



Multiplier Effects of Tourism Sector in Yogyakarta: Input-Output Analysis

Didi Nuryadin¹, Purwiyanta²✉

^{1,2}UPN "Veteran" Yogyakarta

Permalink/DOI: <https://doi.org/10.15294/jejak.v16i1.40054>

Received: November 2022; Accepted: January 2023; Published: March 2023

Abstract

In the Special Region of Yogyakarta (DIY), the tourism sector contributes roughly to 34% of the total output, either directly or indirectly. Because of the enormous potential of tourism in boosting the economy, the local government was encouraged to adopt plans and programs so that the tourism sector's long-term viability can influence the development of other sectors. This study aims to describe the economic multiplier effects of tourism industry operations. An examination of the input-output table of 35 sectors in the Special Region of Yogyakarta in 2015 was carried out in this study. An examination of output, income, gross value added, and labor linkage and multipliers was made from an input-output analysis. The hotel and restaurant industry, as well as air transport, is considered as the key sector in the linkage study (forward and backward linkage). The sector with the biggest employment absorption, according to the multiplier analysis, is trade.

Key words : Multiplier Effect, Input-Output, Tourism

How to Cite: Nuryadin, D., & Purwiyanta, P. (2023). Multiplier Effects of Tourism Sector in Yogyakarta: Input-Output Analysis. *JEJAK*, 16(1). doi:<https://doi.org/10.15294/jejak.v16i1.40054>

✉ Corresponding author : Purwiyanta
Address: Jl. Padjajaran, Sleman, Yogyakarta, Indonesia. 55283
E-mail: purwiyanta@gmail.com

INTRODUCTION

The tourism sector has both direct and indirect contribution approximately 8-9% to the economy of Gross Domestic Product (GDP) of ASEAN countries, including Indonesia, and creates 1 in 11 jobs (Antara, 2014). United Nation World Tourism Organization (UNWTO) estimates that the prospect of

tourism, especially in ASEAN, is expected to grow to 10.3% in 2030 (UNWTO, 2018). According to the World Tourism and Travel Council, tourism sector in global GDP comprises 10.4%. The number of employees in this sector reaches 313 million and constitutes 9.9% of the total jobs in the world (WTTC, 2018).

A different situation occurred after WHO (12 March 2020) declared COVID-19 as a pande-

mic, which significantly affected the global economic, politics, and social systems. Health communication strategies and measures, such as social distancing, travel and mobility bans, community lockdowns, stay-at-home campaign, mandatory self-quarantine, and gathering restrictions, have put a stop to global travel, tourism, and recreation (Sigala, 2020).

The tourism sector eventually became of the sectors hit hardest by the COVID-19 pandemic due to the decrease in travel demand and supply, which resulted in the decrease of tourism prices. Hoque et al. (2020) suggested that the tourism sector currently has to face threats that have never existed before. Chanona et al. (2020) suggested that tourism demand has changed during the pandemic because the tourism sector puts people at risk of infection. It was reported that the number of international tourist arrivals has dropped due to Covid-19 with a significant reduction of -22% globally in quarter I of 2020. The Asia-Pacific and Europe areas have the most decline of -34.6% and -19.1% reduction, respectively (webunwto.s3.eu, 2020). As a result, other sectors such as airlines, hospitalities, and MSMEs which are related to the tourism sectors have also impacted as well as those sectors show a minus growth during pandemic (Harchandani & Shome, 2021). Bakar & Rosbi (2020) stated that existing regulations affected the decline in consumers, loss of business income, and layoffs resulting in higher unemployment of a country. UNWTO predicted that global tourism would decrease by 20 to 30% until March 2020.

The tourism sector, which has been the pillar of the Special Region of Yogyakarta, has also been in shock with the social distancing regulation. Restrictions on outdoor activities and overseas travel decreased the income from transportation, accommodation, and tourism industry sectors. As a result, the

economy of the Special Region of Yogyakarta contracted to minus 0.17% in the first quarter of 2020. The open unemployment rate as of February 2020 rose to 3.38% compared to February 2019, which was 2.86% (BPS, 2020). In decades, the Special Region of Yogyakarta has had the highest rate of poverty and inequality in Java Island, and with this shock, its condition could more exacerbate. Thus, the recovery of tourism sectors is prominent way to maintain the economy.

Tourism is a sector which has a multiplier effect, which is a situation where tourism development can influence the development of other supporting sectors, such as infrastructure, service, transportation, food and beverages, as well as the opening of wider employment opportunities. In addition, the tourism sector has a significant and sustainable relationship with food, agriculture, and small and medium industries, thereby creating synergies in regional development. Tourism has also been proven to help poor areas (Hjerpe, 2018; Ferrari et al., 2018). Tourism has direct and indirect effects on the economy. Tourists who spend their money in a hotel help create jobs directly and provide value-added in the hospitality industry. However, other industry such as agriculture/ farmers where the hotel obtains their food, the craft industry which supply souvenir, and the clothing industry which provide hotel equipment also gain the indirect effect from the hotel activity. Therefore, tourism has a large multiplier effect on other sectors and it is very important to the rest economy (Rusu, 2011). Kumara, Prastyo, & Rahayu (2021) estimated that during pandemic, Indonesia lost potential income from tourism by IDR 99.09 trillion and has impacted other sectors such as FnB sector by IDR -17.9 trillion dan trade by IDR -10.7 trillion.

