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RATIONALIZING PUBLIC SPENDING ACCORDING TO THE REQUIREMENTS OF HUMAN SECURITY OBJECTIVES: A COMPARATIVE STUDY USING DATA ENVELOPMENT ANALYSIS

Through this study, we will attempt to measure the extent of public spending rationalization for the 44 countries under investigation, assuming the achievement of human security. We will employ data envelopment analysis for this purpose. Our findings indicate that 36% of the sample countries operate at full efficiency, with an average efficiency exceeding 78%, a remarkably high percentage.

***Keywords**: rationalization of public spending; dimensions of human security; data envelopment analysis; efficiency; variable returns to scale.*

Public expenditures reflect the role and development of the state. As the state's role has evolved, so too has the concept of public spending. This represents the funds allocated from the state treasury by its administration, institutions, and various ministries to address public needs (Tariq, 2009). Therefore, the level of public

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spending is a crucial determinant of the proportion of national income allocated to public expenditure. This leads us to inquire: What percentage of national income is devoted to public spending? Some argue that this figure should not surpass 25—30% of national income, while others contend that this is excessively high, as it is arbitrary rather than grounded in economic principles (Al-Obaidi, 2001). Generally, it is not scientifically feasible to establish a fixed percentage of national income dedicated to public expenditure. This is due to the numerous factors influencing this proportion, primarily: the state's economic system, economic conditions (including the business cycle), and its financial and borrowing capacity. A defining characteristic of our time is the sustained growth in public spending. This phenomenon is observed across developed and developing nations, irrespective of their political systems or economic ideologies. Economic literature suggests a correlation between increased government spending and GDP growth. This relationship has been a focal point of extensive research and debate among financial experts for decades. Two primary perspectives on this correlation have emerged: one aligned with Wagner's Law and the other with Keynesian theory. However, during the mid-1980s, most countries worldwide encountered significant economic and financial challenges characterized by declining public revenue, insufficient funds to cover public expenditures, and state budget deficits. Consequently, attention shifted towards rationalizing public spending. While economic literature abounds with terms like spending controls, prioritization, and efficiency improvement, «rationalization» emerged as the most comprehensive and accurate descriptor. As a fundamental economic and rational concept applicable to both individual and societal behavior, spending rationalization gained prominence. Despite conceptual and practical variations in its implementation, there is widespread consensus on the principle's importance, particularly in the context of recurrent financial crises. This research primarily aims to illuminate the significance and prerequisites of public spending rationalization. However, contemporary realities necessitate linking public spending rationalization to predetermined overarching state objectives, chief among which is human security. Given the growing threats to human security in numerous countries during this decade, **this article** explores the rationalization of public spending through the lens of human security dimensions.

RATIONALIZING SPENDING, NATURE, IMPORTANCE AND REQUIREMENTS FOR SUCCESS

The terms «rationalization» and «rationality» are ubiquitous in both macro and microeconomic contexts. Economic rationality, for instance, is often invoked in discussions of decision-making by economic agents. Moreover, rationality predates economic behavior. As Jones noted in his 1908 paper, «Rationale in Every Day of Your Life», rationality is inherent to human experience (Vadim et al., 2013).

Terminologically, the concept of rationalization is multifaceted. Economic rationalization specifically refers to the judicious management of finances, encompassing both income generation and expenditure (Ibn Rushd, 2004).

The term «rationalization of spending» derives from the economic concept of «rationality», which implies the sensible, prudent allocation of funds based on logical reasoning and sound judgment (Saeed, 1966). Contemporary researchers often equate rationalization with a cognitive process involving reasoned decision-making that prioritizes quality and quantity. Conversely, practical rationalization is the deliberate alignment of means and ends within human behavior. While these two facets of rationalization can be distinguished, they are fundamentally interconnected, forming complementary components of human action (Abdel Hafez, 1992). Many researchers view public spending rationalization as encompassing expenditure control, waste minimization, elimination of unnecessary spending, efficiency enhancement, and optimal utilization of economic and human resources (Asfour, 2008). Some believe that rationalizing public spending means being effective in allocating resources and being efficient in using them in a way that maximizes the well-being of society (Abu Dawah, 2006). Essentially, public spending rationalization aims to enhance the effectiveness and efficiency of public expenditures through the strategic application of financial tools.

