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## ANALYSIS OF TRADE MARGINS IN SERBIA

**Abstract:** Research into the size and structure of the margin in trade is a continuous, relevant, and complex issue. Margin is one of the significant performance indicators of trade. In this study, starting from that, the size and structure of the trade margin of the European Union are analyzed, with special reference to Serbia. The research results show the following: In the trade of the European Union, the margin rate ranges from 7.02% (Luxembourg) to 22.05% (Ireland). In the leading countries of the European Union, the trade margin rate is Germany at 15.15%, France at 16.48%, and Italy at 13.48%. In the countries in the region of Serbia, the trade margin rate is Croatia 13.22% and Slovenia 13.15%. The trade margin rate in Bosnia and Herzegovina is 11.35%. In Albania, the trade margin rate is 11.66%. In Serbia, the trade margin rate is 15.79. The trade margin rate in Serbia is higher than in Croatia and Slovenia. In the trade of Serbia, the sales margin rate in the period 2013-2022. ranged from 13.51% (2014) to 20.45% (2013). The average sales margin rate in Serbian trade is 14.82%. It is lower in 2022 compared to 2021. The rate of margin from stocks in Serbian trade ranges from 69.52% (2015) to 122.74% (2013). In 2022, compared to 2021, the margin rate from inventory is lower. The average rate of margin from stocks in Serbian trade is 79.97%. In Serbian trade, there is a strong correlation between margin and sales, the purchase value of realized goods, operating expenses, salary of employees, net profit and inventory, and that at the level of statistical knowledge. There is a strong correlation between the rate of margin on sales the rate of margin on inventory and the rate of operating costs of trade in Serbia. The target margin of trade in Serbia can be achieved by effective control of sales, purchase value of realized goods, operating costs, employee wages, net profit, and inventory. The purpose of this is to improve the competitive position and digitize the entire business.

**Keywords:** sales, purchase value of realized goods, margin, operating costs, net profit

**JEL classification :** C61, M41, L81

### 1. INTRODUCTION

By the nature of things, the margin is one of the most important performance indicators of trade. In terms of structure, it serves to cover operational costs and generate a certain profit for the needs of trade growth and development. It is formed freely and in a controlled manner. The size of the trade margin, regardless of the way it is formed, should be large enough to suit producers, traders, and consumers. Bearing in mind the importance of the margin in trade, in this study, in addition to the theoretical and methodological analysis, the determinants of the size and structure of the trade margin of the US and the European Union are empirically investigated, with special reference to Serbia. The aim and purpose of this is to specifically point out what measures should be taken to achieve the target size and structure of the trade margin in Serbia. The research hypothesis in this study is based on the fact that continuous analysis and control of the size and structure of the margin is a prerequisite for achieving the target performance in trade. Consequently, the research methodology based on ratio analysis, statistical analysis, and DEA analysis was adopted. The necessary empirical data were collected from various

relevant sources (Internet sites, Eurostat, and the Agency for Economic Registers of the Republic of Serbia). The composition of the study is such that, in addition to the introduction and conclusion, it includes a literature review and theoretical, methodological, and empirical dimensions of the margin problem in trade.

## 2. REVIEW OF THE LITERATURE

In the literature, the gross margin of trade is from different angles. By the nature of things, significant attention has been devoted to the theoretical and methodological basis of gross margin analysis (Berman et al., 2018; Levy et al., 2019; Lukić, 2011, 2020). The size of the gross margin of trade in individual countries is different, as indicated by numerous empirical studies ( O'Riordan, 1993; Potjes & Thurik, 1993 ). It is also different for individual trade sectors (Patrick D'Arcy et al., 2012). Special attention in the literature is devoted to the empirical analysis of the impact of inventory on the size of the gross margin in retail (Gaur et al., 2014 ). The influence of margin on the performance of trading companies in Serbia has been investigated in the literature (Lukić, 2017). The size and structure of operating costs as a component of the gross trade margin in Serbia were also analyzed (Baralić, 1982; Lukić, 2021; Lovreta & Petković, 2021). Transportation and storage costs significantly affect the size of the gross margin in trade. The size and structure of the margin are specific for certain economic branches, for example in the oil industry ( Nowakowski & Karasiewicz, 2016). Competition is a significant factor in the size of trade margins ( Carter, 2019). In the literature, considerable attention has been paid to price and margin control of food supply chains in the European Union (Baltussen et al., 2019). Business concentration and margin increase in the retail sector were especially analyzed (Hambur & Cava 2018). In the literature, considerable attention is paid to gross margin, gross profit, and price elasticity of demand (Vance, 2021). Generally speaking, all relevant aspects of trade margin have been analyzed in the literature. At the center of attention in the literature is the problem of determinants of the size and structure of the margin in trade ( Ailawadi & Harlam, 2004).

## 3. THEORETICAL AND METHODOLOGICAL ANALYSIS OF THE MARGIN IN TRADE

Margin is a very important indicator of trading performance (Berman et al., 2018; Levy et al., 2019). In terms of structure, it serves to cover operating costs and generate a certain profit for the needs of growth, development, and improvement of trade operations. The size of the trade margin should be such that it can cover all operating costs make a certain profit, and satisfy everyone in the value chain (suppliers, traders, and customers). Determinants of the size of the margin are sales, purchase value of goods, dependent procurement costs, energy costs, operating costs, employee wages, profit, assortment, competition, digitization of the entire business, government policy, and others. Effective control of these and other factors can influence the achievement of the target margin. In the methodological sense, that is to say, the margin rate is determined as the difference between the sale and purchase value of the goods divided by sales times 100, i.e.:  $\text{Gross margin percentage} = (\text{Sales} - \text{Cost of goods sold}) / \text{Sales} \times 100$ . It shows how much, for example, \$1 of sales generates \$margin. In other words, it shows how much % of the margin is realized on 100% of sales. Margin is very often expressed as a % of investment in inventory. The rate of margin from investments in inventory is determined by dividing the margin by inventory times 100, that is:  $\text{Gross margin return on investment} = \text{Gross margin} / \text{Cost of average inventory} \times 100$ . It shows how much, for example, \$ of margin is realized on \$ 1 of inventory investment. In other words, it shows how much % margin is realized on 100% investment in inventory. The margin rate is different for certain sectors, but markets do not. As a rule, it is lower in wholesale trade than in retail trade. For the sake of illustration, Table 1 shows the margin rate of wholesale trade, retail trade, and electronic trade.

