




Macroeconomic aspects of comprehensive costs of assets as a prerequisite for equipping the defense system with weapons and military equipment

Aleksandar O. Savić^a, Milan M. Mihajlović^b, Ivan D. Božović^c

^a Ministry of Defence of the Republic of Serbia,
Military Technical Institute, Belgrade, Republic of Serbia,
e-mail: aleksandar22071993@gmail.com, **corresponding author**,
ORCID iD:  <https://orcid.org/0000-0002-9640-1583>

^b University of Defence in Belgrade, Military Academy,
Belgrade, Republic of Serbia,
e-mail: milan.mih83@gmail.com,
ORCID iD:  <https://orcid.org/0000-0001-7949-2631>

^c University of Priština - Kosovska Mitrovica, Faculty of Economics,
Kosovska Mitrovica, Republic of Serbia,
e-mail: ivan.bozovic@pr.ac.rs,
ORCID iD:  <https://orcid.org/0000-0001-6400-7461>

DOI: 10.5937/vojtehg71-44145; <https://doi.org/10.5937/vojtehg71-44145>

FIELD: military science, public procurement

ARTICLE TYPE: review paper

Abstract:

Introduction/purpose: The activity of managing the budget funds of the Ministry of Defense and the Serbian Armed Forces (MoD and AF) does not accept even minimal mistakes in the procurement of weapons and military equipment (WME). Equipping the Serbian Armed Forces with weapons and military equipment must be economically justified because a large part of the budget is allocated for that purpose. The goal of the research is to look at the economic aspect of treating costs as a prerequisite for the process of equipping the defense system with weapons and military equipment.

Methods: For the purposes of the research, we used analytical and descriptive methods in order to see the comprehensive costs of assets that precede the effective equipping of the Ministry of Defense and the Armed Forces with WME. The research included the analysis of 18 review and research papers, which we analyzed in accordance with the Rulebook on equipping the Serbian Armed Forces with weapons and military equipment.

Results: The results of the research indicate that economic justification is expressed implicitly by the ratio of intangible benefits and achieved goals to the invested funds. The most common reason why economic

justification is not expressed explicitly by the difference between the initial investment and the final asset quantity is the existence of a number of circumstances for making wrong investment decisions. Also, if the costs are not considered in detail during the entire life cycle of the investment, it can be assumed that the planned target result is not certain.

Conclusion: The research indicates that not considering costs during the entire life cycle of the investment is the main reason for unplanned investments in the later stages and the emergence of numerous problems in the functioning of the defense system.

Keywords: accounting inclusion, expenses, equipping, weapons and military equipment, life cycle.

Introduction

The defense system in the Republic of Serbia is constantly exposed to economic, financial, social and political restrictive conditions. The Ministry of Defense and the Serbian Armed Forces are considered the main elements of the defense system and are required to work on the development of the capabilities, the physical and psychological preparedness of their employees and the development and modernization of weapons and military equipment. However, budget funds intended for these purposes are established and repeated year after year.

In order for the defense system to function successfully under these conditions, it is necessary to establish resource management, i.e. a modern management approach aimed at realizing realistic and sustainable development strategies. The management approach is based on interdisciplinary analysis of problems, astute forecasting of conditions and long-term planning, which avoids deviation from pre-defined goals during a change of government and abandoning the previously adopted projects and solutions.

Significant investments in the Serbian Armed Forces, i.e. significant equipping of the military forces with weapons and military equipment, exceed the scope of work and capabilities of the Ministry of Defense and the Serbian Armed Forces. For these reasons, it is necessary for the state to get involved in this kind of investment process, which, by optimizing the use of financial resources at the state level, will provide additional financial resources for the functioning of the Defense System. The Ministry of Defense is a state institution that includes the Serbian Army. As such, it must manage allocated budget funds in a controlled manner. The question of the justification of investment in equipping the Serbian Armed Forces with weapons and military equipment is of

fundamental importance both for the Ministry of Defense and for the society in general.

An investment involves a whole series of process activities that can be divided into the following areas: planning, preparation, realization and execution. Investment consists of the following basic elements: investor, investment project, interest and discount rate (Todorović, et al, 2000). The interest rate and the discount rate represent the amount of financial resources that are invested, the planned period for the realization of the investment project and the expected results.

Investing involves the process of exchanging something known for some expectations and benefits in the future. Uncertainty and time dispersion of values are considered the basic characteristics of investment. The degree of uncertainty of all factors in the future and their effects are directly related to the investment period.

That is why the management of investments is considered necessary when allocating large budget funds for an investment project, as well as when there is a high degree of risk for achieving the set goals. In almost all countries, investments are regulated by law as a process realized through several stages (Jovanović, 2006): pre-investment analysis, development of an investment program, making a decision on the realization of the investment, creation of technical documentation, realization of the investment project and putting the investment into operation.

