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Performance Evaluation Using the DEA-Stepwise Modeling Approach Method: Case Study of the Export-Import Sector in Indonesia

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Abstract
The export and import industry are now a significant determinant of a nation's economic progress in the age of globalization. A nation's ability to export helps it earn foreign cash that it can utilize to fund development and spur economic expansion. Conversely, import-related activities might assist in satisfying the need for products or services that cannot be effectively provided domestically. Entrepreneurs can increase the competitiveness of local products and the quality of their products through imports and exports, which will enhance both industrial progress and community welfare. To maximize the nation's economic progress, the government and business owners must continue to boost import-export activity. The objective of this study is to evaluate Indonesia's export-import sector's performance using the stepwise modeling approach and the DEA method. One technique to determine which export-import sector activities are effective and ineffective is performance evaluation. These two sectors can support the country's economy in this way and do so with a long-term approach. The research results indicate that efficient DMUs have the smallest presentation (20%) and inefficient DMUs have the largest percentage (80%). The efficient DMU category is C (1). Inefficient DMU categories, namely: SK (0.285), S (0.193), M-US (0.472), and T-J (0.11).
Keywords: *performance evaluation, stepwise approach, DEA, export, import*

Abstrak
Dalam era globalisasi, sektor ekspor dan impor menjadi salah satu faktor penting dalam mempengaruhi pertumbuhan ekonomi suatu negara. Melalui kegiatan ekspor, suatu negara dapat memperoleh devisa yang dapat digunakan untuk membiayai pembangunan dan meningkatkan pertumbuhan ekonomi. Di sisi lain, kegiatan impor dapat membantu memenuhi kebutuhan barang atau jasa yang tidak dapat diproduksi secara efisien di dalam negeri. Melalui ekspor impor, pengusaha dapat meningkatkan kualitas produk dan daya saing produk dalam negeri, sehingga dapat meningkatkan kesejahteraan masyarakat dan pertumbuhan industri. Oleh karena itu, penting bagi pemerintah dan pengusaha untuk terus meningkatkan kegiatan ekspor impor agar dapat mengoptimalkan pertumbuhan ekonomi negara. Tujuan penelitian ini adalah untuk mengevaluasi kinerja sektor ekspor-impor di Indonesia dengan menggunakan metode DEA dan *Stepwise Modelling Approach*. Evaluasi kinerja merupakan salah satu cara untuk mengidentifikasi efektif dan tidak efektifnya kegiatan sektor ekspor-impor. Dengan demikian, kedua sektor tersebut dapat berperan sebagai pilar perekonomian nasional secara berkelanjutan. Hasil penelitian mengindikasikan bahwa DMU Efisien memiliki presentasi terkecil (20%) dan DMU Tidak Efisien memiliki persentase terbesar (80%). Kategori DMU Efisien adalah C (1). Kategori DMU Tidak Efisien, yaitu: SK (0.285), S (0.193), M-US (0.472), dan T-J (0.11).
Kata Kunci: *evaluasi kinerja, pendekatan Stepwise, DEA, ekspor, impor*

1. Introduction

An important part of the Indonesian economy is the industrial sector. One of the main drivers of the country's economy is the industrial sector. The industrial sector has the ability to: (i) create revenue through imports and exports; (ii) absorb workers; (iii) construct labor- and asset-intensive businesses; and (iv) increase productivity through the use of modern technology. Consequently, the government keeps trying to create an eco-friendly industry [1].

The majority of businesses are interested in assessing their own performance. Performance measurement will enable the business to: (i) assess the benefits and drawbacks of its operations; (ii) better

position itself to satisfy customers; and (iii) have a point of reference for expanding its efforts to develop new products, services, and production methods [2].

Businesses usually evaluate their performance by looking at their current advantages and disadvantages. An organization's ability to grow and develop depends on its ability to evaluate business performance. The objectives of performance evaluations are to: (i) evaluate a company's present operations internally; and (ii) compare its performance to industry standards and best practices. This will assist an organization in (i) recognizing its advantages and disadvantages, (ii) better organizing its operations to satisfy client needs and specifications, and (iii) identifying business opportunities to enhance operations and activities through the development of new products, services, and procedures [3].