In today's world, expenditure rationalization has become paramount. In many countries, public expenditure patterns and magnitudes often exhibit irrationality. Overall spending levels are escalating at an unjustified pace, while structural distortions abound. These distortions stem from a disregard for prioritization principles, as often observed in the allocation of resources to less beneficial areas over more critical ones. Additionally, projects are frequently allocated funds that exceed or fall far short of actual requirements, leading to suboptimal resource utilization and misallocation. These factors contribute to a decline in public revenues.

Consequently, expenditure rationalization pursues a multifaceted set of objectives:

- combating extravagance and waste, as well as all forms of misuse of authority and public funds;
- propelling economic development and addressing the socio-economic challenges faced by the state;
- ensuring preparedness for a range of financial situations, both favorable and challenging, at the local and global levels;
- reducing budget deficits and narrowing the gap between revenues and required expenditures.

REQUIREMENTS FOR RATIONALIZING PUBLIC EXPENDITURE IN THE CONTEXT OF EMBRACING HUMAN SECURITY GOALS

The concept of human security gained prominence in the 1994 United Nations Development Programme (UNDP) Human Development Report, which defined it as «freedom from fear and want» (Chenini, 2022). This definition encompasses two primary dimensions: protection from chronic threats

like hunger, disease, and oppression, and safeguarding against sudden disruptions to daily life patterns in homes, workplaces, and communities (Hamoumi, 2013).

P. Heinbecker further refined the concept, emphasizing the individual and community levels rather than the state-centric approach (Collin, 2003). B. Buzan expanded the scope of security beyond the state to encompass human groups. Today, human security is recognized as a multidimensional framework comprising seven interrelated components that, when integrated, form a robust foundation for upholding human dignity and freedom (Azrawal, 2016). And it includes:

• ***Economic Security.*** Ensuring favorable conditions that promote relative increases in labor and capital productivity, guaranteeing a high standard of living and a just economic system for individuals (Masnoua, Barkno, 2016);

• ***Food Security.*** While definitions of food security vary, ensuring the production of adequate and better quality food for future generations remains a cornerstone of this dimension (Bin Obaid et al., 2017);

• ***Health Security.*** Comprises the actions and measures aimed at preserving, protecting, and preventing individuals from health risks (Belkheir, 2022);

• ***Environmental Security.*** Encompasses the protection of nature, the environment, and the vital interests of citizens, communities, and the state from both internal and external influences, as well as negative development trends that threaten human health (Sonia, 2014);

• ***Political Security.*** Manifests in the stability of the political system, citizen participation in its dynamics, and openness to progress (Chenini, 2022);

• ***Personal Security.*** Focuses on providing protection to individuals in the face of armed conflicts, rising rates of organized crime, drug trafficking, and human trafficking, all of which pose significant threats to individual safety;

• ***Community Security.*** Refers to the ability to maintain the continuity of traditional patterns of language, culture, identity, and customs (Hashemi, Ben Yahia, 2023).

In general, rational financial management depends on stable rules and principles that govern the flow of public expenditures at appropriate rates to achieve public policy objectives, especially if they are based on achieving human security. The rules or requirements for rationalizing spending vary from one researcher to another and from the circumstances of one country to another, and can be summarized as follows:

First, making human security the paramount goal of public spending. Public sector performance hinges on aligning goals with results, essentially creating new value. Consequently, establishing overarching political objectives is paramount for the success of public spending rationalization and effective expenditure control (Galdemar, 2012).

