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The Gravity Model of Indonesian Tourism Trade and Investment

Faurani Santi Singagerda[1*], Andi Desfiandi[2], Elin R Marantika[3]

[1,2,3]**Faculty of Economics and Business, Darmajaya Institute of Informatics and Business, Lampung, Indonesia**

E-mail: [1]faurani@darmajaya.ac.id, [2]desfiandi@gmail.com, [2]elinmarquezzz@gmail.com

[*)]**Corresponding Author**

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Abstract

This study aimed to determine the performance of tourism investment and trade in Indonesia following the outbreak of COVID-19 and other economic and non-economic factors. Goods and services for Indonesian tourism from 8 sample countries over 26 years were examined using a tourism economy approach and a gravity panel model of the flow of investment and trade. Regarding research originality, the model developed is constructing tourism economic theory applying the Keynesian method. The results showed that economic factors, such as GDP per capita, interest rates, exchange rates, prices, and economic distance, and non-economic factors, such as population, travel alerts, and pandemics, significantly affect investment flows and the tourism trade. Furthermore, tourism competitiveness increased globally in 2019. However, potential economic leakage in FDI and trade were identified. As a result, the government must emphasize long-term and efficient investment and trade in the tourism sector, particularly in the context of systemic shocks such as a pandemic.

Keywords:
trade; investment; tourism economy; competitiveness; gravity

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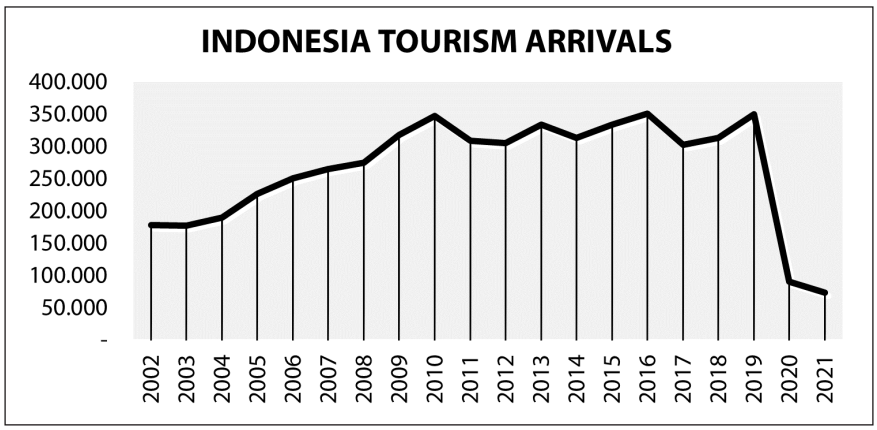
INTRODUCTION

Tourism is vital in sustaining the country's economy since it can boost national growth. As a result, increasing tourist investment has been a significant focus of tourism development strategies. According to the Indonesian Ministry of Tourism and Creative Economy, this industry investment increased by 70 percent in 2019 (Wardhana et al., 2019). Tourism demand can generate capital (exchange rate) and goods/services, which encourage tourism-related activities (supply side) (Kim et al., 2018). Due to these activities, tourists spend money on accommodation, transportation, communication, entertainment, trade, and food. Similar to increasing tourism demand, new investments, labor, and capital emerge (Singagerda & Aeni, 2017).

According to Olivia et al. (2020), tourism foreign exchange revenues from international tourist visits increased by 3.7 percent in 2019. However, it fell by over 90 percent in 2020 due to the Covid-19 epidemic, which influenced the sector's operations. Tourism consumption is relatively high due to public consumption adjustments during the pandemic. Figure 2 illustrates the tourism industry growth during the pandemic following the number of tourist visits, specifically in 15 major tourist destinations.

The Covid-19 virus began in Wuhan, China, and has terrified the world since early 2020. Indonesia has struggled with the Covid-19 virus since early March 2020. This pandemic has caused multiple causalities and deaths globally and destroyed businesses, including Indonesian tourism (Fernandes, 2020; Ozili & Arun, 2020; Evenett et al., 2021). Figure 1 shows the tourism sector's progress throughout the pandemic. Based on the number of tourist visits inbound from 15 major tourist destinations, the industry experienced a significant fall.

