The Analysis of the Financial Risk of Trade in Serbia

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Abstract

The analysis of the factors of retail companies' bankruptcy has lately been a very challenging research question. It was largely influenced by the existing unfavorable, unstable and uncontrollable general business conditions. Taking this into consideration, this paper examines the risk of bankruptcy of trade, especially retail companies in Serbia. In doing so, the research methodology is based on the measurement of bankruptcy risk developed by Kralicek on the example of European companies (DF value indicator and Quick Test). In view of similar general business conditions it fully corresponds to the analysis and forecast of the financial risk of trading companies in Serbia. By applying the Kralicek's method of assessment – the financial stability of trading companies in Serbiaismoderate. Due to this, it will be necessary to encourage the improvement of financial stability in the future by applying the appropriate measures in trading companies in Serbia.

Keywords: *business indicators, Kralicek's DF indicator, QuickTest model, financial stability, profitability*

JEL classification: B16; F65; G30; L81; M40
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1. Introduction

Examining the causes and predicting bankruptcy in any sector is very challenging, especially in the current circumstances due to the general economic and financial crisis. Numerous factors influence the bankruptcy of a trading company, such as: unfavorable general economic business conditions, reduced income, current illiquidity, very low operating cash flows and high indebtedness. Efficient control can greatly influence on the reduction of the financial risk of trading companies.

The subject of the research in this paper is, above all, the factors and estimates of bankruptcy of trading companies in Serbia. The aim and purpose of the research is to apply the appropriate methodology (primarily the Kralicek's model) in order to research the issue of bankruptcy risk assessment of trade companies in Serbia. This is an important prerequisite for mitigating the risk of bankruptcy of trade companies in Serbia (by undertaking adequate measures).

There is extensive literature dealing with theoretical-methodological problems and the specifics of empirical analysis and forecast of financial risk of enterprises in trade (Berman, 2013; Levy, 2014; Kingyens; 2012; Klepáč; 2016;

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Pang; 2016; Keener, 2013; Stanisic, 2017, Polo, 2015; Kralicek, 2007; Keglević-Kozjak, 2014; Alihodžić, 2013). However, there are few works devoted to analyzing the factors of financial risk (i.e. the prediction of bankruptcy) of trading companies in Serbia (Lukić, 2011, 2018; Lukic, 2013, 2014, 2015a, b, c, 2017a, b, c). To a certain extent, a void is filled with this paper in what we find its scientific and professional contribution.

The basic hypothesis of the research in this paper is that familiarity with the factors and the likelihood of bankruptcy of all enterprises, including trading, is an essential prerequisite for mitigating of the given problem. This is also related to the problem of risk assessment of bankruptcy of trade enterprises in Serbia, which is in the focus of research in this paper.

Regarding the methodology, the estimation of the bankruptcy risk of trade enterprises in Serbia is based on the application of the Kralicek's model (Value of DF Indicators and Quick Test) developed on the example of European companies. Given the similar business conditions, this model fully corresponds to the analysis and prediction of the financial risk of trading companies in Serbia.

For the purposes of this study, empirical data have been collected from the Business Registers Agency of the Republic of Serbia. They are completely comparable given the fact that a uniform normative regulation is applied in the last few years.

2. The illustration of the bankruptcy risk in retail

The methodology of measuring and assessing the financial risk i.e. bankruptcy of the company is fully developed. Thus, for example, the FRISK®scorepredicts a financial risk based on an enterprise bankruptcy in the public sector by using a 10-point scoring scale with 96% accuracy. FRISK® "10" marks the highest financial stability. The "1" mark represents the biggest financial bankruptcy risk. Ratings below "5" are in the "red zone" with a financial risk greater than the average. Given methodology is fully applied to retail companies. For illustration purposes, Figure 1 shows the risk of bankruptcy in retail. It clearly shows that the well-known global retailer Wal-Mart is at the lowest risk of bankruptcy. The situation is similar with the retail companies Costco, Home Depot and Tiffany. On the other hand, retailers facing the higher risk of bankruptcy are JC Penney, Neiman Marcus, J. Crew.

Various economic and financial business conditions make financial risks in retail companies to be different. Thus, for example, the financial risk at Wal-Mart is at a very low level, while the financial risk for Toys R US is high.

