Total Factor Productivity of Tourism Economic in Indonesia Based on Input Output Table Analysis

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Abstract

The Indonesian government has set the tourism sector as one of the priority sectors to drive the Indonesian economy. The target of Gross Domestic Product (GDP) contribution from tourism is 8 percent of total GDP in 2019. Since 2010 the number of inbound tourist coming to Indonesia increased every year. However, the share of GDP from tourism remained stable at 4 percent. Productivity is considered as a measure of how to manage resources to be used to achieve optimal results. The most commonly used measurement of productivity is Total Factor Productivity (TFP). The increasing number of tourist coming to Indonesia is not followed by the increasing share to Total GDP is a sympton there is problem in productivity of tourism sector. However, the tourism itself is not stated as industry in System of National Account. Input Output Table can describe the role of tourism sector in an economy. The aim of this research is to analyze TFP of tourism sector in Indoensia. Using input output table analysis, the result showed that the change in TFP of toursim sector relatively small and tend to be negative for every economic sector related to tourism.

Keywords—*Total Factor Productivity, tourism sector, input-output table*

1. Preliminary

Tourism is considered as one of the sector that can drive economic growth. Indonesian government has set tourism as one of priority sectors to be improved in order to drive the economy and make the Indonesian economy as an independent economy just like written in the 2014-2019 National Long-Term Development Plan (RPJMN).

The tourism sector in Indonesia has an important role. It is one of the five largest contributor to foreign exchange in Indonesia and continues to increase while other sectors start to decline (Kemenpar, 2018). Intensive tourism promotion is carried out by the Indonesian government to attract foreign tourists to visit Indonesia. The promotions tend to increase every year, in line with the number of foreign tourists that also continue to increase each year from 2010 to 2016.

The increasing number of foreign tourists in Indonesia indicates that the tourism sector continues to experience progress. This condition is expected to increase Indonesia's economic growth through additional GDP. This is because the tourism sector is not an independent sector, but rather has close relationships with other sectors. If one area is visited by many tourists, it can drive the economy in that area's region, such as in the accommodation sector. The consumption of food and drink will also affect the electricity and gas sector. Even so, Indonesia's economic growth from 2011 to 2016 tends to slow down. One of the main components of economic growth is technology or commonly associated with productivity, which can encourage sustainable economic growth.

The GDP contribution of the tourism sector to the national GDP stagnated at 4 percent in 2010 to 2016. This shows that the increase in tourism input, in this case is the number of foreign tourists, is not accompanied by an adequate increase in output. This shows that there is a problem with the productivity of the tourism sector, because the input should be in line with the output.

The RPJMN has stated that the tourism sector's GDP contribution target is 8 percent in 2019. Meanwhile, the realization of the tourism sector's contribution to the national GDP in 2016 is only 4.13 percent with a target contribution of 5 percent. Accordingly, it is still difficult

to achieve the target of 8 percent tourism sector's GDP contribution to the national GDP in 2019.

Therefore, the development of the tourism sector must be followed by an increase in productivity, so that it can realize the important role of the tourism sector as a driving force of Indonesia's economic development. By utilizing the factors of production more efficiently and optimally, the productivity increases and also maintaining long-term output growth. The tourism sector, which is considered as a sector that is able to drive Indonesia's economic growth, should be able to increase its output in a sustainable manner by the efficient use of production factors.

There are two measurement types of productivity that are commonly used, namely partial productivity and Total Factor Productivity (TFP) (Murray, 2016). The measurement of partial productivity calculates the productivity of one input against the produced output, with other types of inputs considered to have little effect on production output or considered constant. While Total Factor Productivity (TFP) is often said to be a part of the produced output from the production process but cannot be explained by factors of labor and capital production. This TFP is an indicator that is often used to measure productivity.

Based on the description above, this study wants to find out the general picture of the tourism sector in Indonesia and examine changes in the TFP in the tourism sector in each economic sector.

Research on TFP, by using input-output tables, has been done a lot, but no one has calculated the TFP in the tourism sector. Because of that, we are interested in calculating the changes of TFP in the tourism sector by using input-output tables.

Calculation of the changes in TFP can be done by using input-output table, it has been proven by some previous research. One of them was conducted by U-Primo E. Rodriguez, Liborio S. Cabanilla, and Antonio Jesus A. Quilloy (2010) also used input-output tables to calculate changes in TFP in the poultry sector. His research shows that TFP growth contribute to reducing production costs by 12.7 percent and contribute to additional revenue of 15 percent in the poultry sector. The researcher also revealed that the use of input-output tables has the assumption of constant return to scale and is used when the available data is limited.

Furthermore, the calculation of TFP using input-output tables was also conducted by Noorationah Sulaiman (2012) who found that intermediate inputs play a large role in TFP changes in the manufacturing sector. The lack of labor and capital contributions in the TFP are caused by a lack of skilled workers to operate the available sophisticated capital, so that the use of inputs become inefficient.

