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Muhammad Farhan
Universitas Indonesia, mfarhanp1@gmail.com

Hera Susanti
Universitas Indonesia, hera.cpt27b@gmail.com

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Cover Page Footnote

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The Effect of Crime on Tourism in Indonesia

Muhammad Farhan[1], Hera Susanti[2*]

[1,2]Faculty of Economics and Business, Universitas Indonesia, Salemba Raya 4, 10430, Jakarta, Indonesia

ABSTRACT

Tourism sector is widely known as one of economic sectors that can be the engine of economic growth in an effort to reduce poverty in a country. However, growth in the tourism sector can be influenced by safety factors. Tourists tend to avoid tourism destination areas with high crime rates in order to avoid becoming victims of crime. This study aims to analyze the effect of crime on the number of tourist arrivals in Indonesia by using four proxies of crime, which are total crime rate, property crime rate, violent crime rate, and fraud crime rate. This study utilizes a panel data with Fixed Effect Model Within-Group (FEM WG) regression as the main model and Instrumental Variable – Two-Stage Least Squares (IV-2SLS) model to test the endogeneity of the crime variables. The estimation result shows that crime has a negative effect on tourist arrivals in Indonesia. Fraud crime tends to have a stronger effect on tourist arrivals than property and violent crimes. The negative effect of crime tends to be stronger in popular tourism destination areas.

Keywords: Crime; Tourism; Indonesia; Fixed Effect; Panel Data

1. Introduction

As one of the national priority programs in the Nawa Cita program of the President of the Republic of Indonesia, tourism is widely believed by researchers, practitioners, and international organizations to be a catalyst for economic growth and a tool to reduce poverty (Medina-Muñoz et al., 2016). The role of tourism as an economic growth catalyst is due to its status as one of the largest economic sectors worldwide, making its growth have significant impacts on a country's economy. Besides its considerable size, tourism is an important economic sector as it can be a source of tax revenue for the government to support development initiatives (Saha & Yap, 2014). Additionally, tourism can serve as a source of foreign exchange earnings for a country (Suharyanto et al., 2020). The various economic benefits provided by the tourism sector undoubtedly make it a compelling reason for the Indonesian government to give special attention to the tourism sector in Indonesia.

The progress of the tourism sector in a country can also be influenced by the crime rate and the level of criminal activity. Tourists tend to avoid areas prone to conflict and crime for travel due to safety and comfort reasons. The tourism industry and travel activities are

* Corresponding author:
E-mail: hera.cpt27b@gmail.com
Affiliation: Universitas Indonesia, Jakarta

highly sensitive to crisis events that affect the political, socio-economic, and environmental conditions of destination areas (Dimanche & Lepetic, 1999). Having good security conditions not only enhances the value of tourism products in destination areas but also becomes a significant motivator for tourists to visit those related destinations (Tarlow, 2019). Therefore, maintaining a low crime rate is crucial for the development of the tourism sector in Indonesia. By ensuring a safe environment for tourists, the country can attract more visitors and foster the growth of the tourism industry, leading to positive economic and social impacts. The effect of crime on tourism activities in Indonesia can be depicted in Figure 1 as follows.