In the context of tourism economy, a multiplier approach is usually adopted to examine the existence of economic impact, which is determined through input-output (IO) analysis (Archer & Fletcher, 1996; Wagner, 1997; Sinclair,

1998). The multiplier measures the impact of each increase in tourist spending (demand) on the economy, usually in terms of output, income, and employment. Tourism IO studies have been carried out in the national and regional levels, for instance, Siswahto & Muryani, 2020 (North Sulawesi); Hasanli & Baizakov, 2019 (Azerbaijan, Kazakhstan, Iran); Tohmo, 2018 (Finland, regional input-output); Munjal, 2013 (India); Atan & Arslanturk, 2012 (Turkey), Kim & Chon, 2009 (Korea); Kweka et al., 2003 (Tanzania); and Tohamy & Swinscoe, 2000 (Egypt). However, the analysis of the multiplier effect of tourism in the Special Region of Yogyakarta comprehensively and the both direct and indirect effects on all sectors was still limited. Thus, this current study attempt to analyze the multiplier effect of tourism using input-output (IO) analysis to identify the impact of tourism development on the economy of the Special Region of Yogyakarta. First, a multiplier analysis was performed to examine the impact of the tourism sector on output, income, employment, and community income. It is expected that the development of tourism sector has direct positive effect to the other sectors's output as well as income and employment, vice versa. Second, an analysis of the forward-backward linkage between the tourism sector and other sectors was made. Third, an analysis of investment needs was

carried out for tourism development in the future.

METHOD

The Special Region of Yogyakarta Input-Output Table of 2015 for 35 sectors was utilized as the analytical tool in this study. It consists of 17 economic sectors in total. The data of the tourism sector in the input-output table were taken from the 2015 Indonesia Standard Industrial Classification (ISIC) in the tourism sector, the Special Region of Yogyakarta Special Input-Output Survey (SKIO) of 2015, the National Socio-Economic Survey (SUSENAS), the Indonesia Tourist Survey (WISNUS), the Passenger Exit Survey (PES), and the Moving Position Data (MPD). After determining the output value of economic activities in the tourism sector, the output value aggregation was carried out to get the output value of the tourism sector.

The economic impact of tourism can be investigated by analyzing its impact on production growth, factors of production, and balance of payments (Mikic, 1988). To estimate the direct-indirect impacts and variations in tourist spending, a multiplier analysis is needed, which can be considered as a measure to estimate the total impact of tourism on an economy. Input-output (I-O) analysis is an appropriate technique to capture the total impact of tourism through estimating the multiplier (Mazumder et.al., 2011).

Table 1. Input-Output Table for 3 Production Sectors (BPS, 2008)

Input Structure	Output Allocation	Intermediate Request			Final Request	Provision	
		1	2	3		Imports	Number of Outputs
Intermediate	1	X_{11}	X_{12}	X_{13}	F_1	M_1	X_1
Input	2	X_{21}	X_{22}	X_{23}	F_2	M_2	X_2
	3	X_{31}	X_{32}	X_{33}	F_3	M_3	X_3
Primary Input		V_1	V_2	V_3			
Number of Inputs		X_1	X_2	X_3			

Where, X_i is a supply come from domestic output; M_i denote supply come from imports for similar products; X_{ij} stands

for Intermediate request; F_i is a Final request; and V_i denote the Primary input.

Each row in table 1 was calculated using this following equation:

$$\begin{aligned} x_{11} + x_{12} + x_{13} + F_1 &= X_1 + M_1 \\ x_{21} + x_{22} + x_{23} + F_2 &= X_2 + M_2 \\ x_{31} + x_{32} + x_{33} + F_3 &= X_3 + M_3 \end{aligned} \tag{1}$$

Subsequently, equation (1) was written in the form of a general equation:

$$\sum_{j=1}^3 X_{ij} + F_i = X_i + M_i, \text{ for } i = 1, 2, 3 \tag{2}$$

Where, X_{ij} is a Provision of sector i used by sector j ; X_i stands for Total output (domestic) of sector i ; F_i symbolised for Final demand for sector i ; and M_i is Imports in sector i . Then, it was derived into an algebraic equation:

$$\begin{aligned} x_{11} + x_{21} + x_{31} + V_1 &= X_1 \\ x_{12} + x_{22} + x_{32} + V_2 &= X_2 \\ x_{13} + x_{23} + x_{33} + V_3 &= X_3 \end{aligned} \tag{3}$$

Instead, a general equation was used:

$$\sum_{j=1}^3 X_{ij} + V_j = X_j, \text{ for } j = 1, 2, 3 \tag{4}$$

With V_j is Primary input (GVA) of sector

The direct backward linkage of sector j can be seen from the sum of intermediate input coefficient value of sector j or the number of elements of matrix A in column j . The number of intermediate input coefficient of sector j shows the degree of direct backward linkage of sector j . The direct backward linkage index of sector j was obtained from the following formula:

$$DBLI_j = \frac{\sum_{i=1}^n a_{ij}}{\sum_{i=1}^n a_{ij}} \tag{5}$$

Where, $DBLI_j$ denote a Direct Backward Linkage Index of sector j and a_{ij} is intermediate input coefficient of sector j from the i -th sector.

