CORRELATION OF ECONOMIC INDICATORS OF PROCUREMENT OF AGRICULTURAL PRODUCTS FOR THE NEEDS OF THE DEFENCE SYSTEM

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ABSTRACT

In the current situation of war conflicts, but also as a consequence of the COVID-19 pandemics, the economic crisis caused by the lack of goods, primarily food, energy sources, weapons and military equipment and multiple other products and services, has induced price increases and inflation. In this regard, there are substantial challenges present in the field of procurement of agricultural products. In that sense, we methodologically included analysis and synthesis, compilations, inductions and deductions of "military budgets", GDP and some other indicators in several currently most significant countries and in the Republic of Serbia, in the context of compromised global security. The aim is to attain relevant indicators and conclusions which will provide certain guidelines for improvement of procurement of agricultural products for the needs of the defense system in the future.

Introduction

Procurement of agricultural products in the Republic of Serbia is regulated mostly by the Public Procurement Law (PPL) and numerous bylaws which represent this area as very complex and demanding in the sense of expertise of personnel who deal with tasks of public procurement. All state bodies, i.e., budget users, are obliged to comply with the said regulations, including the Ministry of Defense which places the emphasis on the application of rules and specificities which apply to procurement in the defense and security sector.

Along with the legal norms, the key deciding factor for procurement of agricultural products is the level of funds allocated for "military budgets" for defense needs. It is entirely

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expected that in the conditions of compromised security and ongoing war conflicts in the world these funds are being increased, as our research will demonstrate. However, even the allocated funds od not fully guarantee the realization of all necessary procurement, due to the presence of major risks and uncertainties in many fields of the global level, which alter and multiply on a daily basis following the decline of the security situation. It is precisely due to the decline of security and intensification of war conflicts in the world, along with other much larger risks, that it is necessary to increase both audit and control of public procurement of agricultural products in comparison to the normal state of affairs in peace.

Based on research results and experiences of other countries, the aim is to improve public procurement of agricultural products for the defense system needs.

Increase of "military budgets" in the world for the needs of defense system

Along with legal regulations, every military faces essential limitations expressed in funds allocated by the state. The issues of the amount of budget funds allocated for defense needs is particularly important in conditions of compromised security – imminent war danger and war conflicts (Adepoju & Obialo, 2022). The current situation of war conflicts in the world and the economic crisis and inflation, have pushed many countries into drastically increasing their "military budgets", i.e., the allocation of budget funds for military needs. Allocation of more funds is also affected by the lack of goods, increase of prices and the problem of price setting, primarily food, agricultural products, energy sources, armament and military equipment and many other products and services. Hence, along with reduced capabilities of suppliers, we find that it is necessary to analyze the budget expenditure for defense needs. Despite the existence of a certain balance in budget funds regarding the costs of personal, operational and investment expenditure, conditions of compromised security cause the increase of funds allocated for defense needs. Data regarding countries with the highest defense budgets in 2020 and 2021, shown in the table, demonstrate this trend:

Table 1. Top 10 countries in 2020 and 2021

	Country	Defense budget US$bn	
		2020	2021
1.	USA	738.0	754
2.	China	193.3	207.3
3.	India	64.1	65.1
4.	Russia	60.6	62.2
5.	UK	56.5	66.6
6.	France	55.0	59.3
7.	Germany	51.3	56.1
8.	Japan	49.7	49.3
9.	Saudi Arabia	48.5	46.7
10.	South Korea	40.4	46.7

Source: Krstić et al. (2022)

Comparative of data indicates the following:

- From a chronological perspective, the largest military expenditure is seen in USA, China, India and only then Russia,
- For the sake of comparison, USA has a military budget twice as large as China, India, and Russia combined, or 12 times larger of a budget than Russia,
- The data indicating that USA is spending multiple times more than others does not indicate that they have multiple times more weapons or that it is the most advanced in comparison with other global powers. Namely, a certain portion of this money is spent on financing procurement of agricultural products. China and Russia have significantly less procurement of agricultural products that USA,
- A global increase of military budgets in 2021 in comparison with 2020 is evident,
- Larger expenditure is visible in developed countries and countries with objectively compromised security,
- Even the smallest of countries inevitably must invest in procurement of agricultural products for the defence system needs,
- In the period from 2020 till today, the overall global military expenditure has reached two trillion dollars (2.112 billion dollars) for the first time, breaking another infamous record,
- Increase of global military expenditure can be seen starting from 2018, resulting in the overall increase of 17%, with 2021 being the seventh consecutive year marked by an increase of military budgets in over 100 countries.