Traditional management understanding states that what cannot be measured cannot be managed. [4] identified that to increase global competitiveness, companies must have efficient costs and be able to develop operational excellence. Therefore, it is necessary to prepare, develop, and manage organizational activities that are in line with organizational goals [5].

Effectiveness is used in the performance evaluation framework idea. The requirements and satisfaction of the customer define this effectiveness. The following are some factors taken into account while evaluating performance: (i) fluctuating company operating conditions; (ii) competitive rivalry; (iii) as a reference for improving company performance; (iv) a requirement organization in change; (vi) conditions of continuous change; (vii) external requirements; and (viii) the influence of information technology [6].

Businesses require performance evaluation to ascertain the profitability and economics of sustainable operations and to furnish data on business choices. When standards or benchmarks aren't provided for review, performance evaluation is especially crucial in helping a corporation enhance its operational procedures. One technique for assessing performance is Data Envelopment Analysis, or DEA. Decision-Making Units (DMUs) are compared to one another using the DEA method. Organizations, businesses, projects, business units, decision-making units, and individuals can all be considered DMUs. Due to DEA's numerous inputs and outputs, company performance reviews will become more intricate. Reducing the dimensions of the data set can solve this issue without affecting its primary characteristics as a whole [7].

A primary objective of DEA research is to identify relevant input and output factors. The choices made for input and output variables have a significant impact on how effective a DMU is. There hasn't been much progress made in solving this issue. The creation of models is the main area of interest for DEA research. Choosing input and output variables is typically a subjective process. In DEA, the best input and output variables are chosen using the Stepwise Modeling Approach (STW). The goal of this strategy is to create the DEA model. The DEA model's potential input and output variables are treated first in the backward approach of the STW process. A variable was eliminated from the model at every stage as a result of the DMU effectiveness factor analysis. In theory, the numerical process can go on until the treatment involves just one input variable and one output variable. The ultimate computation outcomes may serve as a criterion for selecting the best DEA model [8].

Exports and imports are international trade activities that involve buying and selling goods or services between countries. Export and import activities greatly influence a country's economic growth. However, this activity cannot be done haphazardly. To control exports and imports, the government sets regulations and tariffs. Even though the two are related, there are differences between exports and imports. Exports refer to the activity of selling goods or services from one country to another. Meanwhile, imports are the opposite, namely buying goods or services from other countries and bringing them into the country [9]. The various benefits obtained from import-export activities are as follows:

1. Import-export activities can encourage various industries to continue to innovate. Creating newer and more efficient products will be very necessary to build new target market segments.
2. The profits that will be obtained will likely be much greater if you sell products abroad. Each country has different economic conditions and currencies. This difference has a significant impact on increasing profits.
3. Import-export activities will make the market reach wider. By reaching international markets, it will have an impact on increasing company profits.
4. Expanding the product range can increase production scale. One effective way to increase production scale is by increasing material supplies. Therefore, production costs can be minimized.
5. Selling products to other countries is one way to avoid local competition.
6. Import-export activities are cooperation between countries. If the collaboration is well established, they can release new programs (such as knowledge exchange, business opportunities, and so on).

7. Import-export activities can also cover deficiencies that occur in a country. This is because they do not yet have adequate resources.
8. The lack of resources and target market in the export and import business can minimize the risk of monopolies. The product will reach a wider target market [10].

The export and import industry are now a significant determinant of a nation's economic progress in the age of globalization. A nation's ability to export helps it earn foreign cash that it can utilize to fund development and spur economic expansion. Conversely, import-related activities might assist in satisfying the need for products or services that cannot be effectively provided domestically. Entrepreneurs can increase the competitiveness of local products and the quality of their products through imports and exports, which will enhance both industrial progress and community welfare. To maximize the nation's economic progress, the government and business owners must continue to boost import-export activity [11].

The objective of this study is to evaluate Indonesia's export-import sector's performance using the stepwise modeling approach and the DEA method. One technique to determine which export-import sector activities are effective and ineffective is performance evaluation. These two sectors can support the country's economy in this way and do so with a long-term approach.

2. Material and Methods

Data Envelopment Analysis (DEA) Method

In order to estimate the relative efficiency of many departments or organizational units as Decision-Making Units (DMUs), decision-makers might apply the Data Envelopment Analysis (DEA) method. Any area of life can benefit from this approach. The fact that DEA can employ a wide range of inputs and outputs during implementation makes it a powerful technique as well. The degree of technical advancement, productivity index, scale, issues with minimum prices and maximum benefits, and other issues that are connected to multilateral production functions can therefore be resolved using the DEA approach.

