

Analysis Criteria for Defense Expenditure Performance – Economy, Efficiency, and Effectiveness

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Abstract: Based on the analysis of public expenditure performance, this article discusses the economy, efficiency, and effectiveness of defense expenditure performance, explains the relationship of the three, and emphasizes their unity, interaction, and priority. The defense expenditure performance evaluation system, which is a comprehensive assessment of processes and results, is put forward along with the unification of economy, efficiency, and effectiveness. This system can be used to analyze whether the allocation and use of defense funds have achieved the strategic objectives of the Department of Defense.

Keywords: Defense expenditure performance; Economy; Efficiency and effectiveness

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1. Introduction

In the context of the global economic downturn, some countries have begun to cut defense budgets, and almost all defense departments are more committed to reallocating defense resources according to the principle of performance in order to achieve the established defense strategic goals as far as possible under the constraints of limited resources. In order to improve the performance of defense expenditure, defense departments should allocate and use defense expenditure appropriately under the framework of economy, efficiency, and effectiveness.

2. General criteria for the performance analysis of public expenditure

In the new public management theory, performance refers to the outcomes, impact, and effect of public expenditure, which includes economy, efficiency, and effectiveness. They are known as the 3E criteria. Economy, efficiency, and effectiveness reflect the contents and requirements of performance from three different aspects. They are considered as a unified and integrated system (**Figure 1**).

2.1. Economy

Economy, also known as conservation, refers to the minimization of cost in regard to the occupying resources without affecting the achievement of the set objectives. That is to say, an organization would purchase a specified quality and quantity of resources at the lowest cost to achieve the set objectives (**Figure 1**). Economy measures the reduction of the input cost required for organizational activities. It is usually measured by the money saved from low-cost input ^[1]. Therefore, the economy of performance is mainly

concerned with the procurement process of the resources required by the organization.

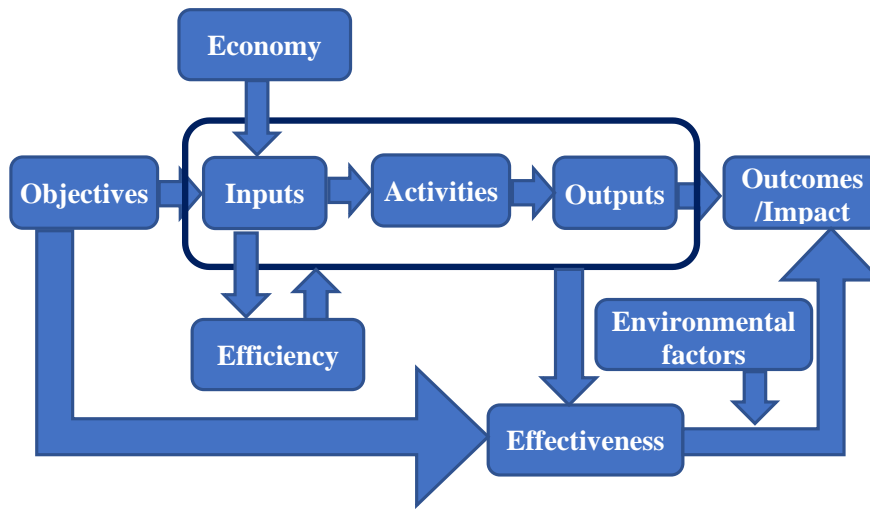


Figure 1. Relationship among public economy, efficiency, and effectiveness

Economy emphasizes that in the process of achieving organizational objectives, it is not only important to minimize the cost of occupying resources, but also ensure that the expected effects are achieved. The general principles of economy are as follows: the best results are achieved by using the given resources when resources are limited (maximization principle); minimum resources are used to obtain the given output when the output is certain (minimization principle); balance between resource cost and expected effect (optimization principle).

Economy can be affected by the following negative factors: part of the organization's funds is not used rationally; the purchase price is artificially high, which means that the price of the resources is higher than the normal market price; there is excessive expenditure, which means that the quality of resources purchased is higher than what is necessary. Economy is to save the procurement cost of resources.

2.2. Efficiency

Efficiency refers to the fact that an organization is able to provide products or services of specified quantity and quality with less and less resources. It represents the relationship between input and output (**Figure 1**). Efficiency is usually measured in the ratio of the output to the input of activities. Therefore, the efficiency of performance is mainly concerned with the allocation process of the resources by the organization.