Figure 1. Indonesian Tourist Arrivals



Source: authors, 2022

The economic impact of COVID-19 includes limited job opportunities and economic growth due to reduced human mobility (Uur & Akbıyık, 2020; Maliszewska et al., 2020). Market anomalies are also caused by changes in consumer behavior (Nicola et al., 2020). Companies are experiencing reduced output and spending power

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limiting economic growth (McKibbin & Fernando, 2020). Consequently, it is impossible to forecast how long the COVID-19 pandemic will impact the country's economy (Fernandes, 2020).

Around the world, firms are suffering from reductions in their manufacturing and consumption activities. Global economic activity is hampered by limited inter-country transportation (McKibbin & Fernando, 2020). Furthermore, individual and corporate panic has disrupted standard consumption patterns, resulting in market abnormality (Evenett et al., 2021). Global financial markets also reacted to the developments with global stock indices. Due to the unknown nature of the outbreak's course and duration, predicting the disease's economic impact is impossible. Even in the current prevailing situation, the economic slowdown trumped the SARS outbreak (Uur & Akbıyık, 2020).

The pandemic's unpredictable nature significantly impacted the tourist sector (Baum & Hai, 2020; Hanoatubun, 2020). The impact is revenue decline and was particularly hard hit by demand-side shocks (due to movement restrictions, border closures, and tourists' fears of the virus) and supply-side shocks (due to rules regarding accommodation, catering, and recreational facilities closure). Indonesia's tourism industry is ranked 40th in the World Economic Forum's 2019 report, with a total value of 4.03 billion. The assessment was based on investment conditions, tourist goods/services supply, comfort, and security. According to Haryana (2020), investment's role and provision of goods/services should be addressed through various policies that promote tourism competitiveness to improve tourist performance. The government is concerned about future steps to boost Indonesian tourism's performance.

Kim et al. (2018) addressed this gap in their research by examining the influence of Japan's economic strategy, Abenomics, on South Korean tourists, the country's largest inbound market. Factors associated with Abenomics, such as per capita GDP, relative pricing, and exchange rates, are significant drivers of Japanese inbound tourism. Abenomics is associated with a considerable increase in South Korean tourist arrivals. The findings underscore the critical role of government economic policies in increasing international tourism demand via their economic impact. Indirect effects may arise from behavioral changes (Nicola et al., 2020), such as when consumers refrain from spending and visitors avoid places that appear to be at risk to avoid infection.

Several studies on the pandemic and its influence on tourism demand were also conducted, including Singagerda (2014); Tang & Tan (2016); Balli & Tsui (2015); Tang & Lau (2021). Due to the pandemic, most global travels ceased, with most governments imposing entry restrictions and border closures on foreigners (Uur & Akbıyık, 2020; Gössling et al., 2020; Nicola et al., 2020). Indirect effects may arise from behavioral changes (Nicola et al., 2020).

Pandemic outbreaks affect tourism-related economic activities (Brida et al., 2016). Businesses worldwide are experiencing contractions in their production and consumption activities. Transportation between nations is becoming increasingly complex, resulting in a slowdown in global economic activity (McKibbin & Fernando, 2020). Furthermore,

consumer and business panic has altered normal purchasing, causing market abnormality. Global financial markets reacted to the adjustments, and global stock indices dropped. Amid global turmoil, the International Monetary Fund estimated that the global economy would decline by 4.4 percent, contrary to its initial growth target of 5.6 percent (Liu et al., 2020).

Baum & Hai (2020) and Wong et al. (2021) found that the unpredictability of economic conditions during the pandemic greatly influenced many industries. Consequently, the tourist sector has experienced a significant drop in revenue, impacting the economy. Using an Artificial Neural Network (ANN), Jaipuria et al. (2021) projected international tourists' arrival in India and foreign exchange profits. With and without lockdown, they analyzed the impact of COVID-19 on foreign exchange losses and earnings using four parameters. The ramifications include strategic and operational actions aimed at optimizing foreign currency profits. However, McKibbin & Fernando (2020) note that numerous research issues exist due to the need for more knowledge on this outbreak.

