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Efficiency of Public Spending in Achieving Indicators of Human Security Dimensions: A Comparative Study Using Data Envelopment Analysis

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Abstract

The current global landscape is experiencing numerous geopolitical shifts and security threats that directly affect human security and economic stability. The present study originates from this observation and aims to explore the interconnectedness between development and individual security, the significance of public spending and its role in strengthening human security dimensions, and the efficiency of public spending in improving human security indicators. The study utilizes data envelopment analysis (DEA) to measure spending efficiency in 44 countries regarding human security indicators. The analysis, assuming variable returns to scale, reveals that 16 out of the 44 countries achieved output efficiency. The average efficiency was 94%. Additionally, a crucial finding suggests that lower-income countries with lower public spending demonstrate lower efficiency in enhancing human security indicators. Thus, an increase in public spending contributes to improvements in human security indicators, ultimately leading to a higher human security index.

Keywords: Public spending, security, dimensions of human security, data envelopment analysis, efficiency

JEL Classification: D61, H50, O15, H56

1. Introduction

Security is widely regarded as the fundamental driver of overall development, particularly economic progress. It also underpins sustainable development. Consequently, nations prioritize security, viewing it as the foundation for development and a core national responsibility. Traditionally, state security was the sole concern, protecting national sovereignty from external military threats. However, significant global transformations in the early 1990s exposed the vulnerabilities of state-centric security systems. This led to the emergence of human security, a broader concept encompassing all types of security threats and involving new actors beyond the state, including humanitarian organizations. Human security complements and strengthens state security, acting as two sides of the same coin. True security today prioritizes individuals, recognizing that national security relies on citizen security.

The roundtable discussion titled *Economics of Peace*, held in Costa Rica in January 1990, produced a clear statement that the world needs "a new concept of global security" with a shift in "defence orientation and foreign policy goals, from a nearly exclusive concern with… to a broader concern for the common security of individuals from social violence, economic hardship and environmental degradation". This requires "attention to the root causes of individual insecurity and the obstacles to the full realization of human potential". The report placed these challenges in the context of a post-Cold War world, along with an emphasis on reducing military spending and creating peace to ensure greater human development and alleviate economic imbalances.

The significant rise in global military spending, evident in national budgets and reports from the Stockholm International Peace Institute, warrants examination. Military spending is a facet of public expenditure, justified by the state's inherent role in external defence. Proponents argue for its return on investment in terms of stability and progress. While a link exists between military spending and security concerns, it is not the sole solution. Security can be achieved through non-military means, as many contemporary national security threats are non-military in nature. Economic pressures, for example, pose significant threats. This highlights the shift in security concerns since the 1990s.

This research posits that the field of security studies is no longer solely concerned with military force and war management. The concept of security has expanded and deepened, transitioning from state-centric security to the more comprehensive concept of human security. This broader understanding encompasses the security of individuals, which underpins both public and state security.

The present study aims to:

- Define and explain the concept of human security, including its scope and key economic elements.
- Explore the impact of public spending on various aspects of human security.
- Analyse the relationship between security and economic development financing, considering the influence of security on both public expenditures and public revenues.
- Utilize previous research into security and development spending to establish the well-documented mutual influence between security and development.
- Propose a novel research approach: comparing the efficiency of public spending in maximizing human security indicators across multiple countries.

Building on prior research examining the relationship between security spending and economic development, this study confirms the well-established concept of a two-way influence between security and development. This reciprocal relationship is documented extensively in economic and security literature. To contribute new knowledge, this research proposes a novel approach: comparing public spending efficiency across multiple countries in maximizing indicators related to human security dimensions.

2. Concepts of Human Security

The end of the Cold War and the rise of globalization highlighted the need to refocus security studies on the individual. This led to the first attempt at defining human security in the 1994 United Nations Development Programme's Human Development Report, which stated: "Human security means first: safety". This safety encompasses protection from chronic threats such as hunger, disease and oppression, as well as from sudden disruptions to daily life in homes, workplaces and communities (Chenini, 2022).