**Table 1:** Sectoral analysis of the margin rate

Wholesale Industry Profitability Ratios	2 Q 2023	1 Q 2023	4 Q 2022	3 Q 2022	2 Q 2022
	2023	2023	2022	2022	2022
Gross Margin	24.91 %	18.87 %	23.12 %	21.55 %	21.87 %
Gross Margin Annual (TTM)	24.85 %	18.57 %	22.24 %	21.92 %	22.18 %
Gross Margin Ranking	#89	# 99	#88	# 96	# 96
EBITDA Margin	8.17 %	4.11 %	8.01 %	4.3%	5.92 %

EBITDA Margin Annual (TTM)	6.63 %	5.13 %	6.12 %	5.12 %	5.7 %
EBITDA Margin Ranking	#82	# 92	# 75	# 94	# 96
Operating Margin	4.93 %	4.01 %	6.82 %	3.11 %	4.35 %
Annual Operating Margin (TTM)	5.02 %	4.19 %	4.65 %	3.9%	4.27 %
Operating Margin Ranking	#88	#85	# 75	# 90	# 95
Pre-Tax Margin	6.04 %	3.18 %	6.85 %	1.67 %	4.12 %
Pre-Tax Margin Annual (TTM)	4.44 %	3.73 %	3.98 %	3.14 %	3.71 %
Pre-Tax Margin Ranking	#70	#80	# 58	#88	#89
Net Margin	4.49 %	2.36 %	5.46 %	1.05 %	3.18 %
Net Margin Annual (TTM)	3.35 %	2.83 %	3.04 %	2.22 %	2.7 %
Net Margin Ranking	# 75	#80	# 59	#85	#

Source: [https://csimarket.com/Industry/industry\\_Profitability\\_Ratios.php?ind=1310&hist=1](https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=1310&hist=1)

Retail Sector Profitability Ratios	2 Q 2023	1 Q 2023	4 Q 2022	3 Q 2022	2 Q 2022
	2023	2023	2022	2022	2022
Gross Margin	25.02 %	23.36 %	24.45 %	23.63 %	23.52 %
Gross Margin Annual (TTM)	25.08 %	23.51 %	24.27 %	23.36 %	23.49 %
Gross Margin Ranking	# 13	# 12	# 13	# 13	# 13
EBITDA Margin	6.8 %	6.42 %	6.56 %	3.7 %	5.51 %
EBITDA Margin Annual (TTM)	6.52 %	6.17 %	5.8 %	5.77 %	6.59 %
EBITDA Margin Ranking	# 12	# 12	# 12	# 13	# 13
Operating Margin	4.94 %	4.47 %	3.49 %	2.62 %	4.63 %
Annual Operating Margin (TTM)	4.12 %	4.23 %	3.94 %	3.63 %	4.22 %
Operating Margin Ranking	# 12	# 12	# 13	# 13	# 13
Pre-Tax Margin	5.01 %	4.07 %	2.87 %	2.03 %	3.77 %
Pre-Tax Margin Annual (TTM)	3.72 %	3.72 %	3.09 %	3.27 %	3.99 %
Pre-Tax Margin Ranking	# 11	# 12	# 11	# 13	# 13
Net Margin	3.88 %	3.11 %	2.17 %	1.43 %	2.93 %
Net Margin Annual (TTM)	2.83 %	2.85 %	2.3%	2.52 %	3.09 %
Net Margin Ranking	# 11	# 12	# 11	# 13	# 13

Source: [https://csimarket.com/Industry/industry\\_Profitability\\_Ratios.php?s=1300](https://csimarket.com/Industry/industry_Profitability_Ratios.php?s=1300)

Internet, Mail Order & Online Shops Industry Profitability Ratios	1 Q 2023	4 Q 2022	3 Q 2022	2 Q 2022	Q1 2022
	2023	2022	2022	2022	2022
Gross Margin	43.75 %	38.08 %	41.5 %	41.63 %	39.47 %
Gross Margin Annual (TTM)	41.85 %	39.38 %	39.84 %	39.38 %	38.95 %
Gross Margin Ranking	# 58	#70	# 63	# 62	# 63
EBITDA Margin	11.21 %	12.27 %	1.43 %	-	3.27 %
EBITDA Margin Annual (TTM)	8.15 %	5.7 %	7.88 %	8.83 %	10.88 %
EBITDA Margin Ranking	# 68	#55	# 101	# 104	# 97
Operating Margin	3.32 %	-	-	2.5%	2.54 %
Annual Operating Margin (TTM)	1.82 %	0.9%	1.37 %	2.29 %	3.11 %
Operating Margin Ranking	# 91	# 98	# 97	# 101	# 94

Pre-Tax Margin	2.77 %	-	0.21 %	-	-
Pre-Tax Margin Annual (TTM)	0.11 %	-	1.18 %	1.92 %	3.93 %
Pre-Tax Margin Ranking	#87	# 94	# 94	# 101	# 97
Net Margin	2.03 %	-	0.02 %	-	-
Net Margin Annual (TTM)	0.13 %	-	1.27 %	1.84 %	3.65 %
Net Margin Ranking	#84	# 95	# 95	# 100	# 97