In the forward linkage, which is a degree of sensitivity, this analysis was interpreted

as follows: if the forward linkage of sector I is more than or equal to or less than one, the degree of forward linkage of sector I is more than or equal to or less than one average of another sector's linkage in general. The number of forward linkage index signifies the degree of linkage of a sector, which if it increases, it can encourage development in more downstream sectors (as an input to other sectors or sales).

The direct forward linkage of sector i can be seen from the number of intermediate input coefficient value that is in line with sector i or the number of elements of matrix A in row i . The number of intermediate input coefficient of sector i indicates the degree of direct forward linkage of sector i . The direct forward linkage index of sector I was obtained from the following equation:

$$DFLI_i = \frac{\sum_{j=1}^n a_{ij}}{\sum_{i=1}^n a_{ij}} \tag{6}$$

Where $DFLI_i$ is Direct Forward Linkage Index of sector I ; a_{ij} is intermediate input coefficient of sector j from the i -th sector.

Multiplier analysis attempts to see the impact of changes in final demand (exogenous variables) on sectoral output (endogenous variables) in the economy. The three multiplier analysis include output multiplier, household income multiplier, and employment multiplier. Output multiplier analysis was performed to identify the impact of changes in sectoral demand on the output of other economic sectors. When demand for one sector increases, it will have an impact on the increasing production in other sectors. Products from other sectors are needed as production inputs for the sector. In the IO analysis, output multiplier can be written as follows:

$$X = (I - A)^{-1}F \tag{7}$$

Where X is output matrix; F is exogenous variable; $(I-A)^{-1}$ is multiplier matrix.

First, this study will estimate gross value added. According to Wikarya (2015), gross value added indicates the amount of remuneration from production factors, consisting of wages and salaries, business surplus, indirect taxes, depreciation, and subsidies, which can be formulated as follows:

$$VA_j = V_{201j} + V_{202j} + V_{203j} + V_{204j} + V_{205j} \quad (8)$$

Where, V_{201j} is expense or income for employees; V_{202j} is business surplus (profit and payment to the state); V_{203j} express the expense for depreciation of capital goods; V_{204j} stands for net indirect tax: net value added tax; and V_{205j} is government subsidies.

Gross value added coefficient of sector j was obtained from:

$$V_j = \frac{VA_j}{X_j} \quad (9)$$

After obtaining a number of V_j as many as the sectors in the IO table, they were placed into a diagonal matrix.

The sectoral gross value added was calculated using:

$$VA = \hat{V} (I - A^d)^{-1} F \quad (10)$$

Where, M is gross value added; \hat{V} is diagonal matrix of $n \times n$ size; while $(I - A)$ is a multiplier; and F denote the stimulus.

Second, the multiplier estimated is household (community) income multiplier. Household income multiplier, or commonly referred to as income effect of the IO model, indicates changes in final demand which will have a direct or indirect impact on changes in income of the sector itself or other sectors depending on the income multiplier (Nazara, 2005). The income effect value was formulated as follows:

$$M = \hat{V} (I - A^d)^{-1} \quad (11)$$

Where, M is income effect matrix $n \times n$ size; $(I - A^d)^{-1}$ denote the total output multiplier

matrix; and \hat{V} is income coefficient diagonal matrix $n \times n$ size.

If the income effect is the result of the diagonal matrix of income coefficient multiplied by output multiplier, the impact of final demand on changes in income becomes:

$$\Delta M = \hat{V} (I - A^d)^{-1} \Delta F \quad (12)$$

Income multiplier of sector j was determined using the formula:

$$y_j = \frac{\sum_{i=1}^n m_{ij}}{v_j} \quad (13)$$

Where, y_j is income multiplier of sector j; m_{ij} stands for element of income effect in matrix row i column j; and v_j is income coefficient of sector j.

The number y_j shows how much income changes for the economy as a whole if the income of employees in sector j changes by one unit of money.

Third, Employment multiplier is assessed. Employment multiplier or commonly referred to as employment effect, is the total effect of changes in employment in the economy due to an increase in final demand in a particular sector. Employment multiplier is similar to household income multiplier. The main difference is that employment multiplier is expressed in units of employment. Employment effect was formulated as follows:

$$E = \hat{L} (I - A^d)^{-1} \quad (14)$$

Where, E denote the employment impact matrix; and \hat{L} is an employee coefficient matrix consisting of the ratio of employee to the total input of each sector.

Employee coefficient matrix is a diagonal matrix whose components were obtained from:

$$l_j = \frac{TK_j}{X_j} \quad (15)$$

Where TK_j is the number of employee in sector j; and X_j total input of sector j.

