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International Scientific Conference**FINANCIAL RISK CRITERIA IN DETERMINING FINANCIAL
SECURITY OF COMPANY**Natalya Savchenko (a)*, Valentina Derbeneva (b)
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**Abstract**

The company's ability to withstand various threats is a key factor in ensuring its good financial situation. This work reviews the main approaches to the financial security of a company and some of its components. We study the theoretical aspects of financial security, i.e. its criteria and financial stability indicators. We analyze the notion of financial risk in the context of company capital structure and describe the main approaches to determining financial risk. We also deal with the basic existing financial security assessment methods that include liquidity and solvency, business activity, and profitability indicators, as well as those of financial stability. We identified the threshold values for the basic indicators of financial stability. We analyzed the correlations between financial leverage and its degree indicator. We identified the risk criteria across the levels of financial leverage differentiation factor, clarified the criteria for the key financial stability indicators to adapt them for the assessment of the financial security of a company. We hypothesize that the proposed financial risk criteria are versatile and can be used for companies of various types. We give an example of financial risk calculations for specific Russian companies to assess their financial security using the proposed methods. When the differentiation factor is used, the level of financial security of the companies in question is a bit higher than that obtained using the conventional methods, which means better assessment results. We identified the advantages of the proposed methods and determined further research prospects for financial security.

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Keywords: Financial security, financial risk, financial stability indicators, financial leverage effect, financial leverage factor

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1. Introduction

One of the key problems in company management is the adaptability of its economic security system to the system of key performance indicators (KPI). Currently, KPI systems serve as a strategic benchmark for any company. Identifying the risk level is a financial component of the KPI system. Risk management helps forecast negative trends and prospective opportunities for company operation (Sergeev, 2019). We must note that determining risk levels also falls within the scope of the financial security system, one of the key elements of the economic security of a company. To ensure a sustainable financial system, it is necessary to exercise financial risk management in some areas (Guliyeva, 2019). The financial security assessment receives great assessment nowadays. The researchers analyze financial security indicators for large, medium, and small companies (Safargaliev et al., 2019).

2. Problem Statement

The financial security level can be assessed using various methods that traditionally include the indicators of financial stability, liquidity, profitability, and business activity (Kvasnytska et al., 2019). Of this set of indicators, we may only use the financial stability indicator to identify the financial risk level. We believe that the existing financial security methods are quite one-dimensional in determining the financial stability criteria. They look at them from one viewpoint only and do not consider company size, life cycle stages, and other factors. This can be explained by the fact that the financial stability indicators characterize the structure of company capital, including its equity and debt. The attraction of loan funds is always associated with financial risks (Kovalev, 2010). According to Brigham and Houston (2016), financial risk is the extra risk for the shareholders resulting from the company's decision to raise a loan. The authors of financial security methods assuming that financial risk is external for the company set up criteria for financial stability indicators based on the ratio of its equity capital and debt. We believe that these criteria are suitable for the overall assessment of the financial situation of a company but insufficient for the assessment of financial security level.

3. Research Questions

Today, there is plenty of research works on the risk-oriented approach to the economic security of a company (Kalashnikova et al., 2018). Financial security is a key component of economic security. The methods and approaches to determining the financial security level receive close attention in contemporary economic literature. The majority of the approaches review the operational or financial activity indicators and analyze the effects of changing these indicators for the results of any commercial company, i.e. operational or net profits (Guan et al., 2016).

In Russian practice, the main financial security methods are set out in works by Papekhin (2007), Blazhevich (2011), Zaporozhceva and Rjabykh (2013), Kavyrshina (2015), Sapozhnikova and Tkacheva, (2019). All these methods contain a group of slightly different financial stability indicators. For the purposes of this research, we selected the three main financial stability indicators that feature in all of the abovementioned methods. They include the equity ratio, financial leverage factor, and financial stability

coefficient. These factors characterize the structure of funding sources and, as a result, the level of financial risk that is external to the company and associated with attracting loans. Table 1 provides financial stability indicator criteria for the assessment of a company's financial security according to the methods in question.

