

**SPECIFICITY OF PERFORMANCE MEASUREMENT  
IN THE MINISTRY OF DEFENSE  
AND THE SERBIAN ARMED FORCES**

*UDC 65.015.25:335(497.11)*

**Tatjana Stevanović<sup>1</sup>, Ljilja Antić<sup>1</sup>, Aleksandar Savić<sup>2\*</sup>**

<sup>1</sup>University of Niš, Faculty of Economics, Serbia

<sup>2</sup>Serbian Armed Forces, 3rd Land Force Brigade, 31st infantry battalion, Zaječar, Serbia

**Abstract.** *The purpose of this paper is to investigate the specific characteristics of performance measurement on the example of the Ministry of Defense and the Serbian Armed Forces. The calculation of financial and non-financial performance measures of the Ministry of Defense and the Serbian Armed Forces contributes to constant improvement or maximization of their ability to provide goods and services through the effective and efficient acquisition and use of different types of resources. The research was conducted using the data on selected financial and nonfinancial performances from the 31st Infantry Battalion reports in the period from 2012 to 2018. In order to confirm the hypothesis, the method of analysis, the synthesis method and the correlation analysis method were used. The empirical results of this study show that there is a high degree of interdependence between the financial management and control systems, on the one hand, and increased training of people and more adequate maintenance of motor vehicles, weapons and combat techniques, on the other. The main contribution of this paper is to emphasize the importance of performance measurement in the Ministry of Defense and the Serbian Armed Forces and their contribution to creating a certain level of socialwelfare.*

**Key words:** *performance measurement, financial and nonfinancial performance, Ministry of Defense, Serbian Armed Forces*

**JEL Classification:** M41

---

Received May 09, 2019 / Revised June 29, 2019 / Accepted July 08, 2019

\* PhD student at University of Niš, Faculty of Economics, Serbia

**Corresponding author:** Tatjana Stevanović

University of Niš, Faculty of Economics, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Serbia

E-mail: [tatjana.stevanovic@eknfak.ni.ac.rs](mailto:tatjana.stevanovic@eknfak.ni.ac.rs)

## 1. INTRODUCTION

The main goals of public sector organizations are to maximize the scope of public services provided from available resources and to use resources according to purpose, while respecting the quality of meeting the wider needs of the society and achieving maximum profits and certain surpluses. Full coverage of costs, minimizing subventions, as well as maximizing the amount of funds available for post-related goals are also the significant goals of these organizations. Difficulties in determining the optimal level of spending contribute to increasing the importance of budgetary control, i.e. controlling the cost-effectiveness in relation to the permitted budget of a public organization. The developed performance measurement system requires the budgeting systems based on achieved performances. An adequate implementation of the budgeting system is very important as a support when defining the planned goals, that is, the control of the execution of the budget, because this is the assumption of an adequate allocation of resources in the following period. All public goods in one country have a major impact on its economic development, political stability, and the quality of life of its citizens. For the above reasons, there is a constant tendency towards increasing the rationality in spending budgetary funds, improving the efficiency of providing and raising the quality of public services (Webb, 2010).

The purpose of measuring the performance of the Ministry of Defense and the Serbian Armed Forces is determined by the needs of the entity that uses this information. In general, information about the performance of the Ministry of Defense and the Serbian Armed Forces can be used for two basic purposes: making economic decisions and meeting the requirements for public accountability. Evaluation of the performance of the Ministry of Defense can be carried out at different levels, that is at the level of an individual organization in the Ministry of Defense, at the level of a certain type of activity or program or at the level of the Ministry as a whole. Otherwise, performance evaluation is an activity carried out in all organizations that have the character of a reporting entity.

Very often, the purpose of evaluating performance is conditioned by the level at which the observed organization is located. For example, at the level of a single reporting entity or user of resource in the Ministry of Defense, such as the Military Security or the Military Intelligence Agency - the purpose of evaluating performance can be improving various aspects of the performance of the entity, evaluating the influence of the appropriate management on the performance of the entity, demonstrating public responsibility or allocating resources. Evaluating the performance of the Ministry of Defense and the Serbian Armed Forces is a complex system, primarily because of the primary goal - the production of services and goods, which in their nature are public goods, and in that way contribute to the creation of a certain level of social well-being. Because of this particular goal of functioning, military security intelligence organizations are accountable to the community, not to the amount of profit realized, such as for profit organizations, but for the efficient and effective using the collective resources entrusted to them.

In accordance with the laid goal, this paper, besides to the introductory considerations, consists of the several parts. In the second part of the article, attention is dedicated to the role, the importance, and the management of performance of the Ministry of Defense in the security sector of the Republic of Serbia. Third part of paper provides an insight into the research methodology and the initial research hypothesis. The research results and their discussion is given in the fourth part of the paper. Finally, concluding observations are made in the last part of the paper.

## 2. THE THEORETICAL CONTEXT OF RESEARCH

### 2.1. The role of the Ministry of Defense in the security sector

The Ministry of Defense participates in the security sector through its agencies - the Military Security Agencies (MSA) and the Military Intelligence Agencies (MIA). These are military services, which are organized as administrative authorities within the Ministry of Defense. Their competencies and tasks are derived from their role in the defense system and the security sector.