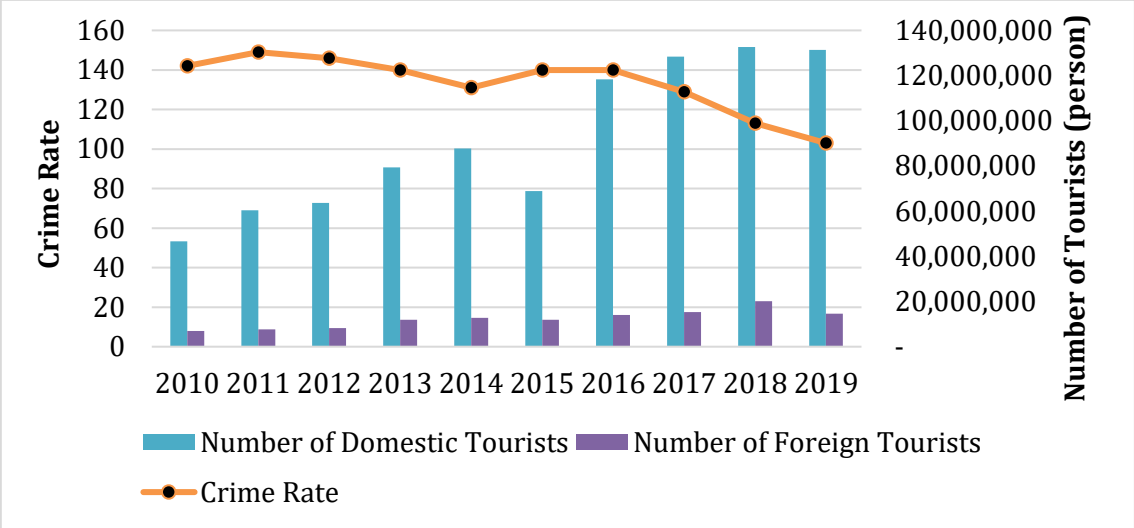

Figure 1. The Trend of Crime Rate and the Number of Domestic and Foreign Tourists in Indonesia during the Period 2010-2019

Source: Badan Pusat Statistik (various years), processed.

Figure 1 illustrates the relationship between the crime rate and the number of domestic and foreign tourists approximated by the number of domestic and foreign guests in both star-rated and non-star-rated hotels in Indonesia nationwide from 2010 to 2019. Based on Figure 1, it can be observed that the increasing trend in the number of domestic tourists is accompanied by a decrease in the crime rate. A similar trend is also observed for foreign tourists concerning the crime rate. However, the effect of the crime rate on the number of foreign tourists does not have a significant impact. Nevertheless, the trends observed in the number of domestic and foreign tourists concerning the crime rate indicate that tourism activities can thrive in destinations with low crime rates. Conversely, an increasing crime rate leads to a decline in the number of tourists. Therefore, it can be concluded that the number of tourists is sensitive to the crime rate.

Based on Adiyia et al. (2017), when compared to other service sectors, tourism is considered a more conducive sector in efforts to reduce poverty. Tourism offers various

economic benefits, such as generating employment opportunities for both skilled and unskilled workers in both formal and informal sectors. Additionally, the nature of the tourism sector fosters forward and backward linkages, provides markets for local production in areas with limited economic growth options, and stimulates the development of infrastructure facilities for rural households, such as roads, electricity, and clean water. Furthermore, as highlighted by Croes & Rivera (2016), tourism development aimed at poverty reduction can also provide several indirect benefits. These include creating stable and higher-paying jobs, improving access to healthcare and education, stable export earnings, generating economic opportunities in remote areas, fostering economic diversity, and enhancing the value of location-specific commodities. With its inclusive characteristics, allowing local communities and unskilled workers to participate, the development of tourism should be considered a strategic plan in Indonesia's national development efforts to enhance human development performance. The growth of the tourism sector can drive economic development in destination areas and contribute to poverty reduction in those regions. Moreover, tourism development can contribute to improving Indonesia's human resources quality through poverty reduction effects. However, it is essential to acknowledge that the role of the tourism sector in poverty reduction can also be influenced by the crime rate in each province in Indonesia. A low crime rate can provide a sense of safety for tourists visiting a destination area. Therefore, the security condition in tourism destinations can significantly impact the growth of the tourism sector in those areas. Further understanding is needed on how the crime rate affects the tourism sector in Indonesia.

By definition, tourism is an "ambiguous" activity. There is not yet a universally accepted definition of tourism agreed upon by experts in the field worldwide. This is due to the difficulty in defining tourism activities themselves. Tourism is often viewed as travel activity. However, this is debated because, although tourism involves travel, not all travel activities can be classified as tourism (Pender & Sharpley, 2005). Although the definition of tourism is still debated by various experts around the world, the definition proposed by the United Nations World Tourism Organization (UNWTO) is the most widely accepted globally. The UNWTO defines tourism as a social, cultural, and economic phenomenon that involves the movement of people to countries or places outside their usual environment for personal or professional purposes. Based on this definition, it can be concluded that tourism activities occur due to a push from social, cultural, or economic factors that motivate individuals to travel from their place of origin to their destination.