In its narrow definition, it focuses on the fact that human security means freedom from fear (Hammoumi, 2013) as stated by Paul Heinbecker: "Human security focuses on individuals and societies rather than states. It is also based on the idea that state security is necessary but not sufficient to achieve human survival. Human security focuses on military and non-military sources of threat, as the security and survival of individuals is part of it. It complements the achievement of global security, and it complements and does not replace the concept of national security. In addition, achieving human security depends on new tools, including the role of non-governmental organizations." (Azeroual, 2016).

3. Dimensions of Human Security

Barry Buzan argues that security extends beyond the state to encompass human groups and various sectors beyond military force. Individuals and societies are affected by security issues in areas such as economy, environment, culture, politics and social welfare (Belhadi, 2025).

The Human Development Report issued by The United Nations in 1994 built upon this concept. It incorporated the five components of human security developed by Barry Buzan and further expanded on this concept by adding two additional components (UNDP, 1994). As a result, human security came to be based on seven core interrelated components that, through their integration and interconnectedness, form a solid foundation for the embodiment of human dignity and freedom. The report identified these components as economic security, food security, health security, environmental security, personal security, social security and political security (Azeroual, 2016).

Economic security refers to the ability of individuals to meet their basic needs for food, housing, clothing and healthcare, particularly during times of hardship such as natural disasters or economic downturns. It ensures a minimum standard of living and provides a sense of security beyond just material well-being. National economic security focuses on creating favourable conditions for increased productivity of labour and capital. This fosters a high standard of living for citizens and a stable economic environment that attracts domestic and foreign investment, promoting sustainable economic growth (Barkno, 2016).

Food security refers to the ability to ensure access to sufficient, safe and nutritious food for all people at all times. While definitions may vary, ensuring food availability for future generations remains a core principle. This concept faces two primary challenges: bridging the consumption gap and scaling up production. Firstly, global food consumption currently outpaces production, requiring imports from other countries to meet the shortfall. Secondly, to meet the demands of a growing population in the medium and long term, food production needs to be significantly increased (Bin Obaid *et al*., 2017).

Health security encompasses the policies and practices designed to safeguard human health and protect individuals from health threats. It considers health from two perspectives: the individual level, encompassing physical, psychological, mental and spiritual well-being, and the public health level, which focuses on the collective health of a population and strategies such as raising herd immunity (Belkheir, 2022).

Environmental security focuses on safeguarding nature, the environment and the well-being of citizens, society and the state. This includes protection from internal and external threats, as well as unsustainable development practices that endanger human health, biodiversity and the functioning of ecosystems essential for our continued existence (Bayzat, 2014).

Political security refers to a state where citizens are empowered to exercise their civil and political rights within a functioning participatory democratic system. This type of security is characterized by a stable political system, active citizen participation in its processes and a commitment to ongoing development (Chenini, 2022).

Personal security is considered one of the most fundamental elements of human security, given its critical role in safeguarding human life. It focuses on protecting individuals from threats such as armed conflict, the rise of organized crime and drug and human trafficking. Individual security also encompasses the right to privacy in matters of ideology, language and culture. Additionally, it ensures the ability to pursue ambitions within a societal framework that promotes equal opportunities and fair distribution of resources.

Societal security refers to the ability to maintain the continuity of traditional language, culture, identity and customs. Rapid changes at the international or national level can negatively affect the identity characteristics of groups. This can erode their privacy and disrupt the established social fabric. Such developments may also lead to the emergence of foreign values that clash with the existing societal structure. From the perspective of human security, societal security can be understood as the sense of belonging an individual feels within a group, local community, organization or racial/ethnic group. This group affiliation provides members with a cultural identity and offers practical support (Hashemi and Ben Yahia, 2023).

4. Security and Public Spending

Security and public spending are interconnected elements. Weaknesses in one area negatively affect the other, while stability and development in either one lead to positive outcomes for both. Three main perspectives exist when examining the relationship between security, public spending and development. The first perspective posits that development is the independent variable, while security is dependent. This means that security can only be achieved with certain preconditions, such as increased spending on economic, health, environmental and food security, as outlined by the United Nations Development Programme in 1994. The second perspective argues that increased security spending can lead to higher

public expenditures, which can have a positive impact on development. The third perspective views the relationship between security, public spending and development as intertwined and overlapping. It emphasizes the mutual causality between these elements: development can be a requirement for achieving security, and conversely, security can be a result of successful development policies. The size and effectiveness of public spending ultimately determine the strength of this relationship (Tawigher, 2023).