Many factors affect retailers' financial risk, such as: income reduction, significant loss, high debt, low operating cash flow and others. The effective control of these and other factors (i.e. with the increase in the efficiency of financial flows' management) can significantly mitigate the financial risk. Permanent monitoring can therefore control financial risk.

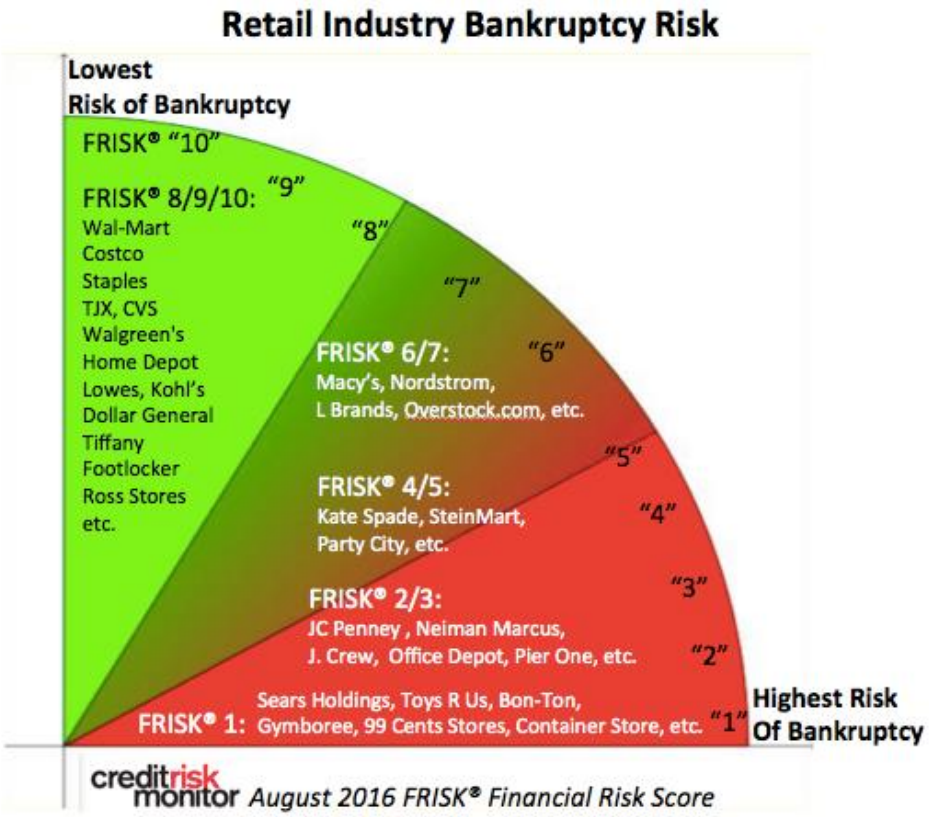

Figure 1. Illustration of bankruptcy risk assessment in retail
Source: A Snapshot of Financial Risk in the Retail Industry, https://www.creditriskmonitor.com/blog/snapshot-financial-risk-retail-industry (January 27, 2018)

All in all, familiarity with the potential risk of retail company bankruptcy is one of the means for mitigation of the future financial problems, as well as implementation of the appropriate measures in the context of this (such as efficient revenue management, operational cash flows, current liquidity and financial indebtedness). This can be done with the application of any developed method for assessing the potential risk of bankruptcy of a given retail company. In the further presentations of the treated problems in this paper, we will carry out an assessment of the bankruptcy risk of trading companies in Serbia by using the Kralicek's model.

3. Kralicek's DF indicator

There are numerous models for assessing the financial risk (i.e. bankruptcy) of a company. In this paper we will look at the implementation of Kralicek's DF indicators of estimating (i.e. predicting) the financial and business performance of trading companies in Serbia. Referring to the Altman model of bankruptcy forecasting of companies operating on the US market, on a sample of European companies (operating in the markets of Austria, Germany and Switzerland) Austrian Professor Peter Kralicek (1990) developed a multivariate discriminatory analysis model for predicting bankruptcy, known as Kralicek's DF indicator, and Quick Test. Its discriminatory function, developed on the basis of the financial statements of the analyzed companies operating on the European market, is as follows:

$$DF = 1.5X1 + 0.08X2 + 10X3 + 5X4 + 0.3X5 + 0.1X6 \quad (1)$$

where:

DF = value of discriminatory function;
X1 = net cash flow (EBIT + depreciation) / total liabilities;
X2 = total assets / total liabilities;
X3 = earnings before interest and taxes (EBIT) / total assets;
X4 = earnings before interest and taxes (EBIT) / total income;
X5 = inventories / total revenues;
X6 = operating income / total assets.