Expenditure for the defence system needs in 2021 exceeded 2.000 billion dollars with USA, China, India, Great Britain and Russia spending the most, as reported by SIPRI (Kuhe & Uba, 2018). Everything indicates a global "military race".

Besides the discussed data, based on the available information for 2022, it can be concluded that a drastic increase of "military budgets" in multiple countries is evident, primarily due to the current war conflicts and worsened global security situation. We present some dominant examples.

The current year of 2022 has primarily been marked by the conflict of Russia and Ukraine. The phenomenon of aiding warring sides is evident, and it is particularly visible in the case of NATO aiding Ukraine, primarily in arms and military equipment, measured in tens of billions of dollars. USA dominates this process, and its aid to Ukraine represents one of the largest military aids to a foreign country in US history. Ukraine is also being aided by many European countries, heavily pressured by USA. This indicates the intentions of NATO countries, as large powers invest in wars only with certain goals and interests. The conflict in Ukraine demonstrates the great power and might of the military industry, as well as the fact that all arms sent to aid Ukraine are no gift – rather, it will be paid dearly. Looking back to the rise of US industry,

we point out one of the most significant moments in January 1961, when the 34th US president Dwight D. Eisenhower warned the US citizens of the "formation of a new military-industry complex, supported by the banking sector, whose main goal is to keep USA permanently militarily engaged all across the world" in his last TV address. His successor, president John F. Kennedy was also an adversary of excessive military spending and an advocate of diplomacy as he considered that the majority of global conflicts can be settled with negotiations – we all know how that ended. Numerous war conflicts followed, mostly financed by USA. Significant increase of oil and petroleum products export from Kuwait, mostly to the North American markets, contributed to the development of US military industry. These cheap energy sources were the main trigger of the consumer-boom in the US in the period between 1975 and 1990. Economists often stated that "US economy is progressing fueled by the Middle East". Today, USA has by far the largest military budget in the world (around 750 billion dollars) which additionally increases during the year through special projects brought to life by presidential decrees or Congress votes – which is currently being done in order to secure aid to Ukraine.

China holds second place, with 252 billion dollars allocated for the military. However, due to China's political system, other economy sectors can promptly be placed in the service of military industry. In the context of the growing tensions between Taiwan and China, on August 25th Taiwan proposed that 19 billion dollars are to be spent on defence next year, representing a twofold increase in comparison to 2022. (Govdeli, 2022).

An increase of defence budget by 13,9%, to a record level of 586,3 billion Taiwanese dollars or 19, 41 billion US dollars, has been proposed. These funds are planned for fighter planes and other equipment and means of the defence ministry. For years now Taiwan has been increasing the defence funds. In March, China announced that it will spend 7,1% more on defence in 2022, i.e., 1,45 trillion Yuans (211,62 billion dollars), while many experts consider this to be not an accurate figure. Chief security challenges of Beijing are the dispute with Taiwan and the disputes in the South Chinese Sea. China is spending money on advanced equipment, including invisible fighter jets and aircraft carriers, while Taiwan is trying to counter that by investing more in armament like missiles which can reach far into China's territory. Taiwan prioritizes further modernization of its armed force. The Stockholm International Peace Research Institute (SIPRI) stated that China is now among the largest weapons producers in the world. Shipments of arms to the Middle East have been at record levels for years (Milanović et al., 2023; Temelkov, 2022).

India comes third, spending 72 billion dollars. It also plans to increase military expenditure by 2025, mostly for air force modernization, creation of cosmic forces, utilization of its own launch vehicles GSLV-3 for military satellites launch.

Russia is placed fourth, with 61,7 billion dollars allocated for the military. Once compared, USA has a military budget twice as large as China, India, and Russia combined, or 12 times larger of a budget than Russia. However, the data indicating

that USA is spending multiple times more than others does not indicate that they have multiple times more weapons or that it is the most advanced in comparison with other global powers. Namely, substantial dispersions of US troops in military bases around the world demands huge funds for financing. On the other hand, Russia is rich in natural resources and energy which enable industrial and military-industrial development. The Russian military industry consists of around 3,000 companies, employing some two million people. Russia is the world's second weapons exporter, following USA, and it covers 20% of overall arms sale. Russia has especially modernized and strengthened its military in the past two decades. Both Russia and China are greatly developing their militaries as they plan to dominate and increase their military presence in the world.

Germany announced that it will increase its military budget by roughly 100 billion euros in 2022.

All circumstances and global developments indicate that even the smallest countries must invest in the military. If we observe the Balkan countries, data shows that Bosnia and Herzegovina has a 165 million dollars military budget, Montenegro around 65 million, Croatia (a NATO member) around 800 million, while Serbia has a military budget between 850 and 900 million dollars. Weapons procurement done by Serbia and other countries, both from East and West, are always pervaded by political influence, interest and money.