Cooper et al. (1998) divided the definition of tourism from the demand and supply sides. Tourism from the demand side can be defined as the activities of traveling and staying of an individual in an area outside their usual environment for a period of less than one year for purposes such as recreation, business, leisure, and other reasons. The demand-side definition of tourism emphasizes the elements of movement and staying of an individual in a destination outside their usual environment or place of residence or work. This movement is short-term and temporary, with the destination not intended to become a permanent place of residence or work. On the other hand, tourism from the supply side can be defined as an industry comprising all companies, organizations, and facilities designed to meet the needs and desires of tourists. These tourists can be either domestic or international. Generally, tourism activities in a country are predominantly carried out by local residents, with most travel typically conducted using land transportation. Tourism is not always just about holidays for leisure; it also includes business trips, conferences, and educational visits as reasons for travel. However, tourism is often perceived as a form of recreational activity, and business trips are not always considered as tourism.

Tourism activities involve various types of companies and organizations, creating a tourism system. Leiper (1990) explains that there are three basic elements: the tourist element (the actors in the tourism system), the geographic element (including traveler-generating regions, tourist destinations, and transit routes), and the tourism industry (companies and organizations involved in the delivery of tourism products). These three elements interact with each other through transactions and impacts. Leiper asserts that the tourism industry comprises all companies, organizations, and facilities designed to serve the specific needs and desires of tourists. Thus, the existence of the tourism industry is due to the presence of a broad network of commercial and non-commercial organizations that are interconnected to achieve the same goal, which is to meet the needs of tourists.

The involvement of various types of companies and organizations in the tourism industry indicates that tourism activities engage multiple economic sectors, including accommodation, attractions, and transportation. Some economic sectors within the tourism industry, such as accommodation and transportation, can be seen as independent industries. The presence of independent industries within the tourism industry suggests that tourism can be categorized as a downstream industry, meaning the performance of these independent industries significantly affects the overall performance of the tourism industry. Thus, tourism can be described as a collective activity carried out by various independent industries that

have the right to operate independently. This collective activity encompasses both economic and social activities (Pender & Sharpley, 2005).

From the demand side of tourism, motivation is a crucial factor that determines an individual's decision to travel. According to Cooper et al. (1998), motivation is defined as an impetus that drives an individual to act or stimulates their interest. Many tourism-related literatures utilize the concept of motivation as a primary influence on consumer behavior. Consumer motivation factors can be explained using Maslow's Hierarchy Model of motivation. This theory suggests that motivation can be ranked or hierarchically organized based on an individual's needs. The Maslow's Hierarchy Model can be depicted in Figure 2 as follows.

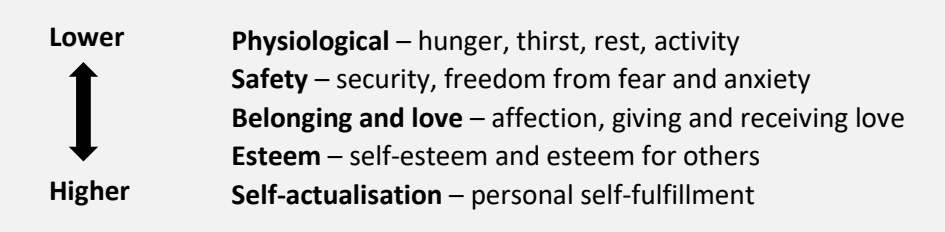

Figure 2. Maslow's Hierarchy of Needs
Source: Cooper et al. (1998)

Based on this theory, Maslow argues that if the needs in the hierarchy are not met, the lowest level of needs, which are physiological needs, will dominate consumer behavior. Once the consumer's physiological needs are satisfied, they will be motivated to fulfill the needs at the next level in the hierarchy until reaching the highest level of needs, which is self-actualization. The motivation that arises within individuals to engage in tourism activities is also influenced by the attractiveness of the tourism destination. Weaver & Lawton (2014) explain that there are several tourism attraction factors that influence the appeal of a tourism destination. These factors include the availability of 3S tourism products (Sea, Sand, and Sun) or beach resorts-based tourism, the internal economic development condition of the tourism destination area, the geographical proximity of the tourism destination, the accessibility to the tourism destination, the availability of supporting tourism services, the presence of attractions, the cultural and spiritual connection between tourists and the tourism destination area, the affordability in the tourism destination area, the security, stability, and peace condition of the tourism destination area, positive market perception regarding the tourism destination area, and pro-tourism government policies.