The Military Security Agency (MSA) is formed within the Ministry of Defense and performs general security and counter-intelligence tasks. Within the framework of general public procurement tasks, the tasks of the MSA are the following: to analyze security risks that disturb normal functioning; to plan, organize and control the way of securing facilities and assets as well as the measures in implementation of certain activities; to apply and control the application of security measures; to perform security checks; to issue security certificates (permits and approvals); to carry out activities in the field of industrial safety; to provide information and network systems; to provide data leakage through cryptographic protection; to provide security protection to other entities and perform other general security tasks (Zakon o vojnobezbednosnoj agenciji i vojnoobaveštajnoj agenciji, 2013).

Within its counter-intelligence tasks, the MSA: monitors, analyzes and prevents the disintegration of intelligence, prevents intelligence by foreign bodies or bodies from collecting data against the Ministry of Defense and the Army of Serbia; exposes and eliminates domestic and foreign, as well internal and external terrorism and extremism; investigates and analyzes crimes, crimes against humanity and other goods protected by international law. In addition to the above-mentioned work related to organized crime, the cases of abuse of office, money laundering, as well as acceptance of bribes and bribery are also discovered and investigated by the MSA.

The Military Intelligence Agency (MIA) is also formed within the Ministry of Defense and its jurisdictions are the following: to collect and check data and information and then to process, analyze, evaluate and deliver them to the competent authorities; to exchange information and data with other organizations and services of the Republic of Serbia, as well as with foreign organizations of other countries; to keep the collected data and information and protect them from unauthorized discovery, giving, using, losing or destroying, in accordance with the law and bylaws; to plan to train their own persons for realization of tasks and activities as well as for protection of objects and documents; to protect persons who are sent to work abroad by the Ministry; to take care of the equipment and the means used in the work, without any unauthorized access; to acquire, develop and use information systems, communication systems and data transmission systems, as well as means for the protection of information; to organize training of members of the MIA or organize specialized courses, perform research, form archives and publish own editions; to plan, organize and conduct internal control of the work of MIA members; to request from the competent security services security checks of legal and natural persons when it is necessary for the performance of tasks within the jurisdiction of the MIA; to plan equipping and procuring things for their own needs; to perform other tasks within his/her jurisdiction (Zakon o vojnobezbednosnoj agenciji i vojnoobaveštajnoj agenciji, 2013).

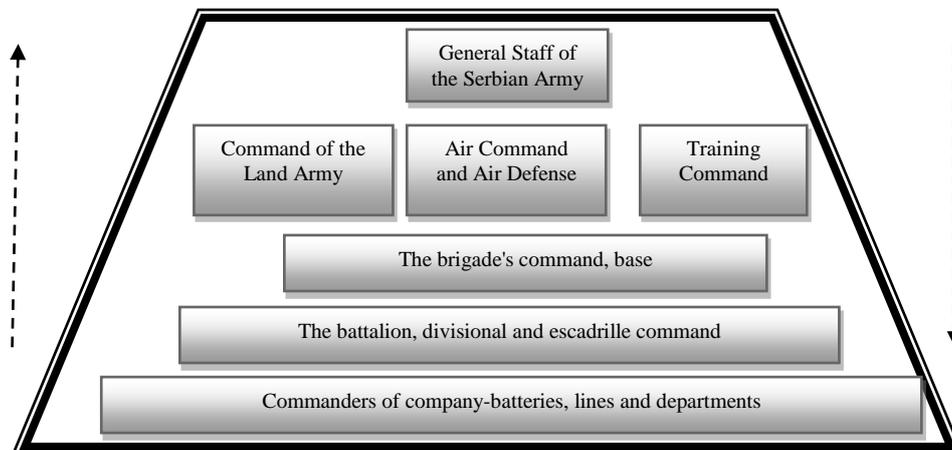
The Act on Internal Organization and Systematization of both the MSA and the MIA as well as the way in which they operate is a state secret. Members of the MSA and the MIA are professional members of the Serbian Armed Forces, civil servants and attorneys.

The military intelligence and intelligence agencies have groups for financial, logistical, IT and other support, which perform different tasks within their scope of work.

## 2.2. The place and the role of the fourth level of beneficiaries in the Ministry of Defense and the Serbian Armed Forces

The Ministry of Defense, more precisely the administrative bodies within the Ministry of Defense that have the status of direct beneficiaries of the budget funds (Military Intelligence Agency, Military Intelligence Agency and the Defense Inspectorate) and institutions, units and commands of the Army of Serbia, are considered to be users of the budget funds of the Republic of Serbia.

The fourth level of funds users in the Army of Serbia is a battalion, which can be infantry, mechanized, engineering, logistic and others. The battalion is the basic united tactical unit, permanent formations. In peace, the battalion exists within the brigade of the Land Forces, Air Force and Airborne Defense, or the Training Command, and, in the war, it performs tasks individually and in the composition of more units or temporary composition. Figure 1 shows the organizational structure of the General Staff of the Serbian Armed Forces. It consists of the aforementioned three units of the Serbian Armed Forces, which consist of brigade units. The brigades further consist of battalions, while the battalions consist of company, company of lines and lines from the department.