Based on the above, a comprehensive examination of the tourism sector's role in global trade and investment during the pandemic is demanded. Tourism is mainly recognized as having the ability to contribute to Indonesia's economic growth, which is highly dependent on trade and investment flows, as well as the accessibility of goods and services and cross-border human mobility (Singagerda & Aeni, 2017; Baum & Hai, 2020). This condition is critical for the tourist industry's long-term development, especially regarding its economic impact on the country.

This research aims to assess the flow of investment and tourist trade, the factors that influence it, and how Indonesian tourism performed before and after the COVID-19 epidemic. As a research novelty, this study adopts a macro-micro approach to analyze the flow of tourism trade and investment, a micro approach that focuses on the tourism economy, which is defined by supply-demand mechanisms in various international tourism transactions. The macro approach is concerned with the concept of growth as defined by the Keynesian spending approach, with both concepts related to the impact of a pandemic (Singagerda & Aeni, 2017; Baum & Hai, 2020; Hanoatubun, 2020; Uur & Akbıyık, 2020).

METHODS

The Gravity Panel model was used to examine the factors of investment flows, tourism trade, and their impact on the Indonesian tourism sector before and after the CoVID-19 pandemic (Singagerda, 2014; Xu et al., 2019; Baum & Hai, 2020; Hanoatubun, 2020). Six countries are represented in the data set with time series from 1995 to 2020 (ASEAN, Japan, United States, United Kingdom, China, European Union, Australia, and the Rest of The World). This study is using 156 data. Additionally, national income operational variables (GDP), per capita income, Indonesian interest and exchange rates, economic distance (the ratio of GDP to the total population of the country), exports/imports, FDI, the number of tourist visits, the country's tourist population, the

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economic crisis of travel warning policies, and the COVID-19 pandemic. The framework depicts the link between variables shown in Figure 2.

The Gravity model approach is also used in this study to examine the demand side of tourism (the concept of the tourism economy) using the Keynesian model (Durbarry, 2004; Singagerda, 2014), where:

$$Y = C + I + G + (X - M)$$

According to the Durbarry (2004) and Baltagi (2021) models, the parameters of the FDI model and the flow of Indonesian Tourism Goods/Services that are constructed are as follows:

Model 1: International Tourism Investment Flow in Indonesia

$$\mathrm{Ln(FDI)_{ijt}} = \beta_0 + \beta_1 \mathrm{LnGDPC_{ijt}} + \beta_2 \mathrm{R_{it}} + \beta_3 \mathrm{LnPOP_{ijt}} + \beta_4 \mathrm{LnPRICE_{ijt}} + \beta_5 \mathrm{Ln\ TA_{ijt}} + \beta_6 \mathrm{Ln\ EXCH_{ijt}} - \beta_7 \mathrm{Ln\ DIST_{ijt}} + \beta_8 D1_{ijt} + \beta_9 D2_{ijt} + \beta_{10} D3_{ijt} + \varepsilon_{ijt} \quad (1)$$

Model 2: Export of Indonesian tourism goods/services

$$\mathrm{L_n}(X)_{ijt} = \beta_0 + \beta_1 \mathrm{LnGDPC_{ijt}} + \beta_2 \mathrm{LnPOP_{ijt}} + \beta_3 \mathrm{LnEXCH_{ijt}} + \beta_4 \mathrm{LnPrice_{ijt}} + \beta_5 \mathrm{LnPrice_{kjt}} - \beta_6 \mathrm{LnDIST_{ijt}} + \beta_7 \mathrm{LnXi_{ijt-1}} + \beta_8 \mathrm{D1_{ijt}} + \beta_9 \mathrm{D2_{ijt}} + \beta_{10} \mathrm{D3_{ijt}} + \varepsilon_{ijt} \quad (2)$$