Source: [https://csimarket.com/Industry/industry\\_Profitability\\_Ratios.php?ind=1302](https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=1302)

In this specific case, therefore, the margin rate is lower in wholesale trade than in retail trade. With e-commerce, the margin rate is significantly higher than with traditional wholesale and retail trade. The margin rate is different for individual product categories. As a rule, it is lower in food products than in non-food products. For illustration purposes, Table 2 shows the margin of selective sectors (ie, product categories) in the US

**Table 2:** Margins by Sectors (US), January 2023

Industry Name	Gross Margin	Net Margin
Apparel	51.84%	5.07%
Beverage (Alcoholic)	44.42%	5.76%
Beverage (Soft)	53.55%	14.60%
Drugs (Pharmaceutical)	67.02%	18.35%
Electronics (Consumer & Office)	32.29%	0.54%
Electronics (General)	27.35%	6.32%
Hotel/Gaming	56.29%	1.10%
Insurance (General)	40.00%	15.21%
Insurance (Life)	25.99%	6.07%
Food Wholesalers	14.39%	1.09%
Oil/Gas Distribution	23.60%	2.08%
Restaurant/Dining	30.07%	9.28%
Retail (Automotive)	21.04%	4.07%
Retail (Building Supply)	34.51%	8.67%
Retail (Distributors)	31.30%	7.30%
Retail (General)	23.25%	2.35%
Retail (Grocery and Food)	24.71%	1.96%
Retail (Online)	42.78%	0.64%
Retail (Special Lines)	29.90%	3.86%
Transportation	21.94%	6.99%
Transportation (Railroads)	52.26%	27.65%
Utilities (General)	36.67%	12.68%

Note: Last Updated in January 2023 By Aswath Damodaran

Source: [https://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/datafile/margin.html](https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/margin.html)

In the displayed table, as can be seen, the margin rate ranges from 14.39% ( Food Wholesalers ) to 67.02% ( Drugs (Pharmaceutical) ). Generally speaking, the margin rate is lower for food (fast-moving goods) than for other product categories. (slower moving goods). There are two margin management strategies in trade: the strategy of small margin higher sales, and the strategy of higher small lower sales. The choice of margin management strategy in trade depends, among other things, on the product category. The concept of managing product categories is one of the important levers for improving the performance of traders.

**The size of the trade margin in the US.** The size of the trade margin is different for individual countries due to the different influences of key factors. In this study, we will illustrate this through the example of trade in the US, the European Union, and Serbia. Table 3 shows the margin rate in the US by trade sector and product category.

**Table 3:** Gross margin in the US

	2021	2020	2019	2018	2017
Wholesale trade-durable goods	26.6%	24.4%	24.4%	24.7%	25.2%
Wholesale trade-non-durable goods	21.7%	18.1%	17.6%	17.1%	18.1%
General Merchandise Stores	31.6%	30.5%	32.7%	30.6%	31.6%
Food Stores	28%	28.1%	27.1%	27.6%	26.7%
Apparel And Accessory Stores	39.8%	31.5%	34.5%	35.5%	36.9%
Home Furniture, Furnishings, And Equipment	47.9%	37.3%	36.3%	35.8%	36.6%
Miscellaneous Stores	35.4%	31.8%	30.5%	33.6%	32.3%

<https://www.readyratios.com/sec/ratio/gross-margin/>

The data in the given table shows that the margin rate in 2021 in the US was for wholesale - durable goods at 26.6%, wholesale - non-durable goods at 21.7%, food stores at 28%, home furniture, and equipment stores at 47.9%, etc. Therefore, in the US, the margin at the grocery store is significantly lower than at the others. The very nature of the product category, among other things, determines the size of the margin. In the US, the trade margin is higher than in the countries of the European Union and Serbia.

**Size of trade margin in Russia.** To compare the size of the trade margin in the US and Russia, we will analyze the size of the trade margin in Russia. Table 4 shows the size of the margin of wholesale and retail trade in Russia.

**Table 4:** Margin of trade in Russia

	Wholesale and retail trade in motor vehicles and repairs, %		Wholesale trade, except motor vehicles and repairs, %		Retail trade, except for motor vehicles and repairs, %	
	2019	2020	2019	2020	2019	2020
Gross profit (margin)	8.93	10.19	18.53	16.49	24.80	24.87
Gain	1.81	3.03	6.12	4.43	2.86	3.48

**Note:** Author's calculation

**Source:** Trade in Russia 2021. Federal State Statistics Service (Rosstat), Statistical Collection, Moscow 2021.

In Russia, the margin of wholesale trade, excluding motor vehicles and direct sales in 2020, was 16.49%. In retail trade, except for motor vehicles, the margin was 24.87%. The trade margin in Russia is therefore lower than in the US

**The size of the trade margin in the European Union.** The trade margin of the trade of the European Union is calculated as the difference between the turnover and the total supply of goods and services. By the nature of things, the size of the trade margin for individual European Union member countries is different. Table 5 and Picture 1 show the trade margin rate in the European Union for 2020. Descriptive statistics of the observed statistical variables of European Union trade are shown in Table 6.