In deciding to engage in tourism activities, tourists expect assurance of their safety from the destination region/country while carrying out their tourism activities. As a second-

level need based on Maslow's Hierarchy of Needs theory, security, which includes freedom from violence and security threats, must be fulfilled first before tourists embark on their tourism activities. If this security need is not met in a tourism destination, tourists will be reluctant to visit that particular destination. Poor security conditions in a tourism destination can significantly impact the performance of tourism in reducing poverty in that area. Therefore, security is a crucial factor in the development of the tourism sector.

The safety of an area is greatly influenced by its crime rate. Widespread criminal activity in an area can indicate that the area is very unsafe for tourists to visit. Criminal activities that occur within a community naturally arise because of certain impulses in individuals to commit such acts. The emergence of crime can be explained by the Anomie theory proposed by the classical sociologist Emile Durkheim (1858-1917). Anomie (a = "without"; nomos = "norm") is a terminology that describes the absence of norms or a lack of rules. Generally, anomie arises during rapid social changes that can affect social solidarity within a community. During such social changes, many longstanding relationships and rules become outdated, and the development of new rules and functional relationships to support the old ones cannot keep up with the ongoing transformation, resulting in a lack of adequate regulation (anomie condition) (DiCristina, 2016). Based on Walsh & Ellis (2007), Emile Durkheim divided social solidarity into two types: mechanical solidarity and organic solidarity. Mechanical solidarity is the solidarity that arises among individuals who share similar experiences and conditions and have minimal division of labor. They share the same values and develop strong emotional bonds with the collective. This solidarity condition can suppress antisocial behavior among them and create strong informal social controls. On the other hand, organic solidarity characterizes modern society with diverse occupational specialization. The highly diverse division of labor results in varying experiences and conditions among people, weakening social bonds and shared values. The increasing complexity of society makes it challenging to maintain social cohesion due to ambiguity and contradictions in rules and moral behavioral standards resulting from division of labor and rapid social changes. The growing complexity in society creates a lack of common rules or norms, which ultimately can foster criminal behavior and other forms of deviance proportionate to the level of social deregulation in the community. As a highly diverse country, anomie undoubtedly exists within Indonesian society. With the continuous growth of Indonesia's economy, anomie will emerge in society due to the increasing diversity of the workforce and differences in social status. Ultimately, the potential for criminal behavior will remain present.

Research analyzing the impact of crime on tourism is still relatively scarce. However, several previous studies have examined the relationship between crime and tourism. Based on these previous studies, crime has a negative association with tourism activity (Ahad et al., 2022; Altindag, 2014; Fourie et al., 2020; Lorde & Jackman, 2013; Mohammed & Sookram, 2015; Moyo & Ziramba, 2013; Parida et al., 2017, 2018; Saha & Yap, 2014; Yap & Saha, 2013). In their study, Fourie et al. (2020) found that the level of security in a tourism destination has a negative relationship with the number of tourist arrivals in that area. Security can also be influenced by political instability. Yap & Saha (2013) revealed in their study that political instability is inversely related to tourism receipts and the number of tourist arrivals. Altindag (2014) found that violent crime is negatively related to the number of international tourist arrivals and international tourism income. This indicates that tourists tend to evaluate the risk of victimization when choosing a tourism destination. Similar results were also found by Parida et al. (2018) in India, where an increase in criminal activity negatively affected the number of both foreign and domestic tourist arrivals in the short term. However, the estimation results showed that major terror attacks did not have a significant impact on the number of foreign and domestic tourist arrivals in India. Similar results were also reported by Parida et al. (2017) when examining tourism determinants in India.