The general principles of efficiency are as follows: the output would be maximized when the input is fixed (maximization principle); the input would be minimized when the output is fixed (minimization principle); a balance between resource consumption and maximum output (optimization principle) ^[2].

Practically, efficiency can be further divided into technical efficiency and distribution efficiency. Technical efficiency represents the quantitative relationship between input and output on the marginal production curve, while distributive efficiency represents the monetary relationship between costs and benefits. Technical efficiency is a purely material and technical relationship, it has no economic significance; this defect needs to be compensated by distribution efficiency.

Efficiency can be affected by the following negative factors: there are defects in the working methods of achieving the expected objectives; the plans, procedures, activities, and the management of relevant institutions are defective; the benefit-cost ratio of organizational activities is lower than that of similar social projects; the implementation of organizational activities is slow and the progress lags behind. Efficiency is

to achieve the optimal way of resource allocation.

2.3. Effectiveness

Effectiveness, also known as validity, refers to the fact that the final results from the outputs are in line with the strategic objectives of the organization and the extent to which these strategic objectives are achieved. It represents the relationship between the output and the result (**Figure 1**). Effectiveness is on behalf of the contribution of the output to the ultimate objectives of the organization and is usually measured by the ratio of the actual effect to the expected effect. Therefore, the effectiveness of performance is mainly concerned with the process of achieving the established objectives.

Effectiveness can be affected by output, results, and external environmental factors. It is essential to distinguish between output and result. For example, in terms of education in a certain area, output can be expressed by the literacy rate of the population in that region, while the result can be expressed as the educational level. External environmental factors include a variety of socio-economic influences. Therefore, the key point of effectiveness is to clarify whether the effect on the organization is a direct result of output or the influence of external environmental factors.

Effectiveness can be affected by the following negative factors: the use of resources does not lead to the expected results and the failure to identify or control the impact of external environmental factors lead to deviations from the expected results through the activities. Effectiveness is to ensure the correct direction of resource allocation.

In the performance evaluation process of public sectors, economy, efficiency, and effectiveness are usually the main considerations in designing a performance index system. The economic index mainly considers cost and resources, the efficiency index mainly considers resources and output, while the effectiveness index mainly considers output and results. It is possible to evaluate the service level of public sectors in the interlinked process.

3. Analysis criteria for defense expenditure performance

As part of the public sector, the Department of Defense is the same as any other public sector in basic attributes. Defense expenditure is a part of the national financial expenditure, and its performance can be evaluated based on the general criteria and methods of public expenditure performance. Therefore, the criteria of economy, efficiency, and effectiveness are applicable to analyzing the performance of defense expenditure. At the same time, it would be of benefit to clarify that the activities carried out by the Department of Defense have their own unique characteristics and have special requirements for performance evaluation. The performance evaluation of defense expenditure must be implemented in close conjunction with the management needs and institutional characteristics of the Department of Defense.

The evaluation framework of defense expenditure performance is shown in **Figure 2**. With various threats faced by a country, strategic judgments and objectives are formulated based on the evaluation of those external threats. These include a detailed draw-up plan of armed forces along with the confirmation of the quantity of personnel, equipment, infrastructures, and other resources required in the plan to implement the defense strategic objectives. These resources are expressed in the form of currency, that is the annual defense budget, which is allocated to various defense organizations after being approved. Each defense organization would then use the allocated funds to acquire the required personnel, equipment, infrastructures, and other resources. All of these resources are invested in defense activities to perform military missions and implement various military plans to form outputs, which lead to results under the influence of external environmental factors. This means that those outputs have finally achieved the defense strategic objectives. Defense organizations would then feedback the results and combine new threats as the

basis for adjusting the defense strategic objectives. With that, a complete and closed loop is finally achieved [3].



Figure 2. Evaluation framework of defense expenditure performance

The evaluation framework of defense expenditure performance emphasizes the continuous and repeated dynamic cycle process, thus reflecting the unity of economy, efficiency, and effectiveness of defense expenditure performance.

3.1. The economy of defense expenditure performance

The economy of defense expenditure performance is shown in the process of fund → organization → input in **Figure 2**. It reflects on how well defense organizations manage to acquire the required personnel, equipment, infrastructures, and other resources of specified quality and quantity to achieve the expected strategic objectives at the lowest cost, or whether the defense procurement cost can be minimized without changing the quantity and quality of the required resources. The economy of defense expenditure performance mainly focuses on the procurement process of resources. In this process, it is not only important to minimize the cost, but also ensure that the quantity and quality of resources can achieve the expected defense objectives.

