

Measuring the Productivity of SDG-3 Output in OIC Countries

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Sustainable Development Goal 3 (SDG 3) focuses on ensuring healthy lives and promoting well-being for all at all ages. It aims to address various aspects of health and well-being, with specific targets to achieve by 2030. This study aims to calculate the efficiency and productivity based on SDG-3 output, 'Good Health and Wellbeing' in 50 countries that are members of the OIC over an 8-year period, from 2010 to 2017. Efficiency measurement was conducted using the Data Envelopment Analysis (DEA) method. Meanwhile, to measure the productivity score, this study using Malmquist Productivity Index (MPI). The result shows that the average efficiency value of OIC countries as a whole is 0.54. The country with the highest efficient value is Brunei with an efficiency value of 0.998, and the lowest country with an efficiency value of 0.35 is Indonesia. On the other hand, the country that experienced the most increase in productivity was Turkey with a TFP value of 1.357 and the country that experienced the largest decrease in productivity was Cameroon with a TFP value of 0.746.

Keywords: SDG-3; OIC; Health; DEA; MPI; Productivity

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INTRODUCTION

In September 2015, the 193 member states of the United Nations adopted the 2030 Agenda for Sustainable Development, which includes 17 Sustainable Development Goals and 169 targets. These goals build on the Millennium Development Goals (MDGs) that were in place from 2000 to 2015 but are more comprehensive, integrating economic, social, and environmental dimensions of sustainability.

The SDGs cover a wide range of issues, including poverty eradication, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industrial innovation and infrastructure, reduced inequalities, sustainable cities and communities, responsible consumption and production, climate action, life below water, life on land, peace, justice, and strong institutions, and partnerships for the goals.

For a country, efficiency is very important. The concept of efficiency is often defined as doing the thing right. It is usually associated with how a country achieves its goals. In addition, this research is also to reveal that OIC countries as a group cannot achieve the prioritized SDGs by 2030 if the total factor productivity of each OIC country has not been well optimized. In other words, the productivity of the OIC countries is also very important for achieving the targets in the long run.

Good health is one of the goals that are part of the SDGs, to be precise mentioned in the fifth goal with the wording, namely ensuring a healthy life and promoting well-being for all people at all ages, this point then becomes one of the main concerns of OIC countries, especially countries that fall into the category of Least Developed and Low Income Countries (OIC-LDLICs) or OIC countries with less development and less income. On the other hand, improving health not only improves people's welfare, but also increases the potential for income generation and increased employment opportunities as well as opportunities for the lower middle class to obtain health and education facilities which will have an impact on targeting better health and education services that can meet their needs. (Bayraktar, 2002)

Determining the limiting factor that becomes the benchmark of whether a country has worked efficiently and productively is also important to note. It is not necessarily that the factor chosen as a variable to measure the level of efficiency can represent the aspect as a whole. For this reason, a formulation of efficiency

and productivity measurement that can involve multi-variables is needed. In the world of efficiency measurement, many approaches are currently known, including Data Envelopment Analysis (DEA).

DEA is based on the Cobb Douglas production frontier curve (Farrell, 1957). According to Tsolas and Giokas (2012), DEA is a tool that can be used to measure and compare the performance of a number of service units or business units and DEA can also show the specifics of the inefficiency of these service units. Therefore, to measure the efficiency of OIC countries between the observed periods, this study uses DEA analysis. DEA specifically looks at the level of efficiency of each unit between one period and another, so that changes in the level of efficiency used based on the inputs and outputs that have been determined will be seen.

Furthermore, to measure the productivity of the observed OIC countries, this study uses the Malmquist Productivity Index (MPI) analysis. The Malmquist index is part of the DEA method that specifically looks at the level of productivity of each unit, so it will see changes in the level of efficiency and technology used based on predetermined inputs and outputs. The Malmquist Index is also used to analyze changes in performance over time.

LITERATURE REVIEW

Measuring the effects of health and welfare elements in a country's development has been an interesting area of research over the past few years, for example the research conducted by Kefeli & Zaidi (2014), both of whom stated in their research that health is one of the most important factors for a country's economic development. However, good economic development can also lead to better health conditions. Knowing which is the cause and which is the effect is very important for the implementation of a policy, especially if a large proportion of income is allocated to improve health conditions.