A state forced to direct resources towards defending its political borders inevitably hampers its development and security. This effect can be explained through two lenses. The first involves the concept of the ratchet effect: when a state plays a pivotal role in defending its external security, it shifts resources from civilian uses to military ones. However, practical reality has shown that even when the military threat ends, these resources often do not return to their previous civilian uses, nor do they regain the same level of productivity (Abdo, 2014). Weak development and low or lack of per capita income can lead to weak security. This situation creates fertile ground for various crimes and thefts, initially driven by basic needs.

However, these crimes may start simple but can escalate into organized criminal activity that is difficult to dismantle over time. Weak and imbalanced security also leads to capital flight, where money migrates away from areas lacking security. National security is therefore a paramount concern for all governments and people globally. Achieving it paves the way for prosperity, advancement and progress for nations (Ben Ashour and Ben Bouziyan, 2022).

This study investigates the relationship between public spending efficiency and human security dimensions. While previous research has often examined these two concepts separately, with a particular focus on literary studies in political science for human security and economic analyses for public spending efficiency, there is a notable gap in understanding how public spending can effectively contribute to achieving human security goals. This research aims to bridge this gap by analysing the extent to which public spending efficiency aligns with and supports the realization of human security dimensions.

5. Comparative Study Using Data Envelope Analysis

Data envelopment analysis (DEA) is a quantitative tool used in operations research that measures the relative technical efficiency of production units. It does this by comparing the inputs and outputs of administrative units with similar goals and activities (Talal, 2009). The data envelopment analysis (DEA) method is based on the concept of efficiency developed by Farrell (1957) and builds on economic principles of efficiency. In DEA, efficiency refers to getting the most out of available resources. An efficient organizational unit is one that either produces

the maximum possible outputs with a given set of inputs or minimizes its use of inputs while maintaining a certain level of outputs (Farell, 1957). Farrell believed that efficiency is the fractional relationship between inputs and outputs. He proposed two ways to measure efficiency, the first of which is input orientation measurements. The second is on the output side and is called output orientation measures (Teerath and Nand, 2014).

The efficiency index of a facility ranges from zero to one, with one representing complete efficiency and zero indicating complete inefficiency (Quey, 1996). This method is called data envelopment analysis because it creates an "envelope" defined by the most efficient units. The data from these efficient units are then used for comparison with less efficient ones (Al-Shuaibi, 2004), making DEA a valuable tool for benchmarking (Sherman and Zhu, 2006).

DEA offers several advantages. It excels at identifying the best performing units for comparison with inefficient ones, even when dealing with multiple inputs and outputs. Unlike some methods, DEA does not require information on input or output prices, nor does it necessitate inputs and outputs to be measured in the same units. It can handle diverse measurement scales and avoids relying solely on sample means for evaluation. Additionally, DEA is flexible and does not impose limitations on specific production function forms, ensuring fairness in the relative assessment of each unit (Manzoni and Islam, 2009).

To facilitate the comparison process, we will focus on the commonly used formula associated with the VRS (variable returns to scale) model within the DEA framework (Färe and Grosskopf, 2004).

As a principle, good efficiency must represent the largest outputs, and it is not necessary for the units of measurement to be identical in either inputs or outputs (Cooper *et al*., 2007; monetary values, number of people, meters, *etc*.).

5.1 Mathematical formulation (output-oriented)

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.

Objective: max θ

Subject to:

$$\sum_{j=1}^{n} \lambda_j y_{rj} \geq \theta y_{r0} \quad \text{for } r = 1, \ldots, s \tag{1}$$

$$\sum_{j=1}^{n} \lambda_j x_{ij} \leq x_{i0} \quad \text{for } i = 1, \ldots, m \tag{2}$$

$$\sum_{j=1}^{n} \lambda_j = 1;\ \lambda_j \geq \text{for } j = 1, \ldots, n \tag{3}$$

where θ means efficiency score of the decision making unit (DMU) under evaluation; λ_j is weights assigned to each of the n DMUs in the comparison set; y_{rj} is the output r of the DMU j; y_{r0} denotes the output r of the DMU under evaluation; x_{ij} represents the input i of the DMU j; x_{i0} stands for the input i of the DMU under evaluation; n expresses the number of DMUs in the comparison set; m denotes the number of inputs and s is the number of outputs.

