The Role of Tourism in Promoting Export Performance in Indonesia: Gravity Model Approach

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ABSTRACT: The tourism sector has the opportunity as a source of information regarding the demand preferences of foreign tourists for goods produced in tourist destination countries. The preference of foreign tourists in this study is measured by using the value of Indonesian exports of goods to the country of origin of tourists one year after their visits. The purpose of this study is to analyze the role of the tourism sector in increasing demand for exports of domestic goods by foreign tourists. To overcome the endogeneity problem, this study uses the Corruption Perception Index (CPI) as an instrumental variable which is estimated by *Two Stage Least Square* (2SLS). By using data on exports of goods based on *Broad Economic Categories*, the results show that the preferences of tourists from Malaysia, Singapore, China, Japan, and Australia for Indonesian products are in food and beverages (primary), food and beverages (processed), industrial commodities. supplies, and consumer goods. These results conclude that the tourism sector can boost export performance through intensive and extensive trade margins.

KEYWORDS: International Tourism, Export, Gravity Model, Broad Economic Categories

1. INTRODUCTION

The tourism sector is designated as a potential sector that can drive other sectors in the Indonesian economy. This policy must be supported by the commitment of stakeholders in increasing the economic value of the domestic tourism sector. The role of the tourism sector as an economic driver can be seen from its contribution to GDP, absorption of investment and labor, business development, and as a foreign exchange contributor (LPEM FEB UI, 2018). Tourism contributes significantly to long-term economic development, where tourism can influence economic activity through various channels and create a multiplier effect that can encourage economic growth (Brida and Pulina, 2010).

Based on the Central Statistics Agency, foreign tourist visits to Indonesia increased from 12.6 percent to 15.8 percent in 2018. In the market mechanism, tourism demand must be adjusted to tourism supply in the form of providing tourism goods to meet tourist needs, both before, during, as well as after the visit. Tourists' decisions to visit a country are not only based on economic factors, but also non-economic factors (Petit and Seetaram, 2018). Economic factors that influence tourist decisions are the level of tourist income, exchange rates, and tourism prices. Meanwhile, non-economic (social) factors can be in the form of attractiveness of tourist destinations, security of tourism services and the corruption index of tourist destination countries (Borhan and Arsad, 2019).

According to Fourie et al (2019), tourists' decisions to visit are influenced by threats in the destination countries, one of which is the level of corruption. These threats have a negative impact on tourists' decisions to visit. A high level of corruption causes a high cost economy, thus hampering economic activity. The higher the level of corruption, the lower the demand for tourism in a country. Several empirical researchers use the number of foreign tourist visits to analyze a country's tourism demand (Reis and Varela, 2015; Santana-Gallego et al, 2016; El-Sahli, 2017).

Based on empirical studies in various countries, the development of the tourism sector has a relationship with international trade (Santana-Gallego et al, 2016; Reis and Varela, 2015; Madaleno et al; El-Sahli, 2017; Petit and Seetaram, 2018). Increasing the number of foreign tourist visits has been proven to reduce the cost of international trade (Santana-Gallego et al, 2016). In addition to creating jobs and investment, the tourism sector can be an additional channel that can improve a country's export performance (El-Sahli, 2017).

The economic impact of tourism activities can be maximized by increasing the relationship between tourists and local producers (Madaleno et al, 2016). The tourism sector has the opportunity to be a source of information regarding tourist

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preferences for products produced in tourist destination countries (Santana-Gallego et al, 2016). During a visit, there is a possibility of interaction between tourists and local producers (El-Sahli, 2017). This shows that the tourism sector can be a place to increase export demand through intensive and extensive trade margins.

The role of tourism as a leading sector and driver of the Indonesian economy has not been maximized. In relation to the trade sector, commodities based on the tourism sector such as local/traditional goods, souvenirs, and so on are still limited. This study underscores the importance of knowing the preferences of foreign tourists to domestic products that can boost export performance and improve Indonesia's current account deficit. The purpose of this study is to analyze the role of the tourism sector in increasing demand for exports of domestic goods by foreign tourists.

