

Assessment of the Financial Stability of Russian Printing Companies: Business Services Sector[#]

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Abstract: This article substantiates the necessity of assessing financial stability of printing companies involved in the business services sector. Peculiarities of business activities of today's printing companies under current conditions have been revealed and financial stability levels of these companies, computed based on Edward Altman's Z-score bankruptcy probability assessment model, have been defined. To analyze the status of printing companies involved in the business services sector, Altman's methodology that is based on a five-factor model for predicting the insolvency risk of companies was applied. The analysis of the industry allowed us to distribute selected companies in three zones of bankruptcy. The number of companies in three bankruptcy zones as well as their share in the total scope of firms in the period under review was defined. Recommendations on the implementation of a set of measures in production and management structures of the assessed companies have been suggested. These measures allow the financial position of the companies in the industry to be maintained and strengthened. The results of this study may lay the foundation for further studies of urgent issues related to the analysis and evaluation of the financial sustainability level of printing companies.

Keywords: Printing companies, sustainability, financial stability, assessment, business services sector.

1. INTRODUCTION

The relevance of this study is induced by the necessity to assess financial stability of companies with the aim to substantiate a mechanism for implementing a sustainable development concept in the domestic business, in particular, in the printing industry's business printing products segment.

Any development implies the existence of a goal that is directly predefined by opportunities, conditions and level of development of the company, as well as the by level of social progress of the country. We can speak about sustainable development only if a company is being developed based on integrated economic, social and environmental factors (Yussuf *et al.* 2017; Kheifits *et al.* 2017).

Financially sound printing companies have real chances not only to develop sustainably and to improve the efficiency of their business operations, but also to ensure a high level of competitiveness under digital economy conditions.

Various methods for analyzing the probability of bankruptcy of companies and for defining financial stability levels of these companies are available. In fact, these are special analytical coefficients for bankruptcy prediction, expressed as a set of formulas developed by leading European and domestic economists. Based on this analysis, we can judge the financial and economic stability of companies operating in the market under review. Two main approaches to bankruptcy prediction are emphasized (Kovan 2009), i.e.:

1. Quantitative approach. This approach is based on financial data and calculation of basic indicators, which are then used to evaluate financial stability of a company. The most famous foreign models include the models developed by Altman (USA), Tuffler (Great Britain), Beaver, Lis, Springate, Fulmer, etc. Russian models are represented by those developed by Saifullin-Kadykov, Davydova-Belikova, IGEA, etc.
2. Qualitative approach. This approach is based on the acquisition of statistical data on bankrupted companies and their comparison with the data provided by the company under review. Foreign models include Argenti's A-score as well as methods developed by Skone, Golder, Conan,

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etc. The most reputable Russian models here include models developed by Zaitseva, Savitskaya, Dontsova, Nikiforova, Kovalev, etc.

However, Edward Altman's Z-score model (Altman 2006), created at the turn of the 1960s, is considered the most famous one of all models available for bankruptcy probability assessment. This model is often called a discriminant model, since Altman used the multiple discriminant analysis technique to determine the weight values of the coefficients in the integral model for constructing his model. As a result, he received a statistical classification model for determining the class of a company (high probability of bankruptcy, low probability of bankruptcy, uncertainty zone). The experience of the developed market countries confirmed high accuracy of bankruptcy prediction based on two- and five-factor models (95% of all cases).

The present and the future of printing companies seem to be dependent on the pace of entry in a modern format of the economy. Certainly, financially stable companies have great potential for development in tune with current digital trends (Yussuf 2017).

RESEARCH METHODOLOGY

The following basic features are attributable to business operations of today's printing companies:

- Market space division into process and product segments as well as segments focused on a certain group of consumers;
- Deep transformation of printing companies due to the necessity of implementing technological and technical innovations and advanced materials, specific to the digital economy, in the production process, and changing business models, which are capable to increase efficiency

and ensure sustainable development of printing companies;

- Market for printing works is an unstable dynamic system, whose status continuously depends on the ratio and level of influence of customers, suppliers, new participants, new alternative products and printing infrastructure.