Changes in the number of employees needed due to changes in domestic final de-

mand of each sector were formulated as follows:

$$\Delta E = \hat{L} (1 - A^d)^{-1} \Delta F^d \tag{16}$$

Employment multiplier of sector j was determined using:

$$z_j = \frac{\sum_{i=1}^n e_{ij}}{l_j} \tag{17}$$

Where, z_j is employment multiplier of sector j; e_{ij} express the element of employment (E) impact matrix in row i column j; and l_j is an employee coefficient j.

The number on z_j implies the number of addition (reduction) of employment opportunities for the economy as a whole if employment opportunities in sector j increases (decreases) by one person.

To determine the impact of changes in final demand in the tourism business sector on the regional economy, especially regional economic development, an analysis was carried out by entering the shock value in the IO

table so that the impact arising from changes in the output of tourism business sector was found to be interpreted. The data used to analyze the impact of tourism development included the data from local government budget (APBD) for tourism activity programs or tourism supporting activity programs in the Special Region of Yogyakarta, the data on private investment in the tourism sector, and the data on tourist spending.

RESULTS AND DISCUSSION

Table in Appendix 1. analysis reveals a sector's backward and forward linkage, allowing the researchers to examine how one sector uses the product of others or stimulates the development of others, either directly or indirectly. Tourism is classified into (27) trade, (28) hotels and restaurants, (29) land transportation, (30) water transportation, (31) air transportation, and (35) other services according to IO Table of 35 Sectors in the Special Region of Yogyakarta.

Tabel 2. Forward and backward linkages of tourism-related sectors in the Special Region of Yogyakarta based on IO table (Key sectors)

IO Code	Sector	Backward Linkage		Forward Linkage		Description
		Value	Index	Value	Index	
11	Marine product processing industry	1.576	1.204	2.252	1.477	Key sector
15	Wood, rattan, and bamboo industry	1.410	1.077	1.822	1.195	Key sector
16	Pulp and paper industry	1.454	1.111	2.328	1.527	Key sector
17	Rubber and rubber goods industry	1.351	1.032	1.831	1.201	Key sector
18	Petrochemical industry	1.442	1.101	2.670	1.751	Key sector
19	Cement industry	1.450	1.108	1.561	1.024	Key sector
25	Electricity, gas, and clean water	1.348	1.029	1.656	1.086	Key sector
31	Air transportation	1.532	1.170	1.540	1.010	Key sector
32	Communication	1.329	1.015	1.608	1.055	Key sector
33	Financial institution and agricultural service	1.497	1.143	1.639	1.075	Key sector

Source: Data processing, 2021

A sector is deemed crucial (leading) in the economy if it has a forward and backward linkage index of more than one (Didit & Devi, 2008; Siswahto & Muryani, 2020). The hotel and restaurant sector (28) and the air transportation sector (31) are at least two tourism-related sectors that are included in the key sectors. Despite not being a key sector, the land transportation sector (29) has the highest distribution power, indicating a 1.181 rise in the output of other sectors providing inputs (including the sector itself). The three industries that play a relatively substantial part in the formation of output are (32) other services, (28) hotels and restaurants, and (27) trade.

The output multiplier in tourism-related sectors includes: (27) trade (1.1841); (28) hotels and restaurants (1.4091); (29) land transportation (1.5456); (30) water transportation (1); (31) air transportation (1.5322); and (35) other services (1.4120). The the output multiplier value of, for example, IDR 1.1841 million for (27) trade sector signifies that an increase of 1 million in the final demand in that sector will raise the economic production (total of all sectors) by 1.1841 million, *ceteris paribus*. Investing or developing in sectors with a high output multiplier value will yield the best results (Appendix 2).

Sectors with high multipliers of gross value added (GVA) include: (27) trade (0.9567), (28) hotels and restaurants (0.7541), (29) land transportation (0.7709), (30) water transportation (0), (31) air transportation (0.5750), and (35) other services (0.7834). According to the calculation of the added value of tourism-related sectors, such as the hotel and restaurant sector (28) of 0.7541, an increase in the final demand for the hotel and restaurant sector (28) of IDR 1 million

will increase the added value in the economy by IDR 0.7541 million, *ceteris paribus*. All variables included in the added value, such as wages and salary, corporate surplus, depreciation, and indirect taxes, will increase if the final demand rises in industries with high GVA multipliers. These results are in line with the previous literatures conducted in Indonesia and other countries (Kumara, Prastyo, & Rahayu, 2021). The results show that these sectors have a direct influence from tourism activities so that if a shock occurs, the sector will experience quite a severe impact.

In tourism-related sectors, the multiplier value of household income is as follows: (27) trade (0.2807), (28) hotels and restaurants (0.2497), (29) land transportation (0.2968), (30) water transportation (0); (31) air transportation (0.2363), and (35) other services (0.4757). Sector (35), other services, has the highest income multiplier, which is 0.4757, implying that an increase of IDR 1 million in the final demand in the sector will boost household income by IDR 0.4757 million, *ceteris paribus*. If the final demand for sectors with strong household income multipliers rises, household incomes in tourism-related sectors will rise as well.