It's noteworthy that these general objectives are multifaceted across ministries (such as education, interior, and culture) and encompass both short-term (like ensuring optimal school entry conditions) and long-term (like fostering

educational democracy) horizons (Muzellac, 1986). Harey contends that a primary challenge is aligning budget preparation with management requirements, necessitating the formulation of precise and clear goals for government programs. This demands a comprehensive assessment of administrative unit competencies to prevent ambiguous or irrelevant specific goals that misalign with human security needs. Steiner emphasizes the interconnectedness of long-term and medium-term goals, asserting that defining overarching objectives is crucial for accurately setting sub-goals at the departmental level, as security goals influence program development (Ben Azza, 2015).

Second, Human security and spending priorities. Various literature and models have indicated that public spending and its priorities are determined through what is known as the social preference function. This function determines the relative weights of various spending appropriations, especially those related to achieving human security. The crucial point is how individual preferences are transmitted to decision-makers. This raises the fundamental issue of how public spending priorities are formed.

Literature on the social planner suggests that policymakers do not have direct knowledge of individual or societal preferences (Torsten, Tabellini, 2002). Instead, they determine spending priorities based on their understanding of these preferences. From this perspective, public spending priorities are the outcome of efforts by various ministerial sectors and are presented within the framework of the state's general budget, subject to study and approval by Parliament. This process involves regulatory stages and requires the involvement of local stakeholders (Al-Shikar, 2009).

Third, allocating materials according to the structure of the program to achieve human security objectives. Resources are allocated based on the program structure to achieve established goals. This leads to the reorganization of the state's administrative structure to meet program requirements, with programs detailed into sub-programs, activities, and tasks. All components aim to ensure dimensions of human security, identifying centers responsible for completing program components (Abu Douh, 2006).

At this stage, it is necessary to develop an integrated information system to prepare periodic reports. These reports determine the volume of public services provided compared to targeted goals from activity programs. Additionally, they identify actual costs of public services, categorizing them into variable costs related to activity volume and fixed costs. This allows for identifying deviations in fixed and variable costs due to price changes or activity volume deviations from planned levels (Ghali, 2008).

Fourth, oversight of public spending. Ensuring the rational direction of public spending necessitates efficient and effective oversight. This oversight ensures that spending is allocated to various capacities in a manner that achieves desired goals within the framework of the principle of optimal efficiency (Abdel Fattah, 1996).

THE EFFICIENCY OF USING PUBLIC SPENDING IN ACHIEVING THE DIMENSIONS OF HUMAN SECURITY, A COMPARATIVE STUDY USING ENVELOPE ANALYSIS OF DATA

The data envelopment analysis (DEA) method has emerged as a new quantitative tool in operations research to measure efficiency. It determines the optimal combination of total inputs and outputs for decision-making units with similar goals and activities, thereby assessing their level of technical efficiency. DEA is rooted in the efficiency definition developed by Farrell in 1957 and utilizes the economic theory known as Pareto optimization (Benlebbad, 2024).

The efficiency index of the facility ranges from zero (0), indicating complete inefficiency, to one (1), indicating complete efficiency. The Data Envelopment Analysis (DEA) method is considered the optimal benchmarking tool (Sherman, Zhu Joe, 2006). We will utilize the standard formula for the DEA method, which assumes the Variable Return to Scale (VRS) model, to facilitate the comparison process (Färe, Grosskopf, 2004).

Data Envelopment Analysis (DEA) provides an estimate of resource rationalization possibilities and improving output levels in low-efficiency administrative units. It supports decision-makers in allocating resources among these units. What distinguishes the DEA method:

• there is no need to specify weights for inputs and outputs beforehand; the program determines them automatically. Prices of inputs and outputs do not need to be specified;

• DEA doesn't require setting assumptions (mathematical formulas) for the function linking dependent and independent variables, unlike the Cobb-Douglas function;

• it provides an accurate assessment of both relative efficiency and the marginal values of inputs and outputs. Additionally, it sets specific goals for improving efficiency.