The value of the DF indicator can be positive and negative. Positive value indicates the solvency of a given company. The negative value shows its insolvency. Table 1 shows the values of the DF indicator with a corresponding financial stability estimate.

Table 1. Critical values of the DF indicators with a corresponding financial stability estimate

Value DF indicators	Financial stability
>3,0	Excellent
>2,2	Very good
>1,5	Good
>1,0	Medium
>0,3	Bad
≤0,3	Beginning of insolvency
≤0,0	Moderate insolvency
≤-1,0	Pronounced insolvency

Source: Adapted to Kralicek P. [online] Available at: (www.kralicek.at/pdf/krdruck.pdf) [Accessed in January 16, 2018]

4. Kralicek's Quick Test

In addition to DF indicators, Professor Kralicek created a Quick Test model that is applied in assessing the financial performance and profitability of the company assets used (i.e. the risks of indebtedness, liquidity, profitability and success) based on four key indicators grouped so that the first two determine financial stability and the other two profitability. With the Quick Test model a scoring scale of grades 1 to 5 is defined for every indicator, where 1 represents the best and the 5 lowest score. In Table 2, the Kralicek's Quick Test model is shown.

Table 2. Kralicek's Quick Test model

Indicator	Excellent (1)	Very good (2)	Good (3)	Bad (4)	Risk from insolvency (5)	
Ratio of self-financing **(K1)**	>30%	≥20%	≥10%	<10%	Negative result	Financial stability
Period of debt repayment in years **(K2)**	<3	≤5	≤12	≤30	>30	
Percentage of total capital profitability **(K3)**	>15%	>12%	≥8%	<8%	Negative result	Profitability
Share of cash flow in operating revenues **(K4)**	>10%	≥8%	≥5%	<5%	Negative result	

Source: Adapted to Kralicek P. [online]
Available at: *www.kralicek.at/pdf/krdruck.pdf*. [Accessed in January 16, 2018]

The indicators of Kralicek's Quick Test model are:

K1 – capital / total liabilities. This indicator shows the share of capital in total sources of financing. It is recommended that the value of this indicator is 10% or higher.

K2 – (total liabilities – cash) / (net profit + depreciation). This indicator shows the duration of debt repayment, i.e. the ratio between total liabilities less cash and net profit (earnings after taxation) plus depreciation. If the value of this indicator is greater than 30 (years), this means that the company has some difficulty with solvency. It is recommended that the value of this indicator should be equal to 12 years or less.

K3 – EBIT (earnings before interest and taxes) / total assets. This indicator shows the profitability of total assets in relation to operating profit. If the value of this indicator is negative, it is considered that the company has certain difficulties with solvency. It is recommended that the value of this indicator should be 8% or higher.

K4 – (net gain + depreciation) / operating income. If the value of this indicator is negative, it means that the company has some difficulty with solvency. It is recommended that the value of this indicator should be 5% or higher.

5. Financial stability of trade in Serbia

The financial stability of trade enterprises in Serbia is determined by numerous specific factors, and these are: unfavorable general economic business conditions, underdevelopment of the financial market, foreign exchange risk, low current liquidity, high indebtedness, slower growth of sales revenues, low profitability, high bank interest rate, inflation, high unpaid receivables etc. By applying the Kralicek's model in this paper, we will look at financial stability – the risk of bankruptcy – of trading companies in Serbia. Table 3 shows the relevant analytical indicators for calculating Kralicek's DF value of trade companies in Serbia for the period of 2013-2016. (The number of trade companies in the observed years is as follows: 2013–33,905, 2014 – 32,911, 2015 – 32,603 and 2016 – 32.907) (According to: Business Registers Agency of the Republic of Serbia, Belgrade). Figure 2 shows the trend of Kralicek's analytical indicators of financial stability of trade enterprises in Serbia.