Research about tourism TFP was conducted by Adam Blake, M. Thea Sinclair, and Juan Antonio Campos Soria (2006) using the computable general equilibrium (CGE) method. The results of that research indicate that the increase of human capital and innovation can drive the productivity of the tourism sector, which then will increase efficiency and prosperity. The factors that encourage productivity will be more effective when working together than working independently. More productivity growth comes from innovations that will improve the quality of production and services rather than by cutting costs.

2. Methodology

2.1 Theoretical Basis

In the production process, the size of output produced depends on the factors of production used. To explain the relationship between inputs, processes, and output in a produvtion process, we can use the production function. The production function is as follows:

$$q = F(K, L) \quad (1)$$

where q is output, K is capital and L is labor.

Technology also determines output produced by the use of a certain amount of capital and labor. The production function that describe the use of technology in the production process is Cobb-Douglas production function, and written as follows:

$$Y = AK^{\alpha}L^{\beta} \quad (2)$$

where Y is total production, A is the productivity of available technology, K is the factor of capital production, L is the factor of labor production, α is the output elasticity of capital input, and β is the output elasticity of labor input. Output elasticity measures the response of output to changes in capital or labor used in the production process, assuming ceteris paribus.

This technological productivity is also often known as Total Factor Productivity (TFP). Initially, TFP was included in residual or residual element, because it was considered as another factor besides labor and capital that affected the increase in output. Technology in here is not entirely a technology in the form of sophisticated machines, but also a slowdown, acceleration, progress in labor education, production knowledge, knowledge of the process of producing goods and services, knowledge of how to organize production activities and other matters that are moving the production function will be considered a technological change (Lipsey & Carlaw, 2004). According to Abramovitz (1962) the change in TFP happen due to the influence of progress on managerial efficiency and industrial organization.

The TFP plays an important role in country's economic performance, analyzing economic fluctuations, sources of economic growth, and differences in per capita income between countries. If a country's economy has a high TFP apart from the factors of capital and labor production that affect its economic growth, the economy can develop rapidly. The increase in TFP can lead the increase in output, therefore it will increase the earning. There are many ways to calculate TFP, but generally the methods divided into two, namely the parametric and non-parametric method. The parametric method is often associated with the econometrics method, and requires a production function. Non-parametric methods do not require production functions or assumptions in calculating TFP. Another way to calculate TFP is general equilibrium analysis using input-output tables. The TFP calculation using input output table can see changes in the TFP in the tourism sector in each economic sector. As we know, tourism is not explicitly stated in System National Accounts (SNA) as an industry. Tourism industry therefore can be defined as the set of industries which facilitate by providing infrastructure and products and services and make possible travelling for different purposes and travelling to places of leisure and business interests. Tourism industry is all about providing necessary means to assist tourists throughout their travelling. By the characteristic of its sector, it is more convenient to analyse tourism sector with input output table.

2.2 Data Collection Methods

The data used in this study are secondary data from Statistics Indonesia (BPS) and Ministry of Tourism Office. The data used are Indonesian input-output tables 2010 by total transactions based on basic prices, gross domestic product according to business field based on current prices in 2010, 2014, 2015 and 2016, Gross Domestic Price (GDP) by expenditure at current prices in 2014, 2015 and 2016, tourism sector input-output tables 2011, 2014, 2015 and 2016.

2.3 Analysis Method

This study will discuss changes in total factor productivity (TFP) in the tourism sector in Indonesia by looking at the value of changes in the tourism TFP in each economic sector, using the input-output table.

The analytical method used in this research is descriptive analysis of input-output tables. Before conducting the analysis, the Indonesian input-output table aggregation table in 2010 will be carried out in total at the base price, from 185 sectors to 17 sectors, in accordance with the concordance of Indonesia's 2010 input-output table classification, also to aggregate the sector's input-output table tourism in 2011-2016.

Economic activities in the tourism sector are activities that are only intended for tourists. All goods and services produced and consumed for and by tourists are output from the tourism sector whose value comes from the many economic activities attached to the 17 sectors of the input-output table. Therefore, to calculate the total output from the tourism sector, it is necessary to have an output value of tourism economic activities based on the 17 sectors.

After aggregation, to get the total transaction input-output tables in 2014, 2015 and 2016 that are not yet available, an update is made to the aggregated tables into 17 economic sectors. To get the tourism sector input-output table in 2010, a sectoral proportion of the input-output table was carried out in 2011, then use the total in 2010 to get the sectoral value of the input-output table in 2010. After getting the total input-output table and tourism in 2010, 2014, 2015 and 2016 the TFP change calculation can be done using the input-output table.

The process of updating Table I-O in 2010 will be from 2014 to 2016

The process of updating or updating the 2010 input-output tables, to get input-output tables in 2014, 2015 and 2016, uses a non-survey method. One of the most commonly used non-survey methods is to use the RAS method.