As a principle, good efficiency should minimize inputs relative to outputs, regardless of whether the units of measurement for inputs or outputs are identical (such as monetary values, number of people, meters, etc.) (Cooper et al., 2007).

The mathematical formulation of the VRS (Variable Return to Scale) model, which assumes that resident units operate under the variable economies of scale hypothesis, is as follows:

$$\left.\begin{aligned} &\min\theta_{\pi} = \frac{\sum_{r=1}^{s} u_r y_{r\pi}}{\sum_{i=1}^{m} v_i x_{i\pi}}; \\ &\text{s.c.;} \\ &0 \le \frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}}; \end{aligned}\right\}$$

$$j = 1, ..., n;$$
$$R = 1, ..., s;$$
$$\boldsymbol{u_r, v_i \geq 0};$$
$$I = 1, ..., m,$$

where j — the number of decision making units (DMU) that are compared to each other in the DEA method; DMU_j — Decision making unit number j; θ — Efficiency index for the unit under evaluation using the DEA method; y_{rj} — the value of the output r produced by decision-making unit j; x_{ij} — the value of the input i used by the decision-making unit j; r — the number of outputs produced by each decision making unit (DMU); i — the number of inputs used by each decision-making unit (DMU); u_r — the factor or weight assigned by the DEA to the output r to reach the degree of efficiency (100%); v_i — the coefficient or weight assigned by the DEA to input i to reach the degree of efficiency (100%).

The objective function mentioned in the mathematical formula (1) aims to maximize the efficiency index θ for the decision-making unit π, under the constraint that any decision-making unit with a set of parameters u and v evaluated with the rest of the units must not exceed the value of any decision-making unit 1 (100%), which means full efficiency.

The application of data envelopment analysis (DEA) depends greatly on the selection of sample inputs and outputs, as this affects the interpretation, use, and acceptance of the results. Based on the literature reviewed, the study variables can be categorized into inputs and outputs. The inputs category includes one variable: public spending as a percentage of gross domestic product (GDP), assuming that the latter can be rationalized. On the other hand, the study outcomes are based on maintaining consistent outputs across different dimensions of human security. These dimensions can be mathematically expressed using indicators, with seven indicators included in this study. The study utilized the latest data available from 2021-2023 for each indicator across various dimensions of human security. The comparison included 44 countries from different parts of the world.

Government spending as a share of GDP varies widely between countries, with Australia showing the highest level at 22.02% and Angola the lowest at 7.23%. From preliminary observations, Australia, despite being a high-income country, maintains high public spending, unlike Angola, despite its lower income levels, which exhibits very low public spending. This disparity indicates varying levels of government investment in public services and infrastructure.

The economic security index, which measures individual economic stability, also varies significantly. Australia recorded a rate of 54.12% in this index, indicating higher rates of employment and guaranteed incomes that provide economic stability. In contrast, Algeria's index rate reached 29%, suggesting that only a third of the labor force in the country has economic income ensuring their living security.

This trend suggests that higher government spending often correlates with improved economic security, although other factors may also influence these outcomes.

Food and health security indicators reveal a positive relationship, with countries having higher food security tending to show better health security. For example, Argentina has a relatively high Global Food Security Index score of 64.8 and a Global Health Security Index score of 54.4. Statistics indicate that five African countries have a food security index below 50, reflecting the reality of African countries where people suffer from food insecurity. In contrast, European countries enjoy economic prosperity and food security that exceeds 70% in most countries on the continent. Environmental performance and Global Peace Indices also show a correlation, with countries such as Australia scoring high on both, suggesting that better environmental health is associated with more peaceful societies. Meanwhile, the Security Threat Index varies widely, with higher scores indicating fewer threats, as reflected in Australia's score of 79% compared to 42%. The Human Rights and Rule of Law Index scores are relatively uniform, at around 79%, indicating consistent respect for human rights and the rule of law in these countries. The Security Threat Index is also directly linked to countries' incomes and the volume of their public spending, which is evident in most African countries.