During the observed period, solvency of trade in Serbia slightly increased (as indicated by indicators X1 – solvency and X2 – financial indebtedness). The profitability of trading companies in Serbia slightly increased in the last years of the analyzed period (judging by the trend of indicators X3 – return on assets and X4 – return on sales). The efficiency of the use of available assets (inventories and total assets) of trading companies in Serbia increased in the observed period – which is clearly indicated by the trend of indicator X5 – share of inventories in total revenues, and X6 – turnover ratio. Based on this, it can be concluded that the solvency of trading companies in Serbia slightly increased and that it is quite "satisfactory" in view of the still existing unfavorable general business conditions. In order to increase the solvency of trading companies in Serbia, it is necessary to manage revenue, costs, assets, liabilities and profit as efficiently as possible. Likewise, it is necessary to adapt adequately to existing general business conditions by applying "new business models" (including modern information and communication technology).

Table 3. Kralicek's analytical indicators of financial stability of trade in Serbia, 2013-2016

	X1 (net cash flow (EBIT + depreciation)/ total liabilities)	**X2** (total assets/ total liabilities)	**X3** (earnings before interest and taxes (EBIT)/ total assets)	**X4** (earnings before interest and taxes (EBIT)/ total revenue)	**X5** (inventories/ total revenue)	**X6** (business revenue/ total assets)
2013	0,1086	1,5285	0,0575	0,0416	0,1613	1,3384
2014	0,1090	1,5452	0,0564	0,0406	0,1617	1,3392
2015	0,1164	1,5779	0,0592	0,0423	0,1727	1,3589
2016	0,1166	1,5868	0,0585	0,0401	0,1729	1,4228

Note: Calculations performed by the author(s).
Source: Business Registers Agency of the Republic of Serbia, Belgrade.

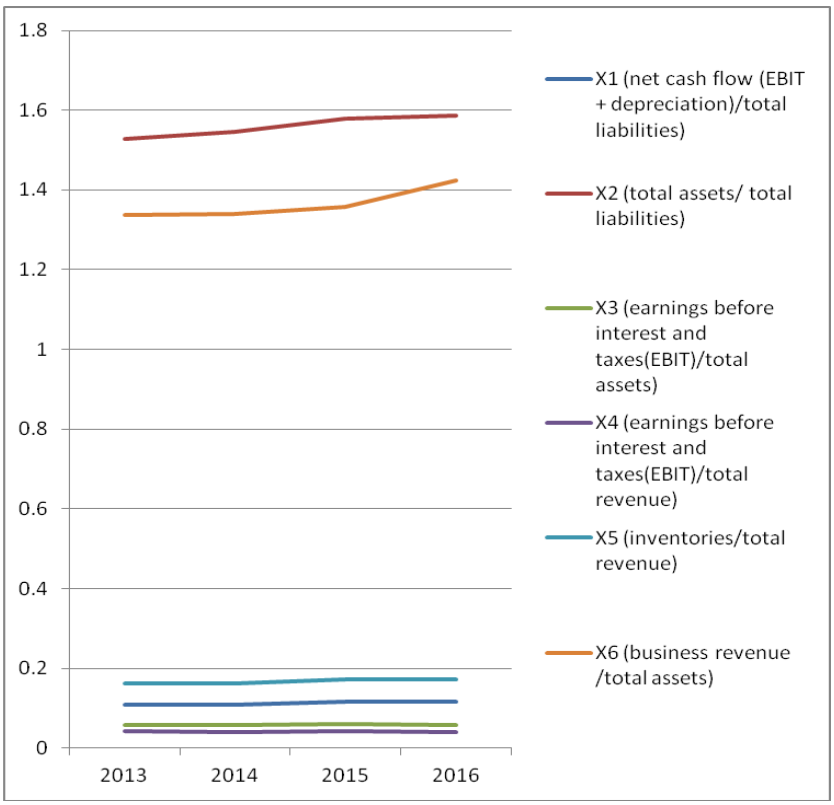

Figure 2. Trend of Kralicek's analytical indicators of financial stability of trade in Serbia
Note: The figure illustrated by the author(s).
Source: Business Registers Agency of the Republic of Serbia, Belgrade

Table 4 shows the descriptive statistics of Kralicek's analytical indicators of financial stability of trade in Serbia for the period 2013-2016.