The DEA method does not require initial parameter estimates. Thus, this method can be used to solve problems that are correlated with subjective factors, simplify actions, reduce errors, and so on. When compared with other methods, the main advantage of the DEA method is that it is purely technical. Thus, it is not necessary to provide known initial parameters of the production function, which ensures an excellent model for comparing the effectiveness of different distribution networks [12].

The DEA approach also has the following benefits: (i) easy computations and computer software access; and (ii) a large amount of input and output data. Over the past 50 years, DEA has been applied extensively in numerous sectors to determine its relative usefulness. Education, athletics, medical facilities, agriculture, financial and non-financial organizations, and so on are some examples of these fields [13].

Input-Oriented DEA Envelopment Model

A linear programming technique that addresses performance measurement in integrated models is called data envelopment analysis, or DEA. Parameters for both input and output are used in some performance measurements. Aspects that need to be minimized are inputs, such as expenses, labor, materials, and so on. One factor that needs to be maximized is output, which includes things like income, profits, and goods produced. Before using DEA, inputs and outputs are categorized and chosen.

Each business activity, procedure, and entity is represented in the estimate by the DEA using decision-making units (DMUs). There are two methods for bringing an inefficient decision-making unit (DMU) up to the efficient DMU criterion's threshold. The two primary approaches to approaching these criteria are as follows: (i) activities to minimize input relative to maximizing output at the current level; and (ii) activities to enhance output relative to minimizing input at current levels. These approaches can be used to approach the criteria either way. Equations 1 to 4 present the DEA model in the linear programming formula. The output criteria of the model are set at the present level, and it is geared toward minimizing input.

$$\theta^* = \min \theta \quad . \quad (1)$$

subjected to the following restrictions:

$$\sum_{j=1}^{n} Xij\ \lambda j \ \leq \ \theta\ Xio\ , \qquad i = 1, \dots, m \quad . \quad (2)$$

$$\sum_{j=1}^{n} Yrj\ \lambda j \ \geq \ Yro\ , r = 1, \dots, s \quad (3)$$

$$\sum_{j=1}^{n} \lambda j = 1 \qquad (4)$$
$$\lambda j \geq 0 \quad j = 1, \ldots, n$$

DMU0 is one of the n stated DMUs. r-input and r-output for DMU0 are represented by Xi0 and Yr0, respectively. The unknown weight is denoted by λj, where j = 1,..., n to find the DMU number. The efficacy value is represented by the solution variable with the notation θ. The answer achieved as described in the following equation is viable if θ = 1. At its ideal value, θ* ≤ 1. DMU0 is located at the optimal criteria limit if θ* = 1, which indicates that the current input level cannot be reduced proportionately. DMU0 is located on the border and the input can be decreased by the same percentage of θ* if θ* < 1. As a result, less input is needed to get the same level of output [14].

Variable selection in the DEA method

The DEA method analyzes efficiency using a number of input and output factors, but it offers no recommendations for choosing these variables. Researchers frequently overextend themselves by using many approaches. The effectiveness value will be directly impacted if a significant number of variables are employed. All DMUs will become effective as a result of this decrease in DMU effectiveness. Insufficient DMU data will lead to an abnormally high number of variables. The computing process will be immediately impacted by this circumstance. The number of DMUs should be three times more than the total number of input and output parameters under ideal circumstances [8].

Stepwise Modeling Approach

Table 1. Stepwise Modeling Approach steps

Stages	Explanation
START Step	Configure every DMU's input parameters J and output parameters K.
Step 1	Utilizing the DEA approach, compute efficiency where i = 1..., J + K. During each procedure, one input variable and one output variable are deleted. For every i-process, fix the effectiveness factor of each DMU (set E1,i). Determine the variations in effectiveness factors (E*-E1,i) for every associated DMU. Determine the mean variation in efficacy metrics (derived from a sequence of i variations). Choose one input or output parameter to be eliminated by choosing the one with the smallest average difference among the previously listed effectiveness criteria. The analysis must retain at least one input and one output parameter. At this point, if there is only one input or output parameter left, it cannot be eliminated; instead, other parameters must be taken into account using the numerical selection process. Please indicate DEA result E1* for removed parameters. The DMU's efficacy in maintaining input and output parameters is the basis for E1*.
Step n + 1	Treat a sequence of DEA operations (i = 1,..., J + K - n) in each step repetition. Compare the findings of En+1, i, and En* (efficacy factors from the previous stage) depending on the chosen input and output parameters J + K - n. Then, choose which parameters are eliminated based on the lowest average difference in factor effectiveness.
END Step	If there is just one input and one output parameter in the model, the computation is finished.