Miller & Blair (2009) explained the procedure about updating input-output tables with the RAS method. The procedure of the RAS method to update the 2010 input-output table to 2014 - 2016 as follows:

1. Basic year data used is the input-output table for 2010 total transactions at the basic price.
2. Calculate the rate of economic growth for 2014 to 2016.
3. Calculate the total inputs (code 2100) per sector for 2014 to 2016, using the value of the economic growth rate obtained in point 2 and the total inputs (code 2100) available in the 2010 input-output table.
4. Calculate intermediate input values (code 1900) = total inputs (code 2100) - Gross Added Value at current prices (code 2090).
5. Calculates the value of the final request (code 3090) = the sum of Gross Added Value at current prices (code 2090) - import.
6. Calculate the value of the final request (code 3090) sectorally.
7. Calculating the value of sectoral requests (code 1800) = total output (code 7000) - final request (3090).
8. Balance the intermediate request value (code 1800) and the intermediate input value (code 1900), using the intermediate demand ratio (code 1800).
9. Finding the input coefficient matrix between target years A (t), by doing iteration.

Total Factor Productivity Using the Input-Output Table

Calculating TFP using the input-output table requires an intermediate input coefficient matrix (matrix A) 2010, 2014, 2015, and 2016, and also an output matrix and value added matrix of the tourism sector.

The calculation steps are as follows:

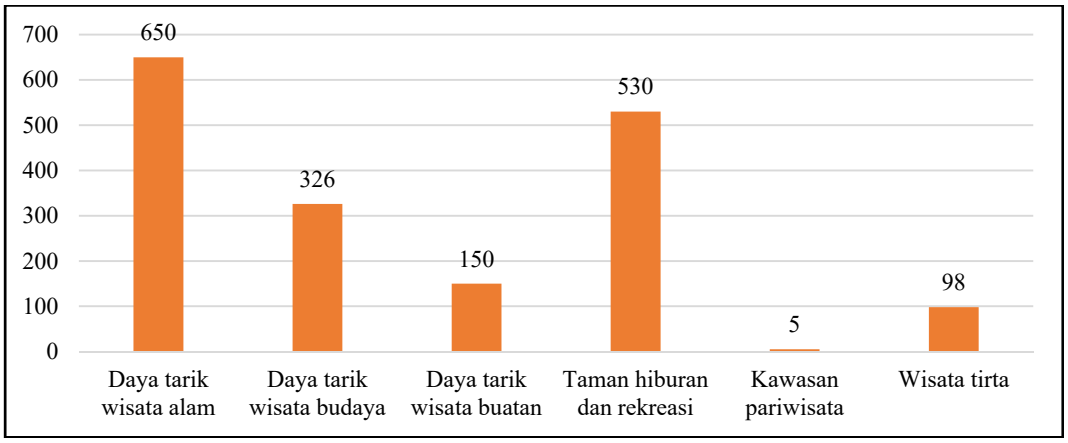
1. Difference between two intermediate matrix coefficients [A], 2014-2010, 2015-2014, and 2016-2010.
2. Transpose the matrices obtained in point 1 → [ΔA] '.

3. Calculate the ratio between value added to output (v) each year, 2010, 2014, 2015 and 2016.
4. Difference between two ratio matrices [v] obtained at point 3 → [Δv].
5. Multiply each matrix obtained in point 2 by the matrix I → - [ΔA] '[i].
6. The difference between the matrix obtained at point 5 and point 4.

3. Results And Discussion

Tourism Sector Description

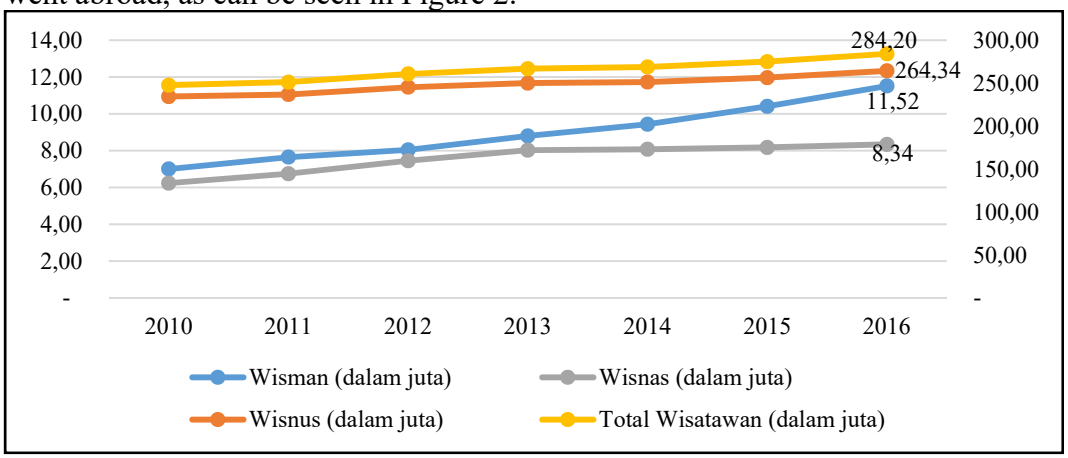
Indonesia is blessed by the various kind of natural panoramic beauty that can be offered to the world and local community. In 2013 there are 4,651 tourist attraction businesses in Indonesia consist of commercial and non-commercial businesses. Figure 1 shows the type of commercial tourist business activity which showed that natural tourism is the most exist business in commercial tourist business, at least there are 650 businesses. This indicates Indonesia has beautiful nature and potentially attract tourists.