Bakhtiari & Meisami (2010) also conducted research on the relationship between health and education to income distribution and poverty in several Islamic countries. Their results showed that improving health and education in Islamic countries will reduce income inequality and poverty in the country. Hajebi and Razmi (2014) also stated that improving health is necessary for economic development, because improving health is one of the factors to improve economic production facilities, increase public potential income and can increase economic development by

reducing the level of depreciation of human resources through health and education.

OIC countries, especially developing countries, need to investigate and assess the status and determinants of their health situation. This is because problems related to health and sanitation conditions in developing countries, including OIC members, are multifaceted and often interrelated. (Konaç, 2003). Asgar, et al (2019) mentioned that maximizing the cost productivity of the health care system in OIC countries, health policy makers should certainly pay attention to factors such as the level of public education, proper use of health services according to needs, management of health care system resources, adequate budget allocation and attention to access to health services according to people's income and needs.

Efficiency and productivity, which can be used in this study, are concepts that show the ratio between inputs and outputs. Both ratios show that efficiency and productivity can be controlled by engineering the management of inputs and outputs, or even both. Efficiency and productivity can be used to measure the performance of a unit of economic activity. An activity can be called efficient if the efforts that have been made provide maximum output, both in quantity and quality. An activity can also be said to be efficient if with minimum effort it can achieve a certain output.

Based on research conducted by Masri and Asbu (2018) on measuring efficiency and productivity in the health system. In achieving sustainable development goals and in particular the movement towards universal health coverage, it is imperative to curb the waste of resources to ensure the population's sustainable access to necessary and effective health services without enduring financial hardship. Results show that overall, total factor productivity in OIC countries decreased by 3.8%. This was due to a 9.1%

decline in technical change, which overshadowed the 5.8% increase in efficiency. The decline in total factor productivity over the study period is likely to hamper the achievement of the sustainable development goal targets of ensuring healthy lives and improving well-being for all at all ages.

METHODOLOGY

The method used in this research is Data Envelopment Analysis (DEA). DEA is a nonparametric method that uses a linear program model to calculate the ratio of output and input for all compared units. The advantage of using DEA is that this approach does not require explicit specification of the function form and requires little structure to form its efficiency frontier. DEA is widely applied in performance evaluation and *benchmarking* in educational institutions, hospitals, financial institutions, *production plans* and others. The units used in DEA are called DMUs. This technique can be used to determine how efficiently a DMUs is used by utilizing existing equipment to produce maximum *output*. The weaknesses that may arise when using this method are *self identifiers* and *near self identifiers*. DEA was first developed by Farrel (1957) who measured the efficiency of a one-input and one-output technique into a multi-input and multi-output technique. In this research, the assumptions used are *variable return to scale* (VRS) and *output oriented*. As stated by Johnes (2006), the output-oriented model is a suitable model to achieve economic efficiency. In this study, the data used to present SDGs sub-goal 3, namely good health, and to measure the economic efficiency of OIC countries are sourced from SESRIC. The detailed inputs and outputs used are stated in Table 1.

Table 1 Input and Output Variables

No.	Input	Output
1	<i>Labor</i>	<i>Maternal Mortality Ratio (per 100,000 live)</i>
2	<i>Capital</i>	<i>Under Five Death (Both Sex)</i>

The analysis tool used in this study is DEAP 2.1 to measure the efficiency level of all DMUs of OIC member countries during the period 2010-2017. The analysis for efficiency measurement will be conducted twice. First, the calculation of efficiency with the CRS or CCR approach introduced by Charnes et al (1978). Second, the calculation of efficiency using VRS or BCC

approach which was first introduced by Banker et al (1984).