Officials of the most powerful countries in the world openly compete and lobby for acquisition of their weapons, directly incentivizing development of their military industry (Vukša et al., 2022). The most obvious example is the influence of USA on EU countries in the context of aid to Ukraine. Competition between great powers is evident in weapons trade. The most striking example can be seen in 2021, when the Australian government cancelled its order of nuclear submarines from France (worth some 56 billion euros) and instead opted for American nuclear submarines. Reasons are mostly directed towards countering the Chinese expansion in the Pacific region which foresees the formation of a tripartite alliance between Australia, USA and Great Britain (Odhiambo, 2009; Pantić et al., 2022). American president Biden declared US's rivalry with China as top priority of foreign policy.

Increased military expenditure is expected to continue in the future. Estimates indicate that the planned US budget for development and improvement will be 24% higher by 2025 and that USA will focus on weapons of new generation – stealth aircrafts of the fifth generation, satellite enemy-tracking and cyber warfare via computer networks. Asides from weapons procurement, the plan is to procure agricultural products as well. China and other powerful countries have similar plans. Along with the increase of expenditure of defence needs, higher expenditure for energy and food are also evident, mostly due to the shortage of these goods and price increase. Wars are fought not only with weapons, but also with good logistical support. The so-called "media war" has been dominating and becoming increasing important in recent years, with tremendous funds and other resources being allocated for it. Therefore, immense changes are occurring on

the global level, both in politics and economy. Due to disturbed relations, the economy is restructuring. Scarcity of many raw materials is evident, production is hindered and decelerated, export-import trade is impeded, suppliers are no longer capable or do not wish to meet the demands of buyers causing the entire market to drastically change all over the world. In addition to the current inflation and skyrocketing prices, impeded supply of energy and food is particularly evident. Certain countries which are caught in war don't even ask for the price of weapons causing the "black market" arms trade to grow. Even with allocated budget funds, there are no guarantees that the necessary goods and services will be acquired (Zekić & Brajković, 2022; Micić et al., 2022).

If we observe the humanitarian side, the UN and international humanitarian agencies estimate that only several billion dollars a year could significantly decrease, or completely alleviate the problem of hunger in the world. This represents only a fragment of the money being spent on the military. Unfortunately, the interests of the rich and powerful dominate over the humanitarian needs of the poor, weak and famished. Obviously, risks and uncertainty are present on the global level, primarily in regards to the functioning of agricultural production, trade, security of devaluation and meeting of basic needs, along with the risk of securing world peace.

Economic indicators of procurement of agricultural products for the needs of defense systems in developed countries and in the Republic of Serbia

Despite the fact that many countries both developed and those in development allocate a certain segment of budgetary funds for procurement of agricultural products for defense needs, this research uses the Republic of Serbia and the following countries as sample: USA, China, India, and Russia. The reason for such a selection of countries is the fact that they top the list of countries which spend the most budgetary funds on procurement of agricultural products for defense needs (Table 1). The following economic indicators were used in the research:

- Budgetary spending for defense needs,
- Gross Domestic Product (GDP),
- GDP per Capita,
- Direct foreign investments,
- Unemployment rate and
- Inflation rate.

The majority of these indicators can be considered as factors of economic development (Durkalić et al., 2019; Janjetović, 2021), in the sense that they create a favorable atmosphere for growth, but are foremost a result of developmental and stabilization policy. Data regarding these indicators in said countries, in the period between 2013 and 2021, are represented in Table 2.

Table 2. Economic indicators of procurement of agricultural products in developed countries and in the Republic of Serbia