Source: 2013 tourist attraction attraction profile

Figure 1. Number of commercial tourist businesses by type

There are a lot of tourist attraction objects in Indonesia are worth visit by tourists from all over the world. The number of tourist visits to Indonesia tends to increase every year. Not only the number of tourists who do tourism in Indonesia tends to increase, the number of tourists from Indonesia who travel abroad (wisnas) also tends to increase every year. Even so, the number of foreign tourists visiting Indonesia is still more than Indonesian citizens who went abroad, as can be seen in Figure 2.

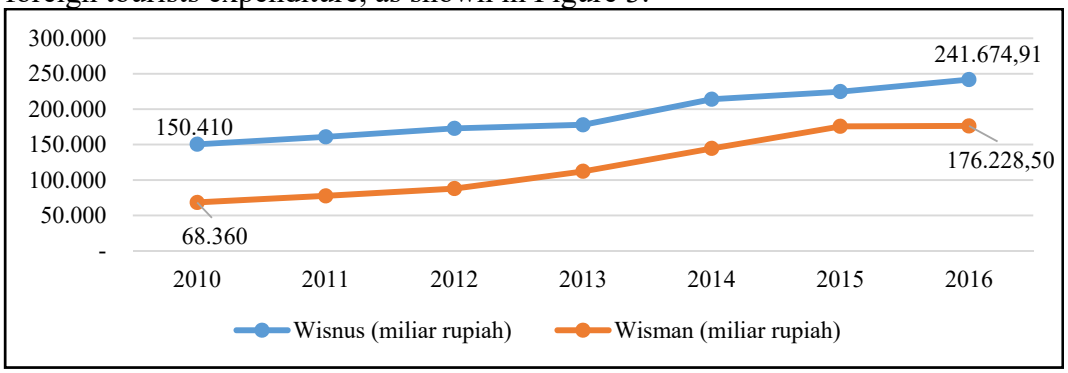


Source: National Tourism Satellite Balance 2012-2017, processed

Figure 2. Number of tourists in Indonesia in 2010-2016

The growth of foreign tourist arrivals is higher compared to the growth of domestic and national tourists. In 2010, the number of foreign tourists visiting Indonesia 7,002,944 people and continued to increase to 11,519,275 in 2016. Meanwhile, the average number of tourists visiting during the 2010 to 2016 period was 8,980,101 people. The government continued promotion causing the number of foreign tourists visiting the country to increase rapidly, besides that in 2015 the Indonesian government added visa-free access to Indonesia to citizens of 45 countries, as stipulated in Presidential Regulation No. 69/2015 about Visa Free Visit.

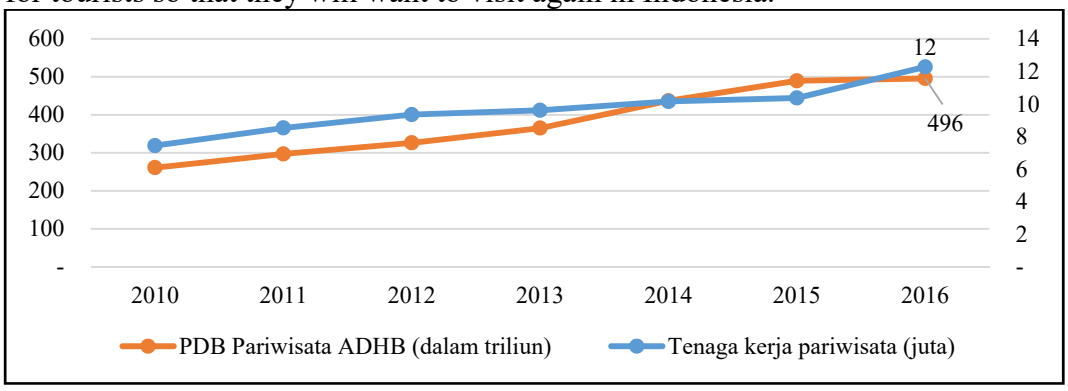
The number of domestic tourists which is more than the number of foreign tourists indicates that the role of tourists is important in tourism, because it holds the biggest role in creating economic impacts, characterized by expenditure by foreign tourists greater than foreign tourists expenditure, as shown in Figure 3.



Source: National Tourism Satellite Balance 2012-2017, processed

Figure 3. Total expenditure for foreign tourists and tourists in Indonesia in 2010-2016 (in billions rupiah)

The number of tourists that continues to increase must be balanced with the number of facilities and infrastructure, as well as the quality of service of workers who directly serve the demand for tourism. The better the quality of human resources will give a positive impression for tourists so that they will want to visit again in Indonesia.