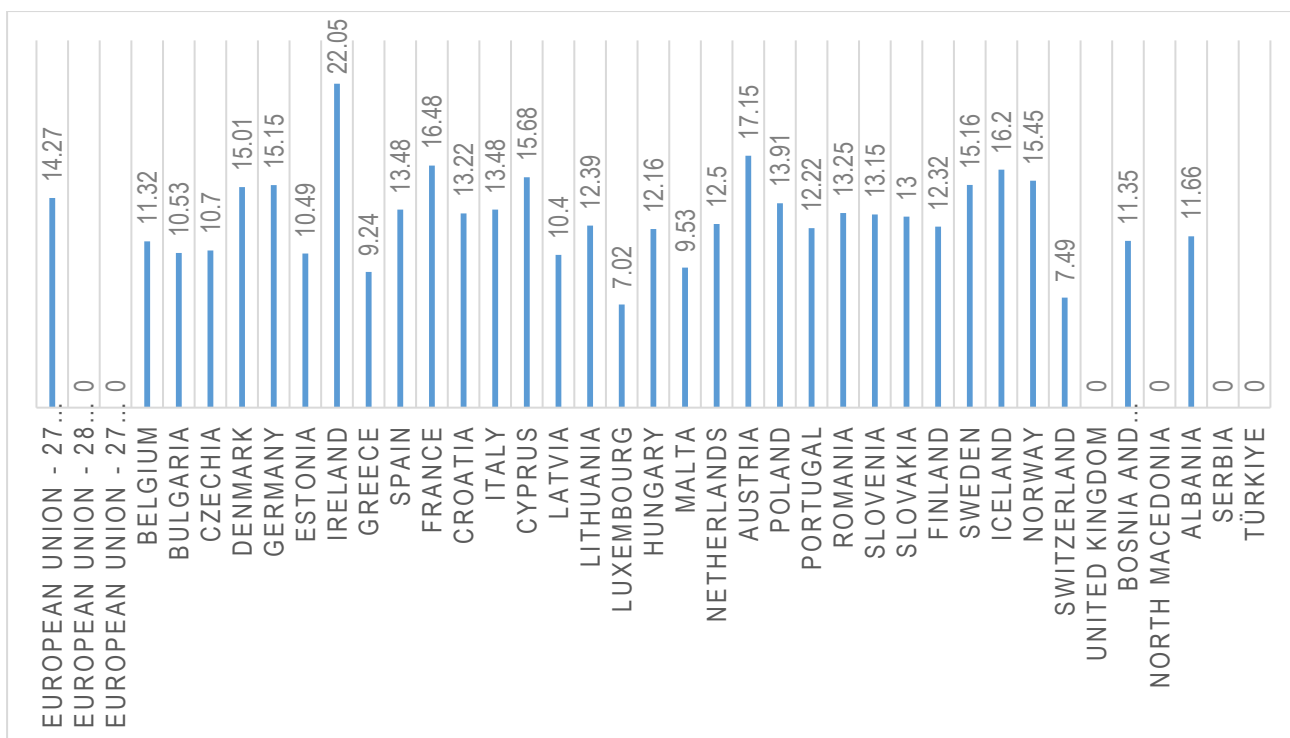
**Table 5:** Gross margin trade in the European Union 2020

Wholesale and retail trade; repair of motor vehicles and motorcycles	Turnover or gross premiums written - million euros	Total purchases of goods and services - million euros	Gross margin – one million euros	gross margin, %
European Union - 27 countries (from 2020)	8,745,002.6	7,497,188.1	1,247,814.50	14.27
European Union - 28 countries (2013-2020)	:	:	:	:
European Union - 27 countries (2007-2013)	:	:	:	:
Belgium	472,683.6	419,183.7	53,499.90	11.32
Bulgaria	67,379.3	60,285.5	7,093.80	10.53

Czechia	159,941.2	142,830.1	17,111.10	10.70
Denmark	187,951.8	159,740.2	28,211.60	15.01
Germany	2,119,183.7	1,798,232.0	320,951.70	15.15
Estonia	26,936.4	24,111.0	2,825.40	10.49
Ireland	183,495.2	143,036.5	40,458.70	22.05
Greece	106,976.0	97,093.2	9,882.80	9.24
Spain	726,551.3	628,641.2	97,910.10	13.48
France	1,331,409.7	1,112,035.6	219,374.10	16.48
Croatia	35,379.7	30,703.3	4,676.40	13.22
Italy	945,227.6	817,787.0	127,440.60	13.48
Cyprus	12,673.7	10,686.4	1,987.30	15.68
Latvia	28,555.4	25,584.7	2,970.70	10.40
Lithuania	41,122.8	36,027.3	5,095.50	12.39
Luxembourg	74,336.3	69,114.4	5,221.90	7.02
Hungary	104,756.1	92,013.8	12,742.30	12.16
Malta	8,603.8	7,784.1	819.70	9.53
Netherlands	691,536.8	605,115.3	86,421.50	12.50
Austria	249,457.7	206,663.7	42,794.00	17.15
Poland	421,418.6	362,803.7	58,614.90	13.91
Portugal	140,636.0	123,456.2	17,179.80	12.22
Romania	128,164.3	111,177.6	16,986.70	13.25
Slovenia	34,082.1	29,601.4	4,480.70	13.15
Slovakia	58,303.8	50,723.6	7,580.20	13.00
Finland	118,489.1	103,888.8	14,600.30	12.32
Sweden	269,750.9	228,867.9	40,883.00	15.16
Iceland	9,140.9	7,660.2	1,480.70	16.20
Norway	179,149.5	151,474.8	27,674.70	15.45
Switzerland	1,186,803.2	1,097,966.8	88,836.40	7.49
United Kingdom	:	:	:	:
Bosnia and Herzegovina	17,221.4	15,267.3	1,954.10	11.35
North Macedonia	8,833.5	:	:	:
Albania	8,337.7	7,365.4	972.30	11.66
Serbia	36,658.5	:	:	:
Turkey	:	:	:	:

**Note:** Author's calculation of margin rate.

**Source:** Eurostat



**Picture 1:** Gross margin trade of the European Union  
**Source:** Author's picture

**Table 6:** Descriptive statistics

Statistics		Turnover or gross premiums written - million euros	Total purchases of goods and services - million euros	Gross margin – one million euros	Gross margin, %
N	Valid	35	33	33	33
	Missing	4	6	6	6
Mean		541032.8629	493154.8727	79289.3152	12.9518
Median		118489.1000	111177.6000	16986.7000	13.0000
Std. Deviation		1500570.56000	1321126.34500	220544.79810	2.94447
Minimum		8337.70	7365.40	819.70	7.02
Maximum		8745002.60	7497188.10	1247814.50	22.05