2. Research Methodology

This study employs secondary data, consisting of the number of domestic and foreign guests in starred and non-starred hotels, as a proxy for the tourism variable. The data is sourced from the Central Statistics Agency (Badan Pusat Statistik – BPS) for the period from 2010 to 2019. Other BPS data used in this research includes total crime data, crime type data, total road length, provincial area, gross regional domestic product (GRDP), the number of sub-districts, the number of regencies, and the number of cities. The reason for using secondary data in this study is to understand the impact of crime on the number of tourists on a macro scale. The use of secondary data offers several advantages, such as accommodating the need for large amounts of data on a national scale and over a time span of more than one year, saving time and costs in conducting research, and providing flexibility in terms of the variables to be observed. Additionally, the use of secondary data in this study can serve as a preliminary overview of the research on the impact of crime on tourism in Indonesia, providing a reference for future research that may examine this topic from a different perspective. This study also incorporates a time dummy variable to capture the effects of government policies in 2015, a year marked by economic challenges in Indonesia.

Additionally, the time dummy variable is also used to capture the effects of the national tourism development policy "10 New Bali," which was proposed in 2015 and commenced promotion and development in 2016. Data for this variable is sourced from the Indonesia Economic Report 2015 from Bank Indonesia and the Maritime Deputy Performance Report 2015 from the Cabinet Secretariat of the Republic of Indonesia. To assess the impact of the popularity of tourism destination areas on the relationship between crime and tourism, the study employs a provincial dummy variable representing popular tourism destinations. The establishment of this variable is based on the National Medium-Term Development Plan (RPJMN) 2020-2024. This variable serves as an interaction variable with the crime variable to observe differences in the impact of crime on tourism between provinces considered popular and less popular in terms of tourism. Data on crime types are derived from the Criminal Statistics published by BPS from 2011 to 2020, providing information on the number of crimes based on different criminal categories during the period from 2010 to 2019. In calculating crime rates for each crime type, the study uses population data per province from the Indonesia Database for Policy and Economic Research (INDO-DAPOER) by the World Bank. Population data in the INDO-DAPOER dataset is sourced from the National Socio-Economic Survey (Susenas) and the Population Census Survey (SUPAS) conducted by BPS.

This research is conducted at the national level, with provinces serving as the unit of analysis. However, this study does not include the provinces of North Kalimantan, West Sulawesi, and West Papua to the observation due to limited statistical data available for certain years during the period from 2010 to 2019, resulting in missing values. Consequently, this research focuses on a total of 31 provinces as the observation units for the study. The basic model used in this study is as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 Z_{it} + \varepsilon_{it} \quad (1)$$

Where Y_{it} represents the tourism variable, which consists of the natural logarithm (ln) of the total number of domestic, foreign, and overall tourist arrivals. X_{it} is the variable of interest, which includes the total crime rate (crime), property crime rate (property), violent crime rate (violent), and fraud crime rate (fraud). Property crime consists of larceny, burglary, motor vehicle theft, vandalism, and arson reported cases. Violent crime consists of homicide, assault, rape, kidnap, and robbery reported cases. Fraud crime is only consist of fraud crime reported cases. The empirical model used in this research is divided into two parts, separating the variable of total crime rate and the variable of crime rate based on its type to obtain non-overlapping estimation results. Z_{it} represents control variables, including the total road length divided by the provincial area (road), government policies (policy), the ln form of gross

regional domestic product per capita (lngrdpk), and the popular tourism destination areas (popdest). The coefficients of variables and error terms are denoted as β and ε_{it}, respectively. This study also employs an interaction variable between crime rate and province, which represents popular tourism destinations in Indonesia, to observe the differences in the general effect of crime on tourism between popular and non-popular tourism destination areas. Thus, this research employs three different empirical models to examine the differences in the impact of crime on tourism, which can be formulated as follows:

Model 1

$$Y_{it} = \beta_0 + \beta_1 crime_{it} + \beta_2 road_{it} + \beta_3 policy_{it} + \beta_4 lngrdpk_{it} + \varepsilon_{it} \quad (2)$$

Model 2

$$Y_{it} = \beta_0 + \beta_1 c.crime\#popdest_{it} + \beta_2 road_{it} + \beta_3 policy_{it} + \beta_4 lngrdpk_{it} + \varepsilon_{it} \quad (3)$$