Table 1. Key financial stability indicator criteria for the company financial security level assessment*

Indicator	Calculation method	Indicator threshold value				
		Method 1	Method 2	Method 3	Method 4	Method 5
1. Equity ratio, unit fractions	The ratio of equity capital to total assets	0.3	0.5	0.5	0.5	0.3
2. Financial leverage factor, unit fractions	The ratio of debt and equity capital	1.0	1.0	1.0	1.0	2.3
3. Financial stability coefficient, unit fractions	The ratio of the sum of equity capital and long-term debt to the total assets	-	-	-	0.6	0.3

Source: Prepared by the author based on financial security assessment methods

*The methods were reviewed in order of appearance in the text

The analysis of the assessment criteria for financial security level shows that generally, they are similar. The list of criteria is longer in method 4 (Sapozhnikova & Tkacheva, 2019). The values of the equity ratio and financial stability coefficient must be above the threshold, while the financial leverage factor must be below the threshold. All of the financial security methods are versatile, which means they can be used for any company and any area of activity. However, a more accurate assessment requires a more careful criteria rating to determine the level of financial security.

4. Purpose of the Study

The goal of this work is to develop financial risk criteria for the assessment of financial stability indicators and their inclusion in the financial security system of a company.

5. Research Methods

This work relies on comparison and analysis methods to contrast various definitions, such as financial security, financial risk, and financial stability. We also used the financial analysis methods, the ratio analysis in particular, to review the key indicators. The research is based on the accounting (financial) reports from three large Russian metal companies.

6. Findings

The classical works on financial analysis and management analyze financial risk using various methods and indicators. For example, E. Brigham and J. Houston determined financial risks through the root-mean-square deviation and the variation factor (Brigham & Houston, 2016). These are efficient and accurate methods of risk assessment but contemporary practice often requires that managers take financial

decisions in very short times, which means they require express analysis method without any additional mathematical and statistical calculations (Savchenko, 2011).

6.1. Formulation of financial risk criteria for assessing financial security

In this work, we aim to complement the assessment of a company's financial security based on its financial stability with the indicators that reflect financial risks, which can be classified as an express-analysis method. The financial risk can be calculated using the financial leverage degree formula:

$$DFL = (1 - T) \times (ROA - r_d) \times \frac{D}{E} \quad (1),$$

where DFL is the degree of financial leverage, %;

T is the profit tax rate;

ROA is the return on assets, %;

r_d is the average interest rate for debt, %;

D is the total debt, currency units;

E is the total equity capital, currency units.

In this formula, the financial risk is calculated based on two indicators: the financial leverage factor and the differentiation factor. The financial leverage factor is the ratio between the debt and the equity capital of the company. This indicator belongs to the financial stability indicators and it was analyzed in Table 1. The differentiation factor is the difference between the economic profitability of assets and the average interest rate for debt (Savchenko, 2014). The economic profitability of assets is calculated using a classic formula:

$$ROA = \frac{EBIT}{A} \times 100 \quad (2),$$

where EBIT is the operating profit, currency units;

A is the total assets, currency units.

The differentiation factor has a significant impact on the resulting financial leverage degree and the benefits of loan funding for a company. If the differentiation factor is negative and the profitability of assets is below the interest rate for the debt, the profitability of the company equity capital reduces as a result of raising additional loans, or the financial risks occur. If the differentiation factor is positive and the profitability of assets is above the interest rate, applying for a credit is quite profitable. The financial risks are low as the company generates enough profits and is able to pay back the debt and loan interest as per schedule (Savchenko, 2019). Within this research, we established that if the differentiation factor is high, the increased financial leverage factor must not prevent the company from being assigned a high or sufficient financial security level.

The suggested financial risk criteria to be included in the company's financial security system are set out in Table 2.