This study uses the classification of export goods based on Broad Economic Categories (BEC). According to El-Sahli (2017) the classification of goods using BEC has advantages, specifically it can classify products broadly and minimize zero missing trade, as well as distinguish between differentiated and less differentiated products. This study analyzes tourist preferences for Indonesian domestic products. In addition, this study uses an instrumental variable that is different from previous research, namely the Corruption Perception Index (CPI). The CPI variable was chosen because a country with a high level of corruption will increase the high cost economy.

2. LITERATURE REVIEW

2.1 Gravity Model

The gravity model assumes that trade between two economies is directly proportional to the mass of the economy and inversely proportional to the distance between them (Krugman et al, 2012). In general, the gravity model assumes that trade between two economies is directly proportional to the mass of the economy and inversely proportional to the distance between them (Krugman et al, 2012). The Gravity Model was first introduced by Tinbergen (1962) to explain the flow of bilateral trade between two countries. The amount of exports that country *i* can provide depends on the economic size of country *I* (Y_i). Similarly, the amount of goods that country *j* can afford to import depends on the purchasing power/income of country *j* *(Yj)* (Xu et al, 2018). The exponential form of the gravity equation is as follows.

$$F_{ij} = \beta_0 \, M_i^{\beta_1} \, M_j^{\beta_2} \, D_{ij}^{\beta_3} \, V_{ij}^{\beta_4} \qquad (1)$$

shows the flow of bilateral trade between country *i* and country *j*; and β_0, β_1, β_2, β_3 and β_4 are estimated parameters. M_i and M_j are the economic mass or size of the economy of country *i* and country *j* as measured by per capita income, GDP, or population. Benedictis and Taglioni (2010) explain that economic mass is an opportunity, capacity, or attraction that causes interaction between two countries. Theoretically, and have a positive effect. D_{ij} is the geographical distance between country *i* and country *j*, where has a negative effect. V_{ij} is a social, political and semi-economic factor between country *i* and country *j* (Bergeijk and Brakman, 2010).

2.1.1 The Gravity Model in Tourism

Tourism activities can be analyzed from the demand side and the supply side. On the demand side, tourism relates to the activities of a tourist in obtaining goods and services, either through consumption, investment, and tourism development activities. While on the supply side, tourism is related to production activities in order to meet the needs of tourists (LPEM FEB UI, 2018).

The gravity model is widely used in the tourism economics literature to explain international tourism flows (Morley et al, 2014; Santana-Gallego et al, 2016; Madaleno et al, 2016; El-Sahli, 2017; Petit and Seetaram, 2018). According to Petit and Seetaram (2018) the gravity model in the tourism sector is related to tourist demand for an item in a tourist destination country obtained from maximizing consumer utility according to the budget limit, which is written with the following equation.

$$M_{ijt} = Y_{it}^{\alpha} \, Y_{jt}^{\beta} \, P_{ijt}^{\delta} \, a_{ijt}^{\sigma} \, d_{ij}^{\gamma} \qquad (2)$$

M_{ijt} is the demand for a product of country *i* by tourists from country *j*. Y_i and Y_j are the masses of country *i* and *j*, respectively. Then d_{ij} is the trade barrier between the two countries, P_{ijt} is the price of the product in country *i* for consumers of country *j*. is the consumer preference of country *j* for the product of country *i*. Morley et al (2014) argue that the flow of international tourism comes from consumer choice theory which explains consumer utility and preferences.

2.2 Consumer Behavior

The theory of consumer behavior is the first step in the derivation of the market demand curve which explains how consumers allocate income among different goods and services to maximize their welfare (Salvatore, 2008). Consumer decision making is related to consumer behavior which explains three important things: consumer preferences, budget limits, and consumer choices (Pindyck and Rubinfeld, 2013).