Model 3: Import of Indonesian tourism goods/services Model

$$\mathrm{L_n M_{ijt}} = \beta_0 + \beta_1 \mathrm{LnGDPC_{ijt}} + \beta_2 \mathrm{LnEXCH_{ijt}} + \beta_3 \mathrm{LnPrice_{ijt}} + \beta_5 \mathrm{LnM_{ijt-1}} + \beta_6 \mathrm{LnFDI_{ijt}} - \beta_7 \mathrm{LnDIST_{ijt}} + \beta_8 D1_{ijt} + \beta_9 \mathrm{D2_t} + \beta_{10} \mathrm{D3_t} + \varepsilon_{ij} \quad (3)$$

Note:

$\mathrm{TA_{ijt}}$ = Demand for international tourism to Indonesia for the t year

$\mathrm{FDI_{ijt}}$ = Indonesian Tourism Investment Flow from country j year tGDPCjt

$\mathrm{R_{it}}$ = Investment interest rate in Indonesia in year t

$\mathrm{X_{ijt}}$ = Export of tourism goods/services from Indonesia to other countries

$\mathrm{PRICE_{ijt}}$ = The real price of Indonesian tourism in the country of origin of tourists

$\mathrm{PRICE_{kjt}}$ = The real price of tourism in competing countries in the country of origin of tourists

$\mathrm{X_{ijt\text{-}1}}$ = Export lag (millions of USD)

$\mathrm{POP_{ijt}}$ = Population of the country of origin of tourists

$\mathrm{M_{ijt}}$ = Import of tourism goods/services from the country of origin of foreign tourists (USD)

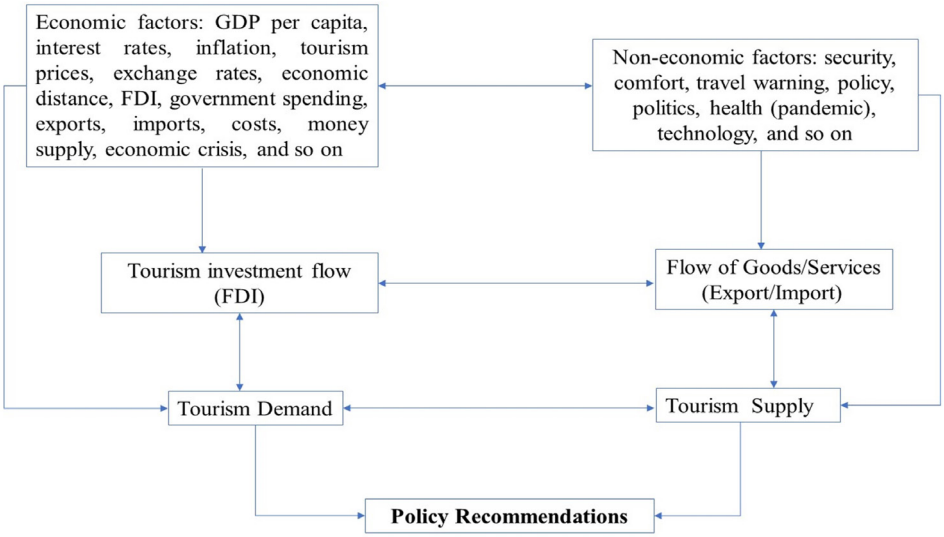
$\mathrm{DIST_{ijt}}$ = Economic distance between Indonesia and the country of origin of foreign tourists (Km/GDPijt)

$\mathrm{GDPCi_{ijt}}$ = Income per capita of the home country of foreign tourists (million USD/ population)

$\mathrm{EXCH_{ijt}}$ = The exchange rate of the rupiah against the currency of the country of origin (rupiah/currency of the country of foreign tourists)

M_{ijt-1} = Import lag (million USD)
$D1_{ijt}$ = Dummy Travel Banned in year t
$D2_{ijt}$ = Dummy Economic crisis in year t
$D3_{ijt}$ = Dummy Covid-19 in year t

Figure 2. Conceptual Framework



Sources: Durbarry (2004); Singagerda (2014); Maliszewska et al. (2020)