RESULT AND DISCUSSION

The discussion tries to show how the level of economic efficiency in 50 countries included in the OIC countries during the period 2010-2017 using

quantitative research methodology with the Data Envelopment Analysis (DEA) method. The data of input-output variables in measuring the efficiency level are indicators that build SDGS obtained from SESRIC (Statistical, Economic, and Social Research and Training Center for Islamic Countries). Besides being able to produce efficiency values, DEA can also produce potential improvements, or the level of

improvement needed to achieve an optimal level of efficiency. Based on the calculation result of DEA method assuming Variable Return to Scale (VRS) by using MaxDea 6.1 software, it can be seen the efficiency level of 50 OIC countries. The efficiency value of OIC countries after data processing can be seen in the following table:

Table 2: Efficiency Value of OIC Countries

Region	2010	2011	2012	2013	2014	2015	2016	2017	Mean	Rank
Southeast Asia										
Brunei	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1
Indonesia	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.36	0.35	50
Malaysia	0.54	0.54	0.53	0.52	0.53	0.52	0.52	0.52	0.53	21
Central Asia										
Uzbekistan	0.44	0.44	0.44	0.44	0.45	0.45	0.45	0.45	0.44	34
Tajikistan	0.57	0.53	0.59	0.56	0.55	0.55	0.56	0.57	0.56	15
Turkmenistan	0.57	0.57	0.58	0.58	0.60	0.60	0.60	0.63	0.59	12
Kazakhstan	0.50	0.53	0.53	0.55	0.56	0.58	0.61	0.62	0.56	16
Kyrgyzstan	0.52	0.51	0.50	0.50	0.51	0.51	0.51	0.52	0.51	25
South Asia										
Pakistan	0.41	0.43	0.42	0.43	0.44	0.41	0.41	0.41	0.42	39
Bangladesh	0.36	0.36	0.37	0.36	0.36	0.36	0.37	0.36	0.36	49
Afghanistan	0.56	0.70	0.64	0.60	0.56	0.51	0.57	0.52	0.58	14
Iran	0.45	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.46	28
West Asia/Middle East										
Lebanon	0.65	0.64	0.65	0.63	0.65	0.67	0.68	0.70	0.66	10
Iraq	0.49	0.49	0.52	0.40	0.41	0.41	0.44	0.48	0.45	30
Saudi Arabia	0.51	0.52	0.52	0.53	0.53	0.54	0.54	0.55	0.53	20
UAE	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	0.96	3
Bahrain	1.00	0.97	0.89	0.86	0.87	0.87	0.87	0.88	0.90	5
Qatar	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	2
Oman	0.69	0.70	0.67	0.66	0.68	0.65	0.64	0.64	0.67	9
Kuwait	0.93	0.98	1.00	1.00	1.00	0.84	0.79	0.80	0.92	4
Jordan	0.50	0.50	0.51	0.54	0.54	0.55	0.57	0.58	0.54	18
Yemen	0.40	0.40	0.40	0.40	0.39	0.39	0.39	0.39	0.39	43
West Africa										
Benin	0.41	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	42
Burkina Faso	0.38	0.38	0.39	0.39	0.39	0.40	0.40	0.39	0.39	44
Cote d'Ivoire	0.54	1.00	0.48	0.41	0.42	0.41	0.43	0.44	0.52	23
Gambia	0.67	0.70	0.52	0.65	0.64	0.70	0.63	0.59	0.64	11
Guinea	0.42	0.40	0.39	0.40	0.40	0.40	0.39	0.41	0.40	41
Guinea-Bissau	0.78	0.82	1.00	0.97	0.77	0.92	0.94	0.88	0.88	6
Mali	0.38	0.42	0.49	0.49	0.45	0.45	0.41	0.42	0.44	35
Mauritania	0.44	0.44	0.45	0.45	0.45	0.45	0.45	0.45	0.45	32
Niger	0.36	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	48