**Note:** Author's calculation

In the trade of the European Union, the margin rate ranges from 7.02% ( Luxembourg) to 22.05% (Ireland). In the leading countries of the European Union, the trade margin rate is Germany at 15.15%, France at 16.48%, and Italy at 13.48%. In the countries of the Serbian region, the trade margin rate is Croatia 13.22% and Slovenia 13.15%. The trade margin rate in Bosnia and Herzegovina is 11.35%. In Albania, the trade margin rate is 11.66%. In Serbia, the trade margin rate is 15.79. Therefore, the trade margin rate in Serbia is higher than in Croatia and Slovenia. The trade margin rate in the European Union and Serbia is lower than in the US

**Determinants of the size of the trade margin in Serbia.** The trade margin in Serbia is calculated as the difference between the sale and the purchase value of the realized goods. The trade margin rate was calculated by dividing the margin by sales times 100. Table 7 and Picture 2 show the trade margin of Serbia for the period 2013 - 2022. Descriptive statistics of the analyzed statistical variables of trade in Serbia are shown in Table 8.

**Table 7:** Gross margin trade in Serbia

	(O) Sales	(I) Cost of goods sold	(O) Margin	(I) Operating costs	(I) Earnings of employees	(A) Net profit	(I) Inventory	% margin from inventory	% margin from sales	% operating costs from sales	% employees' earnings from sales	% net profit from sales
2013	2891518	2300147	591371	501641	151978	89730	481802	122.74	20.45	17.35	5.26	3.10
2014	2594602	2244057	350545	263590	154833	86955	472615	74.17	13.51	10.16	5.97	3.35
2015	2731999	2358585	373414	278149	164718	95265	537135	69.52	13.67	10.18	6.03	3.49
2016	3009651	2590399	419252	314014	180367	105238	584764	71.70	13.93	10.43	5.99	3.50
2017	3172393	2705077	467316	344589	194924	122727	614021	76.11	14.73	10.86	6.14	3.87
2018	3361094	2868190	492904	371088	218410	121816	577828	85.30	14.66	11.04	6.50	3.62
2019	3608329	3070400	537929	398520	238022	139409	669912	80.30	14.91	11.04	6.60	3.86
2020	3664505	3085928	578577	407567	262322	171010	726433	79.65	15.79	11.12	7.16	4.67
2021	4366762	3621202	745560	455549	301793	290011	818986	91.03	17.07	10.43	6.91	6.64
2022	5012305	4205473	806832	560616	341873	246216	982779	82.10	16.10	11.18	6.82	4.91

**Note:** Data in absolute amounts are expressed in millions of dinars. Margin and rates are the author's calculation. (I) – Input elements. (O) – Output elements

**Source:** Agency for Economic Registers of the Republic of Serbia



**Picture 2:** Margin of trade in Serbia

**Source:** Author's picture



**Table 8:** Descriptive statistics of initial data.

Statistics		(O) Sales	(I) Cost of goods sold	(O) Gross Margin	(I) Operating costs	(I) Earnings of employees	(A) Net profit	(I) Inventory	% margin from inventory	% margin from sales	% operating costs from sales	% employees' earnings from sales	% net profit from sales
N	Valid	10	10	10	10	10	10	10	10	10	10	10	10
	Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3441315.8000	2904945.8000	536370.0000	389532.3000	220924.0000	146837.7000	646627.5000	83.2620	15.4820	11.3790	6.3380	4.1010
Median		3266743.5000	2786633.5000	515416.5000	384804.0000	206667.0000	122271.5000	599392.5000	79.9750	14.8200	10.9500	6.3200	3.7400
Std. Deviation		759355.44860	624128.50570	150251.30190	95993.65451	64792.37596	69489.44198	159400.41130	15.28440	2.07709	2.13394	.56596	1.05768
Minimum		2594602.00	2244057.00	350545.00	263590.00	151978.00	86955.00	472615.00	69.52	13.51	10.16	5.26	3.10
Maximum		5012305.00	4205473.00	806832.00	560616.00	341873.00	290011.00	982779.00	122.74	20.45	17.35	7.16	6.64

**Note:** Author's calculation

In the trade of Serbia, the sales margin rate in the period 2013-2022 ranged from 13.51% (2014) to 20.45% (2013). The average sales margin rate in Serbian trade is 14.82%. In 2022, the sales margin rate is lower compared to 2021. The rate of margin from stocks in Serbian trade ranges from 69.52% (2015) to 122.74% (2013). In 2022, compared to 2021, the margin rate from inventory is lower. The average rate of margin from stocks in Serbian trade is 79.97%. The rate of operating expenses from sales in Serbian trade ranges from 10.16 (2014) to 17.35% (2013). In 2022, compared to 2021, the rate of operating expenses from sales is higher, partly due to higher energy costs. The average rate of operating expenses from sales in Serbian trade is 10.95%. The rate of earnings of employees from sales ranges from 5.26% (2013) to 7.16% (2020). The salary rate of employees from sales in 2022 is lower compared to 2021. The average salary rate of employees from sales in trade in Serbia is 6.32%. The rate of net profit from sales ranges from 3.10% (2013) to 6.64% (2021). The rate of net profit of trade in Serbia is lower in 2022 compared to 2021. The average rate of net profit of trade in Serbia is 3.74%. Therefore, the decrease in the net profit of trade in Serbia in 2022 compared to 2021 was influenced by the increase in operating costs, among other things, due to increased energy costs due to the energy crisis. Table 9 shows the correlation matrix of the observed statistical variables in connection with the trade margin in Serbia.