5.2 Key differences from CRS (constant returns to scale) model

- **Constraint 3** ($\sum_{j=1}^{n} \lambda_j = 1$): This constraint is added to the VRS model. It ensures that the weighted sum of the λ_j values equals 1, effectively controlling for scale effects. In the CRS model, this constraint is absent (Banker *et al.*, 1984).

It should also be noted that there are many mathematical equations in this field, and they differ according to the development of the model and its uses. For reference, we will rely on the simple initial model.

Some studies conducted by Cooper ensure the success of using the DEA method with one of the following two rules, otherwise the model will lose its strength between efficient units and inefficient units (Mansouri, 2014).

First rule: The sample size must be greater than the product of the inputs with the outputs in the number 3: $Ss \geq 3(I + O)$, where Ss means decision-making units (DMU), O output and I input.

Second rule: It is called the rule of one-third, where the quality of the model is ensured in the results obtained so that the number of units with full efficiency of 100% should not exceed one-third of the sample studied: Number of $DMU_{100\%} < 1/3\ Ss$.

Data envelopment analysis (DEA) is a versatile tool for assessing the efficiency of administrative units, offering insights into resource optimization and output improvement. Unlike traditional methods, DEA does not require predefined input and output weights or prices, allowing for a data-driven evaluation. Additionally, DEA avoids the need for restrictive functional assumptions, such as the Cobb–Douglas production function (Benlebbad, 2024). By providing accurate relative efficiency scores, marginal values and specific improvement targets, DEA supports informed decision-making. Its applicability extends to government sectors where traditional efficiency measures are challenging due to the intangible nature of services such as education, health and security. The ability of DEA to incorporate both internal and external factors, including qualitative variables such as customer satisfaction, makes it a comprehensive tool for efficiency analysis.

To facilitate the comparison process, we will focus on the commonly used formula asso-

ciated with the VRS (variable returns to scale) model within the DEA framework (Färe and Grosskopf, 2004).

The objective function mentioned in 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 at 1 (100%), which means full efficiency.

5.3 Optimal selection of inputs and outputs

Choosing the right set of inputs and outputs is crucial for data envelopment analysis (DEA) as it affects the interpretability, usability and acceptance of the results. Drawing on relevant literature, this study categorizes variables into inputs and outputs. The input category includes a single variable: public spending as a percentage of GDP.

The outcomes of the study focus on maximizing various human security dimensions, which can be represented mathematically. We utilize seven indicators, one for each dimension. The latest data from 2022–2023 were used for all the human security indicators across the 44 countries included in the reference comparison, representing diverse regions worldwide.

This dataset examines the efficiency of public spending on various human security dimensions across a selection of countries. Key indicators include government spending as a percentage of GDP, along with indices for economic security, food security, health security, environmental performance, security threats, global peace and human rights and the rule of law. These indices capture a broad spectrum of human security concerns, encompassing economic stability, food availability, environmental health and societal peace. As for the sample countries, they amounted to 44 countries and were chosen randomly, wherein we followed the difference in terms of region or continent, and on the other hand, the difference in the income level set by the World Bank.

Government spending as a share of GDP varies considerably across countries. Australia leads with 22.02%, while Angola holds the lowest position at 7.23%. This disparity reflects differing levels of government investment in public services and infrastructure. The economic security index, a measure of economic stability, also exhibits variation. Australia scores a high 54.12, indicating strong economic security compared to Algeria's 29.00. This trend suggests a possible link between higher government spending and improved economic security, though other factors likely play a role as well.