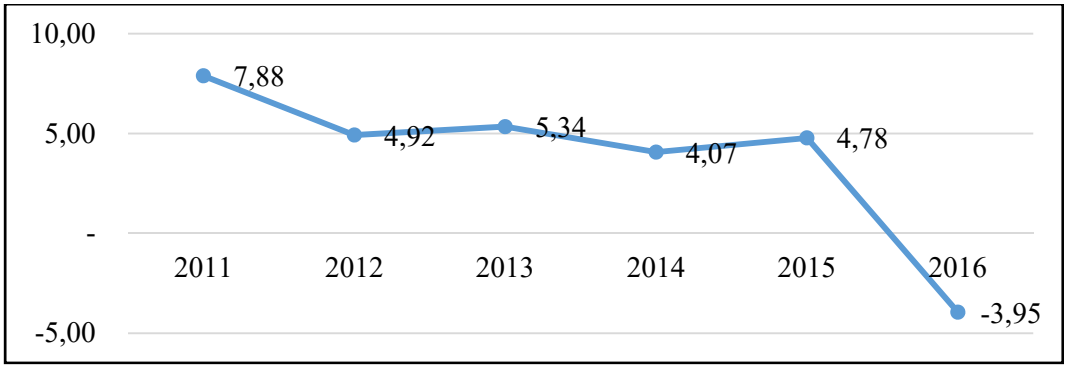


Source: National Tourism Satellite Balance

Figure 4. Gross Domestic Product for tourism and employment

GDP revenue in the tourism sector continues to increase every year, accompanied by an increase in employment in the tourism sector, although in 2015 the addition of absorbed labor was not so much, but in 2016 the amount of employment increased rapidly, can be seen in Figure 4 .

Although there are promising increase in tourist numbers, GDP, and employment, the economic growth of the tourism sector tends to fluctuate and even decline in 2016, as shown in Figure 5.



Source: National Tourism Satellite Balance (data processed)
Figure 5. Economic growth in the tourism sector in 2011-2016

Output Structure

The 2014, 2015 and 2016 input-output tables for the tourism sector are obtained from the National Tourism Satellite Account or called Neraca Satelit Pariwisata Nasional (NESPARNAS). Output is the result of production activities in the form of goods and services produced by economic sectors. It plays an important role in the economy. The more demand for goods and services, the more products will be produced, that will make the value of output increases. From tourism input-output table, it can be seen the percentage of output from each sector due to tourism consumption.

Table 1. Contribution of tourism sector output by sector in 2010, 2014-2016

No	Sektor	2010	2014	2015	2016
(1)	(2)	(3)	(4)	(5)	(6)
1	Agriculture, Forestry, and Fisheries	7,18%	6,51%	6,21%	7,88%
2	Mining and excavation	2,86%	3,12%	4,03%	3,19%
3	Manufacture Industry	29,37%	31,62%	31,05%	30,09%
4	Electricity, Gas Procurement	0,73%	1,33%	1,32%	1,33%
5	Water Supply, Waste Management, Waste and Recycling	0,00%	0,00%	0,00%	0,00%
6	Construction	14,01%	12,99%	13,09%	12,77%
7	Wholesale and retail trade, car and motorcycle repair	5,25%	5,21%	5,35%	5,27%
8	Transportation and Warehousing	17,23%	13,70%	12,10%	11,66%
9	Provision of Accommodation and Food and Drink	15,73%	17,56%	18,97%	18,71%
10	Information and Communication	1,21%	2,21%	2,18%	2,17%
11	Financial Services and Insurance	1,92%	1,68%	1,68%	1,68%
12	Real estate	1,73%	1,55%	1,50%	1,50%
13	Government Administration, Defense and Mandatory Social Security	0,19%	1,22%	1,19%	1,29%
14	Health Services and Social Activities	0,34%	0,30%	0,30%	0,28%
15	Other Services	2,24%	1,00%	1,03%	2,17%
Total Output of Tourism Sector (billion rupiah)		565.150	889.288	983.996	1.033.932

Source: Tourism sector input-output table for 2010, 2014, 2015, 2016 (data processed)

Table 1 showed output of the tourism sector each year produced by economic sectors that produce goods and services consumed by tourists. In 2010 and 2014, the largest contributor to the output of the tourism sector are the manufacture industry, transportation and warehousing, as well as Provision of Accommodation and Food and Drink. More than 50 percent of the tourism sector's output comes from those sectors. Whereas in 2015 and 2016, the largest contributor to the output of the tourism sector came from the manufacture industry, then followed by Provision of Accommodation and Food and Drink sector, and the construction sector, more than 50 percent of the tourism sector's output came from the 3 sectors. Whereas from 2010 to 2016, the smallest contribution of the tourism sector's output came from the water supply, waste management, waste and recycling sectors, almost zero percent.

Input Structure

Input consists of intermediate and primary inputs. Intermediate input is the cost of goods and services used in the production process of an economic activity to produce output. Primary input shows the amount of remuneration provided to the factors of production that play a role in the production process, or the amount of income derived from a production process, often also referred to as added value. By analyzing the input structure, it can see the percentage of intermediate and primary inputs used in a sector's economic activities to produce tourism sector output.