**Table 9:** Correlation

Correlations		(O) Sales	(I) Cost of goods sold	(O) Gross Margin	(I) Operating costs	(I) Earnings of employees	(A) Net profit	(I) Inventory	% margin from inventory	% margin from sales	% operating costs from sales	% employees' earnings from sales	% net profit from sales
(O) Sales	Pearson Correlation	1	.995 **	.919 **	.771 **	.983 **	.922 **	.978 **	.063	.252	-.146	.731 *	.787 **
	Sig. (2-tailed)		.000	.000	.009	.000	.000	.000	.863	.483	.687	.016	.007
	N	10	10	10	10	10	10	10	10	10	10	10	10
(I) Cost of goods sold	Pearson Correlation	.995 **	1	.877 **	.713 *	.988 **	.912 **	.985 **	-.029	.159	-.232	.766 **	.778 **
	Sig. (2-tailed)	.000		.001	.021	.000	.000	.000	.937	.660	.519	.010	.008
	N	10	10	10	10	10	10	10	10	10	10	10	10

(O) Gross margin	Pearson Correlation	.919 **	.877 **	1	.935 **	.864 **	.871 **	.854 **	.436	.611	.225	.512	.745 *
	Sig. (2-tailed)	.000	.001		.000	.001	.001	.002	.208	.061	.533	.130	.014
	N	10	10	10	10	10	10	10	10	10	10	10	10
(I) Operating costs	Pearson Correlation	.771 **	.713 *	.935 **	1	.680 *	.640 *	.680 *	.642 *	.771 **	.517	.265	.470
	Sig. (2-tailed)	.009	.021	.000		.031	.046	.031	.045	.009	.126	.460	.171
	N	10	10	10	10	10	10	10	10	10	10	10	10
(I) Earnings of employees	Pearson Correlation	.983 **	.988 **	.864 **	.680 *	1	.929 **	.977 **	-.046	.149	-.264	.842 **	.822 **
	Sig. (2-tailed)	.000	.000	.001	.031		.000	.000	.899	.681	.462	.002	.003
	N	10	10	10	10	10	10	10	10	10	10	10	10
(A) Net profit	Pearson Correlation	.922 **	.912 **	.871 **	.640 *	.929 **	1	.907 **	.056	.255	-.229	.741 *	.961 **
	Sig. (2-tailed)	.000	.000	.001	.046	.000		.000	.879	.477	.525	.014	.000
	N	10	10	10	10	10	10	10	10	10	10	10	10
(I) Inventory	Pearson Correlation	.978 **	.985 **	.854 **	.680 *	.977 **	.907 **	1	-.092	.132	-.262	.769 **	.784 **
	Sig. (2-tailed)	.000	.000	.002	.031	.000	.000		.800	.717	.465	.009	.007
	N	10	10	10	10	10	10	10	10	10	10	10	10
% margin from inventory	Pearson Correlation	.063	-.029	.436	.642 *	-.046	.056	-.092	1	.955 **	.927 **	-.373	.005
	Sig. (2-tailed)	.863	.937	.208	.045	.899	.879	.800		.000	.000	.288	.988
	N	10	10	10	10	10	10	10	10	10	10	10	10
% margin from sales	Pearson Correlation	.252	.159	.611	.771 **	.149	.255	.132	.955 **	1	.874 **	-.209	.200
	Sig. (2-tailed)	.483	.660	.061	.009	.681	.477	.717	.000		.001	.563	.579
	N	10	10	10	10	10	10	10	10	10	10	10	10
% operating costs from sales	Pearson Correlation	-.146	-.232	.225	.517	-.264	-.229	-.262	.927 **	.874 **	1	-.569	-.301
	Sig. (2-tailed)	.687	.519	.533	.126	.462	.525	.465	.000	.001		.086	.398
	N	10	10	10	10	10	10	10	10	10	10	10	10
% employees' earnings from sales	Pearson Correlation	.731 *	.766 **	.512	.265	.842 **	.741 *	.769 **	-.373	-.209	-.569	1	.736 *
	Sig. (2-tailed)	.016	.010	.130	.460	.002	.014	.009	.288	.563	.086		.015
	N	10	10	10	10	10	10	10	10	10	10	10	10
% net profit from sales	Pearson Correlation	.787 **	.778 **	.745 *	.470	.822 **	.961 **	.784 **	.005	.200	-.301	.736 *	1
	Sig. (2-tailed)	.007	.008	.014	.171	.003	.000	.007	.988	.579	.398	.015	
	N	10	10	10	10	10	10	10	10	10	10	10	10
** . Correlation is significant at the 0.01 level (2-tailed).													
* . Correlation is significant at the 0.05 level (2-tailed).													

**Note:** Author's calculation

So, in the specific case, there is a strong correlation between margin and sales, the purchase value of realized goods, operating expenses, salary of employees, net profit, and inventory, at the level of statistical significance. There is a strong correlation between the rate of margin on sales and the rate of margin on inventory and the rate of operating expenses of trade in Serbia. All this indicates that effective management of components can significantly influence the achievement of the target trade margin in Serbia.