Nigeria	0.36	0.37	0.38	0.38	0.37	0.37	0.37	0.37	0.37	46
Senegal	0.47	0.46	0.41	0.42	0.41	0.41	0.42	0.41	0.43	37
Sierra Leone	0.39	0.40	0.40	0.51	0.51	0.49	0.45	0.46	0.45	31
Togo	0.50	0.49	0.43	0.44	0.42	0.42	0.42	0.44	0.45	33
East Africa										
Djibouti	0.56	0.57	0.57	0.57	0.59	0.66	0.58	0.58	0.59	13
Mozambique	0.42	0.36	0.37	0.37	0.37	0.37	0.37	0.37	0.37	45
Uganda	0.36	0.36	0.36	0.36	0.37	0.38	0.37	0.38	0.37	47
Central Africa										
Cameroon	0.45	0.45	0.45	0.45	0.45	0.45	0.57	1.00	0.53	19
Chad	0.42	0.45	0.44	0.44	0.46	0.47	0.49	0.48	0.46	29
Gabon	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.56	0.52	22
Guyana	0.70	0.74	0.78	1.00	0.72	0.81	0.72	0.73	0.78	7
North Africa										
Egypt	0.43	0.46	0.47	0.49	0.50	0.50	0.49	0.49	0.48	26
Morocco	0.42	0.42	0.42	0.42	0.42	0.43	0.43	0.43	0.42	38
Sudan	0.38	0.39	0.41	0.41	0.44	0.44	0.41	0.42	0.41	40
Tunisia	0.52	0.53	0.53	0.53	0.53	0.57	0.59	0.58	0.55	17
Algeria	0.48	0.45	0.43	0.42	0.41	0.41	0.42	0.42	0.43	36
Albania	0.71	0.71	0.74	0.75	0.75	0.77	0.77	0.78	0.75	8
Azerbaijan	0.50	0.52	0.50	0.51	0.51	0.52	0.52	0.53	0.51	24
Turkey	0.45	0.45	0.46	0.47	0.47	0.47	0.48	0.49	0.47	27
Mean	0.53	0.55	0.54	0.55	0.54	0.54	0.54	0.55	0.54	

Based on the results obtained from table 2. It can be seen that the efficiency value of OIC countries fluctuates every year. It is also known that the average efficiency value of all OIC countries is 0.54. When viewed from the efficiency value of each country, it is found that there are 2 countries that almost every year reach the maximum efficiency value, namely Brunei in 2010 to 2016 and United Arab Emirates in 2013 to 2017. Meanwhile, when viewed in detail, apart from the 2 countries above, it was found that in 2010 Bahrain reached the maximum efficiency value. In 2011 Cote d'Ivoire reached the maximum efficiency value. In 2012 there were three countries namely Qatar, Kuwait, and Guinea-Bissau that reached the maximum value. In 2013 Qatar, Kuwait and Guyana reached the maximum value. In 2014 only Kuwait reached the maximum value, and in 2015, 2016 the country Qatar reached the maximum efficient value. And in 2017 the country of Qatar and also Cameroon reached the maximum efficiency value.

Furthermore, the average efficiency value of the 50 OIC countries since 2010-2017 if sorted based on the largest and smallest efficiency value is as follows, the country with the maximum efficient value which is sorted into the 5 most efficient countries in

the health sector is the first country Brunei with an efficiency value of 0.998, the second country Qatar with an efficiency value of 0.997, the third is the UAE with an Efficiency value of 0.96. the fourth is Kuwait with an efficiency value of 0.91 and the fifth is Bahrain with an efficiency value of 0.90.

As for the inefficient countries if sorted according to the bottom 5 efficient value rankings are Nigeria, Uganda, Niger, Bangladesh, and Indonesia where the 5 countries have efficiency values below 0.5. Indonesia itself is the last most inefficient country which has an efficiency value of 0.35. Based on Table 2, it is also found that there are several countries that have an increasing trend in their efficiency value every year. There are 6 countries that have an increasing trend for 8 years. Those countries are Turkey, Albania, Jordan, UAE, Kazakhstan, and Turkmenistan. And also after observing there is no country which has a significant downward trend for the last 8 years. This shows that there is positive progress shown by OIC countries in achieving SDGs 3 in the health sector.