Year	Economic indicators	Serbia	USA	China	India	Russia
2013	Expenditure for defence (in 000 $)	496.452,3	586.000.000,0	188.150.000,0	59.300.000,0	60.000.000,0
	GDP (in 000 $)	48.390.000,0	16.840.000.000,0	9.570.000.000,0	1.857.000.000,0	2.292.000.000,0
	GDP per Capita	6.755,1	53.291,1	7.020,34	1.438,1	15.974,6
	Direct foreign investments	2.412.000,00	92.101.458,22	53.888.992,0	8.000.000,0	8.754.222,1
	Unemployment rate	7,1	3,5	10,4	12,8	14,5
	Inflation rate	2,2	2,1	2,0	1,4	1,7
2014	Expenditure for defence (in 000 $)	497.820,4	591.000.000,0	192.000.000,0	57.800.000,0	58.500.000,0
	GDP (in 000 $)	47.060.000,0	17.550.000.000,0	10.480.000.000,0	2.039.000.000,0	2.059.000.000,0
	GDP per Capita	6.600,1	55.123,8	7.636,12	1.559,86	14.095,65
	Direct foreign investments	2.752.000,0	92.567.564,6	54.804.151,3	3.659.000,0	9.236.133,0
	Unemployment rate	7,2	4,0	10,2	13,3	13,1
	Inflation rate	1,7	1,2	1,3	1,1	1,9
2015	Expenditure for defence (in 000 $)	497.284,6	590.000.000,0	190.000.000,0	58.000.000,0	58.200.000,0
	GDP (in 000 $)	39.660.000,0	18.210.000.000,0	11.060.000.000,0	2.104.000.000,0	1.363.000.000,0
	GDP per Capita	5.588,9	56.762,7	8.016,43	1.590,17	9.313,0
	Direct foreign investments	2.965.000,0	94.987.679,1	62.778.479,3	9.343.000,0	12.053.488,9
	Unemployment rate	6,9	8,8	6,4	16,1	18,8
	Inflation rate	1,5	1,4	1,8	1,7	2,0
2016	Expenditure for defence (in 000 $)	493.785,6	587.000.000,0	189.500.000,0	59.500.000,0	57.900.000,0
	GDP (in 000 $)	40.690.000,0	18.700.000.000,0	11.230.000.000,0	2.295.000.000,0	1.277.000.000,0
	GDP per Capita	5.765,2	57.866,7	8.094,36	1.714,28	8.704,9
	Direct foreign investments	3.425.000,0	101.601.977,3	68.505.362,8	11.051.000,0	15.998.307,0
	Unemployment rate	6,5	7,9	7,2	17,7	16,2
	Inflation rate	1,6	1,8	1,6	2,1	1,7
2017	Expenditure for defence (in 000 $)	582.820,5	618.000.000,0	189.000.000,0	61.200.000,0	58.100.000,0
	GDP (in 000 $)	44.080.000,0	19.480.000.000,0	23.310.000.000,0	2.651.000.000,0	1.574.000.000,0
	GDP per Capita	6.292,5	59.907,7	8.816,99	1.957,97	10.720,3
	Direct foreign investments	3.145.000,0	100.167.834,4	69.508.134,0	8.145.000,0	13.117.516,3
	Unemployment rate	7,2	7,3	11,2	9,6	14,4
	Inflation rate	3,0	2,4	1,9	1,7	2,0
2018	Expenditure for defence (in 000 $)	736.681,8	685.000.000,0	191.540.000,0	60.850.000,0	58.400.000,0
	GDP (in 000 $)	50.640.000,0	20.530.000.000,0	13.890.000.000,0	2.703.000.000,0	1.657.000.000,0
	GDP per Capita	7.252,4	62.823,3	9.905,34	1.974,38	11.287,36
	Direct foreign investments	3.425.000,1	89.433.199,8	70.635.272,7	7.189.000,0	12.527.246,2
	Unemployment rate	8,8	7,0	10,9	10,1	13,9
	Inflation rate	2,0	3,3	1,7	1,6	1,6
2019	Expenditure for defence (in 000 $)	852.025,8	701.000.000,0	195.920.000,0	62.000.000,0	59.600.000,0
	GDP (in 000 $)	51.510.000,0	21.380.000.000,0	14.280.000.000,0	2.832.000.000,0	1.693.000.000,0
	GDP per Capita	7.417,2	65.120,4	10.143,84	2.047,23	11.536,2
	Direct foreign investments	3.702.000,0	94.870.792,8	78.525.275,0	12.100.000,0	12.896.179,4
	Unemployment rate	10,1	6,6	8,2	10,0	13,9
	Inflation rate	1,9	1,3	1,2	1,1	1,1
2020	Expenditure for defence (in 000 $)	930.842,7	738.000.000,0	193.300.000,0	64.100.000,0	60.600.000,0
	GDP (in 000 $)	53.360.000,0	21.060.000.000,0	14.690.000.000,0	2.668.000.000,0	1.489.000.000,0
	GDP per Capita	7.733,8	63.530,6	10.408,67	1.910,42	10.169,09
	Direct foreign investments	3.845.000,0	99.815.000,0	74.753.000,0	15.690.000,0	11.805.000,0
	Unemployment rate	8,4	4,3	5,9	6,7	10,4
	Inflation rate	1,6	1,1	1,4	1,9	1,2
2021	Expenditure for defence (in 000 $)	1.327.774,9	754.000.000,0	207.300.000,0	65.100.000,0	62.200.000,0
	GDP (in 000 $)	63.080.000,0	23.320.000.000,0	17.730.000.000,0	3.176.000.000,0	1.779.000.000,0
	GDP per Capita	9.203,1	70.248,6	12.556,33	2.256,59	12.194,78
	Direct foreign investments	3.900.000,0	108.000.000,0	75.000.000,0	13.000.000,0	11.000.000,0
	Unemployment rate	9,0	2,4	3,8	4,1	7,3
	Inflation rate	7,9	7,5	7,3	6,6	7,0