Table 2. Financial risk and financial security criteria

Indicator	Financial risk level		
	Low	Moderate	High
Differentiation factor (in DFL definition)	>15%	>5%	<5%
Equity ratio, unit fractions	≥0,5	≥0,3	<0,3
Financial leverage factor, unit fractions	<1	<2	>2
Financial stability coefficient, unit fractions	>0.6	>0.4	<0,4
Financial security level	High	Moderate	Low

If the indicators belong to different criteria, the selection is based on the most indicators belonging to a specific financial risk and financial stability criterion.

6.2. Financial risk and financial security calculation examples

To validate the possibility and viability of using the criteria set out in Table 2, we review the indicators that characterize financial risk as exemplified by three metal-industry companies. For the consistency of results, we selected the companies that have similar sizes, sales (sales profits), and total assets. The indicators and the financial risk and financial security levels for these companies in 2018-2019 can be found in Table 3.

Table 3. Determining the financial risk and financial security levels for the companies using the proposed methods

Indicators	Enterprise 1		Enterprise 2		Enterprise 3	
	2018	2019	2018	2019	2018	2019
Operational profits, mln. of rubles	22821.0	31847.2	1401.5	3681.1	6955.7	12933.7
Average volume of assets, mln. of rubles	119598.5	135217.2	20266.1	28085.6	117223.2	164708.9
Average equity capital, mln. of rubles	47974.1	45477.1	8260.0	7881.5	41399.8	47014.7
Average debt, mln. of rubles	71624.4	89,740.1	12006.1	20204.1	75823.4	117694.2
Economic profitability of assets, %	19.08	23.55	11.67	13.11	5.93	7.85
Average loan interest rate, %	3.57	3.87	11.51	7.63	7.91	6.31
Differentiation factor for financial leverage degree, %	15.5	19.7	0.16	8.48	-1.98	1.54
Equity ratio, unit fractions	0.40	0.34	0.41	0.28	0.35	0.29
Financial leverage factor, unit fractions	1.49	1.97	1.45	2.56	1.83	2.50
Financial stability coefficient, unit fractions	0.85	0.89	0.97	0.70	0.79	0.85

Financial risk level	Moderate-low	Moderate-low	Moderate	Moderate	Moderate-high	Moderate-high
Financial security level	Moderate-high	Moderate-high	Moderate	Moderate	Moderate-low	Moderate-low

Source: Accounting Statements from the official VSMPO-AVISMA website, Accounting Statements from the official STZ website, Accounting Statements from the official CMK website, author's calculations¹

When reviewing the debt of the selected companies, we only reviewed the “proper” debt, i.e. the long-term and short-term loans. This was necessary for a more accurate calculation of the DFL differentiation factor and financial risk assessment.

Table 4 presents the financial security levels for the companies in question calculated using the existing methods. According to the methods, the financial security level is calculated independently for each of the indicators. The overall financial security level is calculated based on the average across all indicator groups.

Table 4. The calculation of the financial security levels of the companies in question using the existing methods

Indicators	Enterprise 1		Enterprise 2		Enterprise 3	
	2018	2019	2018	2018	2019	2018
Equity ratio, unit fractions	0.40	0.34	0.41	0.28	0.35	0.29
Financial security level	Low	Low	Low	Low	Low	Low
Financial leverage factor, unit fractions	1.49	1.97	1.45	2.56	1.83	2.50
Financial security level	Low	Low	Low	Low	Low	Low
Financial stability coefficient, unit fractions	0.85	0.89	0.97	0.70	0.79	0.85
Financial security level	High	High	High	High	High	High

Source: Prepared by the authors based on Tables 1 and 3

Thus, all three companies have low financial security levels, which signifies high financial risks and high dependency on loan funds.

If we compare the financial risk and financial security assessment results in Tables 3 and 4, we can see that the proposed method produces a more comprehensive and thus more detailed assessment of the indicators.