**Fig. 1** Organizational structure of the General Staff of the Serbian Armed Forces

*Source:* Andrejić, M., Milenkov, M. (2010). *Osnovi logistike*. Beograd: Vojna akademija, p. 349.

The battalion represents the basic modular, tactically acceptable, existentially capable unit, with a solid capability to perform tasks and survive on a modern battlefield. It combines combat forces, forces for financial, logistical, IT and other support and combat support forces.

Infantry battalions are organized in such a way that, if necessary, they can receive the mark of another type of battalion with certain formative adjustments. The battalion is intended for performing various combat operations on the front, in its own background

and on temporarily occupied territory. Also, the battalion can perform other tasks within the defined missions of the Army.

The financial service of the Ministry of Defense and the Serbian Armed Forces is organized by the Rulebook on Financial Operations in the Ministry of Defense and the Serbian Armed Forces in five levels of planning, depending on the level of units, from the central level (organizational unit of the Ministry of Defense in charge of the budget and finances) to the fourth level (units of the Army of Serbia rank of the battalion command), whereby the organizational units of the financial service, scope, competencies and job descriptions are defined. The financial service of the Ministry of Defense and the Serbian Armed Forces is organized at the following levels (Pravilnik o finansijskom poslovanju u Ministarstvu odbrane i Vojsci Srbije, 2017):

1. the central level - organizational unit of the Ministry of Defense in charge of budget and finance,
2. the first level - departments and sections for finance in the administrative bodies within the Ministry of Defense, the sectors of the Ministry of Defense, the Secretariat of the Ministry of Defense and the General Staff of the Serbian Armed Forces,
3. the second level - departments, groups or independent executives for finances in the administrations of the Ministry of Defense and the Serbian Armed Forces and their equal composition and finance units in the commands of operational units,
4. the third level - sections for finances in brigade commands and their uniforms,
5. the fourth level - groups or independent executives for finances in battalion commands - divisions and their uniform composition.

The fourth level user in theoretical sense is a group, that is, an independent executive for finances in the battalion commands - divisions and their equal composition, to whom the superior command allocates funds that are further disposed of in accordance with the needs of the given unit. The financial service authority of the users of the fourth level funds is obliged to dispose of the funds in a legal, economical, effective and efficient way and record it in the appropriate business books.

The Financial Service is responsible for the analysis of executing the financial plan and inventory in accordance with this Rulebook. The Financial Service prepares the proposal of a financial plan, keeps books of accounts, prepares financial statements, performs control of accounting documents and manages funds in accordance with the provisions of the Financial Regulations and the orders of the authorizing officer. The material accountancy is managed by the beneficiary of the fourth level of the organization of the financial service, which has been assigned the status of the holder of the material accountancy maintenance and the unique identification number of the holder of the material accountancy maintenance. Material bookkeeping is conducted separately for the unit to which the accounting code was assigned and for a self-contained unit of war (Pravilnik o materijalnom poslovanju u Ministarstvu odbrane i Vojsci Srbije, 2017).

### **2.3. The characteristics of performance management process in the Ministry of Defense and the Serbian Armed Forces**

The traditional form of budgeting in public sector shows the tendency to move towards budgeting based on results, i.e. achieved performance (Poister, 2003). Performance-based budgeting systems demand a more advanced performance measurement model that, in addition to the input criteria, includes some more difficult measurable performance indicators of the quality of services provided, as well as effectiveness and efficiency measures.

The importance of the Ministry of Defense as part of the non-profit public sector is great in modern conditions, especially in the developed countries. A large number of people are employed in this sector, so it has a great contribution to increasing the employment of a country. Also, the development of this sector is relevant for the development of commercial sector and, consequently, for the overall economic development of the country.

Performance management in the Ministry of Defense does not differ significantly from performance management in commercial enterprises and includes performance planning, performance measurement, performance analysis and reporting, and, finally, performance enhancement actions.

The process of performance planning is done through strategic and operational planning. Achieving the appropriate coordination of a military security agency with an external environment implies the implementation of strategic planning. The key is to identify the most important strategic issues and problems that the agency will face for a long time, and to develop a strategy for their effective solutions. Strategic plans define the strategic goals from which operational goals are performed, i.e. through business plans (budgets) the strategic goals are concretized and timed to dynamist and operational (Berman, 2007).

Measuring performance of the Ministry of Defense carries certain specifics, since the results arising from the mission often are not measurable by financial traditional performance measure. Namely, in the Ministry of Defense non-financial performance criteria are much more relevant. In most cases, the underlying reason is that the product or service is difficult to measure and intangible. In this connection, it is necessary to include a system of financial and non-financial performance measures, which is not based on profit, as in the case of profit organizations, but on meeting the needs of the organization (Antony & Govindarajan, 2007). Thus, the system of criteria for measure performance of military security agencies should be conceived in the light of four main dimensions: the coherence of goals and means for their realization, the coherence of the source (the volume of resources) and their spending, the achievement of the balance of meeting the interests of current and future generations of users and the sustainability of the agencies (Brujin, 2007).