In the Republic of Serbia, investment in weapons and military equipment for the needs of the Ministry of Defense and the Serbian Army is regulated by law. The reform of the public sector, which is carried out in the Republic of Serbia, covers all areas, including the defense system. As part of this reform, significant attention is directed to the optimization of total costs, even individual costs. This leads to the development of an adequate accounting methodology for determining the costs of the lifetime of assets, with teamwork and cooperation among technical and tactical procurement managers, designers and experts for integral logistic support (Stanković et al, 2020).

The goal of the research is to apply the approach of integral logistical support of weapons and military equipment in the area of accounting, based on the principles of a systemic approach. This paper also aims to make certain theoretical and empirical knowledge about costs available to the public, in order to create a suitable basis for their improvement.

Investing in weapons and military equipment for the needs of the defense system

Investing in weapons and military equipment for the needs of the Ministry of Defense and the Serbian Armed Forces is normatively regulated by the Rulebook on equipping the Serbian Army with arms and military equipment (Službeni vojni list, 12/2022). Regarding the period up to 2016, when the new Rulebook on equipping the Serbian Armed Forces with weapons and military equipment was adopted (Službeni vojni list, 26/2016), it can be stated that for almost two decades until then, the Rulebook on equipping the Yugoslavia Army with weapons and military equipment in peace (Službeni vojni list, 25/1996), was not harmonized with the requirements of the time and the real situation. Also, individual National Defense Standards 0477/83, 1096/85, 8196/92 and 9000/97 were considered normative documents that regulate the process of equipping the Serbian Armed Forces with weapons and military equipment.

The Rulebook specifies the technical and tactical bearers and bodies responsible for development and research, defining the maintenance system, procurement, etc. Through the process of planning, programming, research, development, production, testing and procurement, the Serbian Army is equipped with weapons and military equipment. In accordance with the Rulebook, a model with the following activities was defined for equipping the Serbian Armed Forces with weapons and military equipment:

- research and own development,
- development of copying according to the sample, i.e. according to the obtained license,
- development of cooperation with a business partner from abroad,
- procurement of imported funds,
- procurement of assets from the domestic market, and
- receiving donations from the country and abroad.

Also, the Rulebook determines the course of the process, with a detailed explanation and determination of the activity holders, subjects in the process and documents that should be prepared in the preparation of the proposal for making a decision on investment in equipping the Serbian Armed Forces with weapons and military equipment. A tactical study, a preliminary analysis and an implementation program are considered the basic documents at the beginning of the process of equipping with weapons and military equipment in accordance with the Rulebook. The tactical study is a document that is not mandatory in all

processes of equipping with weapons and military equipment, and its preparation depends on the specific case. In contrast to the tactical study, the preliminary analysis and the implementation program are considered mandatory documents, and during their preparation, the focus is placed on the technical and technological aspect of the equipment analysis. When preparing the previous analysis and the implementation program, there is also an economic aspect, specifically the aspect of costs, but its more detailed analysis is not carried out.

When preparing the preliminary analysis, one part of the document should include the projection of costs and the conditions of development, production, cost of assets, equipment, investment, deadline for execution and integral technical security. However, the Rulebook does not define the need to consider the total costs during the lifetime of assets. In the implementation program document, the costs are stated in more detail within the framework of the technical and economic analysis, but still without specific instructions on their time calculation.

The analysis of the treatment of the material and the financial aspect of the investment in equipping the Serbian Armed Forces with weapons and military equipment was carried out through a case study. The analysis determined a different approach to the treatment of the mentioned investment activity. In certain situations, only the static aspect is present, while the dynamic aspect and the aspect of total costs are not considered. Whether an investment project will be accepted depends on the percentage of satisfaction of the conditions that the project requires, e.g. maximizing the relationship between effects and investment. According to Jovanović (2006), investment projects can be evaluated statically and dynamically. The static aspect is applied to pre-investment project activities and is mainly oriented towards small and medium-sized projects. In contrast to the static one, the dynamic aspect is mainly used in investment project activities. It is also oriented towards small and medium enterprises. However, the dynamic aspect is also oriented towards large companies, but with pre-investment project activities. Equipping the Serbian Army with weapons and military equipment is considered a large project, and it is necessary to conduct an adequate research study before making an investment decision. It is important to note that the existing regulations and practice of equipping the Serbian Armed Forces with weapons and military equipment do not fully treat the material and financial aspect, so investment decisions are made on the basis of intuition or empirical knowledge, which creates a risk in meeting the set goals.

Impossibility of adequately assessing the justification of investments occurs most often in the pre-investment period, due to the impossibility of monitoring the costs of investments in equipping the Serbian Armed Forces with weapons and military equipment. Also, during the period of exploitation of assets, unforeseen costs arise, with huge differences from the planned ones, which raises the question of the justification of the investment, the usability of weapons and military equipment and their expediency (Vukosavljević et al, 2021). The problem that arises in connection with unplanned costs is also related to organizational and functional entities that participate in the investment project and are considered technical and technological experts. On the other hand, they are not experts in the economic field, so it is necessary to include this type of field in education at all levels of schooling in the defense system (Andrejić, 2001).