Table 2. Allocation Of Input In The Sectoral Tourism Sector Production Process 2010, 2014-2016

No	Sector	2010		2014		2015		2016	
		Intermediate Input	Primary Input	Intermediate Input	Primary Input	Intermediate Input	Primary Input	Intermediate Input	Primary Input
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Agriculture, Forestry, and Fisheries	34%	66%	16%	84%	7%	93%	22%	78%
2	Mining and excavation	19%	81%	26%	74%	42%	58%	25%	75%
3	Manufacture Industry	60%	40%	63%	37%	62%	38%	63%	37%
4	Electricity, Gas Procurement	63%	37%	72%	28%	72%	28%	72%	28%
5	Water Supply, Waste Management, Waste and Recycling	51%	49%	65%	35%	63%	37%	64%	36%
6	Construction	63%	37%	65%	35%	65%	35%	66%	34%
7	Wholesale and retail trade, car and motorcycle repair	46%	54%	32%	68%	32%	68%	32%	68%
8	Transportation and Warehousing	63%	37%	60%	40%	58%	42%	59%	41%
9	Provision of Accommodation and Food and Drink	50%	50%	48%	52%	48%	52%	48%	52%
10	Information and Communication	21%	79%	38%	62%	38%	62%	38%	62%
11	Financial Services and Insurance	34%	66%	28%	72%	28%	72%	28%	72%

12	Real estate	29%	71%	28%	72%	28%	72%	37%	63%
13	Government Administration, Defense and Mandatory Social Security	42%	58%	40%	60%	40%	60%	38%	62%
14	Health Services and Social Activities	45%	55%	42%	58%	42%	58%	42%	58%
15	Other Services	50%	50%	49%	51%	49%	51%	58%	42%

Source: Tourism sector input-output table for 2010, 2014, 2015, 2016 Indonesia (data processed)

From table 2 it can be seen the percentage of the use of intermediate and primary inputs to produce tourism sector output from each economic sector. In 2010, the electricity, gas, construction, transportation and warehousing sectors are the sectors that used the highest input compared to other sectors in producing output for the tourism sector. Whereas the mining and quarrying sector uses the least inputs compared to other sectors to produce tourism output.

Then in 2014-2016, the electricity, gas procurement sector was the sector that used the highest input in producing output for the tourism sector. Whereas the agriculture, forestry and fisheries sectors use the least amount of input to produce tourism sector output.

This shows that from 2010 and 2014-2016 the output from gas electricity procurement sector is mostly used in intermediate inputs or raw materials compared from sectors. While the sectors that use inputs relatively small are those that can process intermediate inputs well so that the production costs small.

By looking at the percentage of the use of intermediate inputs in the production process, it can be seen whether a production process is running efficiently or not. Does labor can produce optimal output by streamlining intermediate inputs used in the production process, so that the percentage of primary inputs obtained by labor production factors is more than the percentage of intermediate inputs or raw materials for production.

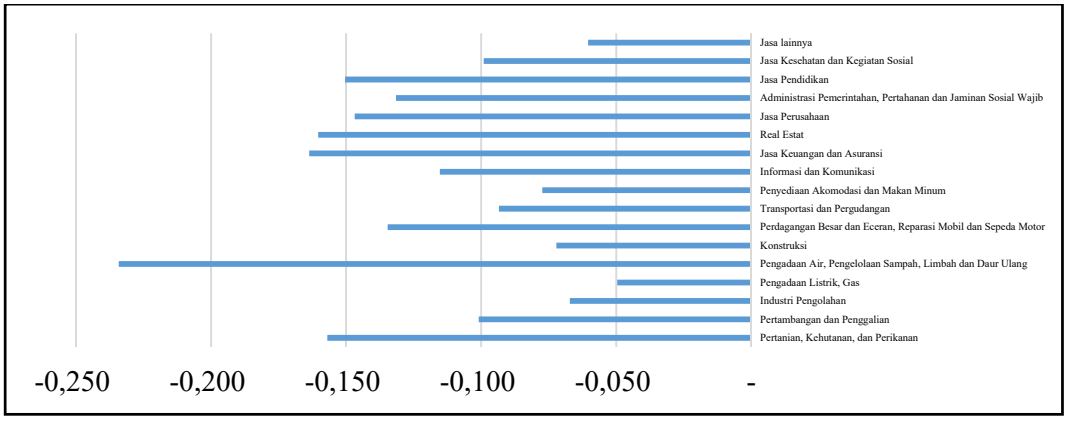
Efficient use of intermediate inputs influence the changes in TFP. When the percentage of use of intermediate inputs in the production process increases, the TFP value will decrease. If the percentage of use of intermediate inputs decreases, this indicates that labor can make efficient use of inputs, so that the percentage of primary inputs or added value obtained by labor in the form of remuneration will increase, as well as the TFP whose value increases.