Source: Putri and Chetchotsak (2019)

The DEA provides a method for choosing input and output variables called the Stepwise Modeling Approach. The Stepwise Modeling Approach's fundamental process involves modeling the DEA method's parameters backwards. Beginning with each input or output variable, this method applies the DEA method to calculate efficiency. By examining the effectiveness factors of decision-making units (DMUs), one of the variables is eliminated from the numerical process at each step. In **Table 1**, the Stepwise Modeling Approach's steps are listed [8].

Research methodology

This research has five steps for problem-solving: (i) definition and research design stages; (ii) preparation, data collection, and data assessment stages; (iii) data processing stages; (iv) results analysis and conclusion stages. phases of preparation, gathering, and analyzing data, such as: (i) categorizing input and output data; and (ii) identifying input-output variables and the DMU (decision-making unit). The stepwise modeling approach is used to select the DEA input and output variables during the data processing phases. Set-up input, output, and DMU data in Microsoft Excel spreadsheets with columns for DMU and DMU under evaluation data, input and output data, constraints, and efficiency would be the first step. The Solver program in Microsoft Excel will calculate DMU efficiency. Results analysis, covering (i) efficient DMU analysis; (ii) inefficient DMU analysis; and (iii) comparative analysis of DMU classification.

3. Results and Discussion

Data, Variables, and DMU

The data used in this research is Indonesian export and import data for 2022 [15]. These data include: aluminum imports, iron and steel imports, copper imports, import value of motor vehicles, import volume, import value, iron and steel exports, gas exports, oil product exports, export volume, and export value. Countries that have export-import cooperation with Indonesia include China, South Korea, Singapore, Malaysia, the United States, Thailand, and Japan. Based on this data, input-output variables and decision-making units (DMU) can be determined, as shown in **Tables 2** and **3**. An overview of the overall data used in this research is presented in **Table 4**.

Table 2. Input and output variables

No.	Components	Input-Output	Variable
1.	Aluminum import (net weight: 000 kg)	Input_1	X1
2.	Iron and steel imports (net weight)	Input_2	X2
3.	Copper import (net weight: 000 kg)	Input_3	X3
4.	Motor vehicle import value (CIF value: million US$)	Input_4	X4
5.	Import volume (net weight: thousand tons)	Input_5	X5
6.	Import value (CIF value: million US$)	Input_6	X6
7.	Iron/steel exports (net weight: 000 tons)	Output_1	Y1
8.	Gas exports (net weight: 000 tons)	Output_2	Y2
9.	Export of oil products (net weight: 000 tons)	Output_3	Y3
10.	Export volume (net weight: thousand tons)	Output_4	Y4
11.	Export value (FOB value: million US$)	Output_5	Y5

Source: Data processing

Table 3. Decision making units (DMUs)

No.	Country	DMUs
1.	China	C
2.	South Korea	SK
3.	Singapore	S
4.	Malaysia and United State	M-US
5.	Thailand and Japan	T-J

Source: Data processing

Table 4. Input and output data

Input data							
No.	DMU	X1	X2	X3	X4	X5	X6
1.	C	268,900.3	387.6	49,442.9	786.4	4868.5	17,176.70
2.	SK	33,563.3	1,983.3	12,935.5	228.4	5042	11,718.20
3.	S	20,161.8	560.3	8,213.1	27.7	14250.4	19,409.50
4.	M-US	108,263.1	10.7	10,560.6	23.4	20841.2	24,089.60
5.	T-J	21,020.0	2,816.5	48,930.7	1560.5	38767.2	78,712.70
Output data							
No.	DMU	Y1	Y2	Y3	Y4	Y5	
1.	C	8,339.3	3,299.1	447.8	226,633.40	65,839.30	
2.	SK	320.8	3,239.9	285.8	36,139.80	12,808.70	
3.	S	370.5	4,671.6	2,071.8	18,000.90	14,349.50	
4.	M-US	340.9	193.0	2,558.4	40,865.00	43,612.30	
5.	T-J	308.8	2,621.5	59.7	58,155.70	33,049.90	