Model 3

$$Y_{it} = \beta_0 + \beta_1 property_{it} + \beta_2 violent_{it} + \beta_3 fraud_{it} + \beta_4 road_{it} + \beta_5 policy_{it} + \beta_6 lngrdpk_{it} + \varepsilon_{it} \quad (4)$$

In addition to the three main models mentioned above, this study also conducts an endogeneity test on the crime variable used. Theoretically, crime can be influenced by various factors, one of which is security measures. In this research, the number of police stations is used as a proxy for the government's efforts to maintain security in each province in Indonesia. The variable of the number of police stations is assumed to reflect the vulnerability to criminal activities in a region, which is highly influenced by the presence of the police force in that area. This variable is created by summing up the number of cities, regencies, and sub-districts for every police station in each level of regional administration, and additional value of one for every police station in provincial level. Therefore, besides using the Fixed Effects Model within-group estimator (FEM WG), this study also employs the Instrumental Variable – Two-Stage Least Squares (IV-2SLS) model to capture the effect of the number of police stations on crime. The IV-2SLS model uses the empirical reduced form model to describe the influence of instrumental variables (which are exogenous variables) on the endogenous variable. The reduced form model of the endogenous variable can be formulated as follows:

Reduced Form Model

$$C_{it} = \delta_0 + \delta_1 lnpol_{it} + \varepsilon_{2it} \quad (5)$$

where C_{it} is the variable for crime used in this study, and $lnpol_{it}$ is the natural logarithm form of the number of police stations, which is approximated by the total number of sub-districts, districts, cities within each province, and an additional one for the provincial police headquarters.

3. Results

Table 1.
Estimation Result using Fixed Effect Within-Group Model for Overall Tourists with Total Crime Rate

Variable	(1) lntour	(2) lntour	(3) lntour	(4) lntour
crime	-0.00271***	-0.00272***	-0.000891*	-0.000471
	(0.000574)	(0.000559)	(0.000438)	(0.000382)
road		1.116	0.640**	0.553***
		(1.027)	(0.289)	(0.185)
policy			0.656***	0.365***
			(0.0387)	(0.0643)
lngrdpk				1.615***
				(0.278)
Constant	14.80***	13.90***	13.69***	-14.00***
	(0.105)	(0.873)	(0.261)	(4.760)
Observations	310	310	310	310
R-squared	0.097	0.125	0.573	0.646
Number of id	31	31	31	31
Prob > F	0.0001	0.0000	0.0000	0.0000

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Research Data, processed using STATA 13

Table 2.
Estimation Result using Fixed Effect Within-Group Model for Overall Tourists with Crime Rates based on the Crime Types

Variable	(1) lntour	(2) lntour	(3) lntour	(4) lntour
property	-0.00375	-0.00382	-0.000637	0.000438
	(0.00266)	(0.00263)	(0.00135)	(0.00142)
violent	0.00334	0.00189	0.00344	0.000550
	(0.00535)	(0.00514)	(0.00243)	(0.00196)
fraud	-0.0122	-0.0134	-0.00637	-0.00264
	(0.00887)	(0.00871)	(0.00486)	(0.00406)
road		1.385	0.613**	0.524**

Variable	(1) lntour	(2) lntour	(3) lntour	(4) lntour
		(1.009)	(0.252)	(0.192)
policy			0.673***	0.376***
			(0.0364)	(0.0654)
lngrdpk				1.645***
				(0.294)
Constant	14.60***	13.55***	13.55***	-14.60***
	(0.116)	(0.803)	(0.196)	(5.043)
Observations	310	310	310	310
R-squared	0.071	0.111	0.572	0.644
Number of id	31	31	31	31
Prob > F	0.0036	0.0009	0.0000	0.0000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Research Data, processed using STATA 13

Table 1 presents the results of the Fixed Effect Within-Group (FEM WG) regression estimation for the model of tourists overall with total crime rates. The estimation results are presented using robustness tests to observe the impact of adding variables on the significance of the variables and the changes in coefficient values for each variable. The results indicate that overall crime has a negative impact on the number of tourist arrivals. However, there is a reduction in coefficient magnitude and significance as control variables are included in the model. Model (3) shows that a one-unit increase in total crime rates can decrease the overall number of tourist arrivals by 0.0891 percent, assuming other variables are constant. The negative impact of total crime rates becomes insignificant after including GRDP per capita as a variable in the model.