The values of the labor multiplier in tourism-related sectors are as follows: (27) trade (0.0400); (28) hotels and restaurants (0.0110); (29) land transportation (0.0093); (30) water transportation (0); (31) air transportation (0.0038); and (35) other services (0.0168). Sector (27), trade, has the highest multiplier figure, which is 0.0400. It can be interpreted that an increase of IDR 1 million in the final demand for the sector will increase employment by 40 people, *ceteris paribus*.

Table 3. Tourism-related sector multiplier figures based on IO table in the Special Region of Yogyakarta (Key Sectors)

IO Code	Sektor	Output	Income	Value Added	Labor (person/ IDR million)
11	Marine product processing industry	1.5759	0.1892	0.7175	0.0097
15	Wood, rattan, and bamboo industry	1.4102	0.1964	0.7017	0.0305
16	Pulp and paper industry	1.4540	0.2311	0.7429	0.0182
17	Rubber and rubber goods industry	1.3506	0.1671	0.4836	0.0067
18	Petrochemical industry	1.4418	0.2393	0.7151	0.0178
19	Cement industry	1.4503	0.2098	0.6994	0.0234
25	Electricity, gas, and clean water	1.3476	0.1252	0.5449	0.0062
31	Air transportation	1.5322	0.2363	0.5750	0.0038
32	Communication	1.3294	0.2030	0.8500	0.0036
33	Financial institution and agricultural service	1.4970	0.2080	0.8932	0.0053

Source: Data processing, 2021

The injection (shock) for analysis of the economic impact of the tourism sector development in the Special Region of Yogyakarta were obtained from: (i) tourist spending in 2015-2020 and its trends; (ii) tourism sector investment (private/ community) in 2015-2020; and (iii) government spending (local government budget) for tourism investment and promotion in 2015-2020. With that assumption, the impact of tourism development in the Special Region of Yogyakarta in 2015-2020 on the regional economy could be calculated, both on output, value added, household income, and employment. The result of the calculation can be seen in the following figures 1.

In 2015, the tourism sector development in the Special Region of Yogyakarta could increase the GDP at current prices with IDR 16.563 billion or about 16.72 and absorb 298.56 employees or around 15.78%. With the same assumption (according to the trend), in

2016 -2019, the tourism sector development in the Special Region of Yogyakarta was estimated to increase the GDP at current prices about 20% each year and absorb employee by an average of 23% each year.

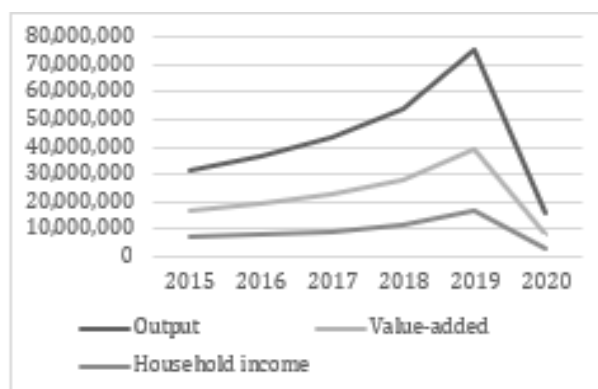


Figure 1. Economic Impact of Tourism Development in the Special Region of Yogyakarta on Output, Gross Value Added, and Household Income in 2015-2020 (IDR Million)

Source: Data Processing, 2021.

A different condition occurred in 2020, where the tourism sector only had an impact of 6% and absorbed 8.5% employees. This was due to the COVID-19 pandemic as a consequence of the social restriction regulations which significantly affected the tourism sector with the decrease in tourist spending. In response to the situation, the government of the Special Region of Yogyakarta refocused its budget on the tourism sector, which was declining by 70% from the previous year. For instance, the direct expenditure component of the Tourism Office of the Special Region of Yogyakarta was recorded to decrease from IDR 56.192 million in 2019 to IDR 17.721 million in 2020. This result resonates with previous findings which stated that there has been unexpected decrease in growth and employment about 2.1% to 6% in Greece and China (Mariolis et al., 2020); Shuifa et al., 2011).

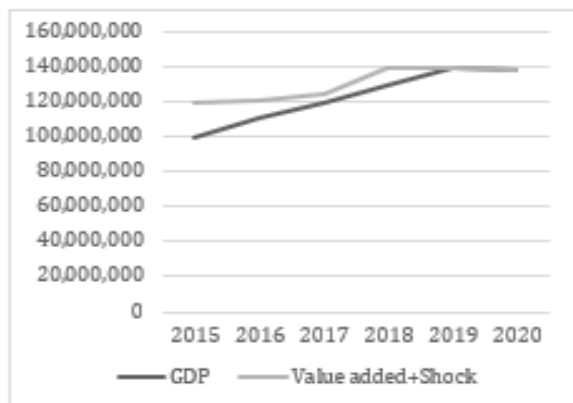


Figure 2. Comparison of Gross Value Added (GDP) in 2016-2021 (With and Without Tourism Development, IDR Million)
 Source: Data Processing, 2021.