Table 4. Descriptive statistics of Kralicek's analytical indicators of financial stability of trade in Serbia, 2013-2016

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
X1 (net cash flow (EBIT + depreciation)/total liabilities)	4	,11	,12	,1127	,00445
X2 (total assets/total liabilities)	4	1,53	1,59	1,5596	,02738
X3 (earnings before interest and taxes (EBIT)/total assets)	4	,06	,06	,0579	,00122

X4 (earnings before interest and taxes (EBIT)/total revenues)	4	,04	,04	,0411	,00099
X5 (inventories/total revenues)	4	,16	,17	,1672	,00653
X6 (business revenues/total assets)	4	1,34	1,42	1,3648	,03980
Valid N (listwise)	4				

Note: Calculation performed by the author using the statistical software program SPSS

The data of descriptive statistics show the average value of the observed analytical indicators of the financial stability of trade enterprises in Serbia in order to envisage their solvency, liquidity, efficiency and profitability and to compare them with "industrial standards" of trade enterprises from countries with developed market economies. Therefore, in Serbian trade companies, on average, the solvency rate (X1) is 0,1127, the financial indebtedness (X2) is 1,5596, the return on assets (X3) is 0,0579 (5,79%), the return on sales (X4) is 0.0411 (4.11%), the share of inventory in total revenue (X5) is 0.1672 (16.72%) and the assets' turnover ratio (X6) is 1.3648.

Table 5 shows the correlation analysis of Kralicek's analytical indicators of financial stability of trade in Serbia for the period 2013-2016.

Table 5. Correlation analysis of Kralicek's analytical indicators of financial stability

Correlations							
		X1 (net cash flow (EBIT + depreciation)/ total liabilities)	**X2** (total assets/ total liabilities)	**X3** (earnings before interest and taxes (EBIT)/total assets)	**X4** (earnings before interest and taxes (EBIT)/total revenue)	**X5** (inventories/ total revenue)	**X6** (business revenue /total assets)
X1 (net cash flow (EBIT + depreciation)/total liabilities)	Pearson Correlation	1	,970*	,881	,027	1,000**	,767
	Sig. (2-tailed)		,030	,119	,973	,000	,233
	N	4	4	4	4	4	4
X2 (total assets/total liabilities)	Pearson Correlation	,970*	1	,740	-,167	,967*	,813
	Sig. (2-tailed)	,030		,260	,833	,033	,187
	N	4	4	4	4	4	4
X3 (earnings before interest and taxes (EBIT)/total assets)	Pearson Correlation	,881	,740	1	,418	,887	,523
	Sig. (2-tailed)	,119	,260		,582	,113	,477
	N	4	4	4	4	4	4
X4 (earnings before interest and taxes (EBIT)/total revenues)	Pearson Correlation	,027	-,167	,418	1	,037	-,555
	Sig. (2-tailed)	,973	,833	,582		,963	,445
	N	4	4	4	4	4	4
X5 (inventories/total revenues)	Pearson Correlation	1,000**	,967*	,887	,037	1	,763
	Sig. (2-tailed)	,000	,033	,113	,963		,237

	N	4	4	4	4	4	4
X6 (business revenues /total assets)	Pearson Correlation	,767	,813	,523	-,555	,763	1
	Sig. (2-tailed)	,233	,187	,477	,445	,237	
	N	4	4	4	4	4	4
*. Correlation is significant at the 0.05 level (2-tailed).							
**. Correlation is significant at the 0.01 level (2-tailed).							

Note: The calculation performed by the author using the statistical software program SPSS

There is a strong positive correlation at the level of statistical significance ($p < 0.05$) between indicators X1 (solvency) and indicators X2 (financial indebtedness) and X5 (inventory management efficiency –reciprocal inventory turnover ratio). High positive correlation between indicators X1 (solvency) and X3 (profitability of total asset use) and X6 (asset utilization efficiency – asset turnover ratio) is not at the level of statistical significance ($p > 0.005$). The positive correlation between indicators X1 (solvency) and X4 (yield from sales) is very poor and it is not at the level of statistical significance ($p < 0.05$). This itself indicates that the financial stability of trading companies in Serbia can be significantly improved by more efficient (integrated) revenue management, cost and profit. To this end, it is necessary to apply the concept of cost accounting by activities, activity management, target costs, customer management, product category management, kaizen, lean, enterprise resource planning, inventory management in accordance with just-in-time philosophy, and other contemporary models in the business of trading companies in Serbia. Particular attention should be given to the implementation of the concept of sustainable development (energy and other efficiency). Likewise, modern information and communication technologies (radio frequency identification, electronic commerce) should be used to the greatest extent possible. The effects of applying "new business models" are improvement of the overall economic, business, financial and environmental performance of trading companies in Serbia.