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2.2.1 Preferences and Utilities

Consumer preferences can mean priorities, choices, or combinations of goods that are preferred by consumers. Basically, preferences are defined in utility theory. Consumer preferences are a fundamental description for analyzing consumer choices, while utility is a way of describing preferences (Varian, 2010). In the context of international trade, the consumer utility function shows consumer preferences for the goods/products of the exporting country (Carrère and Masood, 2018).

On the demand side, rational consumers will try to maximize utility according to the budget limit, which is a function of income, price of goods, and trade costs (Petit and Seetaram, 2018). Consumer utility is not only influenced by physical consumption of commodities, but is also influenced by psychological attitudes, such as group pressures, personal experiences, and the general cultural environment (Nicholson and Synder, 2008).

Consumer preferences can be explained using three assumptions: completeness, transitive, reflexive/continuity. In addition, there is another way to graphically represent preferences known as indifference curves. The indifference curve describes the combination of goods in the market that produces the same level of satisfaction (Pindyck and Rubinfeld, 2013). It is assumed that the consumer has a limited budget in maximizing his utility. Indifference curves have the advantage of improving consumer consumption decisions, the existence of utility maximization, the existence of consumer income which is explained by the budget, and impact of price changes (Chigora, 2015)

2.3 Corruption in relation to Tourism

Economic development, especially in developing countries, depends on income from the tourism sector (UNWTO, 2012). However, most developing countries have weak political systems. A number of empirical studies (Das and Dirienzo, 2010; Saha and Yap, 2015; Fourie et al, 2019) prove a relationship between corruption and a country's tourism performance indicators, such as: arrivals, number of visits, income/foreign exchange, and tourism expenditure.

Fourie et al (2019) explain that the decision of tourists to visit is a function of tourist income, tourism prices, trade agreements, and threats in the destination country. According to him, there are three types of threats: crime and violence, terrorism, and corruption. When a tourist destination country engages in bribery or fraudulent business practices, this will damage the social and cultural image of the country, and hinder tourism competitiveness. High levels of corruption due to uncertainty in government policies and political parties that continue to change can worsen the performance of the tourism sector (Saha and Yap, 2015).

2.3.1 Corruption as an Instrument

The level of corruption in a country is usually measured using the Corruption Perception Index. According to Transparency International, the Corruption Perception Index (CPI) is the perceived level of corruption in a country's public sector using a scale from 0 (very high level of corruption) to 100 (free from corruption). The CPI variable has been widely used in researching the effect of corruption on tourism (Saha and Yap, 2015; Poprawe, 2015, Fourie et al, 2019).

This study uses the Indonesian Corruption Perception Index as an instrumental variable. Instrumental variables in a model are said to be valid and good when: (1) is exogenous, where the instrument is not correlated with the error term; and (2) is relevant, where the instrument is correlated with endogenous variables. In this study, the endogenous variable used is the number of foreign tourist visits to Indonesia. Thus, the research hypothesis is that CPI has a significant effect on the number of tourist visits.

2.4 Empirical Evidences

The relationship between the tourism sector and the export performance of a country has been widely discussed in empirical studies using the gravity model approach (Santana-Gallego et al, 2016; El-Sahli, 2017; Petit and Seetaram, 2018). However, there are several studies that do not use the gravity model approach (Reis and Varela, 2015; Madaleno et al, 2016). A summary of previous research is attached in appendix 6.

Santana-Gallego et al (2016) examined whether tourism has an impact on intensive and extensive trade margins that focus on transaction channel costs. According to him, the way to reduce the cost of international trade is to reduce cultural distance, encourage demand for foreign goods/services, improve tourism infrastructure, and facilitate international trade.

The limitations of the Santana-Gallego et al (2016) research was further studied by El-Sahli (2017) by using two instrumental variables in different country samples: terrorist attacks for non-OECD countries and travel patterns for OECD countries aimed at overcoming the problem of endogeneity. According to El-Sahli, tourism and international trade policies in a country can be carried out by utilizing tourism capital in order to encourage export demand to the tourists' country of origin. Tourism can be an additional channel to improve a country's export performance, especially for traditional products.