Performance analysis is done according to the same methodological principles as in organizations that are profit-oriented. The system of monitoring and analyzing business performance of the Ministry of Defense is conceived and operational at regular time intervals based on the chosen performance criteria system. Adequate tracking and monitoring for appropriate time periods (monthly, quarterly, six month, yearly) creates an information basis that will serve for analysis in the succession of the period. The performance data are accumulated and the corresponding time series of data are formed. On the basis of these, it is possible to identify the current state and trend of performance (growth, decline or stagnation), or it is possible to compare the achieved performance in different periods.

In order for the Ministry of Defense and the Serbian Armed Forces to successfully carry out their missions in the security sector, they must first of all be operatively capable. Operational capability and its development, in line with resource constraints, are aligned with the funds set for the defense system (Doktrina Vojske Srbije, 2010). In this regard, financial and non-financial performance measures are formed.

Evaluating the financial performance of public and non-profit oriented organizations is a far more complex, more challenging and more difficult task than evaluating the financial performance of profit oriented and private sector entities (Barton, 2004). The primary source of differences between public and private sector organizations, which makes the evaluation of financial performance of public organizations more complex, is found in their primary goals

(United States Government Accountability Office, 2008). The primary goal of private and profit oriented organizations is to make a profit and thus create value for investors, or increase their well-being. Therefore, exploiting the opportunity for gain this goal is the main driving force behind the private organizations management in the process of making economic decisions, which is primarily responsible to investors. The primary goal of the public organizations, and also the Ministry of Defense in the security sector, is the production of services and goods, which are in their nature public goods, for the benefit of all those who make up a certain community (and thus create value for all its members) and thus achieving a certain level of social well-being. Due to this particular goal, public organizations are accountable to the community not for the amount of gain, but for the effective and efficient use of collective resources entrusted to them (Popper & Wilson, 2003). Therefore, in order to evaluate the financial performance of the Ministry of Defense, which prepares and presents its financial statements according to accounting requirements based on an accrual basis, it should be used the financial analysis tools that are used by private organizations, but with the necessary degree of critical thinking that respects all the differences between public and private sector (Barton, 2004).

The methods of traditional financial analysis are studied and quantified the relationship between the specific and interlinked positions of the financial statements (Wilson & Kattelus, 2002) in order to systematically determine the financial position and financial performance of the Ministry of Defense in the current, but also in future reporting periods. The indicators of financial positions are classified into following groups: liquidity indicators, indicators of asset utilization efficiency, financial structure indicators, profitability indicators, and market value indicators. The indicators from the first three groups are, to a certain extent and under certain assumptions, applicable to all individual and economic organizations of the public sector, while the latter two (profitability and market value indicators) are relevant only for public enterprises (Stevanović, 2013). Given that the Ministry of Defense in the security sector consists of a military security and military intelligence agency, as well as they by classification are not public companies, we will only monitor the first three indicators in the future, as financial measures of the performance of the Ministry of Defense in the security sector.

#### **2.4. The analysis of relevant financial and non-financial performance measures of the Ministry of Defense and the Serbian Armed Forces**

According to the general definition, liquidity is the ability of the Ministry of Defense to pay off all its maturing obligations unconditionally, at a certain point and in the required amount, while still possessing craft assets that enable it to smoothly continue its activities and not impair its ability. The purpose of calculating any measure of liquidity is to obtain a general impression of the degree of short-term creditors protection. The quantification of these liquidity measures, when available with relevant data from the financial statements, is a simple process. However, the lack of standardized indicators in the public sector is objectively conditioned by the fact that the Ministry of Defense is significantly different in relation to other public organizations, and that the organizations within it differ considerably from one another in terms of the height and structure of working capital, amount, structure and deadlines the maturity of short-term liabilities, as well as in terms of the type of activity conditioned by the period of time during which working capital must inevitably have to be available. Therefore, the calculated liquidity

measures should always be used in the context of the relative share of working capital in total assets and the relative share of short-term liabilities in total liabilities. In addition, each of these measures is static size, that is, it is calculated on a database that is relevant at a certain point in time (the reporting day). This disadvantage can be reduced in several ways: comparing with historical achievements and assessments, using a statistical methodology, whether there are characteristic trends and deviations from them (trend analysis), comparing with other organizations that have the same or similar characteristics and analysis of origin, time schedule and amount of cash inflows and outflows.

Basically, investing in any form of organized activity, there is always the assumption that the invested resources will be efficiently used, is that certain investments will have as much activity as possible (or that a certain volume of activities will be achieved with the lower investment) (Flynn , 2007). The financial indicators of the activity include all the relative relationships between income and expenses, from one and single and total investments in business assets, on the other hand, which are called turnover coefficients of business assets. The financial information presented in the financial statements of the Ministry of Defense and in the Notes to the financial statements enables the calculation of the purposeful indicators of the efficiency of using trusted resources. As well as indicators of liquidity, all activity indicators are static measures. Therefore, in order to better understand the efficiency of resource use, it is necessary to compare the current indicators of activities with historical achievements using the statistical methodology, and to determine if there are characteristic trends and deviations from them (trend analysis), as well as to make comparisons with other organizations that have the same or similar characteristics.