Table 1 presents information characterizing trends of the domestic printing market development by product types in 2014 – 2016.

In 2014 and 2015, the marketable products segment was inferior to the printed technical products segment and the segments tailored to a specific group of consumers. In 2016, the situation began to change and the marketable products segment occupied two-thirds of the total market share for printing services. This happened because printing companies, producing marketable products for the retail market, became more active in using the digital economy achievements and, on this basis, began to reconfigure their business models aimed at ensuring sustainable development.

Besides, the printed technical products segment dominated in 2014 and 2015, but in 2016 it began to occupy the second position, losing twice to the newspaper sector (ref. to data in Table 1). This was attributable to the slowdown in the Russian business development, which is the consumer of products made in this sector, as well as technological inferiority and low efficiency of business models used.

The data indicated in Table 1 testify that the market for printed products developed differentially. The markets for books, magazines and printed technical products are shrinking, the newspaper market is fluctuating, while the market for other printed products tends to grow. The decline in the books & magazines market is due to the changed consumer behavior: a

Table 1: Printing Market Development Trends in 2014 – 2016 (Russian Printing Industry 2017)

	Market share by types of printed products, %				
	Newspapers	Magazines	Books	Printed products for technical and production purposes (business services sector)	Other printed products
2014	28	6	10	40	16
2015	27	11	9	35	18
2016	41	10	8	21	20
Trends	↑	-	↓	↓	↑

huge number of readers have preferred electronic publications. The newspaper market fluctuations and, specifically, a significant rise in the pace of its growth, are explained by an active move of the largest newspaper publishers towards digitization. The development of the other printed products segment is predefined by a successful search for new niches in the market for printing products and services. The shrinkage of the printed technical products market is attributable to business stagnation in Russia.

Existing situation in the printed technical products market requires the reevaluation of the financial stability of companies involved in this market in order to choose a further up-to-the-date mechanism for increasing efficiency and ensuring sustainable development of these printing companies.

Financial stability of printing companies engaged in the business sector may be analyzed by E. Altman's bankruptcy prediction model.

This analysis aims to find general laws and trends, inherent to the group of companies under consideration. It allows you to identify a share of companies with a high probability of bankruptcy and, on this basis, come to a conclusion about status of these companies over a certain time interval. Accordingly, this allows us to evaluate companies involved in the business services sector, make decisions on penetration to this market, terminate business or implement a set of measures to minimize the risk of bankruptcy of the company.

STUDY RESULTS

To analyze the status of printing companies involved in the business services sector, Altman's methodology that is based on a five-factor model for predicting the insolvency risk of companies, whose shares are not listed on stock exchanges (private companies), was applied. This model is often called the enhanced Altman model; it was developed in 1983 after modifications of the original model for companies whose shares are listed on stock exchanges.

Formula for computing this model is as follows (Altman *et al.* 2017):

$$Z = 0,717x_1 + 0,847x_2 + 3,107x_3 + 0,42x_4 + 0,995x_5$$

where x_1 – own working capital (Current assets - Current liabilities) / total assets (net working capital share in assets; it characterizes solvency);

x_2 – retained earnings / total assets (return on assets calculated based on retained earnings);

x_3 – profit before paying taxes and interests (Operational profit) / total assets (return on assets);

x_4 – book value of own capital / loan capital (financing ratio);

x_5 – revenue / total of assets (asset turnover).

The Altman five-factor model based evaluation aims to place companies in one of the following zones:

$Z < 1,23$ - high probability of bankruptcy, low financial stability (red zone);

Z in the range of 1,23 to 2,89 – economic entity is in the uncertainty zone (gray zone);

$Z > 2,9$ – typical for stable and financially sound companies.

The accuracy of the prediction is up to 95%, 83% and 70% for up to one year, two year and five year periods, respectively.

For the industry analysis, 28 printing companies, operating in the business services market for more than 5 years, were selected. This group of companies has been working in B2B market and in the digital printing market. The analysis was carried out based on financial statements of the companies provided from the unified information base <https://zachestnyibiznes.ru> (open source). Financial status of the companies was analyzed for 2012-2016.