Source: Data processing

Data Arrangement in Microsoft Excel Spreadsheets

Input and output data are arranged on a Microsoft Excel spreadsheet (**Table 5**). The concept of calculating efficiency scores uses the Input-Oriented DEA Envelopment Model. Next, the MS Excel Solver function was operated to obtain an efficiency score for each DMU (**Table 5**).

Table 5. Data in Microsoft Excel spreadsheet with Solver Function (Input-Oriented DEA Envelopment Model)

DMUs	X1	X2	X3	X4	X5	X6	Y1	→	Y5	λ	Eff.
C	268,900	388	49,443	786	4,869	17,177	8,339		65,839	0	1
SK	33,563	1,983	12,936	228	5,042	11,718	321		12,809	0	1
S	20,162	560	8,213	28	14,250	19,410	371		14,350	0	1
M-US	108,263	11	10,561	23	20,841	24,090	341		43,612	0	1
T-J	21,020	2,817	48,931	1,561	38,767	78,713	309		33,050	1	1

Constraints	Ref. Set		DMU under Evaluation	5	Eff. 1
Input1_X1	21020	≤	21020		
Input2_X2	2817	≤	2817		
Input3_X3	48931	≤	48931		
Input4_X4	1561	≤	1561		
Input5_X5	38767	≤	38767		
Input6_X6	78713	≤	78713		
Output1_Y1	309	≥	309		
Output2_Y2	2622	≥	2622		
Output3_Y3	60	≥	60		
Output4_Y4	58156	≥	58156		
Output5_Y5	33050	≥	33050		
∑λ	1				

Source: Data processing

Stepwise Modeling process and efficiency scores

The variable selection process using the Stepwise Modeling Approach is presented in **Table 6**. The starting point with its original variables is called "Start." Five variables are the output (Y1, Y2, Y3, Y4, Y5) and six input (X1, X2, X3, X4, X5, X6) variables. One variable that is eliminated in the Step-1 process is X1. (X1, Y1, Y2, Y3, Y4, Y5) are the five input variables that make up the remaining variables. During Step 2, a variable called Y1 is released. Four output variables (Y2, Y3, Y4, Y5) and five input variables (X1, X2, X3, X4, X5, X6) make up the remaining variables.

Table 6. Stepwise process and efficiency scores

Components	Start	Step1	Step2	Step3	Step4	Step5	Step6	Step7	Step8	END
Remaining Inputs	X1 X2 X3 X4 X5 X6	X2 X3 X4 X5 X6	X2 X3 X4 X5 X6	X3 X4 X5 X6	X3 X4 X5 X6	X4 X5 X6	X4 X5 X6	X5 X6	X5 X6	X6
Remaining Outputs	Y1 Y2 Y3 Y4 Y5	Y1 Y2 Y3 Y4 Y5	Y2 Y3 Y4 Y5	Y2 Y3 Y4 Y5	Y3 Y4 Y5	Y3 Y4 Y5	Y4 Y5	Y4 Y5	Y5	Y5
Variable Dropped	X1	Y1	X2	Y2	X3	Y3	X4	Y4	X5	
DMU	Efficiency Scores									
C	1	1	1	1	1	1	1	1	1	1
SK	1	1	1	1	0.621	0.503	0.503	0.285	0.285	0.285
S	1	1	1	1	1	1	0.577	0.193	0.193	0.193
M-US	1	1	1	1	1	1	1	0.472	0.472	0.472
T-J	1	0.343	0.343	0.343	0.285	0.175	0.175	0.11	0.11	0.11

Source: Data processing

Similarly, Step 3 through End generates either one input variable or one output variable in turn. X6 and Y5 are the final variables that are left after the END process. As a result, the chosen input variable is X6, and the chosen output variable is Y5. All processes have different efficiency scores. This circumstance impacts the quantity of effective and ineffective DMUs.