Overall, the data highlight the diversity in the efficiency of public spending in achieving its primary goal of human security. Higher government spending is generally associated with improved economic security, food security, health, and environmental performance. Together, these indicators provide a comprehensive view of how different countries prioritize and achieve various aspects of human security through their public spending strategies. Further analysis can delve deeper into these associations and explore the causal factors behind these trends.

The numbers also indicate that the average public spending for the sample countries combined reached 16%, which is a normal percentage and agreed upon internationally and in the principles of public finance. However, there are countries whose public spending exceeded the internationally recognized level of 30%, achieving very high percentages, such as Kuwait, whose spending reached 46% of GDP, while other countries remained at a normal level. As for the rest of the indicators, the differences between countries were not large. There is not a significant gap between them.

Data analysis using data envelopment analysis in the process of measuring efficiency indicates that there are two methods of measuring efficiency at constant returns to scale (CRS), meaning that the effect of the inputs is constant on the number of outputs. Any increase of one unit in the inputs has the effect of a change of the same amount in the size of the outputs. This is not realistic, so we turned to the analysis based on the variable returns to scale (VRS) hypothesis and chose the input approach that is, reducing the inputs and achieving complete efficiency of the outputs. The implication of this hypothesis is that the change in the inputs has a disproportionate impact on the size of the change in the volume of the outputs, and this is also known as the BCC-I model. Under this hypothesis, 16 countries out of the sample of 44 countries under study were able to reach full efficiency of 1 or 100%. This percentage represents 36% of the countries in the sample that are above the efficiency curve in the input orienta-

Table. 1. **Study variables**

Countries	Input	Output						
	Government spending, % of GDP	Economic security index	Global food security index	Global health security index	Environmental performance index	Security threats index	Global peace index	Human rights and rule of law index
Algeria	15.48	29.00291	58.9	26.2	29.6	42	79.06	79.06
Angola	7.23	41.43495	43.7	29.1	30.5	34	79.8	79.8
Argentina	15.4	46.5258	64.8	54.4	41.1	57	81.63	81.63
Australia	22.02	54.12144	75.4	71.1	60.1	79	84.75	84.75
Benin	10.06	35.92247	48.1	25.4	29.6	48	78.23	78.23
Bolivia	19.09	48.36538	65	29.9	40.1	47	79.99	79.99
Brazil	18.03	5.050812	65.1	51.2	43.6	38	75.38	75.38
Cameroon	10.96	41.52845	46.4	28.6	30.2	19	73.4	73.4
Canada	20.69	54.87489	79.1	69.8	50	78	86.5	86.5
Chile	14.4	49.12313	74.2	56.2	46.7	64	81.26	81.26
China	16.01	55.362	74.2	47.5	28.4	51	79.91	79.91
Colombia	13.95	49.6798	60.1	53.2	42.4	33	73.07	73.07
Costa Rica	15.4	49.07	77.4	40.8	46.3	71	82.69	82.69
Denmark	21.78	53.21	77.8	64.4	77.9	89	86.9	86.9
Dominican Republic	11.34	52.74364	65	34.5	51.2	45	79.81	79.81
Ecuador	14.76	53.21813	65.6	50.8	46.5	40	79.05	79.05
Egypt	7.27	29.38	56	28	35.5	30	77.33	77.33
El Salvador	18.02	44.74254	64.2	40.8	40.8	40	77.21	77.21
Finland	24.02	51.21778	83.7	70.9	76.5	80	86.01	86.01
France	24.01	46.51512	80.2	61.9	62.5	71	80.61	80.61
Germany	21.95	48.96082	77	65.5	62.4	77	85.44	85.44
Greece	20.11	29.38475	72.2	34.3	27.7	60	82.01	82.01