The efficiency value can be classified into 4 groups based on the efficiency scale, namely *Fully Efficient* (100%), *High Efficient* (80-99%), *Medium Efficient* (50-80%), and *Low Efficient* (less than 50%) (Rusydziana,

2017). Of the total 400 DMUs analyzed, there are 26 DMUs (percentage of 6.5%) that reach the maximum efficiency value of 100%, while the other 374 DMUs (percentage of 93.5%) do not reach maximum efficiency (100%), with the following details; 80-99% efficiency as many as 49 DMUs, 50-80% as many as

142 DMUs, and efficiency values below 50% as many as 209 DMUs, within 8 years from 2010 to 2017.

Furthermore, Table 3 shows the average efficiency gains of OIC countries by continent. This is intended to evaluate efficiency gains regionally.

Table 3. Efficiency per region

DMU	Countries Mean	Region's Mean	Ranking	DMU	Countries Mean	Region's Mean	Ranking
Southeast Asia				West Africa			
Brunei	1	0.626667	2	Benin	0.4	0.47615	6
Indonesia	0.35			Burkina Faso	0.39		
Malaysia	0.53			Cote d'Ivoire	0.52		
Central Asia				Gambia	0.64		
Uzbekistan	0.44	0.532	5	Guinea	0.4		
Tajikistan	0.56			Guinea-Bissau	0.88		
Turkmenistan	0.59			Mali	0.44		
Kazakhstan	0.56			Mauritania	0.45		
Kyrgyzstan	0.51			Niger	0.37		
South Asia				Nigeria	0.37		
Pakistan	0.42	0.455	8	Senegal	0.43		
Bangladesh	0.36			Sierra Leone	0.45		
Afghanistan	0.58			Togo	0.45		
Iran	0.46			East Africa			
West Asia/Middle East				Djibouti	0.59	0.44333	9
Lebanon	0.66	0.702	1	Mozambique	0.37		
Iraq	0.45			Uganda	0.37		
Saudi Arabia	0.53			Central Africa			
UAE	0.96			Cameroon	0.53	0.5725	4
Bahrain	0.9			Chad	0.46		
Qatar	1			Gabon	0.52		
Oman	0.67			Guyana	0.78		
Kuwait	0.92			North Africa			
Jordan	0.54			Egypt	0.48	0.458	7
Yemen	0.39	Morocco	0.42				
Europe				Sudan	0.41		
Albania	0.75	0.576667	3	Tunisia	0.55		
Azerbaijan	0.51			Algeria	0.43		
Turkey	0.47						

Based on the analysis of Table 3, it shows that the highest efficiency at the regional level is dominated

by OIC countries from the Asian region. This is proven by the highest regional efficiency achieved by the West

Asia or Middle East region. Almost all OIC countries in the region have an efficient value above 0.5 except for two countries, namely Iraq and Yemen. While the 2nd largest region is the OIC countries located in the Southeast Asia Region occupied by Indonesia, Brunei, and Malaysia. In this region, there are 2 countries that have the lowest and highest efficiency values. The lowest is Indonesia while the highest is Brunei. And in the 3rd position there are countries in the European region occupied by Turkey, Ajerbaizan, and Albania. In the European region itself, the efficiency value is very different between countries. If the efficiency value of Turkey and Ajerbaizan can increase again in the future, it will make the region reach the highest efficiency value among others.

The last rank is occupied by countries from the East African region where it is occupied by Djibouti, Mozambique, and Uganda where only Djibouti has an efficiency value above 0.5 while the other 2 countries also rank at the bottom of the Efficiency value ranking and which makes the region the least efficient region in the health sector.

Productivity of OIC Countries

The productivity value of OIC countries will be measured using the Malmquist Index, with an

output approach. The Malmquist Index is a measure used in productivity analysis to assess changes in total factor productivity (TFP) over time. It was introduced by Swedish economist Staffan B. L. Malmquist in 1953. The index is particularly useful for comparing the efficiency and productivity changes of different entities (such as firms, industries, or regions) over multiple periods. A Malmquist Index greater than 1 indicates productivity growth, a value less than 1 indicates productivity decline, and a value equal to 1 indicates no change in productivity over the given period.

The Malmquist Index is often used in the context of frontier analysis, where the production frontier represents the maximum possible output attainable given a set of inputs. The index is calculated as the ratio of the distance between two points on the frontier over time, representing changes in productivity. The model used is BCC (Banker, Charnes, Chooper) which assumes Variable Return Scale (VRS). Total Factor Productivity Change (tfpch), Technical Change (techch), Efficiency Change (effch), Pure Efficiency Change (pech) and Scale Change (sech) of each country will also be shown.