Tourism TFP Using Input-Output Table

This study measures changes in the TFP in the tourism sector by using an input-output table analysis, to see changes in the TFP in the tourism sector in each sector of the economy and know which sectors need to be addressed and improved.

The Average of Tourism TFP by Economic Sector

The average TFP change in the tourism sector from 2010 to 2016 for each economic sector is negative. This shows that in the period 2010 to 2016, the tourism sector's TFP tended to decline. With an average reduction in the TFP the largest tourism sector is in the water supply, waste management, waste and recycling sectors. The smallest decrease in the TFP in the tourism sector was in the electricity, gas procurement sector, can be seen in Figure 5.



Source: Indonesian Input-Output Tables in 2010, 2014, 2015 and 2016

Figure 5. Average changes in tourism TFP in 17 sectors of the Indonesian economy in 2010 – 2016

Changes in TFP in the Tourism Sector by Economic Sector

Table 3. Changes in TFP in the tourism sector and changes in share inputs between sectors in 2010 and 2014, and 2014 and 2015, 2015 and 2016.

No	Sector	2010-2014		2014-2015		2015-2016	
		ΔTFP	Changes in share of intermediate input (%)	ΔTFP	Changes in share of intermediate input (%)	ΔTFP	Changes in share of intermediate input (%)
1	Agriculture, Forestry, and Fisheries	-0.02	1.88	-0.25	25.48	-0.2	20.69
2	Mining and excavation	0.03	-2.99	-0.24	23.66	-0.1	9.81
3	Manufacture Industry	-0.01	0.92	-0.11	11.21	-0.08	8.89
4	Electricity, Gas Procurement	0	-0.02	-0.08	8.65	-0.06	6.54
5	Water Supply, Waste Management, Waste and Recycling	-0.58	58.2	-0.06	6.26	-0.06	5.8
6	Construction	0.02	-1.95	-0.14	14.59	-0.1	10.3
7	Wholesale and retail trade, car and motorcycle repair	-0.01	0.23	-0.23	23.39	-0.17	17.33
8	Transportation and Warehousing	0.02	-0.32	-0.18	20.79	-0.12	13.26
9	Provision of Accommodation and Food and Drink	-0.01	-0.26	-0.14	17.22	-0.08	11.81
10	Information and Communication	0	-0.26	-0.19	19.25	-0.15	16.06
11	Financial Services and Insurance	0	0.4	-0.29	29.82	-0.2	20.5
12	Real estate	-0.02	2.21	-0.25	26.37	-0.21	21.42

13	Company services	-0.1	10.25	-0.2	19.76	-0.14	14.03
14	Government Administration, Defense and Mandatory Social Security	-0.1	0	-0.22	22.33	-0.17	16.88
15	Education Services	0	0	-0.27	26.7	-0.18	18.41
16	Health Services and Social Activities	0	0.04	-0.17	17.58	-0.12	12.6
17	Other Services	0.38	-34.86	-0.31	32.41	-0.24	24.62

Source: 2014, 2015 and 2016 input-output tables (data processed)

Changes in the tourism sector TFP in 17 economic sectors in the study year tend to be negative, shown in Table 3, except for changes in TFP between 2010 and 2014. Changes in the tourism sector TFP are positive in 5 economic sectors, namely in the mining and quarrying, construction, , transportation and warehousing, health services and social activities, and other services. The positive change in TFP shows that the 5 sectors sought to improve and improve the efficiency of the use of intermediate inputs in the production process from 2010 to 2014, as indicated by the value of changes in share inputs among them that experienced a decline, in Table 3.

While changes in the TFP in the tourism sector from 2014 to 2015, and from 2015 to 2016 in each sector of the economy are negative. This shows that there is a decrease in the value of TFP in the tourism sector every year. The decrease in TFP was caused by lack of efficiency in processing intermediate inputs to produce output. Table 3 shows the percentage of use of intermediate inputs that increased in 2015 and 2016 in each sector so that the percentage of primary input income decreased.

In 2015, the sector that experienced the most TFP decline was other service sectors, down by 0.31 and the sectors that experienced the least decline were the water supply, waste management, waste and recycling sectors, which amounted to 0.06. In 2016, the biggest decrease in TFP was by other service sectors with a decrease in TFP of 0.24 and the sectors that had the lowest TFP decrease were the water supply, waste management, waste and recycling sectors, with a change in value of 0.06.

The sectors that experienced the most decrease in the TFP in the tourism sector were the sectors that added the highest percentage of input use compared to other sectors, and the sector that experienced the least decline in the tourism sector was the sector which added the least amount of input use compared to other sectors.