Guatemala	11.52	49.57743	62.8	51.5	56.2	67	81.1	81.1
Hungary	20.56	51.68419	71.4	29.1	28	38	78.7	78.7
India	10.35	39.10215	58.9	54.4	55.1	82	84.92	84.92
Indonesia	10.18	50.12661	60.2	42.8	18.9	40	76.86	76.86
Ireland	11.38	52.14159	81.7	50.4	28.2	48	81.71	81.71
Italy	19.21	42.99675	74	55.3	57.4	79	86.88	86.88
Japan	21.6	55.2358	79.5	51.9	57.7	55	83.38	83.38
Kenya	12.27	45.81059	53	42.8	43.6	54	81.05	81.05
Kuwait	46.9	56.72516	65.2	38.8	30.8	32	77.46	77.46
Mali	16.71	35.22123	51.9	29	28.5	4	70.37	70.37
Morocco	19.22	32.52316	63	33.6	28.4	57	79.8	79.8
New Zealand	20.82	57.97523	77.8	62.5	56.7	84	86.87	86.87
Nigeria	15.75	33.58147	42	28.7	28.3	10	72.87	28
Pakistan	10.5	33.44138	52.2	30.4	24.6	24	72.55	72.55
Poland	18.28	49.70143	75.5	55.7	50.6	82	83.66	83.66
Qatar	12.85	74.61777	72.4	48.7	33	90	84.76	84.76
Saudi Arabia	17.04	45.64042	69.9	33.1	32.8	48	79.49	79.49
South Korea	18.77	56.77985	70.2	65.4	46.9	85	82.37	82.37
Spain	18.77	49.57	75.7	60.9	56.6	72	83.51	83.51
Sudan	20.37	28.69412	42.8	28.3	27.6	17	69.77	69.77
Thailand	17.73	57.05	60.1	68.2	38.1	20	79.39	79.39
Vietnam	8.98	56.71729	67.9	42.9	20.1	65	82.55	82.55

Sources: compiled by the authors from: *The Global Economy*. URL: https://www.theglobaleconomy.com/rankings/mil_spend_gdp/ ; https://www.theglobaleconomy.com/rankings/Government_size/; https://www.theglobaleconomy.com/rankings/Labor_force_participation/ (accessed on: 20.06.2024); Global Food Security Index 2022. URL: https://impact.economist.com/sustainability/project/food-security-index/ (accessed on: 20.06.2024); Global health security index. URL: https://ghsindex.org/report-model/ (accessed on: 20.06.2024); Environmental Performance Index 2022. URL: https://epi.yale.edu/ (accessed on: 20.06.2024).

tion. According to the characteristics of using the data envelopment analysis program (DEA), it is an acceptable percentage in the analysis and is subject to the conditions of its use. According to the results of the study, which considered the distribution of countries according to regions and income levels, the study proved that the outputs are very homogeneous in terms of fully efficient countries, including high-income and rich countries such as Canada and Finland, as well as middle or low-income countries. Countries with full efficiency also vary according to their location, with efficient countries found in Europe and Africa, representing almost all continents except Eastern European countries, which have not achieved full efficiency.

The results of the study also show that the average efficiency reached 78%, which is a good percentage and above the average. However, the analysis revealed that the lowest percentage was 21.20%, indicating the extent of wastefulness in public spending. This percentage was for the State of Kuwait, which had the highest public spending from GDP. This can be explained by the fact that the human security index is not a priority for this country.

