coefficients	Numerators	Denominators	2018	2019	2020
X_1	Working capitals	Balance currency	0.360	0.190	0.160
X_2	Retained profits	Balance currency	0.850	0.710	0.690
X_3	Sales profits	Balance currency	0.170	0.160	0.050
X_4	Equity	Borrowed capital	6.620	2.700	2.420
X_5	Revenues	Balance currency	0.870	1.060	1.00
Z	$0.7170X_1 + 0.8470\ X_2 + 3.10X_3 + 0.420\ X_4 + 0.9950\ X_5$		5.140	3.420	2.850

Over the course of 2018 and 2019, the company is monetary stable. However, 2020 demonstrates an uncertainty situation.

The last model to assess the bankruptcy probability is the Gordon Springate's pattern (Table 9).

Table 9. Evaluation of the bankruptcy probability based on the the g. Springate's model

Coefficients	Numerators	Denominators	2018	2019	2020
K_1	Working capitals	Overall assets	0.360	0.190	0.160

K_2	Profit prior to interests and taxes	Overall assets	0.170	0.160	0.050
K_3	Profits prior to taxes	Short-term liabilities	1.500	1.430	0.370
K_4	Revenues	Overall assets	0.870	1.060	1.00
Z	1.030X1 + 3.070X2 + 0.660X3 + 0.40X4		2.230	2.050	0.960

The investigated time reveals a low bankruptcy probability.

Hence, the study have considered domestic and foreign approaches, which demonstrated that the most straightforward approaches to utilize is coefficient analysis -. Beaver's model. The major drawbacks of the approach is:

- the utilization of coefficient analysis particularly (Deshko, 2018);
- shortage of objectivity for the Russian economy (Baldin et al., 2020).

The following one, is regarded Altman's two-factor pattern, which is associated with the discriminant pattern. Its drawback is the observation of merely 2 indicators, which regarding multifaceted essence of contemporary business in a market economy isn't totally proper. That pattern provides a quite imprecise outcomes (Horak et al., 2020).

More precise are multivariate patterns utilizing the analysis of multiplicative discriminant, which holds a thorough impact on the financial status of the organization.

The observed patterns by Altman, Springate, as well as Kolyshkin and the ISEA model indicated an inconsequential bankruptcy probability. The exception is the patterns by Saifulin and Kadykov (in 2020 - high probability).

The usage of the patterns on the basis of the method of multiplicative discriminant demonstrated that the organization falls into the common zone of uncertainty. Whereas, it seems improbable to state if the organization will be going towards bankruptcy or not.

The utilization of Logit and integrated patterns in Russia has never been vastly utilized, because of high expenses and subjective evaluation by the analyst (Kotliarova & Bzhasso, 2020).

CONCLUSION

Overall, any examined patterns can be utilized to detect the bankruptcy probability. Given the economic situation's volatility, internal and external hazards, it is a prerequisite that all patterns shall be periodically checked and tested for precision.

So as to evaluate the bankruptcy risk, is needed to perform monthly investigation taking into account the domestic logit pattern proposed by Khaidarshin (Khaidarshina, 2019) and the predictive integrated pattern by Deshko. Those 2 models patterns precisely demonstrate the issues in the companies.

For instance, Deshko's model assists in analyzing the internal qualitative indicators of the company affecting its solvency (Table 10) (Deshko, 2018).

Table 10. Company's activities's monitoring

Coefficient	Score
Time factor-order planning	2
data support	1
Technical support	3
Staff	1
Capital holding	0
Fixed assets state	1
Services /Products	2
Marketing	2
Innovation managements	0
Economic cyclicity	0
Expert supports	0
Corporate forms	5
Correspondence of the corporate form to the circumstances of the area	5
Production chains	4
Foreign monetary factors	5
Foreign policy factors	0
Diplomatic factors	0
Ecology	3
Reputation	0
Investment	1
Monetary monitoring	1
Overall score	36

The assessment standards for the pattern is the whole number score. In case it ranges from 5 to 18 of 100 probable, the company would be deemed prosperous. In case the overpack score is above 25, the company is probable to go toward bankruptcy in the five years. The overall score in organizations on the verges of bankruptcy goes from 34 to 70 points. The investigation of the examined company revealed that the whole score is 36. As a consequence, the company is on the brink of bankruptcy.

Utilizing Deshko's pattern would indicate the internal imbalance and permit the management staff to timely adapt the plan for the near future. The negatives of the pattern can be the bias of the internal auditor on the basis of personal experience and qualifications.

Given the investigation and results obtained in this study, to raise the effectiveness of the companys' capital, the approaches below can be suggested:

– to normalize working capitals through handling the minimum requirement for working capital for all the constituent factors vital for the company's normal, uninterrupted functioning. To make a comparison into the planned indicators with the real ones on a monthly basis, conduct a factor investigation of deviations (if any);
– enhance payment and settlement discipline to decrease the non- risk payment.

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