Source: Vo et al. (2019)

If we compare the **budgetary expenditure for procurement of agricultural products for defense needs,** we shall identify a growing trend in the analyzed countries after 2015. In 2015, budgetary spending for the needs of defense of the Republic of Serbia were 497 million dollars, while the least expenditure among developed countries were observed in India (58 billion dollars). In 2017, the most budgetary funds for the needs of defense were allocated by USA (618 billion dollars), while the least were allocated by Serbia (583 million), followed by Russia (58 billion dollars), India (61 billion dollars) and China (189 billion dollars). In the period from 2012 to 2016, recession of budgetary spending for defense needs was recorder in China (2019 – 195,92 billion dollars; 2020 – 193,3 billion dollars) while it grew in other countries. In 2020, budgetary funds for defense needs were the highest in USA and the lowest in the Republic of Serbia, followed by Russia. By comparing budgetary spending on defense in the period 2015-2020, a growth trend was observed in all countries, which was expected due to the growth of consumer prices and due to the consequences of the pandemic caused by the COVID-19 virus.

By comparing the starting positions of GDP in 2013, it can be noted that USA, China, India, and Russia had significantly higher levels in comparison to the Republic of Serbia which is not surprising having in mind the size and population of these countries. On the other hand, it is interesting to observe the narrowing of the gap between Serbia's GPD and that of developed countries in the period between 2013 and 2021. GDP of the Republic of Serbia grew 0.5 times in the period between 2013 and 2021 (and 0,4 time in the period 2020-2021 where a sharp rise in GDP in all countries is evident). The said data indicated that Serbia's GDP rose less than it rose in other developed countries. For example, China's GDP rose 1,1 times from 2013 to 2021 (0,5 times from 2020 to 2021). India's GDP rose 1,2 times from 2013 to 2021 and 0,4 times from 2020 to 2021. USA's GDP rose 0,4 times in the period 2013-2021 (and 0,1 times from 2020-2021). Unlike these countries, Russia's GDP recorded a decrease of 0,4 times from 2013-2021, and a decrease of 0,2 times in the period 2020-2021. Based on this analysis and comparison, we can conclude that GDP growth was the slowest in the Republic of Serbia, and that there was no growth in Russia. In other words, other countries (USA, China, and India) developed faster in regards to these indicators, which is also apparent in 2021 marked by COVID-19.

When comparing **GDP per Capita** of the said countries, we discovered that Serbia's GDP per Capita grew 0,4 times in the period 2013-2021; it grew 0,3 times in USA, 0,5 times in China and 0,4 times in India, while it decreased 0,1 times in Russia. By comparing the trend of GDP per Capita in the last to analyzed years (2020-2021), it grew in the Republic of Serbia by 0,2 times, 0,1 times in USA, 0,2 times in China and 0,1 times in India while it decreased in Russia 0,2 times. In this contest, it can be said that the Republic of Serbia has been progressing fairly well, or even better than developed countries (USA, China, India, and Russia).

Direct foreign investments are relatively considered to be key indicator of efficiency of realization of the process of procurement of agricultural products in a country and a precondition of economic stability. Also, direct foreign investments are even more

important because they spur developmental potentials and lessen the gap between developed countries and those that are in development. However, it should be noted that not all countries in development have the necessary legal and economic bases for the influx of foreign investments. Some countries in transition created attractive and efficient conditions for foreign investments (for example, Poland) which improved the results of transition and its success because it contributed to development, revitalization of economy and industry, modernization of technological production, etc. (Gioia, 2017). The main preconditions for direct foreign investments are specific competitive advantages for locations (manufacturing costs, marketing factors, government policies, etc.) and internalization advantages which differ from country to country (Bekiros et al., 2017). In addition, the most important factor for direct foreign investment is access to new markets (Gövdeli, 2019), making direct foreign investments an indication of social and political situation in a country, as investors prefer to invest in countries with stable political, social, and economic situation. Also, investments can alleviate and contribute to economic growth and prosperity. From the perspective of the Republic of Serbia, they were never on a very high level, in comparison to other countries, especially in the period between 2013 and 2017. However, it is pivotal to highlight the negative trend of direct foreign investments in Russia after 2019, which can be observe as a reason for the following war conflict.