Petit and Seetaram (2018) analyzed the impact of showing cultural preferences on tourism exports. When a country knows the preferences of foreign tourists, it will increase the demand for domestic products and increase the income of the tourist

destination country. Researcher found a way to distinguish cultural distance from cultural preferences, which is a limitation of the Santana-Gallego et al (2016) research. In empirical research using a gravity model approach (Santana-Gallego et al, 2016; El-Sahli, 2017; Petit and Seetaram, 2018), researcher use dummy variables that aim to assess trade barriers with trading partner countries such as free trade agreements, common language, colonial links, landlocked, trade preferences, common currency, first religion, and so on.

The relationship between tourism and international trade without using the gravity model was also carried out by Reis and Varela (2015) and Madaleno et al (2016). Reis and Varela (2016) emphasized the importance of promotional/network effects in the tourism sector that can boost a country's export performance. This is supported by Madaleno et al (2016) who argued that the tourism sector has a contribution to overcome informal trade barriers by promoting export goods. These export goods can be a tourism marketing tool that can increase the curiosity of foreign tourists to the products of the exporting country and encourage tourists' willingness to pay.

3. RESEARCH METHODOLOGY

3.1 Data and Methods

This study was analyzed using a quantitative approach with secondary data. The data used in this study is panel data which is a combination of time series data and cross section of the five countries of origin of tourists with the largest number of foreign tourist arrivals to Indonesia according to the Central Statistics Agency, namely Singapore, Malaysia, China, Japan and Australia for the period 2003 - 2017. This study uses five different types of export goods. The observations used were 375 observations.

This study uses an Instrumental Variable which is estimated by Two Stage Least Square (2SLS). IV and 2SLS can overcome the problem of endogeneity in explanatory variables due to variable bias and inverse causality (El-Sahli, 2017). When there is an endogeneity problem, IV and 2SLS will provide consistent and efficient estimators (Gujarati and Porter, 2012). The advantage of this method is that it can be used on individual (single) equation in the system without specifying the structural relationship between endogenous variables (Baltagi, 2005). The model in this study is as follows:

$$lnX_{nijt} = \beta_0 + \beta_1 TOUR_{t-1\,jit} + \beta_2 lnGDP_{jt} + \beta_3 lnRER_{ijt} + \beta_5 lnDist_{ij} + \beta_5 FTA_{ijt} + \varepsilon_{ijt} \quad (3)$$

The 2SLS estimator is estimated in two stages. The first stage is done by regressing endogenous variables to predetermined (exogenous) variables and instrumental variables. Then proceed to the second stage by regressing the dependent variable to the estimated value of the endogenous and exogenous variables. The regression stages of the equations in IV and 2SLS are as follows:

Stage 1 (*first stage*)
$$lnTOUR_{t-1\,jit} = \alpha_0 + \alpha_1 IPK_{t-1\,it} + \alpha_2 lnGDP_{jt} + \alpha_3 lnRER_{ijt} + \alpha_4 lnDist_{ij} + \alpha_5 dummFTA_{ijt} + \quad (4)$$

Stage 2 (*second stage*)
$$lnX_{nijt} = \beta_0 + \beta_1 \widehat{TOUR}_{t-1\,jit} + \beta_2 lnGDP_{jt} + \beta_3 lnRER_{ijt} + \beta_4 lnDist_{ij} + \beta_5 dummyFTA_{ijt} + v_{ijt} \quad (5)$$

3.2 Variables

Based on the research model that has been described, the following is a description of the operational and data sources of each research variable

Table 1. Description of Variables and Data Sources

Variable	Operational Description	Unit	Data Source
X_{nijt}	Export of goods *n* (based on Broad Economic Categories) to the country of origin of tourists	USD ($)	UN Comtrade
$TOUR_{t-1\,jit}$	The number of foreign tourists visited Indonesia in the 1st lag	Person	Indonesia Central Bureau of Statistics
GDP_{jt}	Real GDP per capita country of origin of tourists	USD ($)	*World Development Indicator*
RER_{ijt}	Real exchange rate	Rupiah/ foreign currency	*World Development Indicator*

$Dist_{ij}$	Geographical distance between Indonesia and the country of origin of tourists	Kilometer/population	CEPII
dummy FTA	dummy for free trade agreement	0 = not involved 1 = involved	CEPII
IPK_{t-1}	Corruption Perception Index of country i at lag 1	Percent, %	Transparency International

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Based on the research model and variable description described in the previous section, the following is a statistical description of each research variable.