3.2. The efficiency of defense expenditure performance

The efficiency of defense expenditure performance is shown in the process of input → activity → output in **Figure 2**. It reflects on how many defense products or services can be achieved through the resource input or how little the defense products or services use up the defense resources. The efficiency of defense expenditure performance mainly focuses on the allocation and process of using defense resources. In regard to this, it is not only important to minimize the resource input, but also ensure that the quantity and quality of defense products or services can achieve the expected defense objectives.

3.3. The effectiveness of defense expenditure performance

The effectiveness of defense expenditure performance is shown in the process of output → result → strategy in **Figure 2**. It reflects whether the defense products or services have achieved the expected defense objectives and the extent to which these objectives are achieved. The effectiveness of defense expenditure performance is concerning the process of achieving strategic objectives.

3.4. Relationship among economy, efficiency, and effectiveness of defense expenditure performance

Defense expenditure performance includes economy, efficiency, and effectiveness. They reflect the performance of the defense department from cost control, work efficiency, and actual effect. Economy, efficiency, and effectiveness are considered as a unified system. They reflect the contents and requirements of the defense expenditure performance from three different aspects, and there are inevitable organic relationships among them.

3.4.1. Interacting and influencing each other

First, economy may lead to loss of efficiency. If the defense department excessively pursues the economy of the resource procurement process, the budget funds may be secured, but the quality of the resources needed for defense activities would be lower and the efficiency reduces. As a result, the expected objectives cannot be achieved. For example, in the construction of a defense infrastructure, if the construction materials provided by the contractor are cheap, the construction cost is low, but the quality of the project cannot be guaranteed, which may increase the rework time and reduce the efficiency. It may also be abandoned due to quality issues as it cannot achieve the expected defense objectives.

Secondly, the pursuit of effectiveness may sacrifice economy. In the private sector, there is a direct and clear correlation between the results of corporate activities and the costs of resource inputs. In the defense sector, the relationship between results and costs is relatively vague. Defense organizations may sacrifice economy in pursuit of excellent results; this would demand a higher cost resulting in an unsustainable budget.

In practice, the economy, efficiency, and effectiveness of defense expenditure performance are often in conflict with one another; thus, it is difficult to be consistent. Economy evaluation, efficiency evaluation, or effectiveness evaluation can be based on the characteristics and stages of defense activities. However, these need specific analysis.

3.4.2. Compatibility and highlighting effectiveness

In general, economy and efficiency emphasize more on quantitative aspects and whether defense organizations are doing things the right way. Effectiveness, on the other hand, focuses more on quality and emphasizes whether defense organizations are doing the right thing; that is, no matter how well defense organizations perform in terms of economy and efficiency, they would not be as good as if they did well in effectiveness. It can be seen that effectiveness is the most comprehensive and important criteria of defense expenditure performance. In addition, it is the necessary condition to perform well in economy and efficiency. Moreover, the particularity of the defense department determines that it pays more attention to the results of military actions and more emphasis on the effects. If defense activities deviate from the expected objectives, it will be of no help even how low the cost of resource procurement is or how high the efficiency of resource allocation is, in which the improvement of economy would only become meaningless, and the improvement of efficiency would result in more wastage.

Therefore, the economy of defense expenditure performance should be highlighted when the quantity and quality of the required defense resources are guaranteed and when the expected objectives can be

achieved. The efficiency of defense expenditure performance should be based on effectiveness and within the defense budget. The effectiveness of defense expenditure performance should be to achieve the expected objectives under the condition of economy and efficiency. On the basis of effect-oriented defense expenditure performance, the compatibility and coordination of economy, efficiency, and effectiveness can be achieved along with the ideal performance level.

4. The performance evaluation system of defense expenditure

The performance evaluation of defense expenditure is a comprehensive assessment of the processes and results of various activities carried out by defense organizations. It is the unification of the processes and results, as well as the unification of economy, efficiency, and effectiveness. In practice, the performance evaluation of defense expenditure mainly examines whether defense organizations follow the principles of economy, efficiency, and effectiveness in their defense activities, and analyzes whether the allocation and use of defense funds have achieved expected strategic objectives in a relatively ideal manner. This is shown in **Figure 3**.