The financial structure of the Ministry of Defense (MSA and MIA) is determined by the structure of the sources from which its activities are financed as well as the relationship between the approved and spent funds. All the data necessary for calculating the financial structure indicators are on the side of the liabilities in the Statement of financial position. In order to examine the development of a financial structure, its deterioration or improvement, it is necessary to compare the current indicators of the financial structure with historical data. The Ministry of Defense, by comparing these indicators with the same kind of indicators for organizations with the same or similar characteristics, in addition to gaining insight into the state of its financial position in relation to it similar, may possibly use this information for negotiations aimed at improving its financing. Calculation and analysis of the financial structure indicators based on the information from the Financial Performance Report are also important because they are based on the solvency, is the ability to settle liabilities within the defined deadline.

The calculation of the financial performance indicators of the Ministry of Defense is not only an objective but a means to examine the current situation and trends and to find ways to constantly improve or maximize its organizational capacity, or to constantly improve or maximize its ability to provide goods and services through effective and efficient acquisition and use different types of resources. The financial information presented in the financial statements enables the calculation and use of financial performance indicators of the Ministry of Defense in the security sector. In addition to financial performance measures, the use of non-financial performance measures is extremely important to provide a complete picture of the Ministry of Defense in the security sector on the results achieved.

One of the key reasons for boosting and monitoring non-financial performance measures, in addition to improving financial performance measures, is the clearer articulation of the goals of the Ministry of Defense and their linking to the strategy (Novičević et al., 2006). In

particular, in controlling the achievement of strategic goals, it is extremely important to apply certain non-financial performance measures of public (social) responsibility (Myhrea et al., 2013). Performance of social responsibility is the driving force of financial performance, and in the final and reputation (image) in the public. Then, financial performance is the driving force behind the performance of social responsibility. Finally, the interactive relationship between the performance of social responsibility, financial performance and reputation of the organization is emphasized (Krstić, 2006).

The right choice of non-financial criteria of the Ministry of Defense in the security sector, closely linked to the strategy, i.e. the criteria for monitoring the implementation and success of the strategy, and can be considered through nine areas (Pravilnik o elementima i kriterijumima za ocenu stanja, operativnih i funkcionalnih sposobnosti Vojske Srbije, 2019): Human Resources Management, Intelligence Scouting, Operations, Logistics, Planning and Development, Telecommunications and Information Technology, Training Activities, Financial jobs and military-political affairs. In order for the Ministry of Defense to define adequate behavior in each of the nine areas, it is necessary to identify the list of criteria. It is important to emphasize that achieving adequate behavior in each area depends on several factors: financial conditions, size of organization, location, legal system, management, etc.

On the basis of the formed areas, non-financial measures of the performance of the Ministry of Defense in the security sector were defined. Thus, within the field of human resource management, the following are distinguished: performance measures related to personnel, such as resolving the situation in the service and other relationships in the service of professional members of the VS or keeping records of personal data of members of the VS; Educational performance measures, such as the realization of selection activities and sending members of the VS to schooling and upgrading, or keeping a database of personnel that is sent for education and training; performance measures related to psychological activity, such as the improvement of psychological activity in the Serbian Army or the provision of psychological support to command.

In the field of intelligence scouting, measures of intelligence security of the Army of Serbia, as well as measures of cooperation and data exchange, are set out. The field of operational affairs refers to the planning of work (preparation of annual and monthly plans for the work of the General Staff of the Army of Serbia, the General Staff of the Serbian Armed Forces and commands-institutions), deployment, order and internal service (deployment and order in the military complex, facility and camp room, and reporting services, on-call services), and control (implementation of control and reporting).

The scope of logistical activities consists of a number of sub standards and their performance measures, such as: operational logistical operations (development of guidelines for logistical planning, planning and management of displacement of material reserves, planning and organization of fire protection, planning and organization of occupational safety and health ), supply (planning, organization and monitoring of the filling of units of the Serbian Armed Forces with moving things), maintenance (monitoring of the state of correctness of exploitation and weather resources and development of maintenance plans), saber planning and organizing of dispatching services for transport and transportation, planning and organizing of food, water supply, dressing, service activities, health care (planning, organization and control of care for injuries and illnesses, planning, organization and control of veterinary protection of animals), infrastructure (maintenance of military real estate, handling and overhaul of TEPs).

The planning and development area includes amendments to the book formations and instructions for the internal organization of work, based on the decision of the Minister of Defense, the drafting, updating and keeping of the Army of Serbia mobilization plan, control of preparations for mobilization in institutions, units and commands. Information and telecommunications technology deals with telecommunication-information security (planning, organization and functioning of telecommunication-information security and military transportation), information protection, official correspondence and office operations.

Training activities are related to training planning (training assessment, risk assessment and resource protection, defining training goals, specification of training tasks), training (preparation for training, pre-training, protection during training), evaluation of training (evaluation of individual training, evaluation of collective training, control of the functioning of the training system in the Ministry of Defense), training means (insight into the state of the means of training, development of training assets).

The field of financial affairs includes the organization of financial and material operations, the implementation of a financial plan, analysis and reporting on the financial operations execution. Finally, the area of military-police affairs concerns the protection of the most important military facilities, certain persons, documents and weapons, and general security measures within the jurisdiction of the Military Police (security protection of classified information, planning and organization of security measures arising from normative documents and orders of the superiors and their command).