Table 2. Descriptive Statistics

Variable	Mean	SD	Min	Max
Export Goods				
1) FnB (Primary)	308.707.182	219.142.295	21.635.190	735.564.358
2) FnB (Processed)	877.269.008	953.487.319	33.478.164	3.735.663.433
3) Industrial Supplies	3.960.850.146	2.765.757.936	692.915.545	10.865.821.163
4) Capital Goods	1.096.385.988	1.083.889.861	105.891.118	3.576.412.775
5) Consumer Goods	659.542.322	427.756.994	36.040.379	1.749.006.356
Tourist Visit	782.168.82	433.392,65	31.497	1.619.572
GDP per capita	31.339,01	20.604,49	2.253,92	55.728,68
Real Exchange Rate	4.145,1	3.381,2	86,62	9.491,16
Geographical distance	3512,64	1953,8	1012,9	5481,53
Corruption (Index)	27,93	5,67	19	37
FTA (dummy)	**Percentage**			
	Involved = 81,3%		Not involved = 18,7 %	

4.2 Estimation Results

Instrumental Variables (IV) in this study were estimated using the Two Stage Least Square (2SLS) estimator. Methods IV and 2SLS are used to analyze the effect of the number of foreign tourist arrivals, the income of the country of origin of the tourists, the real exchange rate, geographical distance, and trade agreements on the export of goods based on the BEC classification to the five countries of origin of tourists with the following estimation results

Table 3. Estimation Results of the Effect of Tourism on Exports

Variable	Food and Beverages		Industrial Supplies	Capital Goods	Consumer goods
	Primary	Processed			
	(1)	(2)	(3)	(4)	(5)
$lnTOUR_{t-1}$	0,329**	1,398***	0,529***	-0,492*	1,117***
	(0,162)	(0,275)	(0,177)	(0,258)	(0,143)
lngdpjt	-0,079	-1,220***	-0,256***	0,617***	0,074
	(0,075)	(0,129)	(0,083)	(0,121)	(0,067)
lnRER	-0,595***	-0,232***	-0,380***	-0,242***	-0,304***
	(0,034)	(0,057)	(0,037)	(0,054)	(0,037)
lnDist	-0,945***	-0,017	0,057	-0,938***	0,021
	(0,089)	(0,153)	(0,098)	(0,143)	(0,079)
FTA	0,114	0,078	0,143	0,901***	-0,145

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	(0,193)	(0,327)	(0,211)	(0,307)	(0,241)
First Stage					
IPK	0,060***	0,060***	0,060***	0,060***	0,060***
Prob>chi2	0,000	0,000	0,000	0,000	0,000
R^2	0,861	0,708	0,685	0,567	0,803
Endogenity test					
$lnTOUR_{t-1}$	0,373	0,000***	0,312	0,032**	0,000***
Weak-Instrument					
IPK_{t-1}	26,331$^{(\checkmark)}$	26,331$^{(\checkmark)}$	26,331$^{(\checkmark)}$	26,331$^{(\checkmark)}$	26,331$^{(\checkmark)}$

Note: the number in brackets ( ) is the standard error; ***, **, and * showed statistical significance at 1%, 5%, and 10%, respectively; (✓) indicates the condition H_0 is rejected, where critical value<eigenvalue

The results of the instrument testing in Table 3 show that the Corruption Perception Index as an instrumental variable is a strong instrument and has a high correlation with the number of tourist visits as an endogenous variable. Furthermore, the results of the endogeneity test show that there is an endogeneity problem in models 2, 4, and 5; while in models 1 and 3 there is no endogeneity problem. When there is no endogeneity problem, the IV and 2SLS methods still produce estimators that are consistent, but not efficient (Gujarati and Porter, 2012).