Analysis of the Stepwise Model Approach Results

Table 7 presents the results of data processing using a stepwise model approach, which includes: number of variables, number of efficient DMUs, number of inefficient DMUs, Total of Efficiency Score (TES), Average Efficiency Score (AES), and Average Change in Efficiency Score (ACES).

Table 7. Results of the Stepwise Model Approach process

No.	Components	Start	Step1	Step2	Step3	Step4	Step5	Step6	Step7	Step8	END
1.	Number of DMU	11	10	9	8	7	6	5	4	3	2
2.	Number of DMU efficient	5	4	4	4	3	3	2	1	1	1
3.	Number of DMU inefficient	0	1	1	1	2	2	3	4	4	4
4.	Total of Efficiency Score (TES)	5	4.343	4.343	4.343	3.906	3.678	3.255	2.06	2.06	2.06
5.	Average Efficiency Score (AES)	1	0.869	0.869	0.869	0.781	0.736	0.651	0.412	0.412	0.412
6.	Average Change in Efficiency Score (ACES)		0.657	0	0	0.437	0.228	0.423	1.195	0	0

Source: Data processing

The number of efficient DMUs in each step is as follows: Start (5 DMUs), Step 1 (4 DMUs), Step 2 (4 DMUs), Step 3 (4 DMUs), Step 4 (3 DMUs), Step 5 (3 DMUs), Step 6 (2 DMU), Step 7 (1 DMU), Step 8 (1 DMU), and END (1 DMU). The number of inefficient DMUs in each step is as follows: Start (0 DMU), Step 1 (1 DMU), Step 2 (1 DMU), Step 3 (1 DMU), Step 4 (2 DMU), Step 5 (2 DMU), Step 6 (3 DMU), Step 7 (4 DMU), Step 8 (4 DMU), and Step END (4 DMU).

Based on the Total Efficiency Score (TES) and Average Efficiency Score (AES), the following conditions can be obtained: (i) Start has the largest values, namely 5 and 1; (ii) Step 7, Step 8, and END have the smallest values, namely 2.06 and 0.412; and (iii) Step 1 to Step 6 have medium values. Based on the Average Change in Efficiency Score (ACES), Step 7 has the largest ACES value (1,195). The smallest ACES (0) consist of Step 2, Step 3, Step 8, and END. ACES currently belongs to Steps 1, 4, 5, 6, and 7. The number of variables used to calculate the efficiency score results in varying ACES values. Even though Step 2, Step 3, Step 8, and END have the same ACES value (0), the number of efficient and inefficient DMUs varies. Steps 2 and 3 produce the number of efficient DMUs (4) and inefficient DMUs (1). In contrast, Step 8 and END produce the number of efficient DMUs (1) and inefficient DMUs (4). Step END is the optimal solution for evaluating import-export performance in Indonesia. The use of two variables (1 input and 1 output) results in Step END having the smallest TES, AES, and ACES values.

Analysis of efficient DMU, inefficient DMU, and comparison

Based on the efficiency score, the number and percentage (%) of efficient DMUs and inefficient DMUs can be determined (Table 15). Efficient DMUs have an efficiency score equal to one. Inefficient DMU has an efficiency score of less than 1. The efficient DMU category is T (1). Inefficient DMU categories, namely: KS (0.285), S (0.193), M-AS (0.472), and T-J (0.11) The number and percentage (%) of efficient DMUs and inefficient DMUs are presented in **Table 8**. Efficient DMUs have the smallest presentation (20%), and inefficient DMUs have the largest percentage (80%).

Table 8. Percentage (%) and DMU classification

No.	DMU classification	DMU type and efficiency score	Amount	Per. (%)
1.	Efficient DMU	C (1)	1	20
2.	Inefficient DMU	SK (0.285), S (0.193), M-US (0.472), T-J (0.11)	4	80

Source: Data processing

Based on the percentage (%) and DMU classification, it can be identified that the best performance of Indonesia's export-import activities is with China (C). Export-import activities with other countries (South Korea (SK), Singapore (S), Malaysia-United States (M-US), Thailand-Japan (T-J)) need to carry out various improvements in international trade cooperation. Export and import activities are international trade activities that are very beneficial for Indonesia's economic growth. Increasing export activities can increase domestic income. Increasing Indonesian import activity can help increase the competitiveness of domestic products.