### 3. RESEARCH METHODOLOGY AND HYPOTHESIS

Managing the financial and non-financial performance of the Ministry of Defense and the Army of Serbia has a powerful effect on the defense system in the Republic of Serbia. Analysis of business performance aims to determine the extent to which unlawful spending of budget funds allocated to the Ministry of Defense and the Serbian Armed Forces has been used, as well as their use in accordance with the principles of economy, efficiency and effectiveness.

In this section we will look at performance management in the 31st infantry battalion. The basic hypotheses from which the research begins include the following:

H1: Missing and damage to movable objects in the 31st infantry battalion arise with the higher spending of approved funds, which is seen as a value measure for the number of tasks performed.

H2: Filling with moving assets in the 31st infantry battalion depends on the total number of units available.

H3: Financial Management and Control System (FMC) contributes to increasing human training and more adequate maintenance of motor vehicles, weapons and combat techniques.

In order to confirm the above hypotheses, the correlation analysis method was used, using the Pearson coefficient of correlation. Correlation coefficient is a measure that shows how much of a certain size is related. The information base for the realization of this research is data on selected financial and non-financial performances from available Reports in the period from 2012 to 2018 (see Table 1).

**Table 1** Selected financial and non-financial indicators of business performance, in the 31<sup>st</sup> infantry battalion in the observed period, 2012-2018

	2012.	2013.	2014.	2015.	2016.	2017.	2018.
<b>Selected financial indicators</b>							
Consumption of approved funds in (1000) RSD	9,476	18,254	23,466	66,701	2,049	9,788	32,458
The amount of defects and damages in (1000) RSD	68	2,345	0	457	1,977	845	158
<b>Selected nonfinancial indicators</b>							
Percentage of keeping a large number of people in relation to the following	72.4	64.8	61.6	54.4	53.7	49.6	48.5
Percentage of filling with mobile means	94	96	93	97	96	98	98
Percentage of establishment of the FMC system (financial management and control)	67.4	69.2	72.4	72.7	73.2	75.6	78.3
Percentage of defective motor vehicles	23	25	17.5	17	16	16	14.5
Percentage of employee training attendance	85.5	90	87.5	92	93.5	93	94

*Source:* Authors systematization according to the internal annual reports of the 31<sup>st</sup> infantry battalion (2012,2013, 2014, 2015, 2016, 2017, 2018).

#### 4. RESEARCH RESULTS AND DISCUSSION

The Pirson coefficient of correlation is used in cases where there is a linear connection between the variables of the observed model and an unintended normal distribution. The value of the Pirson coefficient of correlation ranges from +1 (the perfect positive correlation) to -1 (the perfect negative correlation). It is denoted by a small letter  $r$  and accounted with the following formula:

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

**Table 2** Correlation coefficient of financial performance measures

Financial performance measures	Consumption of approved financial assets in RSD	Amount of deficiencies and damages in RSD
Consumption of approved financial assets in RSD	1	-0,36
Amount of deficiencies and damages in RSD	-0,36	1

*Source:* Authors own calculations

The correlation coefficient between the financial indicators, i.e. between the expenditure of the approved financial assets and the amount of deficiencies and damages is -0.36, which means that the connection is relatively weak and that it is negative. The negative correlation in this case means that the greater the cost of the approved financial means, the less the amount of defects and damages. From the observed hypothesis 1, this should not be so, since any unit in the Serbian Armed Forces executes a large number of tasks and activities at the expense of the approved financial resources, and therefore it is exposed to the greater impact of defects and damage. Based on the results obtained, it is necessary to observe the relationship of these dimensions in the following period, and focus more attention on the proper use, maintenance and maintenance of movable assets, i.e. motor vehicles, weapons, combat techniques and other.

**Table 3** Correlation coefficient between a significant number of people in relation to the following and fillings with moving means

Non-financial performance measures	Percentage of keeping a large number of people in relation to the next	Percentage of filling with mobile assets
Percentage of keeping a large number of people in relation to the next	1	-0.78
Percentage of filling with mobile assets	-0.78	1

Source: Authors own calculations

As can be seen in Table 3, the coefficient of correlation between the percentage of the state of the human condition relative to the next and the percentage of filling with mobile means is -0.78, which tells us that this is a medium strong correlation and that it is negative, which means that a larger number of people are the smaller the percentage of filling with mobile means. From the obtained results, it can be concluded that the unit has the necessary resources, since the percentage is over 90%, but that year after year there is a reduction in the number of jobs or employment, which leads to a decrease in operational capacity. From this it follows that hypothesis 2 is disproved and this leads to the fact that certain funds are put out of use, given the reduced number of people, and makes it difficult for members of that unit to carry out tasks. In the upcoming period, it is necessary to intensify the improvement of working conditions in order to increase the employment rate according to the prescribed unit formation.