The estimation results using IV and 2SLS in Table 3 show mixed results. The number of tourist visits in models 1, 2, 3 and 5 has a positive and significant effect on the demand for exports of food and beverages (primary) and food and beverages (processed), industrial supplies, and consumer goods to the country of origin of tourists one year later. These results are in line with several studies (Reis and Varela, 2015; Madaleno et al, 2016; El-Sahli, 2017)

The estimation results in model 1 show that an increase in the number of tourist visits will increase the demand for exports of food and beverages (primary) to the country of origin of tourists one year afterward. According to the Ministry of Trade (2017), Indonesia has a comparative advantage in the food and beverages sector, especially agricultural products. This can be an opportunity to increase the demand for Indonesian agricultural products. Madaleno et. al (2016) argue that foreign tourists who travel on business purposes play an important role in promoting exports of agricultural products so as to increase export demand for these products. The estimation results in model 2 are in line with El-Sahli 2017) where an increase in the number of tourist visits can increase the export of differentiated goods, especially cultural goods.

The estimation results in model 3 show that an increase in the number of tourist visits will increase the demand for industrial supplies exports to the country of origin of tourists one year afterward. Model 5 also shows a positive relationship between the number of tourist visits and export demand one year after. This result is in line with El-Sahli (2017) and Reis and Varela (2015) where an increase in tourism demand will increase exports of non-food consumption goods, especially local or traditional goods.

Export demand for an item by the country of origin of tourists explains the preferences of foreign tourists to Indonesian products. It can be concluded that the preferences of tourists from Singapore, Malaysia, China, Australia, and Japan on Indonesian products apply to food and beverages (primary), food and beverages (processed), industrial supplies, and consumer goods.

On the real GDP per capita variable from the country of origin of tourists, the estimation results in model 4 are in line with previous research (El-Sahli, 2017; Petit and Seetaram, 2018). However, the estimation results in models 2 and 3 show the opposite results. This result is supported by Azizah and Beik (2015) where the real GDP per capita of the country of origin of tourists will reduce Indonesian exports because Indonesia's market share is low and Indonesia is not the main importer in the tested country. Whereas in models 1 and 5, the real GDP per capita of the country of origin of tourists has no effect on exports of food and beverages (primary) and consumer goods to the country of origin of tourists. According to Fajar et al (2017) this is because the demand for commodities produced in exporting countries is not large, so it is not determined by the GDP of the country of origin of tourists. This result is in accordance with the descriptive explanation in table 2, where the export value for food and beverages (primary) and consumer goods commodities shows a lower export value than the other three commodities.

In the real exchange rate variable, the estimation results of the five models show the opposite direction to the research hypothesis. This relationship is supported by Mukhlis (2012) where an increase in the exchange rate will burden the government and industry due to high foreign debt. There are other factors that cause the exchange rate to be negatively related to exports, such as; the composition of imported products to export products; price change mechanism; and the market share of the exporting country (Fajar et al, 2017).

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On the geographical distance variable, the estimation results in models 1 and 4 are in line with several studies (Inayah et al, 2016; El-Sahli, 2017; Petit and Seetaram, 2018). Meanwhile, the results in models 2, 3, and 5 contradict the research hypothesis. Based on the elasticity of each coefficient in the three models, when the elasticity value is further from 1 (< 1) or inelastic, the increase in geographic distance has no effect on the export of an item.

On the trade agreement variable, the estimation results in model 4 are in line with the research of Santana-Gallego et al (2016) and El-Sahli (2017). While the rest are contrary to the existing theory. This result is supported by Akhmadi (2017) and Inayah et al (2016) who argue that trade liberalization has no significant impact, nor benefits Indonesian exports. It can be concluded that the impact of trade agreements with the five trading partner countries has not been maximized to boost Indonesia's export performance.