The calculations presented allowed us to identify the following trends in the printing industry:

1. Some companies, such as Kripten, Concern Znak, First Printing Yard, Eurocopia -2SPB, Sibznak LTD, demonstrate an annual growth of the indicator over the past 5 years, which is a positive trend for these companies, since the financial stability of these companies increases and the risk of bankruptcy decreases.
2. A group of companies, including Polygraph-zaschita SPB, Orenkart, Plastic On Line, Siberian Production of Securities and Other Fine Printing Products, Innovation Maps and Systems, Sprintex, was identified. These companies demonstrate an annual index decline for the period under review, which is considered

Table 2: Number of Firms in Different Bankruptcy Zones in 2012-2016

Bankruptcy zones	2012	2013	2014	2015	2016
High probability of bankruptcy (red zone)	2 (7,143%)	1 (3,572%)	1 (3,572%)	0(0%)	1 (3,572%)
Mean probability of bankruptcy (gray zone)	7 (25%)	8 (28,571%)	8 (28,571%)	8 (28,571%)	8 (28,571%)
Low probability of bankruptcy (green zone)	19 (67,857%)	19 (67,857%)	19 (67,857%)	20 (71,429%)	19 (67,857%)
Total	28 (100%)	28 (100%)	28 (100%)	28 (100%)	28 (100%)

Compiled by the authors.

as a negative factor, reflecting a decreasing financial stability of the companies and increasing probability of falling into the gray and red bankruptcy zones.

- Altman's index for most companies (Flexoznak, Kirzhachsky Printing House, N.T. Graf, etc.) varies from year to year, which reflects normal functioning of the business, unless the index is below the recommended values (1,23). These fluctuations may be caused by internal factors (changing financial policy of the company, reduced revenues, growing liabilities) and external factors (economic, social, political factors).

Further, the number of companies in three bankruptcy zones (Altman 2000) as well as their share in the total scope of firms in the period under review were defined (Table 2).

Thus, as a result of the company financial stability analysis, it was found that:

- Only 1 company fell into the red zone (high probability of bankruptcy) (Aliot LLC). In this firm, there is a high probability of its bankruptcy and withdrawal from the market, unless an appropriate risk management program is developed and competent management decisions are implemented. In general, the share of companies in the red zone is 3.57%.
- Seven companies (Orenkart, Flexoznak, Akard, Sprintex, etc.) fell into the gray zone (mean probability of bankruptcy). Typically, the Altman index in these companies varies from year to year, indicating an unstable financial status of these companies. The share of companies in the gray zone is 25% of the total number of the firms reviewed.
- All the remaining 20 companies fell into in the green zone (low probability of bankruptcy); the

Altman index of these companies tended to increase or remain at the same level over the period under review. The share of these companies is 71.43% of the total number of companies operating in the industry, which shall be considered as a positive factor, indicating a sufficient stability of this industry and a high share of financially stable companies involved in this sector.

CONCLUSIONS

The analysis of the industry allowed us to distribute selected companies in three zones of bankruptcy. For each zone, recommendations, which will help these companies to maintain and strengthen their financial status in the industry, shall be suggested:

- Red zone (high probability of bankruptcy):
 - Increase output and sales;
 - Revise (increase) ex-works prices for products manufactured;
 - Broaden a range of products;
 - Transfer short-term liabilities to long-term liabilities;
 - Reduce the turnover period of finished goods, stocks, accounts payable and receivables;
 - Conduct a moderate financial policy at the enterprises (reach an optimum borrowed-to-own capital balance);
 - Form the most profitable and least risky investment portfolio;
 - Increase own funds by increasing the size of the authorized capital and by earning more profit;
 - Use factoring as a means of minimizing the risk of non-return of receivables;
 - Reduce labor intensity, consumption of materials, energy intensity of products;

- Change the company's management structure;
 - Sell illiquid property.
2. Gray zone (mean probability of bankruptcy):
- Improve profitability and turnover indicators;
 - Provide continuous monitoring of competitors in the industry;
 - Identify strength and weak sides of the company, as well as define risk zones for creating the most optimal risk management program in the organization;
 - Increase own funds from profit;
 - Attract reliable investors;
 - Reduce costs by establishing long-term futures contracts.
3. Green zone (low probability of bankruptcy):
- Review industry trends;
 - Maintain market share through analysis of competition and implementation of a sound marketing strategy;
 - Arrange additional issue of shares to attract more investors;
 - Implement advanced technologies into the production process, invest in R&D and developments;
 - Eliminate stagnation of stocks and finished products in warehouses;
 - Penetrate new markets.