Conditions for efficient legal procurement of weapons and military equipment

In the process of procuring weapons and military equipment, it is necessary to make a strategic, management, operational and administrative decision in a safe and expedient manner. In this way, the acquisition of assets is ensured at a certain time, when needed, and at the optimal price. The detailed activities needed to be taken into consideration before making a certain decision are:

The strategic decision is preceded by planning and developing the organization and procurement infrastructure, determining the most adequate way of using weapons and military equipment, positioning the standards to be applied, establishing a system of internal financial control, as well as material and financial reporting.

In order to make a smooth management decision, it is necessary to determine the quality and quantity of the procurement that can be carried out by the procurement group, to plan and coordinate the way of operation of the procurement itself, to carry out training and enable persons to implement the procurement procedure and finally to carry out the procedure of measuring the procurement results (Jestrović & Jovanović, 2022).

The operational decision requires the specification and examination of the method of supply of goods and services, evaluation of suppliers' offers, negotiations with them and monitoring of contract and project implementation.

Processing and dispatching purchase orders, checking documentation related to the delivery and receipt of goods (Avakumović et al, 2021), invoices, reports on services performed, payment orders and other documents, as well as keeping records of the entire procurement process are activities that fall within the scope of administrative decisions.

In order to establish an effective legal procurement system in the Ministry of Defense and the Serbian Army, a good knowledge of law and legal procedures is necessary. Appropriate positioning of the procurement service within the Ministry of Defense should also be carried out. Normative regulations of the procurement procedure, adequate selection, training and education of employees and compliance with standards of ethical behavior are also tasks for the successful functioning of the procurement system in the Ministry of Defense and the Serbian Armed Forces.

It is necessary to regulate the basic tasks and obligations of the heads of organizational units in the Ministry of Defense and the Serbian Armed Forces by secondary legal acts, to prescribe the tasks and obligations of officials who are directly involved in the procurement system, including all others who directly or indirectly influence the procurement process, such as deciding on the selection of bidders. In addition, it is necessary to define the activities, holders and responsibilities of all those involved in the procurement process.

Accounting coverage of the costs of weapons and military equipment

Costs are considered a significant indicator for equipping the Army with weapons and military equipment, bearing in mind that budget funds for defense purposes are limited (Mihajlović & Savić, 2022). The defense system must pay special attention to costs, because in conditions of inflation there is an increase in the cost of acquiring weapons and military equipment. Recently, with the change in the procurement system, there is also a comprehensive overview of the costs of exploitation and support in the costs of the life cycle. In the process of procuring weapons and military equipment, the costs incurred can be observable and unobservable (Đorđević & Krstić, 2020). Observable costs are those incurred when equipping units and institutions of the Ministry of Defense and the Army and purchasing assets. They are tied to the tactical carrier, i.e. to the authorities responsible for research, development, improvement and adoption of material resources within their jurisdiction.

In contrast to observable costs, unobservable costs are higher and arise when performing a greater number of activities in various industries. However, as their name suggests, such costs are not noticeable and tactical carriers usually do not consider them. Costs of distribution, maintenance, training, inventory, disposal, removal, etc. are considered unobservable costs, i.e. costs that are not considered.

In the process of procuring weapons and military equipment and calculating the costs incurred during the entire project, all the mentioned costs must be taken into account. Cost calculation can be presented in several ways, that is, several alternative cost solutions that meet the optimal criteria can be offered. In this way, the problem of a multi-criteria nature is solved, regardless of whether it is an optimal combination of costs or the best model (Petrović et al, 2012). The problem of solving a multi-criteria model is given in Table 1.

Table 1 – Problem of solving a multi-criteria model (Petrović et al, 2012)

Таблица 1 – Проблемы решений в многокритериальной модели (Petrović et al, 2012)

Табела 1 – Проблем решавања модела вишекритеријумске природе (Petrović et al, 2012)

		Criterion				Model value
		K1	K2	Kn	
	Model 1					
	Model n					
The degree of difficulty of the criteria						
	Selection of models in accordance with the chosen criterion and its weight					

The problem of solving a multi-criteria model can be dealt with using a number of different methods and techniques. In their research, Drenovac A. & Drenovac B. (2012) singled out a special example of the choice of method and decision criteria. Also, Miličević & Župac (2012) presented the procedures for implementing the methods, with the aim of solving the problem of determining the weight of the criteria. A multi-criteria problem is usually solved by choosing a management model, directed towards the asset being adopted, provided that it meets the optimal requirements at the lowest cost.

During the service life of assets, the costs of acquisition, exploitation and support and disposal are identified.