RESULT AND DISCUSSIONS

Model of Foreign Direct Investment in Indonesian Tourism

The results of this study show that the GDP per capita variable from the tourist's home country and its population, Indonesian tourism price, the number of foreign tourists, the exchange rate, economic distance, and the Covid-19 pandemic all have the potential to significantly affect the fluctuating flow of Indonesian tourism investment. Meanwhile the coefficient of determination describes changes in the GDP per capita of the tourists' home country, interest rates, the population of the country of origin of foreign tourists, Indonesian tourism prices, number of tourists visiting, exchange rates, economic distance, economic crisis, travel restrictions, and the Covid-19 outbreak account for 45.8 percent of the variance in the tourism investment flow variable, with the remaining 54.2 percent explained by other factors.

It indicates that the development of tourism investment in Indonesia is primarily due to non-macroeconomic factors. There are five constraints to investment in Indonesia, including complicated rules, problematic land acquisition, inconsistent public infrastructure, insufficient taxes and incentives, and limited skilled labor (Meilani, 2019). Government intends to implement an omnibus law, which would simplify licensing laws, shorten the licensing procedure, and ensure political stability in order to improve Indonesia's investment ecosystem. Interest rates are essential in determining the amount of investment that enters a country. When interest rates rise, investment declines, and therefore, individuals rush

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to invest in several business industries when interest rates fall. Similarly, the economic distance between Indonesia and the country of origin of tourists significantly affect the FDI. This implies that the greater the economic distance between both Indonesia and the country of origin of tourists (generally described by the ease of mobility/accessibility of capital, goods/services, and labor), the slower the flow of investment will increase by the coefficient of change.

Table 1. Estimation Model of FDI, Export, and Import of Indonesian Tourism

Indonesian Tourism Export				Indonesian Tourism Import			
Variable	**Coefficient**	**t-stat**	**Prob**	**Variable**	**Coefficient**	**t-stat**	**Prob**
GDPIT***	-0.633	-5.812	0.0000	GDPJT	0.030	0.143	0.8862
POPIJT***	1.207	-3.178	0.0017	EXCHIJT**	-0.188	-2.273	0.0242
EXCHIJT**	-0.150	1.270	0.0258	PRICEIJT	0.018	1.192	0.2348
PRICEIJT	0.001	0.081	0.9353	MIJT***	0.283	5.854	0.0000
PRICEKJT**	0.017	1.391	0.1659	FDIIJT	-0.017	-0.725	0.4695
DISTIJT***	-0.598	-3.846	0.0002	DISTIJT	-0.144	-0.616	0.5385
XIJT***	0.132	4.488	0.0000	D1	0.069	1.059	0.2910
D1	-0.046	-0.991	0.3228	D2***	-0.173	-2.981	0.0032
D2	0.064	1.543	0.1246	D3***	-0.353	4.098	0.0001
D3***	-0.247	-3.855	0.0002				
R-Squared		0.970		R-Squared		0.923	
Adj_R_squared		0.967		Adj_R_squared		0.916	
F-stat		358.887		F-stat		141.711	

Indonesian Tourism Investment			
Variable	**Coefficient**	**t-stat**	**Prob**
GDPJT	0.237	0.642	0.5219
RIT***	-0.657	-4.253	0.0000
POPIJT	0.434	0.428	0.6689
PRICEIJT	-0.059	-1.427	0.1552
TAIJT***	-1.314	8.949	0.0000
EXCHIJT	-0.544	-1.538	0.1257
DISTIJT**	0.832	1.814	0.0712
D1**	0.387	2.353	0.0197
D2	-0.222	-1.546	0.1238
D3***	1.117	5.855	0.0000
R-Squared		0.458	
Adj_R_squared		0.410	
F-stat		9.453	

Sources: Singagerda (2014); Baltagi (2021)
Note: *Two side test hypothesis* Ho: $\theta = \theta o$, Hi: $\theta > \theta o$ atau Hi: $\theta < \theta o$

This study shows that the number of tourists visiting Indonesia may be detrimental to FDI in tourism. In the wake of the liberalization process, the mobilization of goods/services, capital, and labor has resulted in economic leakage. In consequence, this has reduced tourism investment and increased visitor arrivals (Singagerda & Aeni, 2017; Ozili & Arun, 2020). These shortcomings are caused by foreign investment supremacy, which leads to thousands of imported hotel equipment, food ingredients, furniture, workers, and foreign airlines.