When we analyze the **unemployment rate** in developed countries, it can be seen that this trend differs greatly. In 2014 the lowest unemployment rate was observed in USA (4,0%) while the highest was observed in Poland (13,3%) and Slovakia (13,1%). In 2015, the lowest unemployment rate was seen in China (6,4%), followed by Serbia (6,9%), while it increased in Russia (18,8%). In 2016 the unemployment rate was the highest in India (17,7%) and the lowest in Serbia (6,5%). Serbia (7,2%) and USA (7,3%) had the lowest unemployment rate in 2017, with the highest being recorded in Russia (14,4%). Unemployment rate in 2018 and 2019 was the lowest in USA (7,0% and 6,6%) while it was again the highest in Russia (13,9%). In 2020 and 2021, the lowest unemployment rate was observed in USA (4,3% and 2,4%) and the highest in Russia (10,4%, 7,3%) and Serbia (8,4%, 9,0%). These countries faced high unemployment in industry (due to the decline of GDP) while recording an increase in employment in service and tertiary sectors. Despite the quick recovery of GDP in the following periods, opening of new jobs in these countries was very slow (except in the service sector). Comparing unemployment between 2013 and 2021, we can conclude that it decreased in all countries (USA 1,4%, China 6,4%, India 9,2% and Russia 5,8%) expect in Serbia, where it increased by 1,9%. According to the analyzed data, we can conclude that the total unemployment rate was the highest in Serbia and Russia, while it was the lowest in USA. Research of low unemployment rate in the Republic of Serbia in comparison to other developed countries revealed that extremely low unemployment rates reflect negative consequences of economic reforms and measures (Tasić et al., 2021). Actually, low unemployment rate is a result of negative measures adopted by the government – low minimal wages, less generous fee for unemployment insurance, etc.

By analyzing data regarding **inflation rates** in observed countries, we discovered that India and Russia had the lowest rates of inflations in all analyzed years. In all analyzed years the rate of inflation was very low, except in 2021 when it sharply grew. In fact, inflation rates in all countries after 2020 grew as a result of the COVID-19 pandemics.

Correlation between economic indicators of procurement of agricultural products for the needs of the defense system

Managing economic indicators in the process of procurement of agricultural products for the needs of the defense system has a powerful effect on a county's system. Analysis of economic indicators aims to determine the extent to which one set of indicators affects others in the context of observed developed countries and the Republic of Serbia.

In this section we shall analyze the correlation of economic indicators of procurement of agricultural products for the needs of the defense system in the selected countries (Serbia, USA, China, India, and Russia) in the period of nine years, observing the years 2013, 2017 and 2021.

Correlation was determined with the use of correlation analysis, namely using Pearson correlation coefficient. Correlation coefficient is the unit used for measuring the correlation between certain variables. Pearson correlation coefficient is used in cases when there is linear correlation between variables in the observed model, along with continuous normal distribution. The value of Pearson correlation coefficient ranges from +1 (perfect positive correlation) to -1 (perfect negative correlation). It is marked by the lowercase letter *r* and it is calculated using the following formula:

$$r = \frac{SSxy}{\sqrt{\mathrm{SSxx} \cdot SSyy}}$$

Correlation coefficients of economic indicators of procurement of agricultural products for the needs of the defense system in analyzed countries are shown in Table 3 (bellow).

Table 3. Correlation coefficients of economic indicators of procurement of agricultural products in developed countries and in the Republic of Serbia

Year	Macroeconomic indicators	Defense expenditure	GDP	GDP per Capita	Direct foreign investments	Unemployment rate	Inflation rate
2013	**Defence expenditure**	1	0,48	-0,58	0,57	0,34	0,60
2017		1	0,34	-0,59	-0,20	-0,14	0,14
2021		1	0,51	**-0,76**	**0,81**	-0,41	0,08
2013	**GDP**	0,48	1	0,001	-0,53	0,03	-0,42
2017		0,34	1	-0,27	-0,58	0,58	-0,58
2021		0,51	1	-0,56	0,16	-0,39	**-0,73**
2013	**GDP per Capita**	-0,58	0,001	1	-0,64	--0,54	-0,46
2017		-0,59	-0,27	1	-0,49	-0,55	-0,60
2021		**-0,76**	-0,56	1	-0,32	0,24	0,36