The Indonesian government's role in increasing the export and import sectors

Government policies to encourage exports and imports are carried out to develop domestic economic activities. Export activities are carried out based on the mutual needs of countries. Some government policies to encourage exports are as follows:

1. The government provides several conveniences for producers of export goods. Policies that support increasing exports include making it easier to process permits and providing facilities to producers of export goods.
2. The stability of the rupiah exchange rate is very important for exporters because a stable rupiah exchange rate against foreign currencies will make it easier for exporters to calculate the production costs of their export products. This is very important for determining the price of the product in the international market.
3. Many countries have made agreements regarding international trade. This agreement includes the willingness of each country to become a buyer or seller of goods so that each country obtains a profit. The seller or exporter has a market with special protection from the agreement.
4. In order to introduce domestic products to the international market, promotion is very important. Implementation of promotions can take the form of trade exhibitions, sports festivals, arts, or other activities that can function as promotions. Trade promotions are carried out by individuals, private institutions, and the government. The government can handle trade promotions and information centers abroad.

Based on the official website of the Ministry of Communication and Information of the Republic of Indonesia, there are three government policies to encourage exports in the short term, including:

1. Selection of superior export-oriented sectors or commodities, including: export priority sectors (food and beverage industry, textiles and textile products, electronics, automotive, and chemicals) and non-priority sectors (fishing industry, general machinery, wood products, rubber, and furniture).
2. In order to cut costs and time, procedural complications include: (i) lowering the amount of commodities that require surveyor reports; (ii) lowering the amount of other export traffic; (iii) making it easier to issue certificates of origin (which do not require Ministry of Foreign Affairs legalization); and (iv) improving logistics efficiency (online DO system, relaxation of automotive export procedures, and automotive center).
3. Economic diplomacy and increasing market access, including: (i) diplomacy on the imposition of Free Trade Area preferential tariffs; (ii) settlement of trade disputes; (iii) increasing access to export markets (non-traditional markets); and (iv) strengthening market intelligence abroad [16].

The international trade policy in the import sector is as follows:

1. The government sets import quotas within a certain period. The aim is not to disrupt domestic production activities.
2. Some imported goods are cheaper than domestically produced goods. For this reason, the government provides subsidies so that the price of domestic goods becomes cheaper. This subsidy is given to producers, for example, by reducing production costs.
3. The import prohibition policy applies to several goods that are considered to be harmful to the community's environment. Apart from that, import bans are also often imposed to save foreign exchange.
4. Tariffs are set on imported goods at cheap or expensive prices. If the price of imported goods is more expensive, it will encourage people to prefer to use domestic products. Meanwhile, countries that adhere to free trade policies usually tend to price imports cheaper or the same as domestic goods [17].

4. Conclusion

Step END is the optimal solution for performance evaluation in the export-import sector in Indonesia. The use of 2 selected variables (X6 and Y5) resulted in Step END having the smallest TES (2.06), AES (0.412), and ACES (0). Efficient DMUs have the smallest presentation (20%), and inefficient DMUs have the largest percentage (80%).

The efficient DMU category is C (1). Inefficient DMU categories, namely: SK (0.285), S (0.193), M-US (0.472), and T-J (0.11). Therefore, the best performance of Indonesia's export-import activities is with China. Export-import activities with other countries (South Korea, Singapore, Malaysia, the United States, Thailand, and Japan) need to carry out various improvements in international trade cooperation.

Efforts to increase national exports continue to be made by the government. To achieve this, the government is implementing various policies. Government policies to encourage exports include: (i) providing convenience to producers of export goods; (ii) maintaining the stability of the rupiah exchange rate; (iii) making international trade agreements; and (iv) increasing promotions. Apart from that, government policies to encourage exports in the short term include: (i) selecting superior export commodities; (ii) procedural simplicity to reduce costs and time; and (iii) economic diplomacy and increasing market access. International trade policies in the import sector include implementing quotas, providing subsidies, imposing import bans, and setting tariffs.

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6. Abbreviations

DEA	Data Envelopment Analysis
DMUs	Decision-Making Units
STW	Stepwise Modeling Approach
TES	Total of Efficiency Score
AES	Average Efficiency Score
ACES	Change in Efficiency Score

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