The economic crisis had a significant negative impact on FDI in the Indonesian tourism sector (see Table 1). For several years, the increase in FDI in Indonesian tourism was triggered by an increase in its competitiveness, particularly when compared to tourism prices in neighbouring countries such as Malaysia and Singapore (Singagerda, 2014;. Furthermore, the Indonesian Investment Coordinating Board (BKPM) has identified COVID-19 as a serious threat to a country's economic stability. The reduction in investment value would be obvious due to trade interactions between countries like China, Europe, and the United States (Evenett et al., 2021). Restrictions or lockdowns have a substantial influence on trade activity. The rule applies to commodity exports and imports from China, the United States, and Europe, providing potential bottlenecks in the supply of industrial raw materials (Baum & Hai, 2020).

Model of Indonesian Tourism Export Goods/Services

The negative relationship between Indonesia's GDP per capita and tourism exports indicates that in case the Indonesia's GDP per capita increases by 1 percent, tourism exports will decrease and vice versa, which contradicts trade theory (Hatab et al., 2010; Maliszewska et al., 2020). Therefore, there is a negative correlation between these two aspects. A rise in purchasing power will increase the public demand because the GDP per capita is an indicator of community welfare due to economic growth (Maliszewska et al., 2020). The output of products/services remained unchanged, pushing up commodities prices (demand-pull inflation). Empirically, foreign tourists' home countries significantly affect Indonesia's tourism exports. Therefore, the population of the home country of the international tourists (as potential market) would increase. A potential market for goods and services depends on the country's population size (Balli & Tsui, 2015).

The actual exchange rate negatively influences tourism exports. When the domestic currency depreciates versus foreign currencies, imported products become more expensive than home products, promoting more exports of goods and services. According to Hoekman & Mattoo, (2008); Gjorgievski, (2011); and Kim et al., (2018), when a country's currency strengthens against foreign currencies, the current account balance is negatively affected. However, exports increase since domestic goods are considerably cheaper than imported ones. The real price of Indonesian tourism in competing countries has a negligible effect on Indonesian tourism exports. Therefore, Indonesian tourists will continue to be a substitute for international tourism with its price as a substitution especially in Asean countries (Singagerda & Aeni, 2017; Wong et al., 2021). Furthermore, the estimation results reveal a weak relationship between the economic crises and export flows. This implies that an economic crisis forces people's purchasing power down due to a country's falling economic performance.

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A large positive link existed between the previous and the coming years tourism exports and value. In case the previous grows, the following one also surges. The trade performance between the two years correlates due to economic growth (Lorde et al., 2011; Balli & Tsui, 2015), such as the emergence of Export Led Growth (ELG) and Growth Led Export (GLE). Moreover, neoclassical trade theory supports this premise because variables other than exports can enhance output. Another possibility is that export performance will be negatively impacted between 2018-and 2019 due to the trade war between China and the United States (Olivia et al., 2020)

Indonesian Tourism Goods/Services Import Model

The estimation results indicate that the coefficient of determination for the variable is determined by the economic distance between the tourist's home country, GDP per capita, real exchange rate, the real price of Indonesian tourism in the country of origin, imports from the country of origin in the previous year, FDI, the economic crisis, Indonesia's travel warning, and the COVID-19 pandemic on the variable outflow of goods/services for Indonesian tourism. These aspects may explain 92.3 percent of Indonesia's tourism import variables, while the remaining 7.7 percent is explained by non-observable factors.

The impact of export performance in the 2018-2019 period will be negative due to the trade war between China and the imports (Noland et al., 2012; Wardhana et al., 2019). Although the home currency depreciates, foreign currencies imports continue to rise (Kim et al., 2018). Despite the rupiah's depreciation, the low competitiveness of domestic tourism goods/services drove up imports. Even the previous year's imports had a significant positive influence on the following year's imports. Furthermore, the trade performance was a determining factor for the development of imports in Indonesia. This is because of the high reliance on imports of goods and services, especially goods that will be used in the production process (Dogru & Bulut, 2018; Guridno & Guridno, 2020).