Table. 2. **Efficiency results for each country**

No.	DMU	Score	No.	DMU	Score
1	Algeria	0,506195	23	Guatemala	1
2	Angola	1	24	Hungary	0,482885
3	Argentina	0,745041	25	India	1
4	Australia	1	26	Indonesia	0,87902
5	Benin	0,801049	27	Ireland	1
6	Bolivia	0,525473	28	Italy	1
7	Brazil	0,571019	29	Japan	0,841092
8	Cameroon	0,671388	30	Kenya	0,780053
9	Canada	1	31	Kuwait	0,212006
10	Chile	0,961372	32	Mali	0,438944
11	China	0,665505	33	Morocco	0,449688
12	Colombia	0,808391	34	New Zealand	1
13	Costa Rica	0,966982	35	Nigeria	0,459043
14	Denmark	1	36	Pakistan	0,711741
15	Dominican Rep,	1	37	Poland	0,87654
16	Ecuador	0,767989	38	Qatar	1
17	Egypt	1	39	Saudi Arabia	0,578533
18	El Salvador	0,545543	40	South Korea	1
19	Finland	1	41	Spain	0,898766
20	France	0,796599	42	Sudan	0,35493
21	Germany	0,880346	43	Thailand	1
22	Greece	0,501588	44	Vietnam	1

Source: DEA solver, excel output result calculation.

The outputs of the DEA program also indicate that six countries fall below the 50% threshold, including Arab countries and a country from Eastern Europe, as well as four countries located in Africa. This indicates the absence of a clear strategy in public spending in these regions. On the other hand, when considering solutions, there is the possibility of reducing public spending by approximately 50% to achieve goals that ensure human security indicators.

The study also indicates that European and high-income countries have achieved rates between 70% and 90% of income-oriented efficiency. This means that with the hypothesis of reducing or rationalizing public spending, there is the possibility of rationalizing public spending by 30 to 10% while obtaining the same results in human security indicators.

The results of the study indicate that countries with complete efficiency are considered a reference in terms of efficiency compared to countries with incomplete efficiency. According to the data, both India and Vietnam served as a reference for 17 countries that did not achieve full efficiency, acting as a benchmark for a third of the sample. Similarly, Egypt, Qatar, and Finland were references for more than 10 countries. On the other hand, countries such as South Korea, New Zealand, Australia, and Italy were not considered reference countries for any of the sample countries.

In a benchmark comparison among three countries — Poland, Greece, and Hungary — Poland was ranked 22nd, in the middle of the sample, with an efficiency rate of 87.65%. Greece was ranked 38th, with an efficiency rate of 50.15%, while Hungary was ranked 39th, with an efficiency rate of 48.28%. Regarding the

Table 3. **Differences**

Greece	Difference, %	Poland	Difference, %	Hungary	Difference, %
Government spending, % of GDP	–49.84	Government spending, % of GDP	–12.35	Government spending, % of GDP	–51.71
Economic security index	78.76	Economic security index	22.16	Economic security index	0.00
Global food security index	0.00	Global food security index	0.00	Global food security index	0.00
Global health security index	37.48	Global health security index	0.00	Global health security index	48.39
Environmental performance index	0.00	Environmental performance index	0.00	Environmental performance index	0.00
Security threats index	0.00	Security threats index	0.00	Security threats index	39.18
Global peace index	0.55	Global peace index	1.66	Global peace index	3.42
Human rights and rule of law index	0.55	Human rights and rule of law index	1.66	Human rights and rule of law index	3.42

Source: DEA solver, excel output result calculation.

changes necessary to reach full efficiency when assuming a change in size, if we take Greece, it can rationalize its public spending by 49.84% to reach full efficiency. This will result in significant increases in the rest of the indicators, as shown in the table below. The same observation applies to the rest of the countries; they can reduce public spending, which will result in an increase in the size of human security indicators.

How much does it cost? How to rationalize? These are among the most important questions that govern research in the field of rationalizing public spending and ensuring human security outcomes. The points addressed in this research can be divided into two basic areas. The first is related to the theoretical aspect of the study, focusing on the rationalization of public spending in its broad and narrow sense and its importance. Generally, the rationalization of public spending involves either reducing public expenditures or raising their efficiency and managing them more effectively, while ensuring the achievement of their goals. Strategies for ensuring this vary, either through setting clear goals linked to specific projects or by increasing oversight.