Acquisition costs are identified through cost analysis and are incurred only once during the asset service life. Also, other costs are identified through cost analysis, but unlike acquisition costs, they arise constantly during the use of assets. Costs incurred during the renewal of resources for the exploitation and provision of services to a system or subsystem during its life cycle are called exploitation costs. They can be costs of acquiring and storing energy sources, ammunition, fuel and the like (Ivanova & Ristić, 2020). Disposal costs also refer to the costs of acquiring the same assets to replace destroyed and worn-out assets. With disposal costs in situations where they depend on some variable, it is necessary to find a way to consider them separately. Otherwise, they are not considered separately, but are an integral part of the exploitation and support costs.

The cost analysis assesses the degree of inflation, the decline in the purchasing power of the population, the decrease in the value of the currency, the growth of discount and interest rates at which loans are granted to commercial banks and households, and other factors that positively and negatively affect the amount of costs. Cost planning is done on the basis of historical data and facts, projections, proposals and cost forecasts. When planning costs, their quantitative and qualitative criteria should be taken into account.

All costs arising in the life cycle of assets can be separated into group costs and individual costs. In this respect, there are acquisition, exploitation and disposal cost groups.

Acquisition costs represent initial visible costs, that is, the costs of initial investments in the development and purchase of assets. They can be divided into costs incurred during research and development of assets and those incurred during investment. They are not decisive when making a decision on the choice of assets from the aspect of costs in the life cycle of assets. Therefore, the initial price does not play an important role for the choice of specific assets. However, this does not mean that when analyzing acquisition costs, one should not pay attention to the total purchase price of assets with equipment, costs of logistics, transport, additional testing, risk and other costs of acquisition and distribution of assets.

Exploitation costs represent the largest group of costs, accounting for 70% of total costs. Exploitation costs are divided into operational costs and logistical support costs.

Operational costs include the costs of training personnel to handle the equipment, the costs of further training and improvement of personnel, the costs of personnel wages, the preparation of accompanying documentation of the equipment, the use of ammunition, fuel and lubricants, as well as other costs incurred during the use of the equipment.

Logistics support costs are constantly incurred and include the following costs: costs of personnel training for asset maintenance, costs of continuous training and improvement, costs of spare parts procurement, their storage, as well as storage of ammunition, fuel and lubricants, costs of procurement of maintenance equipment, periodic testing and preparation of logistic documentation, costs of transportation of assets, construction of facilities and premises for the use and maintenance of assets, costs of collecting the database in the accounting information system and its functioning through nomenclature processing of funds (Klincov et al, 2022).

The costs of removing assets are called asset disposal costs. They can be particularly high for substances that are hazardous to the environment, and it is necessary to analyze them additionally. However, they can at the same time bring a certain amount of income by assigning or selling them, which depends on the way of conducting the policy of equipping and using assets. Efficiency and effectiveness are important principles in these costs. Disposal costs include the following costs: the cost of decommissioning assets, the cost of decommissioning assets and equipment for the use and maintenance of those assets, the cost of retraining personnel to work on other assets and the cost of analyzing costs in the life cycle of assets in order to create a database in the accounting information system.

The integral logistics support system analyzes certain subgroups of costs, which are defined by the standards for equipping the Serbian Armed Forces with weapons and military equipment. Depending on the costs, certain subgroups of costs need to be analyzed in the smallest detail, because they can be significant when choosing the type of weapons and military equipment for the Army. In the system of integral logistical support of weapons and military equipment, it is important to pay attention to the maintenance of assets, equipment for maintenance and equipping, support for supply, transport, handling and storage, care for people, i.e. employees, infrastructure, technical documentation and IT support (Stevanović et al, 2019).

In the maintenance of weapons and military equipment, the level and task of maintenance, reliability, continuity, maintenance time, cycle

time by levels and tasks, operational availability, maintenance technology, as well as the number of annual interventions are monitored.

Procurement of maintenance equipment is carried out according to the quantity, type and location of the equipment, future intensity of its use, readiness for use and requirements for its maintenance. The following elements are classified under the support in the supply of the necessary weapons and military equipment: the level of repair achieved and the location of the assets, the required quantity and quality of spare parts, components and parts for repair, problematic processes, the frequency of replacing parts, the level of depreciation, aging and available stock, storage time period and conditions, time period and procurement cycle. During transport, handling and storage, each user should take care of the quantity, type, location, packaging and dispatching of assets, their storage in containers and other packaging, conservation and the costs of transport and storage. Care for people, i.e. employees, refers to the amount of trained staff and the required level of training, the intensity of training, indirect work on training per employee, the requirement for initial training, the necessity of having training aids and the organization of training. Infrastructure includes the necessity of a facility for training, storage for assets and capital equipment, tools and special devices for handling assets, installation network for servicing and maintenance, authorities for managing microclimatic conditions and facilities, as well as auxiliary authorities for maintenance and cleaning of facilities. The requirements of technical documentation and information support require the acquisition and production of technical manuals, manuals, instructions for operation and maintenance, procedures, etc., the formation of a database on weapons and military equipment, the production of reports on exploitation and maintenance, nomenclature processing of the assets and, finally, the construction or implementing an accounting information system (Savić et al, 2018).