A travel warning policy by the tourists' home country will inevitably damage Indonesia's tourism imports. The country/security destination is related to the travel warning policy normally adopted by visitors' home countries. The 2019 WEF assessment rates Indonesia's security and safety at 5.4 (Lorde et al., 2011; Evenett et al. 2021). This shows Indonesia's competitiveness in security, health, and safety (Sugihamretha, 2020).

According to research, the global COVID-19 pandemic affected Indonesia's tourism imports. Since several countries are implementing lockdowns, international economic activity has been disrupted (Baum & Hai, 2020). According to BPS data, the Covid-19 pandemic affected petroleum & energy imports and non-oil imports over the 2020 period. The decline happened when multiple countries confirmed they had Covid-19, halting international trade. These minimized the risk of a Covid-19 pandemic (Guridno & Guridno, 2020). The Covid-19 pandemic has prompted all countries to limit human activity and mobility, affecting productivity and delivery of goods/services. Following the global economic slowdown, people's purchasing power has shrunk, reducing demand for imported goods. In order for tourism to exist during the pandemic, health and hygiene policies in hotels and tourist destinations/attractions must be

strictly implemented. Similarly, during the current pandemic, development priorities in the three support sub-sectors, including culinary, fashion, and crafts, should be completed.

CONCLUSION

The travel warnings and the COVID-19 pandemic are all variables that affect the flow of Indonesian tourism FDI. This study examined numerous variables, including the GDP per capita of the tourist's home country, exchange rate, and population as a potential tourism market, the price of tourism, the interest rate, and the economic distance, the dummy of the economic crisis. The most significant determinants were the FDI interest rate in Indonesian tourism, leading to foreign tourist visits, economic distance, the economic crisis, and the COVID-19 pandemic. The results showed the possibility of economic leakage in FDI flow in Indonesian tourism, leading to foreign exchange leakage. The mobilization of goods/services, capital, and labor due to liberalization in the use of foreign capital, the construction of facilities on international networks, and the supply chain in the construction of five-star hotels necessitate importing hotel supplies.

Some macro variables, economic crisis, travel advisories, and the covid-19 outbreak, influence Indonesia's tourism exports and imports. Even since the beginning of 2020, the Covid-19 pandemic created an economic contraction in tourist visits and foreign exchange revenues in the tourism industry, including trade and investment transactions. The estimation of the export-import equation of Indonesian tourism products/services based on the calculation of expenditure income (Keynesian approach) showed that there was a chance for Indonesian tourism products to substitute related commodities from other countries, including Thailand, Singapore, and Malaysia, especially in price. Although Indonesia's tourism competitiveness increased globally in 2019, the competitiveness of tourism goods and services still needs to improve. Furthermore, the economic leakage in tourism FDI flows results in foreign exchange leakage due to the mobilization of goods/services, capital, and labor. Due to liberalization in the use of foreign capital and the construction of facilities on international networks, the supply chain in the construction of five-star hotels induces imports of hotel supplies, food ingredients, furniture, workers, and foreign airlines, particularly with the COVID-19 pandemic causing an economic contraction.

Government can increase the competitiveness of industrial products in the global market by improving the quality of domestic industrial products based on market needs. Tracing the advantages of similar products in the market, creating digital technology innovations and mass applying them on a priority scale for high-value products, and establishing regional regulations can help accomplish national and regional efficiency. Therefore, the government should eliminate foreign exchange leakage in the tourism industry by implementing policy strategies, followed by export, supplier, stability in the investment climate, and economic input levels. In addition, related to the pandemic period, the implementation of health and hygiene policies in hotels and tourist destinations/attractions should be followed strictly. Besides that, the policies are designed to promote the good image of Indonesian tourism by developing effective communication strategies with diverse stakeholders at home and abroad. Similarly, development priorities in the three support sub-sectors, including culinary, fashion, and crafts, should be completed soon since they were more resistant during the pandemic.

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