Thus, Altman's methodology allows determination of the financial status not only of a particular firm, but also the state of the industry as a whole. The analysis conducted allows us to conclude that the state of the printing industry in 2012-2016 was rather satisfactory, with the most companies (67-71%) being financially stable and having a low probability of bankruptcy in the next 5 years. Companies with a mean and high probability of bankruptcy can improve their financial situation by implementing a well-developed anti-crisis

program that would contain the measures proposed based on the analysis results.

The results of this study may lay the foundation for further studies of urgent issues related to the analysis and evaluation of the financial sustainability level of printing companies.

REFERENCES

- Altman, E., Hotchkiss, E. 2006. *Corporate Financial Distress and Bankruptcy: Predict and Avoid Bankruptcy, Analyze and Invest in Distressed Debt*. 3rd Edition. John Wiley and Sons, Ltd
- Altman, Edward I. and Iwanicz-Drozdzowska, Malgorzata and Laitinen, Erkki K. and Suvas, Arto 2014. *Distressed Firm and Bankruptcy Prediction in an International Context: A Review and Empirical Analysis of Altman's Z-Score Model*. <https://doi.org/10.2139/ssrn.2536340>
- Altman, Edward I. 2000. *PREDICTING FINANCIAL DISTRESS OF COMPANIES: REVISITING THE Z-SCORE AND ZETA ® MODELS* Retrieved February 7, 2018 (<http://lemeunier.gilbert.free.fr/Investissement/DOCS/PDF/Zscores.pdf>)
- Analysis of the World's Industry Development Experience and Approaches to the Digital Transformation of the Industry in the EAEC Member States. Information and analytical report. Retrieved December 23, 2017 (file:///G:/ЦИФРОВАЯ%20ЭКОНОМИКА/ЦИФРОВАЯ%20ТРАНСФОРМАЦИЯ%20ПРОМЫШЛЕННОСТИ%2013.02.2017.pdf)
- For honest business (portal about companies and business in Russia) Available at: <https://zachestnybiznes.ru/> (accessed February 2018)
- Kheifits, B.I. et al. 2017. "Research trends in global value chain: possibility of practical use for the Russian economy in terms of innovative development". *Social interactions and networking in cyber society*. 127-139. https://doi.org/10.1007/978-981-10-4190-7_11
- Kovan, S.E. 2009. *Theory of Anti-Crisis Management of an Enterprise: A Textbook* ed. by M.A. Fedotova, A.N. Ryakhovskaya. Moscow: KNORUS
- Russian Printing Industry: Status, Trends and Development Prospects (industry report), 2016. Retrieved May 5, 2017: (<http://fapmc.ru/mobile/activities/reports/2016/poligrafija.html>).
- Russian Printing Services Market Survey, 2016. Retrieved May 5, 2017 (<https://www.openbusiness.ru/biz/business/obzor-rynka-poligraficheskikh-uslug-v-rossii/>)
- Yussuf, A.A. et al. 2017. "Evaluation of the Degree of Readiness of Russian Enterprises to Sustainable Development on the Basis of Innovations (on the Example of the Textile Industry)". *Izvestiya Vysshikh Uchebnykh Zavedenii, Seriya Teknologiya Tekstil'noi Promyshlennosti* 4(370), 13-17.
- Yussuf, A.A. 2017. "Features of managing industrial enterprise in the conditions of the digital economy". *Materials of the International Scientific and Practical Conference «Actual problems of management: performance, efficiency, quality»* St. Petersburg, 343-347.