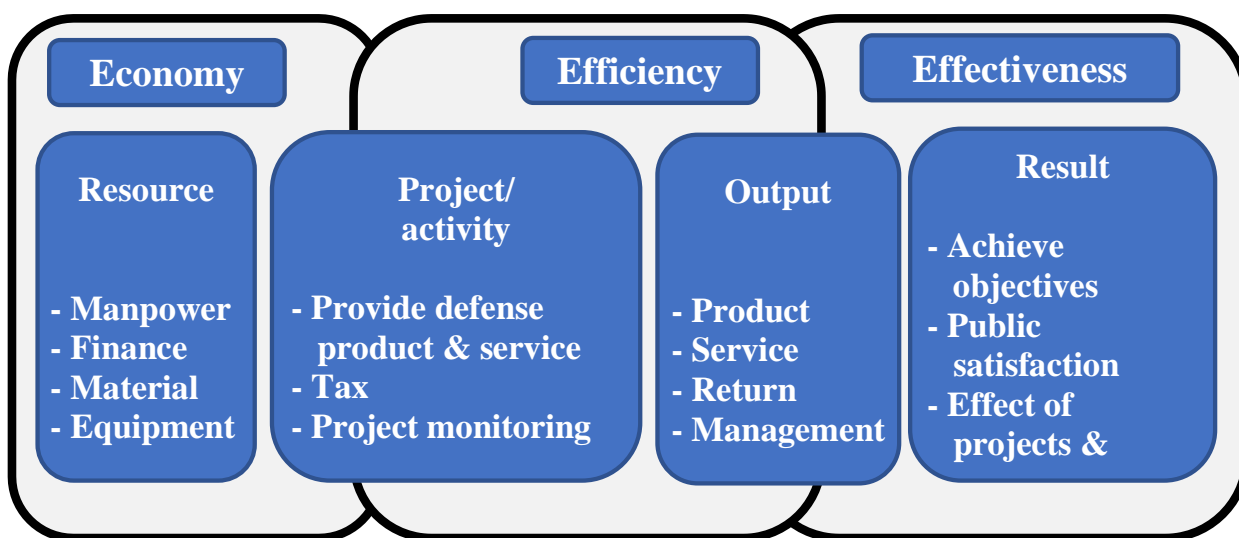


Figure 3. An overview of the performance evaluation of defense expenditure

First, the evaluation of economy should be conducted in the acquisition process of defense resources. The resources include personnel, materials, equipment, facilities, information, energy, land, etc. At this point, the focus should be on the fund management in defense plans and projects, processes, as well as activities in order to investigate whether management policies and behaviors of defense organizations achieve the expected objectives and minimize the cost under quality conditions.

Second, the evaluation of efficiency should be conducted in regard to the organization way of defense projects or activities. The focus should be on the input of personnel, materials, facilities, and other resources used in defense projects, procedures, plans, and activities in order to investigate whether the resource inputs have achieved the maximum outputs. Then, the ratio between the output and input resources can be calculated.

Third, the evaluation of effectiveness should be conducted in regard to the results and effects of defense activities. The focus should be on the achievement of defense objectives, public satisfaction, as well as the impact and effect of programs or activities in order to examine the extent to which plans, processes, projects, and activities have achieved the expected objectives. In that way, the actual results can be compared with the expected results.

The criteria of economy, efficiency, and effectiveness of defense expenditure performance highlight the importance of independent and objective evaluation. The evaluation assists in comprehending the performance of the Department of Defense in order to make relevant strategic adjustments. It allows the investigation of whether the decision for defense projects and activities is the optimal choice, and the rationality of the decision is tested according to the criteria of economy, efficiency, and effectiveness. In addition, it helps to analyze the management of defense projects and activities, as well as to evaluate the accuracy of the budget system. For example, whether defense projects and activities have corresponding performance evaluation index system, whether the supervision of defense projects and activities are appropriate, and whether defense organizations try their best to achieve the expected strategic objectives. Furthermore, the inspection of the internal control system of the Department of Defense can be done through the evaluation. It helps to determine whether the internal control objectives are conducive to the improvement of the management of the Department of Defense ^[4].

5. Conclusion

The 3E criteria is not only applicable to the performance analysis of public expenditure, but also to the performance evaluation of defense expenditure. Economy, efficiency, and effectiveness reflect the contents and requirements of defense expenditure performance from three different aspects. They are considered as a unified and integrated system. Economy mainly focuses on the procurement process of defense resources; efficiency mainly focuses on the allocation and process of using defense resources; effectiveness is concerning the process of achieving the strategic objectives. The performance evaluation of defense expenditure is the comprehensive assessment of the processes and results of various activities carried out by defense organizations, as well as the unification of economy, efficiency, and effectiveness.

Disclosure statement

The authors declare that there is no conflict of interest.

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