**Table 4** Correlation coefficient between the establishment of the FMC system, the correctness of motor vehicles and the presence of employee training

Non-formal performance measures	Percentage of establishment of the FMC system (financial management and control)	Percentage of defective motor vehicles	Percentage of employee training attendance
Percentage of establishment of the FMC system (financial management and control)	1	-0.86	0.83
Percentage of defective motor vehicles	-0.86	1	-0.59
Percentage of employee training attendance	0.83	-0.59	1

Source: Authors own calculations

The multi-correlation coefficient between the non-financial performance measures in Table 4 is 0.82, which means that there is a high degree of direct agreement between them. Partial correlation coefficients show that there is a strong inverse relationship between the percentage of the establishment of the FMC system and the percentage of defective motor vehicles, as well as between the percentage of the establishment of the FMC system and the percentage of the presence of employee training, while the medium strong inversion is between the percentage of defective motor vehicles and the percentage of the attendance of employee training. Financial Management and Control encompasses the entire system of financial and other controls and is implemented by activities,

procedures and policies whose task is to provide reasonable security that the unit will achieve the set goals through: business operations in accordance with contracts, internal acts and regulations, integrity and reality of business and financial reports, economical, effective and efficient use of funds and protection of funds and data (Strategija razvoja interne finansijske kontrole u javnom sektoru u Republici Srbiji, 2009). The higher the percentage of the establishment of the FMC system, the smaller the percentage of defective motor vehicles, the higher the percentage of the attendance of employees. The 31st infantry battalion seeks to encourage the training of employees and the increased presence of employees through the FMC system. This is for the purpose of proper handling of assets and knowledge of their own duties, in order to reduce damage and defects caused by inadequate handling and use of motor vehicles, weapons, combat techniques, and more. This hypothesis 3 is confirmed, however, there is still room for improvement of these non-financial performance measures, since the correlation coefficient is 0.82.

## 5. CONCLUSION

The performance of the Ministry of Defense in the security sector has a significant impact on the long-term stability of the country's financial system. Strategic plans identify the most important strategic issues and problems over a longer period, and they are contained in a strategy which enables their effective realization. The strategic goals and plans are concretized and dynamited through adequate business plans. Since the results arising from the mission mostly are not measurable solely by financial expression, measuring performance of the Ministry of Defense carries certain specifics. It is conceptualized and operational at regular time intervals, based on the chosen performance measurement system and it is linked to a system of monitoring and analysis of business performance of the Ministry of Defense. The management process is rounded off by determining the program of measures and activities for continuous improvement of the performance of the Ministry of Defense and the Serbian Armed Forces.

The information presented in the financial statements enables evaluation of the performance of the Ministry of Defense and the Serbian Armed Forces. In addition to providing an assessment of the compliance of actual payments and collection with the appropriate amounts envisaged in the budget - financial plan, the financial statements allow the determination of liquidity, asset efficiency and financial structure indicators.

Measurement of non-financial performance of the Ministry of Defense and the Serbian Armed Forces can be considered through nine areas: human resources management, intelligence scouting, operational tasks, logistics, planning and development, telecommunications and IT affairs, training activities, financial affairs and military policing. Based on the establishment and control of non-financial performance measures, it is possible to clearly define the objectives of the Ministry of Defense and their link with the strategy.

The calculation of the indicators of financial and non-financial performance of the Ministry of Defense and the Serbian Armed Forces is a means of reviewing the current situation and trends and finding ways to constantly improve or maximize their ability to provide goods and services through the effective and efficient acquisition and using different types of resources. This claim is confirmed by the results of the research, which created the basis for the following conclusions.

In case of higher spending of approved funds, a greater number of tasks and activities are carried out, which is why the units of the Serbian Armed Forces themselves are exposed to the greater impact of defects and damage. Therefore, more attention should be paid to the proper use, storage and maintenance of movable assets, i.e. motor vehicles, weapons, combat techniques, and more.

The unit monitored has the necessary resources, given that the percentage is over 90%, but there is a decrease in employment each year, which leads to a decrease in operational capacity. From this it follows that certain funds are put out of use, and makes it difficult for members of that unit to execute tasks. Therefore, in the forthcoming period, it is necessary to work on improving the working conditions in order to increase the employment rate, in accordance with the prescribed unit formation. A higher percentage of the establishment of the Financial Management and Control system reduces the percentage of defective motor vehicles, and increases the percentage of employees' training attendance. The 31st infantry battalion seeks to encourage the training of employees through the FMC system in order to properly manage assets and knowledge of their own duties, and to reduce damage to motor vehicles, weapons, combat techniques and other.

The system of managing and measuring performance of the Ministry of Defense and the Serbian Armed Forces is a dynamic system that requires continuous work on its improvement and practical implementation and raising awareness of employees. This is because it will produce real effects when applied from the highest management levels to the lowest executive level. Benefits of this system are numerous, but only when its creation is based on rational bases and when it is looked at in an adequate manner by all employees. From all of the above, it follows that through the system of management and measurement of the performance of the Ministry of Defense and the Serbian Armed Forces, the effects of the decisions made are being monitored and it allows for identification of potential risks, in order to avoid problems in the future.