Table 4. Total Factor Productivity by Country

Region	effch	techch	pech	sech	tfpch
Southeast Asia					
Brunei	0.96	0.85	0.983	0.977	0.816
Indonesia	1.016	1.047	1.015	1.001	1.064
Malaysia	1.060	1.021	1.073	0.988	1.082
Central Asia					
Uzbekistan	1.012	1.109	1.012	1.000	1.122
Tajikistan	1.115	1.102	1.107	1.007	1.229
Turkmenistan	1.043	1.293	1.048	0.995	1.349
Kazakhstan	0.989	0.957	1.005	0.984	0.947
Kyrgyzstan	0.959	0.899	0.961	0.998	0.862
South Asia					
Pakistan	1.008	0.954	1.000	1.009	0.962
Bangladesh	0.955	1.015	0.986	0.968	0.969
Afghanistan	1.041	0.963	1.023	1.017	1.002
Iran	1.000	1.054	1.020	0.98	1.054
West Asia/Middle East					
Lebanon	1.066	1.000	1.078	0.989	1.066
Iraq	1.001	1.081	1.021	0.981	1.082
Saudi Arabia	1.007	1.063	1.000	1.007	1.070
UAE	1.032	1.074	1.034	0.998	1.108

Bahrain	0.952	1.028	0.967	0.984	0.978
Qatar	1.005	1.061	0.999	1.006	1.066
Oman	1.010	0.918	1.000	1.010	0.927
Kuwait	0.984	0.92	1.001	0.984	0.905
Jordan	0.992	0.962	1.016	0.977	0.955
Yemen	1.026	1.107	1.034	0.993	1.136
West Africa					
Benin	0.947	0.845	0.963	0.983	0.8
Burkina Faso	0.941	0.794	0.975	0.966	0.748
Cote d'Ivoire	1.018	0.815	1.010	1.008	0.829
Gambia	0.998	1.037	0.999	0.999	1.035
Guinea	1.042	1.140	1.003	1.039	1.188
Guinea-Bissau	1.061	1.145	1.037	1.023	1.215
Mali	1.069	0.9	1.076	0.993	0.962
Mauritania	1.073	0.926	1.073	1.000	0.993
Niger	1.000	0.938	1.000	1.000	0.938
Nigeria	0.997	0.962	1.000	0.997	0.958
Senegal	1.011	1.086	1.000	1.011	1.098
Sierra Leone	1.012	1.173	1.000	1.012	1.187
Togo	1.028	1.163	1.018	1.010	1.195
East Africa					
Djibouti	1.006	0.827	1.007	1.000	0.832
Mozambique	1.100	1.063	1.072	1.026	1.170
Uganda	1.051	1.087	1.049	1.002	1.143
Central Africa					
Cameroon	0.935	0.798	0.974	0.96	0.746
Chad	1.026	0.814	1.020	1.006	0.835
Gabon	1.002	1.019	1.002	1.000	1.021
Guyana	1.028	1.033	1.014	1.014	1.062
North Africa					
Egypt	1.002	0.799	1.000	1.002	0.801
Morocco	1.087	1.077	1.074	1.012	1.171
Sudan	1.109	1.162	1.097	1.010	1.288
Tunisia	1.058	1.198	1.053	1.004	1.268
Algeria	0.948	1.067	0.947	1.002	1.011
Europe					
Albania	1.022	0.92	0.972	1.052	0.941
Azerbaijan	0.932	1.006	0.954	0.977	0.938
Turkey	1.059	1.281	1.052	1.007	1.357
Mean	1.015	1.004	1.016	0.999	1.019

Table 4 above shows that, Total Factor Productivity (TFP) 29 countries experienced an increase in productivity or remained constant while the remaining 21 countries experienced a decrease in productivity. Also obtained from the average results of TFP increased productivity with an average

productivity value of 1,019 at the end of the period. The country that experienced the most increase in productivity was Turkey with a productivity value of 1.357. and the country that experienced the biggest decline in productivity was Cameroon with a productivity value of 0.746. seen from the source that

contributed the most to the increase in productivity from Efficiency changer (EFCH), Pure Efficiency Changer (PECH), and Technical Changer (TECH)

while the source of the decline was from Scale Change (SECH).