Table 1: Study sample

Countries	Input	Output						
	Government spending, percent of GDP (2022)	Economic security index (2022)	Global food security index (2022)	Global health security index (2021)	Environmental performance index (2022)	Security threats index (2023)	Global peace index (2023)	Human rights and rule of law index (2022)
Algeria	15.48	29.00	58.9	26.2	29.6	42	79.06	79.06
Angola	7.23	41.43	43.7	29.1	30.5	34	79.80	79.80
Argentina	15.40	46.53	64.8	54.4	41.1	57	81.63	81.63
Australia	22.02	54.12	75.4	71.1	60.1	79	84.75	84.75
Benin	10.06	35.92	48.1	25.4	29.6	48	78.23	78.23
Bolivia	19.09	48.37	65.0	29.9	40.1	47	79.99	79.99
Brazil	18.03	5.05	65.1	51.2	43.6	38	75.38	75.38
Cameroon	10.96	41.53	46.4	28.6	30.2	19	73.40	73.40
Canada	20.69	54.87	79.1	69.8	50.0	78	86.50	86.50
Chile	14.40	49.12	74.2	56.2	46.7	64	81.26	81.26
China	16.01	55.36	74.2	47.5	28.4	51	79.91	79.91
Colombia	13.95	49.68	60.1	53.2	42.4	33	73.07	73.07
Costa Rica	15.40	N/A	77.4	40.8	46.3	71	82.69	82.69
Denmark	21.78	N/A	77.8	64.4	77.9	89	86.90	86.90
Dominican Republic	11.34	52.74	65.0	34.5	51.2	45	79.81	79.81
Ecuador	14.76	53.22	65.6	50.8	46.5	40	79.05	79.05
Egypt	7.27	29.38	56.0	28.0	35.5	30	77.33	77.33
El Salvador	18.02	44.74	64.2	40.8	40.8	40	77.21	77.21
Finland	24.02	51.22	83.7	70.9	76.5	80	86.01	86.01
France	24.01	46.52	80.2	61.9	62.5	71	80.61	80.61
Germany	21.95	48.96	77.0	65.5	62.4	77	85.44	85.44
Greece	20.11	29.38	72.2	34.3	27.7	60	82.01	82.01
Guatemala	11.52	49.58	62.8	51.5	56.2	67	81.10	81.10
Hungary	20.56	51.68	71.4	29.1	28.0	38	78.70	78.70
India	10.35	39.10	58.9	54.4	55.1	82	84.92	84.92
Indonesia	10.18	50.13	60.2	42.8	18.9	40	76.86	76.86
Ireland	11.38	52.14	81.7	50.4	28.2	48	81.71	81.71
Italy	19.21	43.00	74.0	55.3	57.4	79	86.88	86.88
Japan	21.60	55.24	79.5	51.9	57.7	55	83.38	83.38
Kenya	12.27	45.81	53.0	42.8	43.6	54	81.05	81.05
Kuwait	46.90	56.73	65.2	38.8	30.8	32	77.46	77.46
Mali	16.71	35.22	51.9	29.0	28.5	4	70.37	70.37
Morocco	19.22	32.52	63.0	33.6	28.4	57	79.80	79.80
New Zealand	20.82	57.98	77.8	62.5	56.7	84	86.87	86.87
Nigeria	15.75	33.58	42.0	28.7	28.3	10	72.87	28.00
Pakistan	10.50	33.44	52.2	30.4	24.6	24	72.55	72.55
Poland	18.28	49.70	75.5	55.7	50.6	82	83.66	83.66
Qatar	12.85	74.62	72.4	48.7	33.0	90	84.76	84.76
Saudi Arabia	17.04	45.64	69.9	33.1	32.8	48	79.49	79.49
South Korea	18.77	56.78	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	28.69	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	56.72	67.9	42.9	20.1	65	82.55	82.55

Sources: Global Economy (2024), Economist Impact (2022), Bell, Nuzzo (2021), Yale Center for Environmental Law & Policy (2024)

Positive correlations emerge between food security and health security indicators. Countries with higher food security scores tend to have better health security outcomes. Argentina exemplifies this with a global food security index of 64.8 and a global health security index of 54.4. Similarly, environmental performance and the global peace index appear to be correlated. Countries such as Australia rank highly in both, suggesting a connection between environmental health and peaceful societies. The security threats index, on the other hand, shows wider variation, with higher scores indicating lower threats. Australia's score of 79.0 stands in contrast to a value of 42. The human rights and rule of law index scores are more uniform, hovering around 79, which suggests a general respect for human rights and the rule of law across the selected countries.