Furthermore, from the point of view of percentage of the impact of injection (shock) on GDP and the contribution of the tourism sector to the formation of GDP, the same pattern occurred in 2015-2019, which tended to increase, and contracted in 2020, where injection had an impact of only 6.09% and the contribution of the tourism sector was

21.31% or declining from 27.08% compared to 2019.

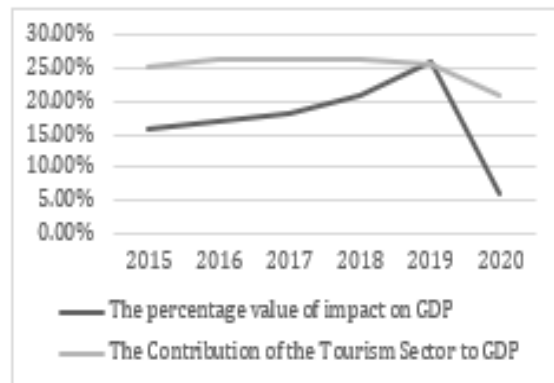


Figure 3. Percentage of Impact and Contribution Value of the Tourism Sector to GDP

Source: Data Processing, 2021.

CONCLUSION

The role of the tourism sector in the economy of the Special Region of Yogyakarta has fluctuated, although not significantly, throughout the year, including in 2020. In 2016, the tourism sector contributed to 26.94%, in 2017 27.21%, and in 2018 27.17%. However, there was a decrease in 2019 and 2020 by 27.08% and 24.09% respectively. The largest contribution came from accommodation and food and beverage at 9.98%.

The main tourism-related sector that has the largest multiplier value is the land transportation sector. The output multiplier value of land transportation sector is 1.545, the gross value-added multiplier 0.770, household income multiplier 0.296, and employment multiplier 0.009. Other sectors that have quite large multiplier values are air transportation, other services, hotels and restaurants, trade, and water transportation.

The impact of the COVID-19 pandemic was seen in 2020, where the percentage of the impact of the tourism sector was 6.09 on the economy and absorbed 8.5 labors. The contri-

bution of the tourism sector was 21.31%, a decrease from 2019 which was 27.08.

The biggest contribution of the tourism sector on the regional economy of the Special Region of Yogyakarta is from the domestic tourist spending. Therefore, efforts are needed to increase the number of tourists (comfort) and unique and typical products from the Special Region of Yogyakarta to support its tourism.

Efforts to increase the contribution can also be made by facilitating business licensing and providing investment incentives to attract private investment in the tourism sector in the Special Region of Yogyakarta. Private investment should be prioritized over investment using local government budget (APBD).

REFERENCES

- Anggraeni, A. (2013). *Analisis Dampak Ekonomi Wisata Bahari Terhadap Pendapatan Masyarakat di Pulau Tidung*. <http://ejurnal.itenas.ac.id/index.php/rekaloka/article/view/102>.
- Archer, B., & Fletcher, J. (1996). The economic impact of tourism in the Seychelles. *Annals of Tourism Research*, 23(1). 32-47.
- Atan, S., & Arslanturk, Y. (2012). Tourism and economic growth nexus: an input output analysis in Turkey. *Procedia - Social and Behavioral Sciences* 62 (2012). 952-956. doi: 10.1016/j.sbspro.2012.09.162
- Central Bureau of Statistics (BPS). (2015). *Perubahan Tahun Dasar PDB Berbasis SNA 2008*. Jakarta: Badan Pusat Statistik.
- Bakar, N. A., & Rosbi, S. (2020). Effect of Coronavirus disease (COVID-19) to tourism industry. *International Journal of Advanced Engineering Research and Science*, 7(4).
- BPS. (2008). *Kerangka Teori Dan Analisis Tabel Input Output*. Jakarta: BPS.
- BPS. (2018). *Cakupan Aktivitas Pariwisata Dalam Klasifikasi Baku Lapangan Usaha Indonesia (KBLI) 2015*. Jakarta: BPS.
- BPS (2019). *Neraca Satelit Pariwisata Nasional (Nesparnas) 2017*. Jakarta: BPS.
- BPS DIY (2020). Laporan Kuartalan PDRB DIY.
- Chang, Y. T, Hyosoo, P., Shu, M. L., & Younghoon, R. (2016). Cruise Traveler Satisfaction at a Port of Call. *Maritime Policy and Management*, 43(4). 483-94.
- del Rio-Chanona, R. M., Mealy, P., Pichler, A., Lafond, F., & Farmer, D. (2020). Supply and demand shocks in the COVID-19 pandemi: An industry and occupation perspective. *arXiv preprint arXiv:2004.06759*.
- Ferrari, G., Mondéjar Jiménez, J. & Secondi, L., (2018). Tourists' Expenditure in Tuscany and its impact on the regional economic system. *Journal of Cleaner Production*, 171. 1437-1446.
- Hasanli, Y & Baizakov, S (2019). Assesment of Impact of Tourism Sector on The Economy of Azerbaijan, Kazakhstan and Iran Using Input-Output Models. *37th International Scientific Conference on Economic and Social Development - "Socio Economic Problems of Sustainable Development" - Baku*, 14-15 February 2019.
- Hjerpe, E. E. & Kim, Y. -S., (2007). Regional economic impacts of Grand Canyon river runners. *Journal of Environmental Management*, 85(1). 137-149.
- Hoque, A., Shikha, F. A., Hasanat, M. W., Arif, I., & Hamid, A. B. A. (2020). The effect of Coronavirus (COVID-19) in the tourism industry in China. *Asian Journal of Multidisciplinary Studies*, 3(1), 52-58.
- Kim, S. S., & Chon, K. (2009). An economic impact analysis of the Korean exhibition