Comparison of Changes in TFP and Tourism GDP Growth

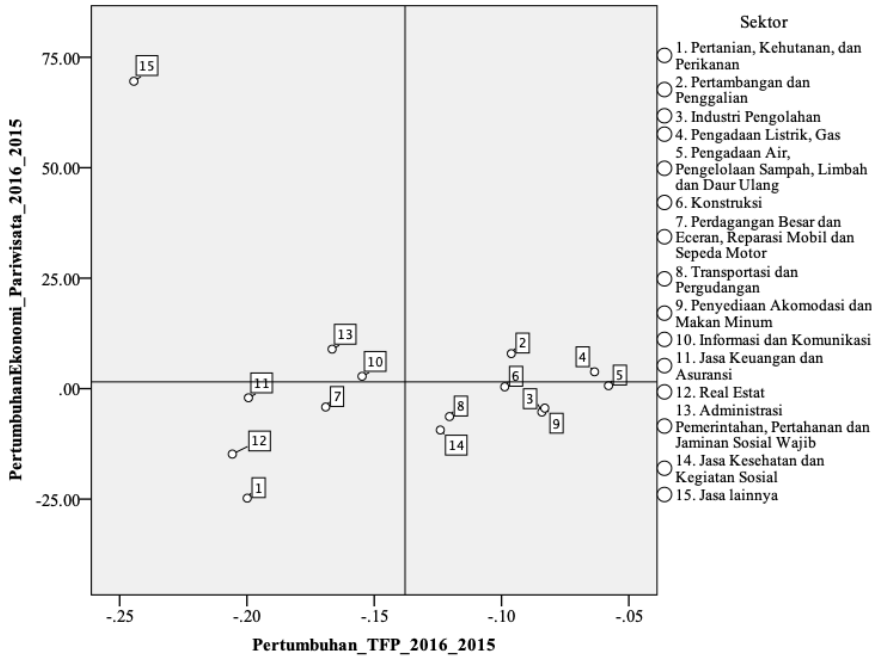
Dividing the relationship between TFP change and GDP tourism growth into 4 quadrants, with the division of quadrants as follows:

Table 4. Quadrant distribution of relationships between TFP changes and GDP tourism growth

Quadrant II Changes in the TFP are below average and GDP growth in tourism sector is above average	Quadrant I Changes in TFP and GDP growth in the tourism sector are above average

Quadrant III Changes in TFP and GDP growth in the tourism sector is below average	Quadrant IV Changes in TFP are above average and GDP growth in the tourism sector is below average

Figure 6 shows the distribution of 15 economic sectors in Indonesia based on data on economic growth in the tourism sector and changes in TFP between 2015 and 2016. There are 2 sectors that are included in quadrant I, namely the mining and quarrying sector, as well as the electricity, gas procurement sector. Economic growth and changes in TFP in the tourism sector in these two sectors are relatively high compared to other sectors. With an average change in TFP and economic growth in the tourism sector respectively -0.14 and 1.35.



Source: Indonesia Input Output Tables and Tourism

Figure 6. Quadrant Analysis Of Tourism Economic Growth And TFP of 17 Economic Sector Growth Towards The Tourism Sector in 2016

Whereas in Quadrant II there are 3 sectors, namely information and communication, government administration, defense and mandatory social security, and other services. The economic growth of tourism in the three sectors was above average, but the change in the TFP in the tourism sector was below average. This indicates that tourism economic growth from 2015 to 2016 in the sector was not driven by productivity, but other factors of production.
In quadrant III there are 4 sectors, namely agriculture, forestry, and fisheries, wholesale and retail trade, car and motorcycle repair, financial and insurance services, real estate. Changes in TFP and economic growth in the tourism sector in these four sectors are either below average or relatively low compared to other sectors. The economic activities of the tourism sector in these four sectors need special attention in order to drive economic growth and change the TFP in the tourism sector.

In quadrant IV, there are 6 sectors namely processing industry, water supply, waste management, waste and recycling, construction, transportation and warehousing, provision of accommodation and food and drink, health services and social activities. The economic growth of the tourism sector is brought on average in these sectors, while the change in TFP is above

average compared to other sectors. This shows that the TFP in the tourism sector has contributed to changes in the TFP but is not strong enough to support NTB's growth in the tourism sector.
The direction of the relationship between TFP changes and economic growth in the tourism sector in 2015 and 2016 is not visible from Figure 15, this shows that the policies in the tourism sector have not been able to increase economic growth.

4. Conclusion

The tourism sector in Indonesia continues to increase from 2010 to 2016. This can be seen from the number of tourists visiting Indonesia, GDP and employment in the tourism business which tends to increase every year. But tourism economic growth continues to experience changes (tends to fluctuate) during the study period.

Changes in tourism sector TFP in each sector tend to be negative from year to year. This can be seen from the average TFP in the tourism sector in each sector which is negative, indicating that the TFP in the tourism sector has decreased during time reference. The decrease in TFP is caused by the inefficient use of intermediate inputs production process. The percentage of the use of intermediate inputs increases each year, causing the decrease of percentage of value added. Thus, the value added obtained is not as expected. The economic sector with highest decrease in TFP is the sector have the highest percentage increase in input use. Whereas the lowest decline in TFP was the sector with the least increase in percentage of input use. There are five sectors experienced positive TFP change between 2010 and 2014, it happen to be the long period of calculation in the change of TFP. The changes in TFP does not absolutely determine the increase or decrease in output, because there is a combination of other factors of production which also determines output in production process.

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