Table 2 presents the results of the Fixed Effect Within-Group (FEM WG) regression estimation for the model of tourists overall with crime rates based on their types. The estimation results show that property crime, violent crime, and fraud do not have a significant impact on tourism. Overall, property crime and fraud have a negative impact on tourism, but the negative effect is weak. The estimation results in model (2) indicate that the negative impact of property crime and fraud occurs at significance levels of 16 percent and 14 percent, respectively. However, the significance weakens after including government policy and GRDP per capita as variables in the model. This indicates that property crime rates, violent crime rates, and fraud rates do not have a strong influence on the overall number of tourist arrivals. The estimation results also show that all three control variables used in this study have a significant positive impact on the dependent variable.

The estimation results for the control variables show that road length, government policy, and GRDP per capita have a significant positive impact on the dependent variable. According to model (4), a one-kilometer increase in road length per square kilometer in tourist destination areas will increase the overall number of tourist arrivals by 55.3 percent, assuming other variables are constant. Government policies in addressing the domino effect of the global economic crisis in 2015 and the implementation of the "10 New Bali" development policy contribute to a 36.5 percent increase in the overall number of tourist arrivals, assuming other variables are constant. A one percent increase in GRDP per capita will lead to a 1.615 percent increase in the overall number of tourist arrivals, assuming other variables are constant. These estimation results indicate that all three variables play a significant role in increasing the overall number of tourists in Indonesia during the period 2010-2019.

Table 3.
Estimation Result using Fixed Effect Within-Group Model for Domestic Tourists with Total Crime Rate

Variable	(1) lndomtour	(2) lndomtour	(3) lndomtour	(4) lndomtour
crime	-0.00273***	-0.00274***	-0.000896*	-0.000483
	(0.000584)	(0.000567)	(0.000441)	(0.000386)
road		1.097	0.617**	0.531***
		(1.034)	(0.289)	(0.189)
policy			0.662***	0.377***
			(0.0379)	(0.0619)
lngrdpk				1.584***
				(0.270)
Constant	14.71***	13.83***	13.61***	-13.54***
	(0.107)	(0.878)	(0.261)	(4.634)
Observations	310	310	310	310
R-squared	0.098	0.124	0.576	0.646
Number of id	31	31	31	31
Prob > F	0.0001	0.0000	0.0000	0.0000

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Research Data, processed using STATA 13

Table 4.
Estimation Result using Fixed Effect Within-Group Model for Domestic Tourists with Crime Rates based on the Crime Types

Variable	(1) lndomtour	(2) lndomtour	(3) lndomtour	(4) lndomtour

Variable	(1) lndomtour	(2) lndomtour	(3) lndomtour	(4) lndomtour
property	-0.00377	-0.00384	-0.000629	0.000433
	(0.00269)	(0.00265)	(0.00135)	(0.00142)
violent	0.00301	0.00158	0.00314	0.000290
	(0.00530)	(0.00511)	(0.00238)	(0.00189)
fraud	-0.0117	-0.0130	-0.00586	-0.00218
	(0.00898)	(0.00883)	(0.00484)	(0.00403)
road		1.373	0.593**	0.505**
		(1.024)	(0.258)	(0.198)
policy			0.680***	0.387***
			(0.0365)	(0.0634)
lngrdpk				1.624***
				(0.289)
Constant	14.51***	13.48***	13.48***	-14.32***
	(0.115)	(0.814)	(0.202)	(4.954)
Observations	310	310	310	310
R-squared	0.069	0.109	0.574	0.644
Number of id	31	31	31	31
Prob > F	0.0032	0.0008	0.0000	0.0000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Research Data, processed using STATA 13