- industry. *International Journal of Tourism Research* 11(3). 311-318.
- Kumara, H. C., Prastyo, D., & Rahayu, S. P. (2011). The Impact of the Covid-19 Pandemic on Tourism Sector in Indonesia Using a Structural Path Analysis Based on Inter-Regional Input-Output Matrix. *Journal of Mathematics and Mathematics Education*, 11(2), 13-29.
- Kweka, J., Morrissey, O., & Blake, A. (2003). The Economic Potential of Tourism in Tanzania. *Journal of International Development. J.Int.Dev.* 15, 335 – 351.
- Leri, I. A. A. (2011). *Dampak Pengeluaran Wisatawan Terhadap Perkembangan Sektor Ekonomi di Provinsi Bali. Thesis. Program Pascasarjana Universitas Udayana, Denpasar.*
- Mariolis, T., Rodousakis, N., & Soklis, G. (2020). The COVID-19 multiplier effects of tourism on the Greek economy. *Tourism Economics*. <https://doi.org/10.1177/1354816620946547>
- Mikic, M. (1988). Tourism's Contribution to Yugoslav Economy. *Tourism Management*, December, 301 - 316.
- Munjal, P. (2013). Measuring the economic impact of the tourism industry in India using the Tourism Satellite Account and input-output analysis. *Tourism Economics*, 19(6), 1345-1359 doi: 10.5367/te.2013.0239
- Nazara, S. (2005). *Analisis Input Output*. Jakarta: LPFEUI.
- Nizar, M. A. (2011). *Pengaruh Pariwisata Terhadap Pertumbuhan Ekonomi di Indonesia. MPRA Paper No. 65628*. <http://mpr.ub.uni-muenchen.de/65628/> (diakses 2 Maret 2021).
- Rusu, S. (2011). Tourism multiplier effect. *Journal of Economics and Business Research*, 17(1), 70-76.
- Sigala, M (2020). Tourism and COVID-19: impacts and implications for advancing and resetting industry and research. *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2020.06.015>
- Sinclair, M. T. (1998). Tourism and economic development: A Survey. *The Journal of Development Studies*, 34(5). 1-51. <https://doi.org/10.1080/00220389808422535>
- Siwahto, E & Muryani. (2020). The Impact of Tourism on Economic in North Sulawesi: Input-Output Analysis Perspective. *JDE (Journal of Developing Economies)*, 5(1) (2020): 41-56.
- Spillane. (1993). *Ekonomi Pariwisata*. Yogyakarta: Penerbit Kanisius.
- Shuifa, K., Chenguang, P., Jiahua, P., Yan, Z., & Ying, Z. (2011). The multiplier effect of the development of forest park tourism on employment creation in china. *Journal of Employment Counseling*, 48(3), 136-144. <https://doi.org/10.1002/j.2161-1920.2011.tb01120.x>
- Tohamy, S. & Swinscoe, A. (2000). The economic impact of tourism in Egypt, *The Egyptian Center for Economic Studies, ECES, Working Paper No. 40*, available at: www.eces.org.eg/MediaFiles/Uploaded_Files/%7B6A6D7BB0-D6AC-47E3-9619-8E9BF917B374%7D_ECESWP40e.pdf
- Tohmo, T (2018). The economic impact of tourism in Central Finland: a regional input-output study. *Tourism Review*, 73(4) . 521-547. DOI 10.1108/TR-04-2017-0080.
- UNWTO (2018). Tourism Highlights Report.
- Wagner, J. E. (1997). Estimating the economic impacts of tourism. *Annals of Tourism Research*, 24(3). 592-608.
- WTTC (2018). Economic Impact Report.

APPENDIX

Tabel Appendix 1. Forward and backward linkages of tourism-related sectors in the Special Region of Yogyakarta based on IO table of 35 sectors