Accounting coverage of the costs of specific weapons and military equipment

For the purposes of this research, the model of Prof. Kanga from the USA is adapted using the formula method in an Excel spreadsheet. As data on the costs of weapons and military equipment and other confidential information are unavailable to the public, the research was conducted on the basis of approximate data. This was intended to examine the mutual influence of the data, how they influence each other

and what is their individual impact on the total cost of weapons and military equipment.

For the research sample, the model of prof. Kanga considered identical aircraft from two squadrons at different airports. In considering the initial purchase price, i.e. the cost of purchasing the aircraft, the prices of the aircraft and equipment for servicing and maintenance, the costs of acquisition and distribution, as well as the costs of basic personnel training were taken into account. The costs of maintenance and modernization of the aircraft in the first five years are almost non-existent, because they are new assets under warranty. After five years, and even later, certain regular investments in the aforementioned assets are required, which leads to an increase in maintenance costs. On the other hand, at the end of half a century of use of the assets, higher costs appear in connection with improvement and modernization, as well as additional tests of the assets for their safe use. Considering the lifetime of the assets, we also have a constant increase in operating costs. However, at the end of the asset useful life, it is possible to sell the asset at a favorable price and in that case generate income instead of a negative cost.

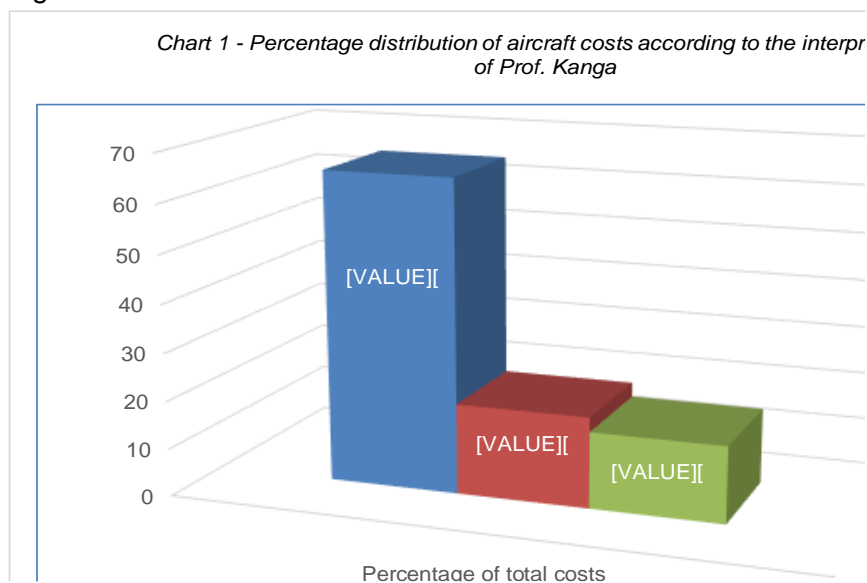


Figure 1 – Percentage distribution of aircraft costs according to the interpretation of Prof. Kanga (Andrejić & Sokolović, 2009)

Рис. 1 – Процентное распределение затрат на воздушные суда в соответствии с интерпретацией профессора Канга (Andrejić & Sokolović, 2009)

Слика 1 – Процентуална расподела трошкова за авионе, према тумачењу проф. Канга (Andrejić & Sokolović, 2009)

If we look at the total costs of the aircraft (Chart 1, Figure 1), It can be concluded that the largest part of the total costs are actually operational costs of using and maintaining the asset (65%), followed by modernization and testing costs (18%) and training costs and other personnel costs (17%).

Through a detailed analysis of the squadron, it was determined that the costs of using and maintaining the assets are the highest because there is a lack of manpower for the said assets, both pilots and other personnel who would be engaged in its preparation and maintenance. In that case, there would be no basic costs for the said personnel (salaries, fees, daily allowances, etc.), but the costs arising as a result of inadequate management and maintenance of the said assets (which are more significant in relation to the personnel costs) would be higher. The costs related to the personnel who handle, work on the preparation and maintenance of the assets are invisible costs which are constantly present and which are decreasing due to the radical reduction of workers. Also, the non-targeted hiring of workers directly affects the increase in operating costs, which means the engagement of trained soldiers under a contract for asset maintenance activities (Savić et al, 2021).

Modernization and testing costs are inversely related to maintenance costs. If maintenance costs decrease, the circumstances for inadequate maintenance increase, together with the costs of testing and modernization. For investing in the modernization of weapons and military equipment, in addition to money, time represents another important resource in these activities.

With training costs and other personnel costs, money and time are also essential resources for their management. Which resource is more important in this case depends on the conditions of acquisition, use, storage, maintenance and disposal of weapons and military equipment.

Conclusion

In the early stages of the development of weapons and military equipment, costs are determined and accounted for during the entire life of assets. In this way, it is possible to influence the total number of assets, as well as to reduce the costs of the asset service life through the change of projects. Accounting inclusion of costs in the Ministry of Defense and the Serbian Army requires and ensures efficient, effective and economical logistical support in the process of procurement of weapons and military equipment. In order to successfully manage costs,

it is necessary to establish a system of internal financial control in the earlier stages of designing the procurement process. The establishment of logistical support and the implementation of internal financial control require ensuring operational readiness and linking it to the costs of the lifetime of assets.