**The influence of the margin factor on the efficiency of trade in Serbia .** In this study using DEA ( Data Envelopment Analysis) analysis of input orientation with constant return, we will examine the impact of margin factors (sales, purchase value of realized goods, operating costs, salary of employees, net profit, and stocks) on the efficiency of trade in Serbia. The input elements are the purchase value of the realized goods, operating costs, wages of employees, and stocks. Output elements are sales, margin, and net profit. The DEA model of input orientation with constant return reads: The CCR model is based on fixed or constant returns to scale. This means that a proportional increase in all inputs results in the same proportional increase in all outputs. The dual of CCR efficiency is expressed as:

*Min*  $\theta$

at the limit

$$\sum_{j=1}^n \lambda_j x_{ij} \leq \theta x_{i0} \quad i = 1 \dots m$$

$$\sum_{j=1}^n \lambda_j y_{kj} \geq y_{k0} \quad k = 1 \dots s$$

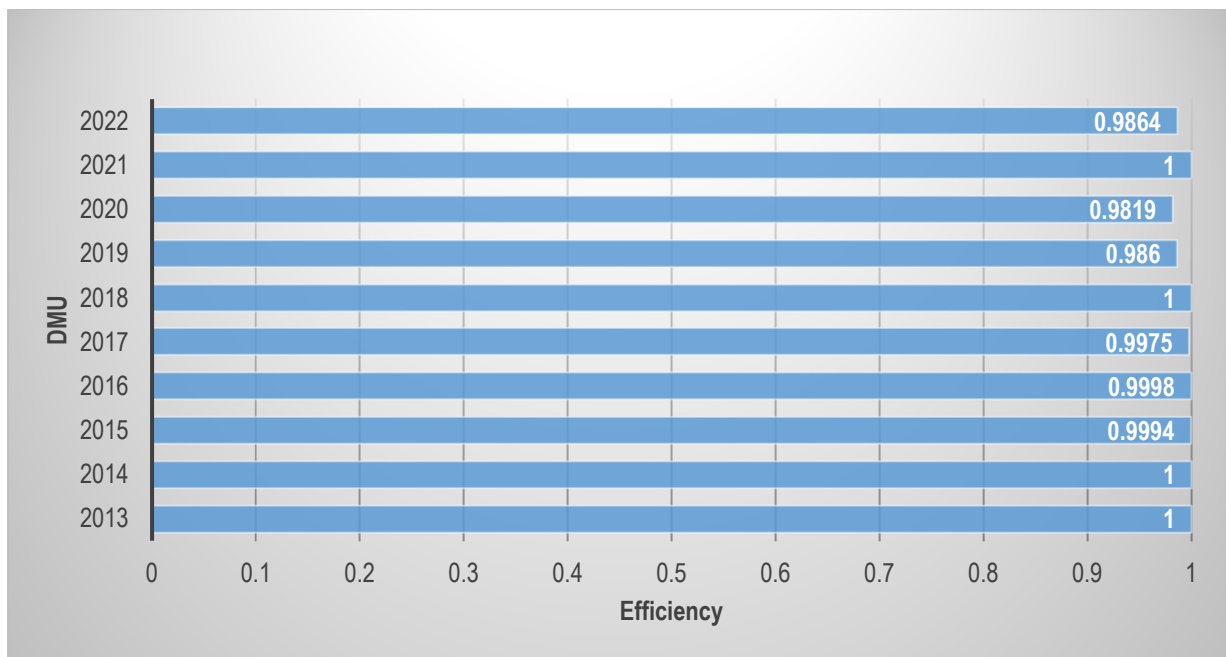
$$\lambda \geq 0 \quad j = 1 \dots n \quad (1)$$

where  $\theta$  is the technical efficiency of the unit DMU 0 ,  $\lambda$  is a dual variable for identifying comparable inefficient units. If  $\theta^*$  is equal to one, the observed DMU unit is technically efficient. Table 10 and Picture 3 show the results of the DEA model of input orientation with constant yield.

**Table 10:** Model = CCR-I

Model = CCR-I										
No.	DMU	Score	Rank		References (Lambda)					
1	2013	1	1	2013	1					
2	2014	1	1	2014	1					
3	2015	0.9994	6	2014	0.991	in 2021	0.037			
4	2016	0.9998	5	2013	0.037	in 2014	1.057	in 2021	0.036	
5	2017	0.9975	7	2013	0.093	in 2014	0.831	in 2021	0.171	
6	2018	1	1	2018	1					
7	2019	0.986	9	2013	0.084	in 2014	0.371	in 2018	0.112	in 2021
8	2020	0.9819	10	2013	0.09	in 2021	0.78			
9	2021	1	1	2021	1					
10	2022	0.9864	8	2013	0.153	in 2014	0.075	in 2021	1.002	
	Average	0.9951								
	Max	1								
	Min	0.9819								
	St Dev	0.0073								

**Note:** Author's calculation.



**Picture 3:** Model = CCR-I  
**Source:** Author's picture

A unit is considered effective if the score is equal to one. If not, then the unit is ineffective. In the specific case, 4 units are efficient and 6 units are ineffective. Therefore, Serbia's trade was efficient in 2013, 2014, 2018 and 2021. In other years it was ineffective (2015, 2016, 2017, 2019, 2020, and 2022). The projection of input/output elements shows in which units and input and output elements the given values should be corrected to achieve an efficiency score equal to unity. Table 11 shows the projection of the impact of the margin factor on the efficiency of trade in Serbia.