IO Code	Sector	Backward Linkage		Forward Linkage		Description
		Value	Index	Value	Index	
1	Paddy	1.245	0.951	1.620	1.063	Non-key sector
2	Other food crops	1.090	0.832	1.833	1.202	Non-key sector
3	Plantation crops	1.131	0.864	1.230	0.807	Non-key sector
4	Livestock and their products	1.216	0.929	1.105	0.725	Non-key sector
5	Forestry	1.093	0.835	1.869	1.226	Non-key sector
6	Fishery	1.082	0.827	1.291	0.847	Non-key sector
7	Oil, gas, and geothermal mining	1.000	0.764	1.000	0.656	Non-key sector
8	Coal, metal ore, and other mining	1.389	1.061	1.484	0.973	Non-key sector
9	Oil refinery	1.000	0.764	1.000	0.656	Non-key sector
10	Palm oil industry	1.000	0.764	1.000	0.656	Non-key sector
11	Marine product processing industry	1.576	1.204	2.252	1.477	Key sector
12	Food and beverage industry	1.576	1.204	1.325	0.869	Non-key sector
13	Textile and textile products industry	1.437	1.097	1.076	0.706	Non-key sector
14	Footwear and leather industry	1.439	1.099	1.405	0.922	Non-key sector
15	Wood, rattan, and bamboo industry	1.410	1.077	1.822	1.195	Key sector
16	Pulp and paper industry	1.454	1.111	2.328	1.527	Key sector
17	Rubber and rubber goods industry	1.351	1.032	1.831	1.201	Key sector
18	Petrochemical industry	1.442	1.101	2.670	1.751	Key sector
19	Cement industry	1.450	1.108	1.561	1.024	Key sector
20	Iron and steel-based and non-iron based metal industry	1.000	0.764	1.000	0.656	Non-key sector
21	Metal goods industry	1.244	0.950	1.970	1.292	Non-key sector
22	Electrical machinery and electrical equipment industry	1.370	1.046	1.496	0.981	Non-key sector
23	Transportation and repair industry	1.289	0.985	2.419	1.586	Non-key sector
24	Other industries	1.373	1.049	1.221	0.801	Non-key sector
25	Electricity, gas, and clean water	1.348	1.029	1.656	1.086	Key sector
26	Building	1.400	1.069	1.127	0.739	Non-key sector
27	Trade	1.184	0.905	1.452	0.952	Non-key sector
28	Hotels and restaurants	1.409	1.076	1.610	1.056	Key sector
29	Land Transportation	1.546	1.181	1.420	0.931	Non-key sector
30	Water transportation	1.000	0.764	1.000	0.656	Non-key sector
31	Air transportation	1.532	1.170	1.540	1.010	Key sector
32	Communication	1.329	1.015	1.608	1.055	Key sector
33	Financial institution and agricultural service	1.497	1.143	1.639	1.075	Key sector
34	Public administration and defense	1.506	1.151	1.259	0.826	Non-key sector
35	Other services	1.412	1.079	1.248	0.818	Non-key sector

Table Appendix 2: Tourism-related sector multiplier figures based on IO table of 35 sectors in the Special Region of Yogyakarta

IO Code	Sektor	Output	Income	Value Added	Labor (person/Rp million)
1	Paddy	1.2447	0.1322	0.6787	0,0386
2	Other food crops	1.0895	0.1539	0.8849	0,0572
3	Plantation crops	1.1314	0.2171	0.8529	0,0040
4	Livestock and their products	1.2164	0.3431	0.8857	0,0559
5	Forestry	1.0930	0.2209	0.9190	0,0046
6	Fishery	1.0824	0.1964	0.9374	0,0048
7	Oil, gas, and geothermal mining	1	0	0	0
8	Coal, metal ore, and other mining	1.3892	0.1929	0.8747	0,0216
9	Oil refinery	1	0	0	0
10	Palm oil industry	1	0	0	0
11	Marine product processing industry	1.5759	0.1892	0.7175	0,0097
12	Food and beverage industry	1.5759	0.1892	0.7175	0,0127
13	Textile and textile products industry	1.4367	0.1873	0.6666	0,0224
14	Footwear and leather industry	1.4394	0.2609	0.5858	0,0123
15	Wood, rattan, and bamboo industry	1.4102	0.1964	0.7017	0,0305
16	Pulp and paper industry	1.4540	0.2311	0.7429	0,0182
17	Rubber and rubber goods industry	1.3506	0.1671	0.4836	0,0067
18	Petrochemical industry	1.4418	0.2393	0.7151	0,0178
19	Cement industry	1.4503	0.2098	0.6994	0,0234
20	Iron and steel- based and non- iron based metal industry	1	0	0	0
21	Metal goods industry	1.2441	0.1746	0.5194	0,0061
22	Electrical machinery and electrical equipment industry	1.3698	0.2049	0.5667	0,0084

IO Code	Sektor	Output	Income	Value Added	Labor (person/Rp million)
23	Transportation and repair industry	1.2889	0.1837	0.6026	0,1920
24	Other industries	1.3727	0.1827	0.6090	0,0601
25	Electricity, gas, and clean water	1.3476	0.1252	0.5449	0,0062
26	Building	1.4000	0.1892	0.5714	0,0094
27	Trade	1.1841	0.2807	0.9567	0,0400
28	Hotels and restaurants	1.4091	0.2497	0.7541	0,0110
29	Land Transportation	1,5456	0.2968	0.7709	0,0093
30	Water transportation	1	0	0	0
31	Air transportation	1.5322	0.2363	0.5750	0,0038
32	Communication	1.3294	0.2030	0.8500	0,0036
33	Financial institution and agricultural service	1.4970	0.2080	0.8932	0,0053
34	Public administration and defense	1.5062	0.6400	0.8876	0,0094
35	Other services	1.4120	0.4757	0.7834	0,0168