The concretization of the elements of internal logistic support is carried out in the phase of realization of the prototype development of weapons and military equipment, which realizes the constant dependence of the technical solution and project in order to achieve the maximum availability or efficiency of assets with minimum total costs. This aims to obtain a tool that will perform tasks with optimal efficiency and costs both in peace and war with very little uncertainty. That is why this process of developing weapons and military equipment is considered the most economical.

Asset procurement costs are minimal in relation to the overall costs registered at the end of the asset service life because most of overall costs relate to asset use and maintenance. Maintenance and exploitation costs depend on the price of the working hour of the asset, while other costs are less affected by the lifetime of the asset. It is most expedient that the largest part of investment takes place in the initial stages through adequate handling and maintenance, in order to obtain an asset with the lowest possible costs during its life of use. All this needs to be regulated by a certain standard through application software solutions which enable multiple comparative analysis and the adoption of optimal solutions.

The process of equipping the Ministry of Defense and the Serbian Army with weapons and military equipment is multidisciplinary and multi-criteria and requires the formation of project teams for its management. The accounting inclusion of the costs of asset procurement enables an overview of the assets during their operational life in order to make the optimal decision. When accounting for costs, not all data are available, but some are obtained directly from manufacturers (who all want to sell their products at the best price). Some cost data are found in the asset databases and are based on historical facts. In this regard, it is not necessary to create a database that will collect information about future flows. Information can also be found with other partners who use identical or similar assets or use them in some other way (e.g. information on the reliability or time of failure of certain parts, etc.). All these data are used in the calculation of costs and their accounting inclusion, using adequate applicable mathematical methods that enable their precise determination.

When equipping the Ministry of Defense and the Serbian Army with weapons and military equipment, it should be borne in mind that these assets are procured for a period of 30 years or longer and that during that period they must be operationally capable of performing various tasks in various conditions. This includes forecasting the costs of their modernization or adaptation, with the aim of bringing them to a state of operational capability and efficiency. When predicting costs, the greatest attention is directed to logistics costs because they make up the largest part of total costs. In order to see total costs in the right way, it is necessary to develop and standardize the methodology of their calculation with the help of an adequate accounting information system. The role of accounting information systems is essential in all organizational systems, from the smallest to the largest ones. In order to properly account for the costs of assets and indicate their importance, it is necessary to study certain principles of logistical support at all levels of training and development of personnel in the defense system, as well as the costs that arise in them along with the way they are recorded and checked by the internal financial control system.

References

Andrejić, M. 2001. Methods and software for the support of planning in logistic organizational systems. *Vojnotehnički glasnik/Military Technical Courier*, 49(1), pp.36-52 (in Serbian). Available at: <https://doi.org/10.5937/vojtehg0101036A>.

Andrejić, M. & Sokolović, V. 2009. Integral logistic support means of armament and military equipment. *Vojnotehnički glasnik/Military Technical Courier*, 57(1), pp.32-53 (in Serbian). Available at: <https://doi.org/10.5937/vojtehg0901032A>.

Avakumović, J., Obradović, L. & Božić, G. 2021. Management and organization of teamwork in the function of sustainable development. *Održivi razvoj*, 3(2), pp.69-80 (in Serbian). Available at: <https://doi.org/10.5937/OdrRaz2102069A>.

Drenovac, A.Ž. & Drenovac, B.Ž. 2012. Possibilities of the application of multicriteria analysis and PROMETHEE methods, on an example of aircraft choice. *Vojnotehnički glasnik/Military Technical Courier*, 60(3), pp.125-142 (in Serbian). Available at: <https://doi.org/10.5937/vojtehg1203125D>.

Đorđević, D. & Krstić, D. 2020. The relationship between fiscal policy and sustainable development. *Održivi razvoj*, 2(1), pp.7-15 (in Serbian). Available at: <https://doi.org/10.5937/OdrRaz2001007D>.

Ivanova, B. & Ristić, S. 2020. Capital accumulation and concentration. *Akcionarstvo*, 26(1), pp.26-34 [online]. Available at: [http://www.ipn.org.rs/uploads/35271/documents/akcionarstvo_slozeno_2020_\(1\).pdf](http://www.ipn.org.rs/uploads/35271/documents/akcionarstvo_slozeno_2020_(1).pdf) (in Serbian) [Accessed: 20 April 2023].

Jestrović, V. & Jovanović, V. 2022. The role of corporate governance in sustainable development. *Održivi razvoj*, 4(1), pp.43-53 (in Serbian). Available at: <https://doi.org/10.5937/OdrRaz2201043J>.

Jovanović, P. 2006. *Upravljanje investicijama, 6. izdanje*. Belgrade: University of Belgrade - Faculty of Organizational Sciences (in Serbian). ISBN: 86-7680-094-4.