On the other hand, this research addresses the issue of human security and how its dimensions are the subject of public policy goals. It explores how to ensure the achievement of these goals while simultaneously rationalizing public spending.

On the applied side, based on the 44 countries that were the subject of the study, we used the data envelopment method. This method relies on benchmarking to analyze data and measure efficiency. We relied on changing returns to scale in the input approach, a principle based on rationalizing public spending to achieve complete efficiency in the goals and dimensions of human security. One of the basic results we reached is that among the sample countries, 36% of them achieved complete efficiency, meaning only 16 countries. These countries differ in terms of region and income level. On the other hand, India and Vietnam were a reference for 17 countries, and the average efficiency reached 78% for this sample, which is a very high and satisfactory percentage. For the rest of the results, you can refer to the details above.

CONCLUSIONS

Based on what we discussed in our research and the results we reached, we present the following recommendations and proposals to improve public expenditures on human security, utilizing the programs, quantitative methods, and techniques employed in this study:

- we must develop our view of human security, shifting from the idea that it is consumer spending to recognizing it as investment spending. Spending on society guarantees an appropriate environment for individuals to comfortably engage in economic activities;
- it is necessary to adopt an approach based on the principle of setting goals related to human security so that this cost becomes an added value in light of the pursued public policy;

• Human security should be one of the priorities and objectives of public spending, with the necessary oversight to ensure its achievement;

• we should work to benefit from the public spending policies of other countries, especially those that served as reference countries in this study, to achieve human security.

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РАЦІОНАЛІЗАЦІЯ ДЕРЖАВНИХ ВИДАТКІВ ВІДПОВІДНО ДО ВИМОГ ЦІЛЕЙ БЕЗПЕКИ ЛЮДИНИ: ПОРІВНЯЛЬНЕ ДОСЛІДЖЕННЯ ЗА ДОПОМОГОЮ АНАЛІЗУ ОБОЛОНКИ ДАНИХ

Державні видатки є основним інструментом уряду для впливу на економіку. Традиційно їх використовували переважно для втручання в ринки і задоволення суспільних потреб. Однак останнім часом вони еволюціонували і стали важливими для досягнення ширших цілей, зокрема, тих, що стосуються безпеки людини. Ця безпека охоплює соціальне, медичне, екологічне та економічне благополуччя і має вирішальне значення для забезпечення сталого розвитку.

Щоб оцінити ефективність державних видатків у посиленні безпеки людини, проведено дослідження з використанням аналізу оболонки даних (АОД — математичний метод, який порівнює відносну ефективність різних суб'єктів прийняття рішень шляхом вимірювання відношення віддачі до затрат). Проаналізовано 44 країни з різними географічним положенням і рівнями доходів шляхом дослідження ефективності їх затрат на основі різних припущень щодо ефекту масштабу.

Висновки показали, що 36 % країн досліджуваної вибірки працювали з повною ефективністю, а середня ефективність була вражаюче високою — 78 %. Такі країни, як Індія і В'єтнам, слугували моделями для понад 17 інших країн. Визначено конкретні дії, які можна здійснити для підвищення ефективності. Наприклад, Греція, Польща і Угорщина потенційно можуть скоротити державні видатки, відповідно, на 49 %, 12 % і 51 % без шкоди для безпеки людей. Крім того, підкреслено необхідність перегляду розуміння безпеки людини. Слід перейти від уявлення про те, що вона передусім пов'язана із споживчими витратами, до підходу, в якому акцент робиться на інвестиціях у суспільний добробут. Такі інвестиції створюють необхідні умови для ефективної участі громадян у економічній діяльності.

***Ключові слова**: раціоналізація державних видатків; виміри безпеки людини; аналіз оболонки даних; ефективність; змінний ефект масштабу.*

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