Table 11: Projection

St. Dev.	Min	Max	Avera	Score	Rank	Cost of goods sold					Operating costs					Earnings of employees					Inventory					Sale					Gross margin					Net profit					
						Data	Projection	Diff. (%)	Data	Projection	Diff. (%)	Data	Projection	Diff. (%)	Data	Projection	Diff. (%)	Data	Projection	Diff. (%)	Data	Projection	Diff. (%)	Data	Projection	Diff. (%)	Data	Projection	Diff. (%)	Data	Projection	Diff. (%)	Data	Projection	Diff. (%)						
0.007	0.981	1	0.995	0.995	1	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0	23001	23001	0
3.634	1	10	4.9	4.9	1	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0	22440	22440	0
62412	22440	42054	29049	29049	1	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0	27050	27050	0
60857	22440	41484	28885	28885	1	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0	26984	26984	0
0.725	1	0	0.499	0.499	1	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0	34458	34458	0
95993	26359	56061	38953	38953	1	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0
94390	26359	55301	38737	38737	1	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0	37108	37108	0
0.725	0	0	0.499	0.499	1	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0
64792	15197	34187	22092	22092	1	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0	19492	19492	0
62940	15197	33723	21872	21872	1	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0	19444	19444	0
1.598	5.088	0	0.824	0.824	1	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0	58476	58476	0
15940	47261	98277	64662	64662	1	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0	61402	61402	0
15099	47261	92973	62469	62469	1	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0	57782	57782	0
3.181	7.102	0	3.242	3.242	1	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0	50123	50123	0
75935	25946	50123	34413	34413	1	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0
75935	25946	50123	34413	34413	1	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0	30096	30096	0
0	0	0	0	0	1	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0	41925	41925	0
15025	35054	80683	53637	53637	1	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0	46731	46731	0
16428	35054	86383	55280	55280	1	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0	47397	47397	0
3.917	0	9,649	2,662	2,662	1	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0	1,425	1,425	0
69489	86955	29001	14683	14683	1	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0	12272	12272	0
85104	86955	31081	16543	16543	1	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0	13023	13023	0
15.54	0	36,95	10,63	10,63	1	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0	6,119	6,119	0

Model = CCR-I

Source: Author's calculation

Thus, for example, to achieve the projected efficiency of trade in Serbia in 2022 in this particular case, it was necessary to reduce the purchase value by 1,355%, operating costs by 1,355%, employee wages by 1,355%, and inventories by 5,397% and increase the margin by 7.065% and net profit by 26.36%. Table 12 shows Slack. Slack shows what measures should be taken to convert inefficient units into efficient ones.

**Table 12: Slack**

Model = CCR-I										
No.	DMU	Score	Rank	Slack Cost of goods sold	Slack Operating costs	Slack Earnings of employees	Slack Inventory	Slack Sale	Slack Gross margin	Slack Net profit
1	2013	1	1	0	0	0	0	0	0	0
2	2014	1	1	0	0	0	0	0	0	0
3	2015	0.9994	6	0	0	79,847	38313	0	1391.12	1555.17
4	2016	0.9998	5	0	0	0	37249.1	0	518,753	581,637
5	2017	0.9975	7	0	0	0	34806.4	0	6661.12	7509.65
6	2018	1	1	0	0	0	0	0	0	0
7	2019	0.986	9	0	0	0	0	0	42946.8	48521.1
8	2020	0.9819	10	0	0	8601.98	31429.8	0	55828.9	63202.4
9	2021	1	1	0	0	0	0	0	0	0
10	2022	0.9864	8	0	0	0	39722.7	0	56999.8	64598.2
		Score	Rank	Cost of goods sold	Operating costs	Earnings of employees	Inventory	Sale	Gross margin	Net profit
	Average	0.9951	4.9	0	0	868.182	18152.1	0	16434.7	18596.8
	Max	1	10	0	0	8601.98	39722.7	0	56999.8	64598.2
	Min	0.9819	1	0	0	0	0	0	0	0
	St Dev	0.0073	3.6347	0	0	2717.49	19257.3	0	24845.9	28131.6

Note: Author's calculation

In the specific case, therefore, to, for example, achieve efficiency in 2022, it was necessary to reduce stocks by 39722.7, and increase the margin by 56999.8 and net profit by 63202.4 monetary units. All in all, if the target trade margin in Serbia is to be achieved, it is necessary to continuously analyze its size and structure. This is significant because the margin is one of the key performance indicators of trade in Serbia.

## 4.CONCLUSION

The investigation of the size and structure of the trade margin between the European Union and Serbia in this study showed the following: In European Union trade, the margin rate ranges from 7.02% ( Luxembourg) to 22.05% (Ireland). In the leading countries of the European Union, the trade margin rate is Germany at 15.15%, France at 16.48%, and Italy at 13.48%. In the countries in the region of Serbia, the trade margin rate is Croatia 13.22% and Slovenia 13.15%. The trade margin rate in Bosnia and Herzegovina is 11.35%. In Albania, the trade margin rate is 11.66%. In Serbia, the trade margin rate is 15.79. The trade margin rate in Serbia is higher than in Croatia and Slovenia. In the trade of Serbia, the sales margin rate in the period 2013-2022. ranged from 13.51% (2014) to 20.45% (2013). The average sales margin rate in Serbian trade is 14.82%. In 2022, it is smaller compared to 2021. The rate of margin from stocks in Serbian trade ranges from 69.52% (2015) to 122.74% (2013). In 2022, compared to 2021, the margin rate from inventory is lower. The average rate of margin from stocks in Serbian trade is 79.97%. The rate of operating expenses from sales in Serbian trade ranges from 10.16 (2014) to 17.35% (2013). In 2022, compared to 2021, the rate of operating expenses from sales is higher, partly due to higher energy costs. The average rate of operating expenses from sales in Serbian trade is 10.95%. The rate of earnings of employees from sales ranges from 5.26% (2013) to 7.16% (2020). The salary rate of employees from sales in 2022 is lower compared to 2021. The average salary rate of employees from sales in trade in Serbia is 6.32%. The rate of net profit from sales ranges from 3.10% (2013) to 6.64% (2021). The rate of net profit of trade in Serbia is lower in 2022 compared to 2021. The average rate of net profit of trade in Serbia is 3.74%. The decrease in the net profit of trade in Serbia in 2022 compared to 2021 was influenced by the increase in operating costs due to increased energy costs due to the energy crisis. In this specific case, there is a strong correlation between margin and sales, the purchase value of realized goods, operating expenses, employee earnings, net profit, and inventory,

and that at the level of statistical knowledge. There is a strong correlation between the rate of margin on sales the rate of margin on inventory and the rate of operating costs of trade in Serbia. This means, in other words, that the target trade margin in Serbia can be achieved by effective control of its components.

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