Table 6 shows the Kralicek's value of DF trade indicators in Serbia for the period 2013-2016.

Table 6. Kralicek's value of DF indicators of trade in Serbia

	2013	**2014**	**2015**	**2016**
X1 (net cash flow (EBIT + depreciation)/total liabilities)	0,1629	0,1635	0,1746	0,1749
X2 (total assets/total liabilities)	0,1223	0,1236	0,1262	0,1269
X3 (earnings before interest and taxes (EBIT)/total assets)	0,5750	0,5640	0,5920	0,5850
X4 (earnings before interest and taxes (EBIT)/total revenues)	0,2080	0,2030	0,2115	0,2005
X5	0,0484	0,0485	0,0518	0,0519

(inventories/total revenues)				
X6 (operating revenues /total assets)	0,1338	0,1339	0,0173	0,0173
DF (discriminatory function value)	1,2504	1,2365	1,1734	1.1565
Financial stability assessment	Medium	Medium	Medium	Medium

Note: Calculations performed by the author.
Source: Business Registers Agency of the Republic of Serbia, Belgrade

According to the data in the table, and estimated on the basis of the value of discriminatory function DF, financial stability of the trade companies in Serbia is at the medium level in all observed years. In order to improve their financial stability, it is necessary to manage the overall financial flows more efficiently.

Table 7 shows the Kralicek's Quick Test model of trade in Serbia for the period 2013-2016.

Table 7. Kralicek's Quick Test model of trade in Serbia

	2013		**2014**		**2015**		**2016**	
	Value	Estimate	Value	Estimate	Value	Estimate	Value	Estimate
Ratio of self-financing - **K1** (assets/total liabilities)	34,57%	1	35,28%	1	36,62%	1	36,98%	1
Debt repayment in years - **K2** (total liabilities – cash)/(net income + depreciation)	11,02	3	10,91	3	9,93	3	9,35	3
Percentage of total capital profitability - **K3** (EBIT/total assets)	5,75%	4	5,64%	4	5,92%	4	5,85%	4
Cash flow share in business revenues - **K4** (netincome + depreciation)/business revenues)	4,12%	4	4,07%	4	4,26%	4	4,23%	4

Note: Calculations performed by the author
Source: Business Registers Agency of the Republic of Serbia, Belgrade.

Based on the data presented in the given table, we can conclude that the ratio of self-financing of trade companies in Serbia is excellent. Time duration of debt repayment (expressed in years) of trading companies in Serbia is good. However, profitability of trading companies in Serbia is bad. The share of cash flows in business revenues, as a measure of profitability, is also bad. All this points to the fact that it is necessary to increase profitability in order to improve the financial stability of trading companies in Serbia. This can be achieved by applying

"new business models" in the function of more efficient revenue management, cost and profit, as well as by using the concept of sustainable development, modern information and communication technologies.

6. Conclusion

In terms of the value of the assessment, the research carried out in this paper by applying Kralicek's model shows that the financial stability of trading enterprises in Serbia is on the average level. The profitability of trade companies in Serbia is unsatisfactory. In order to improve the financial stability of trade companies in Serbia, it is necessary to increase profitability above all. Profitability of trading companies in Serbia can be increased by more efficient management of revenues, costs and profits. This is achieved by applying the concept of cost accounting by activity, activity management, target costs, value chain, customer management, product category management, kaizen, lean, and others. The profitability of trading companies in Serbia can significantly increase with the concept of sustainable development with special emphasis on reduction (with increasing use of renewable energy sources) of energy. The increasing use of modern information and communication technologies (enterprise resource planning, radio frequency identification, electronic commerce) is positively reflected on the profitability of trade companies in Serbia.

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