Year	Macroeconomic indicators	Defense expenditure	GDP	GDP per Capita	Direct foreign investments	Unemploy-ment rate	Inflation rate
2013	**Direct foreign investments**	0,57	-0,53	-0,64	1	0,09	**0,80**
2017		-0,20	-0,58	-0,49	1	0,23	0,91
2021		**0,81**	0,16	-0,32	1	-0,61	0,46
2013	**Unemployment rate**	0,34	0,03	--0,54	0,09	1	0,49
2017		-0,14	0,58	-0,55	0,23	1	0,06
2021		-0,41	-0,39	0,24	-0,61	1	0,19
2013	**Inflation rate**	0,60	-0,42	-0,46	**0,80**	0,49	1
2017		0,14	-0,58	-0,60	0,91	0,06	1
2021		0,08	**-0,73**	0,36	0,46	0,19	1

Source: Author's calculation

Coefficients of multiple correlation of economic indicators of procurement of agricultural products for the needs of the defense system from Table 2 are the following: 2013 = 0,44; 2017 = 0,42; 2021 = 0,44. Based on the coefficients we can assert that there is a statistically significant correlation. When considering partial coefficients, we used the following scale:

0,00 - ±0,20 – low or no correlation,

±0,20 - ±0,40 – slight correlation,

±0,40 - ±0,70 – significant correlation,

±0,70 - ±1,00 – high or extremely high correlation.

Observing partial coefficients from the table marked by the color red, we can conclude that there is statistically high correlation between the indicators in Table 2. Therefore, we can claim that there was statistically high correlation in 2013 between direct foreign investments and inflation rate, and in 2021 between budgetary funds for defense and GDP per Capita, budgetary funds for defense and direct foreign investments and GDP and inflation rate. Based on the analysis of data show in Table 2, we can conclude that there are many economic indicators where the calculated correlation coefficient shows statistically high correlation.

Audit and controls as a method of improving the process of procurement of agricultural products

The highest state body in the Republic of Serbia which is responsible for auditing the budget of the Republic of Serbia, including the audit of public procurement, is the State Audit Institution (Ivanova & Ristić, 2020). In all countries, the money allocated for state institutions, except for personal expenses, is indented for operational costs, provision and investments. It is precisely those funds that are mostly spent in the process of public procurement of goods, works, and services. Accordingly, it makes sense that SAI focuses on auditing public procurements, especially the procurement of agricultural products for the needs of the defense system. SAI has vast experience

in auditing the procurement of agricultural products and the recommendations issued by this institution, as the highest body of control of state's budget, are mandatory for all budget users (Durkalić & Ćurčić, 2019; Koprivica, 2021). These recommendations simultaneously help state institutions in their efforts to improve public procurement of agricultural products. Besides experience with the regular state, here we can also observe significant experience and recommendations regarding procurement in the state of current worsened global security and all other presented problems following such a state. Along with SAI, the procurement of agricultural produces is also controlled by internal audit, inspection and various internal controls, regulated by the Budget System Law (118/21).

We systemized the indicators from the consolidated annual reports on the state of internal financial controls in the public sector of the Republic of Serbia for the past five years (2016-2020) in the following fashion:

Table 4. Indicators of the state of internal financial control in the process of public procurement of agricultural products

SECTOR	RECOMMENRATIONS PER YEAR					%
	2016	2017	2018	2019	2020	2020/2016
Public procurements and contracting	598	741	595	637	450	75,25

Source: Author's calculation

By analyzing the methodologically represented indications, we have reached the following conclusions:

- It is worrying that similar indicators were determined in research regarding the given recommendations 10 years ago (Issa et al., 2022),
- Public procurement of agricultural products holds second place by the number of given recommendations among all controlled segments (internal rules and procedures, bookkeeping, salaries and payments),
- The highest number of recommendations was given in 2017, and the lowest in 2020, which is an indicator of improvement in the area of public procurement. In 2020, 75,25% less recommendations were given when comparing to 2016,
- Reduction in the number of recommendations given in the last five years (2016-2020), demonstrates that managers and personnel in charge of procurement of agricultural products accepted and implemented the recommendation that were agreed upon (Krstić, 2020).

As of recently, the Ministry of Finance of the Republic of Serbia, based on the Decision of the Government, introduced an obligation for all budget users to seek consent for all public procurements, including the procurement of agricultural products, which exceed a certain value from the Ministry of Finance (originally it the value was set at one million, but soon risen to two million dinars) along with certain additional guidance (Stanojević & Milunović, 2020). We remind that a similar obligation regarding public procurement

was introduced during COVID-19, which placed public procurement under control to a certain extent, especially during the state of emergency at the beginning of pandemics.