Table 5. Total Factor Productivity by Year

Period	Effch	techch	pech	sech	tfpch
2010 - 2011	0.644	1.151	0.829	0.776	0.741
2011 - 2012	1.892	0.473	1.544	1.225	0.895
2012 - 2013	0.499	3.882	0.773	0.646	1.939
2013- 2014	1.867	0.353	1.294	1.442	0.66
2014 - 2015	0.802	1.891	0.775	1.034	1.516
2015 - 2016	1.363	0.726	1.283	1.062	0.99
2016 - 2017	0.894	0.999	0.875	1.021	0.894
Mean	1.015	1.004	1.016	0.999	1.019

Table 5 displays productivity levels by year. A TFP score above 1 indicates an increase in productivity, while below one means a decrease. Based on table 5, the productivity of OIC countries on average has decreased, but there was an increase in 2012-2013, 2014-2015 and 2016-2017. The rest experienced a decline. The largest decrease occurred in 2015-2016, while the largest increase was in 2012-2013. The increase in productivity is mostly caused by Efficiency Change (effch). Positive changes in the efficiency level in the Efficiency Change (effch) column occurred in 2011-2012, 2013-2014 and 2015-2016, while the rest had negative changes. This shows that Efficiency Change (effch) plays a role in the economic productivity of OIC countries.

It is known from the results shown in Table 5 which is a table of annual productivity increase of 50 OIC countries, the TFP score above 1 explains the increase in productivity, while below one means a decrease. In the table above, it is found that the average productivity of all OIC countries in each year experiences a fluctuating trend, but when viewed from the average, there is an increase in productivity in all OIC countries by 1,019. this means that OIC countries are increasing their achievements in the 3rd SDGs program, namely health. Furthermore, when viewed in detail, it is found that the increase in productivity occurred in the 2012-2013 period and in the 2014-2015 period. While the lowest productivity decline occurred in the 2013-2014 period with a decrease in productivity reaching a value of 0.66

CONCLUSION

The efficiency value of OIC countries fluctuates every year. The average efficiency value of OIC countries as a whole is 0.54 where there are several countries that reach the maximum efficiency value in some years, countries with maximum efficient values which are sorted into the 5 most efficient countries in the health sector are the first country Brunei with an efficiency value of 0.998, the second country Qatar with an efficiency value of 0.997, the third is the UAE with an Efficiency value of 0.96. the fourth is Kuwait with an efficiency value of 0.91 and the fifth is Bahrain with an efficiency value of 0.90. while the least efficient countries are Nigeria, Uganda, Niger, Bangladesh. And Indonesia. Indonesia itself occupies the lowest position with an efficiency value of 0.35

The highest efficiency value is obtained by countries in the Middle East/West Asia region, then in the second position followed by Southeast Asia, then the third position is Muslim countries in Europe, followed by the fourth position is Central Africa, then the fifth position is Central Asia, then the sixth position is West Africa, the 7th position is North Africa and the last position is South Asia.

The country that experienced the most increase in productivity was Turkey with a productivity value of 1.357. and the country that experienced the largest decrease in productivity was Cameroon with a productivity value of 0.746. Countries included in quadrant 1 (technology and high efficiency) amounted to 25 countries, quadrant 2 (high technology, low efficiency) amounted to 5 countries, quadrant 3 (high

efficiency, low technology) amounted to 11 countries and quadrant 4 (technology and low efficiency) amounted to 9 countries.

Countries that have reached the maximum level of efficiency and high productivity are expected to be able to maintain government performance by maintaining the amount of input, and continuing to strive to increase output. So that the level of community welfare reflected in the SDGs indicators can be maintained, or even improved in the following year. As for countries that have not yet reached a good level of efficiency and productivity, they should be able to improve their government performance by choosing the right strategy to achieve better SDGs.

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