#### REFERENCES

- Andrejić, M. & Milenkov, M. (2010). *Osnovi logistike [Fundamentals of logistics]*. Beograd: Vojna akademija.
- Antony G. & Govindarajan V. (2007). *Management Control System*. New York: McGraw Hill.
- Barton A. (2004). How to Profit from Defence: A Study in the Misapplication of Business accounting to the Public Sector in Australia. *Financial Accountability and Management*, 20 (3), 281-304.
- Berman, E. (2007). *Productivity in Public and Nonprofit Organizations: Strategies and Techniques*. Sage Publications.
- Brujin H. (2007). *Managing Performance in the Public Sector*. London: Routledge.
- Doktrina Vojske Srbije [Doctrine of the Serbian Armed Forces]*. (2010). Beograd: Medija centar „Obrana“.
- Flynn N. (2007). *Public Sector Management*. London: Sage Publications, Ltd.
- Frenkel, J. & A. Levich, R. M. (1975). Covered interest arbitrage: Unexploited profits?. *Journal of Political Economy*, 83 (2), 325-338.
- Jeston, J. & Nelis, J. (2008). *Management by process: A roadmap to sustainable Business Process Management*. Oxford: Butter-Heinemann, Elsevier Ltd., Jordan Hill.
- Krstić B. (2006). Merenje nekih dimenzija nefinansijskih performansi preduzeća [Measurement of some dimensions of non-financial performance of a company]. *Ekonomске teme*, 1-2/2006, 277-283.
- Myhrea, O., Fjellheima, K., Ringnesa, H., Reistada, T., Longva, K. & Ramosb, T. (2013). Development of environmental performance indicators supported by an environmental information system: Application to the Norwegian defence sector, *Ecological Indicators*, 29, 293-306.
- Novičević B., Antić LJ. & Stevanović T. (2006). *Upravljanje performansama preduzeća [Performance management]*. Niš: Ekonomski fakultet.
- Poister T. (2003). *Measuring Performance in Public and Nonprofit Organizations*. San Francisco: Jossey-Bass.

- Popper C. & Wilson D. (2003). The Use and Usefulness of Performance Measures in the Public Sector. *Oxford Review of Economic Policy*, 19 (2), 250-267.
- Pravilnik o elementima i kriterijumima za ocenu stanja, operativnih i funkcionalnih sposobnosti Vojske Srbije [Rulebook on Elements and Criteria for Assessing the Status, Operational and Functional Capabilities of the Serbian Armed Forces]. (2019). *Službeni vojni list*, 16/2017, 3/2019.
- Pravilnik o finansijskom poslovanju u Ministarstvu odbrane i Vojsci Srbije [Rulebook on Financial Operations in the Ministry of Defense and the Army of Serbia]. (2017). *Službeni vojni list*, 17/2011, 3/2013, 12/2014, 9/2017.
- Pravilnik o materijalnom poslovanju u Ministarstvu odbrane i Vojsci Srbije [Rulebook on Material Operations in the Ministry of Defense and the Army of Serbia]. (2017). *Službeni vojni list*, 29/2014, 09/2017.
- Strategija razvoja interne finansijske kontrole u javnom sektoru u Republici Srbiji [Strategy for Development of Internal Financial Control in the Public Sector in the Republic of Serbia]. (2009). Retrieved from: (<http://www.mfin.gov.rs/UserFiles/File/podzakonski%20akti/2011/Strategija%20IFKJ.pdf>).
- United States Government Accountability Office, (2008). *Defence logistics, Improved Analysis and Cost Data Needed to Evaluate the Cost-effectiveness of Performance Based Logistics*. Washington: GAO.
- Webb, W. (2010). Public Management Reform and the Management of Ethics – Incompatible Ideals for the Developing State?. *International Journal of Public Sector Management*, 23 (7), 669-684.
- Wilson E. & Kattelus S. (2002). *Accounting for Governmental and Nonprofit Entities*. Boston: Irwin.
- Zakon o vojnobezbednosnoj agenciji i vojnoobaveštajnoj agenciji [Law on Military Security Agency and Military Intelligence Agency]. (2013). *Službeni glasnik Republike Srbije*, 88/2009, 55/2012 – odluka US, 17/2013.

## **SPECIFIČNOST MERENJA PERFORMANSI U MINISTARSTVU ODBRANE I VOJSCI SRBIJE**

*Svrha ovog rada je da istraži specifičnosti merenja performansi na primeru Ministarstva odbrane i Vojske Srbije. Izračunavanje pokazatelja finansijskih i nefinansijskih performansi Ministarstva odbrane i Vojske Srbije doprinosi konstantnom unapređenju ili maksimiranju njihovih sposobnosti da obezbeđuju dobra i usluge putem efektivnog i efikasnog pribavljanja i korišćenja različitih vrsta resursa. Istraživanje je sprovedeno korišćenjem podataka o odabranim finansijskim i nefinansijskim performansama iz izveštaja 31. pešadijskog bataljona u periodu od 2012. do 2018. godine. Za potvrdu hipoteza korišćena je metoda analize, metoda sinteze i metoda korelacione analize. Empirijski rezultati ovog istraživanja pokazuju da postoji visok stepen međuzavisnosti između sistema finansijskog upravljanja i kontrole, sa jedne strane, i povećane obuke ljudi i adekvatnijeg održavanja motornih vozila, oružja i borbenih tehnika, sa druge strane. Glavni doprinos ovog rada sastoji se u isticanju značaja merenja performansi u Ministarstvu odbrane i Vojsci Srbije i njihovog doprinosa stvaranju određenog nivoa društvenog blagostanja.*

*Ključne reči: merenje performansi, finansijske i nefinansijske performanse, Ministarstvo odbrane, Vojska Srbije*