Also, the Ministry of Finance plans to introduce software for monitoring contracting outside the public procurement portal. The aim is to improve the software for monitoring the realization of public procurements which is intended to include all public procurements to which the PPL in not applied, i.e., to all those for which data is not available at the Public Procurement Portal with the exception of procurement of agricultural products for the needs of defense and security. As stated by the Ministry of Finance, "the said procurement should significantly contribute to a more efficient and effective realization of all jurisdictions of this ministry determined by law, regarding the subject in matter" (Đurić et al., 2020). The stated demonstrates that there is a need to monitor and publish contracts concluded outside the Public Procurement Portal, above certain value, in a unified manner. Among numerous other problems in the field of procurement of agricultural products, such an approach could contribute to a more comprehensive perception and better control of procurement of agricultural products. Along with unification of data regarding public procurement, it would also greatly enable the analysis of participation of all procurement in planned budgetary means of a budget user. The effect would certainly be complete if it would include all procurements to which the law is not applicable, not just those above a certain value.

In the current situation of worsened security in the world many relations in general have become disturbed – in politics, economy, diplomacy, and other areas (Lepojević & Samardžić, 2022). We are witnessing many problems in our own country, when it comes to securing energy sources before the winter in order to secure functioning of the economy and in order to satisfy the needs of our population. Satisfaction of defence needs in such conditions also faces multiple challenges. If we observe from the budget perspective, the funds in the budget approved at the beginning of the year are insufficient due to the inflation and price increases. Even when allocated, they are no guarantee that all planed and unplanned procurements of agricultural products will be realized due to a series of abovementioned problems. Therefore, disturbed and decelerated functioning of economy and disturbed relations on the global market reflect on all areas, including the defence sector. Adjustment of procurement of agricultural products in such conditions is very difficult and complex, especially in the field of defence and security.

Strengthening of national defence industry should definitely be the priority of the Republic of Serbia in the coming period, with a special focus on its modernization in order to justify its existence and in order to satisfy the modern military needs. When importing, it is vital to rely on experiences and good contacts of state companies and national defence industry which deal with import of weapons, equipment and raw materials. Also, involvement of the highest state officials is becoming increasingly necessary in order to procure some sophisticated weapons (Anti-aircraft systems, drones, airplanes, etc.). At the level of the Sector for Public Procurement of the Republic of Serbia, it is necessary to conduct research which should primarily aim to analyze the

effects of the application of the PPL till date, its good and bad sides and to formulate measures and solutions in order to overcome the limitations and problems present in the process of public procurement of agricultural products. The said research should include all state institutions, which would provide their experiences as suppliers in the process of procurement of agricultural products, which would in turn contribute to the research subject.

We particularly highlight the role of the Ministry of Finance, which monitors and controls all public procurements of agricultural products through approval and monitoring of budget spending in the Republic of Serbia. All of the abovementioned accentuates the obligation of budget users to plan public procurement of agricultural products with even more precision, with comprehension of priorities and with constant care for the principles of economy, efficiency and effectiveness. Finally, the role of SAI, as well as all other subjects in charge of audit and control, is crucial as they must determine the omissions and provide recommendations which will oblige all state institutions to improve the sector of procurement of agricultural products. All of the abovementioned will make the procurement of agricultural products more transparent and budget users more responsible for improving public procurements and take responsibility for spending state money, i.e., for informing the public and citizens on how the tax payers' money is being spent.

Conclusion

Public procurement for defense needs primarily imply procurement of weapons and military equipment. However, despite the fact that procurement of weapons is dominant, war cannot be waged without good logistical support, which includes securing many other defense needs as well as procurement of agricultural products. In modern times we can perhaps place political and media preparation first, which also require many resources.

Our research has demonstrated that worsening of the security situation causes proportional growth of military expenditure and acceleration of armament, which is particularly evident in the most powerful nations, as well as those countries which are in conflict. Analyzed data regarding "military budget" expenditure in the world confirms that the arms race in accelerating. The identified indicators demonstrate the duty of our country to arm itself, primarily due to security reasons. Compromised security produces many disturbances, primarily economic crisis and other consequences: inflation, reduction of trade, decrease of production, increase of prices, deficiency of goods, primarily food, energy sources, weapons and military equipment and many other products and services.

Adjustment of procurement of agricultural products for the needs of the defense system in a state of compromised security and multiple disturbed relations and the global market becomes even more complex and challenging. In addition to the allocated budget funds, significant skill is also necessary. The import of weapons requires great diplomacy, even participation of the highest state officials. When it comes to procurement from

the national defense industry, it is much easier to conduct the process but only if the national production has been modernized and it is possible to import and secure the raw materials necessary for production.

Therefore, the challenges of procurement of agricultural products for the needs of the defense system in modern times are evidently tremendous. In addition to satisfying defense needs, it is also necessary to secure the functioning of the economy and society a whole. In times of crisis, it is of particular importance to keep in minded the priorities and economic justification of procurement.

Conflict of interests

The authors declare no conflict of interest.

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