Klincov, R., Marjanović, N., Trnavac, D., Novović, M. & Obućinski, D. 2022. Understandings of economic laws in modern economic theory. *Akcionarstvo*, 28(1), pp.99-114 [online]. Available at: http://www.ipn.org.rs/uploads/35271/documents/akcionarstvo_slozeno_2022.pdf (in Serbian) [Accessed: 20 April 2023].

Mihajlović, M. & Savić, A. 2022. The role of the budget in financing the defense system of the Republic of Serbia. *Ekonomist*, 1(1), pp.16-27 [online]. Available at: <https://ekonomist.org.rs/wp-content/uploads/2022/05/Ekonomist-br.-1.pdf> (in Serbian) [Accessed: 20 April 2023]. ISSN: 2812-9725.

Milićević, M.R. & Župac, G.Ž. 2012. An objective approach to determining criteria weights. *Vojnotehnički glasnik/Military Technical Courier*, 60(1), pp.39-56 (in Serbian). Available at: <https://doi.org/10.5937/vojtehg1201039M>.

Petrović, N.Č., Đedović, B.N. & Petrović, D.N. 2012. Project estimation and selection using the cost: Effectiveness analysis and multi-criteria analysis. *Vojnotehnički glasnik/Military Technical Courier*, 60(3), pp.168-187 (in Serbian). Available at: <https://doi.org/10.5937/vojtehg1203168P>.

Savić, A.O., Avakumović, J.Č. & Tasić, S.S. 2021. The influence of intellectual capital on supply chain management of the Military Technical Institute. *Tehnika*, 76(4), pp.490-498 (in Serbian). Available at: <https://doi.org/10.5937/tehnika2104490S>.

Savić, A., Miljković, M. & Damjanović, T. 2018. Role of accounting documents accounting information system. *Oditor*, 4(3), pp.110-127 (in Serbian). Available at: <https://doi.org/10.5937/Oditor1803111S>.

-Službeni vojni list. 25/1996. *Pravilnik o opremanju Vojske naoružanjem i vojnom opremom u miru*. Belgrade: Ministarstvo odbrane Republike Srbije (in Serbian).

-Službeni vojni list. 26/2016. *Pravilnik o opremanju Vojske Srbije naoružanjem i vojnom opremom*. Belgrade: Ministarstvo odbrane Republike Srbije (in Serbian).

-Službeni vojni list. 12/2022. *Pravilnik o opremanju Vojske Srbije naoružanjem i vojnom opremom*. Belgrade: Ministarstvo odbrane Republike Srbije (in Serbian).

Stanković, V., Mrdak, G. & Miljković, M. 2020. Economic-legal analysis of international investments. *Oditor*, 6(3), pp.89-122 (in Serbian). Available at: <https://doi.org/10.5937/Oditor2003089S>.

Stevanović, T., Antić, Lj. & Savić, A. 2019. Specificity of performance measurement in the ministry of defense and the Serbian armed forces. *Facta universitatis, Series: Economics and Organization*, 16(3), pp.283-297. Available at: <https://doi.org/10.22190/FUEO1903283S>.

Todorović, J., Đuričin, D. & Janošević, S. 2000. *Strategijski menadžment, III izmenjeno izdanje*. Belgrade: Institut za tržišna istraživanja (in Serbian). ISBN: 86-81803-09-3.

Vukosavljević, D., Kaputo, J., Tešić, A. & Vukosavljević, D. 2021. *Macroeconomic environment and the public sector: Place and role*, *Oditor*, 7(3), pp.37-50 (in Serbian). Available at: <https://doi.org/10.5937/Oditor2103037V>.

Макроэкономические аспекты комплексной стоимости денежных средств как обязательное условие оснащения системы обороны вооружением и военной техникой

Александар О. Савич^а, Милан М. Михайлович^б, Иван Д. Божович^в

^а Министерство обороны Республики Сербия, Военно-технический институт, г. Белград, Республика Сербия, **корреспондент**

^б Университет обороны в г. Белград, Военная академия, г. Белград, Республика Сербия

^в Приштинский университет – г. Косовска Митровица, экономический факультет, г. Косовска Митровица, Республика Сербия

РУБРИКА ГРНТИ: 78.75.43 Финансирование военных расходов

78.75.45 Военно-экономические связи

78.75.49 Планирование военной экономики

78.75.73 Статистика, учет и отчетность. Техничко-экономический анализ в военном деле

ВИД СТАТЬИ: обзорная статья

Резюме:

Введение/цель: В управленческой деятельности бюджетными средствами Министерства обороны и Вооруженных сил Сербии (МО и ВС) недопустимы даже мельчайшие ошибки при закупках вооружения и военной техники (ВВТ). Оснащение сербских Вооруженных сил вооружением и военной техникой должно быть экономически оправдано, поскольку на эти цели выделяется значительная часть бюджета. Цель исследования состоит в рассмотрении экономического аспекта затрат как необходимого условия в процессе оснащения системы обороны вооружением и военной техникой.