5. CONCLUSION

The preferences of foreign tourists from Malaysia, Singapore, China, Japan, and Australia for Indonesian products are in food and beverages (primary), food and beverages (processed), industrial supplies, and consumer goods. These results also indicate that the tourism sector has the opportunity to boost export performance for certain goods through intensive and extensive trade margins. In addition, Indonesia's Corruption Perception Index (CPI) also has a positive effect on the demand for foreign tourism to Indonesia.

A country's export performance is also influenced by several other determinants such as real GDP per capita of the tourists' country of origin, real exchange rates, geographical distance, and trade agreements. Some of the estimation results that are not in accordance with the research hypothesis are caused by several factors supported by previous research, such as the large composition of imported products compared to export products for the same product; Indonesia's low market share in the international market; elasticity of demand for traded goods; and the impact of free trade agreements that have not been effective.

The contribution of this research to the existing literature is to identify the phenomenon of tourist preferences from the five countries of origin of tourists with the largest number of visits to Indonesian domestic goods using the classification of goods based on Broad Economic Categories (BEC). Apart from that, this research also has limitations, namely this study does not analyze how long the stay of tourists in Indonesia is needed to encourage the demand for an item in the international market.

The policy implications suggested for the government are maintaining exchange rate stability and inflation, increasing the corruption perception index, maximizing the benefits of international trade agreements, assisting domestic producers in analyzing consumer conditions and preferences of other countries by facilitating trading houses, as well as increasing the market share of domestic and foreign products. international market.

Suggestions for further studies are to further analyze the relationship between tourism and international trade by considering the import component, using a larger number of countries of origin for tourists, replacing geographical distance variables with logistical costs, and using different instrumental variables, such as the political stability index. In addition, controlling multilateral resistance is estimated using origin (importer) and destination (exporter) fixed effects to control trade barriers.

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APPENDIXES
Appendix 1
Product Classification Based on BEC

BEC Code	Commodity
11	*Food and Beverages, Primary*
12	*Food and Beverages, Processed*
2	*Industrial Supplies*
4	*Capital Goods*
6	*Consumer goods*

Source: UN Comtrade, processed

Appendix 2
Previous Research

Researcher	Method	Variable	Notes
Santana-Gallego et al (2016)	Helpman, Melitz, &Rubinstein (HMR) Model	**Dependent variable:** export **Independent Variables:** number of tourist visits, geographical distance, dummy variables related to the gravity model	1 percent increase in the number of tourist visits will increase the probability of exports by 1.25 percent and increase export volume by 9 percent.
Reis dan Varela (2015)	Augmented export supply fuction	**Dependent variable:** export goods **Independent Variables:** lagged number of tourist visits, lagged tourist spending per day per tourist, real exchange rates, world goods exports.	A 1 percent increase in tourist flow will increase 0.5 percent of exports of cultural goods to the country of origin of tourists, and increase international demand one year afterward.
Madaleno et al (2016)	Cointegration and causality	**Dependent variable:** export goods **Independent Variables:** lagged export of goods, lagged total length of stay of foreign tourists	• There is a strong two-way relationship between inbound tourism and the export of goods, when the two countries have historical links. • When two countries engage in commercial relations in the context of international trade, it will encourage tourism. • When tourists are attracted to the culture of the destination country, there is a possibility of increasing demand for local products.
El-Sahli (2017)	OLS and 2SLS	**Dependent variable:** export goods **Independent Variables:** number of tourist visits, real GDP, real exchange rate, dummy variables in the gravity model	An increase in the number of foreign tourist visits will increase the export of differentiated goods (processed food and beverages as well as consumer goods) to the country of origin of tourists with an elasticity of around 1.
Petit and Seetaram (2018)	OLS & PPML	**Dependent variable:** Tourism export **Independent Variables:** preferences, relative prices, nominal GDP, geographic distance, dummy variables in the gravity model	A 1 percent increase in preference (when foreign tourists show their preference for a product) will increase exports of tourism-related goods by 0.39 percent.