Overall, the data highlight the diversity of the efficiency of public spending in achieving 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 the difference between the highest percentage of inputs and outputs and the lowest percentage in a comparison between countries, which amounted to 6 times for government spending as a percentage of gross domestic product. As for outputs, the greatest difference reached 22 times for the personal security index or security threats index. The lowest is the global peace index.

Data envelopment analysis (DEA) relies on benchmarking, where efficient countries serve as a reference point for less efficient ones. This study identified Qatar as the most efficient country (100% efficiency) and a benchmark for roughly half the sample (21 countries). India and Italy followed, serving as references for 14 and 11 countries, respectively. Interestingly, both Egypt and the Dominican Republic achieved full efficiency but were not benchmarks for any other country.

Table 2: VRS efficiency scores

No.	DMU	Score	Rank	Reference set (lambda)
1	Algeria	0.91	33	India
2	Angola	1	1	Angola
3	Argentina	0.95	25	India
4	Australia	1	1	Australia
5	Benin	0.92	28	Angola
6	Bolivia	0.92	31	Italy
7	Brazil	0.87	39	Canada
8	Cameroon	0.86	40	India
9	Canada	1	1	Canada
10	Chile	0.98	18	Canada
11	China	0.94	26	Canada
12	Colombia	0.92	32	Australia
13	Costa Rica	0.98	17	Denmark
14	Denmark	1	1	Denmark
15	Dominican Republic	1	1	Dominican Republic
16	Ecuador	0.92	30	Canada
17	Egypt	1	1	Egypt
18	El Salvador	0.89	38	Italy
19	Finland	1	1	Finland
20	France	0.95	23	Finland
21	Germany	0.98	19	Canada
22	Greece	0.94	27	Italy
23	Guatemala	1	1	Guatemala
24	Hungary	0.90	36	Canada
25	India	1	1	India
26	Indonesia	0.91	35	India
27	Ireland	1	1	Ireland
28	Italy	1	1	Italy
29	Japan	0.97	20	Finland
30	Kenya	0.95	24	India
31	Kuwait	0.89	37	New Zealand
32	Mali	0.81	43	India
33	Morocco	0.91	34	Denmark
34	New Zealand	1	1	New Zealand
35	Nigeria	0.84	42	India
36	Pakistan	0.85	41	India
37	Poland	0.97	21	Denmark
38	Qatar	1	1	Qatar
39	Saudi Arabia	0.92	29	Canada
40	South Korea	1	1	South Korea
41	Spain	0.97	22	Canada
42	Sudan	0.80	44	Denmark
43	Thailand	1	1	Thailand
44	Vietnam	1	1	Vietnam

Source: DEA Solver output results for table 1: Global Economy (2024), Economist Impact (2022), Bell, Nuzzo (2021), Yale Center for Environmental Law & Policy (2024)

Looking at efficiency ratios, we can categorize the sample countries into three groups. The first group comprises the 16 fully efficient countries with diverse geographical distributions. This group includes Egypt and Qatar (North Africa / Middle East, upper-middle income), Denmark and Finland (Europe, high income), Canada (North America, high income) and South Korea and India (Asia). This suggests that income or region does not significantly influence achieving full efficiency.

The second category comprises eight countries exhibiting output-oriented efficiency under the constant returns to scale (CRS) assumptions. Notably, most of these countries are classified as non-high income by the World Bank and tend to be located outside of traditionally "developed" regions. Examples include Kuwait and Brazil, both considered developing economies. This suggests a potential association between lower income and limited public spending with this efficiency range.

The third category includes the remaining countries in the sample. Their efficiency scores fall between 100% and 90%, with variations likely linked to income levels and broader global economic contexts. A key observation is that four out of the 16 fully efficient countries exhibit constant returns to scale (CRS). In these countries (Angola, Egypt, India and Vietnam), increasing public spending leads to a proportional increase in human security indicators. The remaining countries display increasing returns to scale, implying that a rise in public spending results in a more significant improvement in human security. This suggests the potential for achieving full efficiency quickly and at minimal cost.