7. Conclusion

To maintain financial security, companies require specific indicators to determine its level. This work suggested additional criteria to determine financial risks in the assessment of financial stability indicators. These criteria were analyzed on the example of three metal industry companies. We propose using the developed criteria for other companies from different industrial sectors. Further research of the

¹ The official web site of CMK. Retrieved from: <http://www.mechel.ru/sector/steel/cmkn/en/>
 The official web site of STZ. Retrieved from: <https://www.stz.tmk-group.ru/en/>
 The official web site of VSMPO-AVISMA. Retrieved from: <http://www.vsmo.ru/en/>

financial security of companies stipulates analyzing other indicator groups and clarifying the criteria for operating and aggregate risks.

References

- Blazhevich, O. G. (2011). Finansovaja bezopasnost predprijatija: opredelenie minimalno neobkhodimogo urovnja [The finance security of a company: determining the required minimum level]. *Academic papers of NAPKS*. Moscow, 25-31. [in Russ.].
- Brigham, E., & Houston, J. (2016). *Finansovyi menedzhment [Finance management]*. Piter. [in Russ.].
- Guan, B., Zhang, J., & Shang, Z. (2016). The analysis of operating leverage effects based on EBIT changes. *Proceedings of the 3d International Conference on applied social science research*, 105, 1045-1047.
- Guliyeva, S. (2019). Manageability of financial risks as an important factor of financial stability. *37th International Scientific Conference on Economic and Social Development - Socio Economic Problems of Sustainable Development*, 572-576.
- Kalashnikova, E., Tatarovskaya, T., & Tselniker, G. (2018). Risk-oriented approach in the system of enterprise economic security. *International Scientific Conference «Global Challenges and Prospects of the Modern Economic Development» (GCPMED2018)*, 677-687.
- Kavyrshina, O. A. (2015). Instrumentariy finansovogo analiza v sisteme ekonomicheskoy bezopasnosti predprijatija [Financial analysis tools in company economic security systems]. *The development of machine-engineering companies in Russia: problems, practices, prospects*, 11-21. [in Russ.].
- Kovalev, V. V. (2010). *Finansovyi menedzhment: Teoriya i praktika [Finance management. Theory and practice]*. Prospekt. [in Russ.].
- Kvasnytska, R., Dotsenko, I., & Matviychuk, L. (2019). Assessment of financial security of an enterprise in the system providing realization of its financial strategy. *Financial and credit activity-problems of theory and practice*, 30(3), 95-102.
- Papekhin, R. S. (2007). *Faktory finansovoy ustoychivosti i bezopasnosti predprijatija [The factors of financial stability and security at a company]*. Volgograd State University [in Russ.].
- Safargaliev, E., Aetdinova, R., & Karimova, A. (2019). Indicators of financial security of small and medium enterprises. *Revista San Gregorio*, 34, 81-88.
- Sapozhnikova, N. G., & Tkacheva, M. V. (2019). *Ekonomicheskaja bezopasnost: praktikum [The economic security of a company: a practicum]*. VSU Publishing House. [in Russ.].
- Savchenko, N. L. (2014). Osnovnye kriterii finansovogo riska pri opredelenii urovnja finansovogo rychaga v ramkakh ekspress analiza: rossiyskaja praktika [The key financial risk criteria when defining the financial leverage level during express-analysis: the Russian practice]. *Economic Analysis: Theory and Practice*, 44(395), 58-66. [in Russ.].
- Savchenko, N. L. (2011). Osobennosti opredelenija kategorii “operacionnyi leveridzh” v rossiyskoy praktike [The features of operating leverage definition in Russian practice]. *Economic Analysis: Theory and Practice*, 28, 32-36. [in Russ.].
- Savchenko, N. L. (2019). *Upravlenie finansovymi resursami predprijatija [Company financial resource management]*. Ural Federal University. [in Russ.].
- Sergeev, A. A. (2019). *Ekonomicheskaja bezopasnost predprijatija [The economic security of a company]*. Urait [in Russ.].
- Zaporozhceva, L. A., & Rjabykh, M. A. (2013). Razrabotka strategii obespechenija finansovoy bezopasnosti predprijatija [Developing a strategy for the company finance security], *Fundamentalnye issledovania*, 11(8), 1637-1642. [in Russ.].