Методы: Для достижения цели анализа суммарных затрат по эффективному оснащению Министерства обороны и Вооруженных сил вооружением и военной техникой использовались аналитические и описательные методы. В ходе данного исследования проведен анализ 18 обзорных и исследовательских работ. Анализ проведен в соответствии с Регламентом оснащения Вооруженных сил Республики Сербия вооружением и военной техникой.

Результаты: Результаты исследования свидетельствуют о том, что экономическая обоснованность капиталовложений имплицитно выражается соотношением нематериальных выгод и достигнутых целей. Наиболее распространенной причиной, по которой экономическая обоснованность неэксплицитно выражается в разнице между первоначальными инвестициями и итоговой суммой капиталовложений, является наличие ряда обстоятельств, влияющих на принятие ошибочных инвестиционных решений. Кроме того, можно предположить, что прогнозируемый целевой результат не будет соответствовать намеченным планам, если детально не анализировать затраты в течение всего жизненного цикла инвестиционного проекта.

Выводы: Результаты исследования показали, что неучет затрат в течение всего жизненного цикла инвестиционного проекта является основной причиной незапланированных инвестиций на более поздних этапах и возникновения многочисленных проблем в функционировании системы обороны.

Ключевые слова: охват бухгалтерского учета, затраты, оснащение, вооружение и военная техника, жизненный цикл.

Макроекономски аспекти свеобухватних трошкова средстава као предуслов за опремање система одбране наоружањем и војном опремом

Александар О. Савић^а, Милан М. Михајловић^б, Иван Д. Божовић^в

^а Министарство одбране Републике Србије, Војнотехнички институт, Београд, Република Србија, **аутор за преписку**

^б Универзитет одбране у Београду, Војна академија, Београд, Република Србија

^в Универзитет у Приштини – Косовска Митровица, Економски факултет, Косовска Митровица, Република Србија

ОБЛАСТ: војне науке, јавне набавке
КАТЕГОРИЈА (ТИП) ЧЛАНКА: прегледни рад

Сажетак:

Увод/циљ: Активност управљања буџетским средствима Министарства одбране и Војске Србије (МО и ВС) не прихвата ни минималне грешке у набавци наоружања и војне опреме (НВО). Опремање Војске Србије наоружањем и војном опремом мора бити економски оправдано, јер се велики део буџетских средстава издваја за ту намену. Циљ истраживања јесте да се сагледа економски аспект третирања трошкова као предуслов процеса опремања система одбране наоружањем и војном опремом.

Методe: За потребе истраживања коришћене су аналитичке и дескриптивне методе ради сагледавања свеобухватних трошкова средстава неопходних за ефикасно опремање МО и ВС средствима НВО. Анализирано је 18 прегледних и истраживачких радова, у складу са Правилником о опремању Војске Србије наоружањем и војном опремом.

Резултати: Указано је да се економска оправданост исказује имплицитно односом нематеријалних користи и остварених циљева према уложеним новчаним средствима. Најчешћи разлог због којег се економска оправданост не исказује експлицитно разликом почетног улагања и крајњег износа средства јесте постојање већег броја околности које утичу на доношење погрешних инвестиционих одлука. Такође, ако се током целог животног циклуса инвестиције трошкови не разматрају детаљно, може се претпоставити да и планирани циљни резултат није сигуран.

Закључак: Истраживање указује да неразматрање трошкова током целог животног циклуса инвестиције представља основни разлог непланираних улагања у каснијим фазама, што доводи и до настанка бројних проблема у функционисању система одбране.

Кључне речи: рачуноводствено обухватање, трошкови, опремање, наоружање и војна опрема, животно циклус.

Paper received on / Дата получения работы / Датум пријема чланка: 24.02.2023.
Manuscript corrections submitted on / Дата получения исправленной версии работы / Датум достављања исправки рукописа: 15.06.2023.
Paper accepted for publishing on / Дата окончательного согласования работы / Датум коначног прихватања чланка за објављивање: 17.06.2023.

© 2023 The Authors. Published by Vojnotehnički glasnik / Military Technical Courier (www.vtg.mod.gov.rs, втг.мо.упр.срб). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/rs/>).

© 2023 Авторы. Опубликовано в «Военно-технический вестник / Vojnotehnički glasnik / Military Technical Courier» (www.vtg.mod.gov.rs, втг.мо.упр.срб). Данная статья в открытом доступе и распространяется в соответствии с лицензией «Creative Commons» (<http://creativecommons.org/licenses/by/3.0/rs/>).

© 2023 Аутори. Објавио Војнотехнички гласник / Vojnotehnički glasnik / Military Technical Courier (www.vtg.mod.gov.rs, втг.мо.упр.срб). Ово је чланак отвореног приступа и дистрибуира се у складу са Creative Commons лиценцом (<http://creativecommons.org/licenses/by/3.0/rs/>).