One advantage of data envelopment analysis (DEA) is its ability to identify targeted improvements needed to reach efficiency. For instance, Algeria achieved an estimated efficiency of 91%, ranking 33rd out of the 44 countries. According to the DEA model, India serves as a benchmark for Algeria in public spending and human security. However, the crucial question is what percentage increase in human security outputs is required for Algeria to reach full efficiency while maintaining current spending levels. The outputs of the DEA Solver program, presented in the table below, suggest the possibility of progressively raising human security indicators by increments starting at 42.6%.

This finding presents a potential dilemma. It could indicate either:

- **Inefficient spending and neglect:** There might be a waste of public spending in this area, coupled with a lack of focus on human security within public policies.
- **Room for improvement:** Algeria might be able to enhance its human security dimensions by optimizing public spending strategies.

Table 3: Efficiency projected for Algeria

DMU	**1 / Score**			
I/O	**Data**	**Projection**	**Difference**	**%**
Algeria	1.08847525	–	–	–
Government spending, percent of GDP	15.48	15.48	0	0.00%
Economic security index	29.0029146	41.357147	12.3542324	42.60%
Global food security index	58.9	67.6430023	8.74300226	14.84%
Global health security index	26.2	54.9211061	28.7211061	109.62%
Environmental performance index	29.6	56.4317156	26.8317156	90.65%
Security threats index	42	80.2629797	38.2629797	91.10%
Global peace index	79.06	86.0548533	6.99485327	8.85%
Human rights and rule of law index	79.06	86.0548533	6.99485327	8.85%

Source: DEA Solver output results for table 1: Global Economy (2024), Economist Impact (2022), Bell, Nuzzo (2021), Yale Center for Environmental Law & Policy (2024)

6. Conclusion

Public policy is not a "new science" but a well-established field that draws upon various disciplines such as economics, sociology and law. It encompasses a range of government interventions aimed at addressing societal issues. Public policy decisions are characterized by their diversity, comprehensiveness and impact on all aspects of society. Public spending, a key tool of public policy, is a prominent concept in the political, economic, social and academic spheres. Governments formulate and implement public policy, which can be broken down into sectoral policies such as public security policy. This sensitive sector has undergone significant development across various fields.

This study aims to explore the link between public spending and human security. The underlying assumption is that security is essential for sustainable development and vice versa. Developed nations are better equipped to ensure security for their citizens. Public policy can be viewed as a set of decisions aiming for the common good. This study sought to analyse and compare public spending and its security outcomes to shed light on the relationship between them and the various dimensions of human security.

This study highlights a significant positive correlation between public spending and human security. Low-income countries tend to exhibit lower efficiency in achieving human security goals. Conversely, countries classified as "above-average income" by the World Bank demonstrate higher efficiency in both public spending and human security outcomes. Interestingly, the study identified 16 out of the 44 countries (over a third of the sample) that achieved full efficiency (100%) in human security. Additionally, applying data envelopment analysis (DEA) revealed the potential for some countries to achieve complete output-oriented efficiency under specific assumptions, such as changing returns to scale, within a short timeframe.

Based on our research discussions and findings, we propose the following recommendations to enhance public spending on human security:

- **Shifting the paradigm:** We must redefine human security spending as an investment in people. This investment should aim to improve individual well-being and contribute to social stability, moving away from the view of human security as mere consumption expenditure.
- **Security objectives:** Adopting a security-objective-based approach is crucial. This framework ensures that security expenditures provide additional value in the context of broader public policy goals.
- **Diversifying funding:** We advocate for a shift from complete reliance on government funding for human security. Exploring alternative financing strategies can improve resource allocation.
- **Benchmarking:** Studying successful policies and experiences of other countries can provide valuable insights for improving our own approach to human security spending.
- This study also calls for a re-examination of human security in many countries, particularly Arab countries. The social movements that have revealed the weakness and fragility of economic and social structures, and the creation of a new reality of suffering amidst hunger, poverty, need and political instability pose a real threat to Arab human security. This reflects the general dissatisfaction and frustration with ineffective development and government policies, in an environment that restricts basic and public freedoms. The goal of human security is to protect human dignity and liberate people from fear and need, even if it is used as a pretext for.

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