Table 3 presents the estimation results of the FEM WG regression for domestic tourists with the total crime rate. The significance in this model follows a similar pattern to the estimation results in the overall tourist model with the total crime rate, where the addition of control variables leads to a reduction in the significance of the variables of interest. In model (3), the total crime rate variable has a significant negative impact on the number of domestic tourist arrivals with a significance level of 10 percent. The estimation results in model (3) show that a one-unit increase in the total crime rate can decrease the number of domestic tourists by 0.0896 percent, assuming other variables are constant. Table 4 shows the estimation results of the FEM WG regression for domestic tourists with the crime rate based on its type. The results are consistent with the estimation results in the overall tourist model, where the three crime type variables do not have a significant impact. These estimation results are consistent with the results in the overall tourist model, where in model (2), the negative impact of property crime and fraud occurs at a significance level of 16 percent. The significance weakens after including the government policy and GRDP per capita variables. The estimation results for the control variables also show consistent results with the overall

tourist model, where the road length, government policy, and GRDP per capita variables have a significant positive impact on the dependent variable.

Table 5.
Estimation Result using Fixed Effect Within-Group Model for Foreign Tourists with Total Crime Rate

Variable	(1) lnfortour	(2) lnfortour	(3) lnfortour	(4) lnfortour
crime	-0.00267***	-0.00268***	-0.00118*	-0.000613
	(0.000733)	(0.000720)	(0.000657)	(0.000726)
road		1.443	1.052*	0.935**
		(1.163)	(0.589)	(0.437)
policy			0.538***	0.145
			(0.101)	(0.158)
lngrdpk				2.181***
				(0.658)
Constant	11.06***	9.896***	9.721***	-27.68**
	(0.135)	(0.970)	(0.493)	(11.32)
Observations	310	310	310	310
R-squared	0.047	0.070	0.221	0.288
Number of id	31	31	31	31
Prob > F	0.0010	0.0010	0.0001	0.0000

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Research Data, processed using STATA 13

Table 6.
Estimation Result using Fixed Effect Within-Group Model for Foreign Tourists with Crime Rates based on the Crime Types

Variable	(1) lnfortour	(2) lnfortour	(3) lnfortour	(4) lnfortour
property	-0.00366	-0.00374	-0.00108	0.000227
	(0.00255)	(0.00259)	(0.00207)	(0.00200)
violent	0.0116	0.00998	0.0113*	0.00776
	(0.00706)	(0.00682)	(0.00581)	(0.00539)
fraud	-0.0221**	-0.0235**	-0.0176**	-0.0130
	(0.0100)	(0.00951)	(0.00811)	(0.00836)
road		1.553	0.907*	0.799*
		(1.021)	(0.462)	(0.417)
policy			0.563***	0.202
			(0.0889)	(0.151)
lngrdpk				2.000***
				(0.625)
Constant	10.72***	9.547***	9.549***	-24.67**

Variable	(1) lnfortour	(2) lnfortour	(3) lnfortour	(4) lnfortour
	(0.195)	(0.792)	(0.329)	(10.70)
Observations	310	310	310	310
R-squared	0.064	0.089	0.250	0.304
Number of id	31	31	31	31
Prob > F	0.0325	0.0199	0.0000	0.0000

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Research Data, processed using STATA 13

Table 5 presents the estimation results of the FEM WG regression for international/foreign tourists with the total crime rate. The estimation results show that the total crime rate variable has a significant negative impact in all models. However, the coefficient values and significance decrease after adding control variables to the model. Based on model (4), a one-unit increase in the total crime rate leads to a decrease in the number of international tourists by 0.0613 percent, assuming other variables are constant. The total crime rate becomes insignificant after adding the GRDP per capita variable to the model. Table 6 shows the estimation results of the FEM WG regression for international/foreign tourists with the crime rate based on its type. Unlike the estimation results in other tourist models, the results in the international tourist model show that fraud has a significant negative impact on the number of international tourist arrivals. However, the significance weakens after adding the GRDP per capita variable to the model. Based on model (3), a one-unit increase in fraud can decrease the number of international tourists by 1.76 percent, assuming other variables are constant. However, model (3) also shows that violent crime has a significant positive impact on the dependent variable, with a significance level of 10 percent. However, the significance of the violent crime variable weakens after adding the GRDP per capita variable to the model. This positive impact is inconsistent with the theory and previous research findings that indicate violent crime has a negative impact on tourism. However, violent crime has a negative correlation with the number of domestic, foreign, and overall tourist arrivals. This can be seen in Figure 3 below.

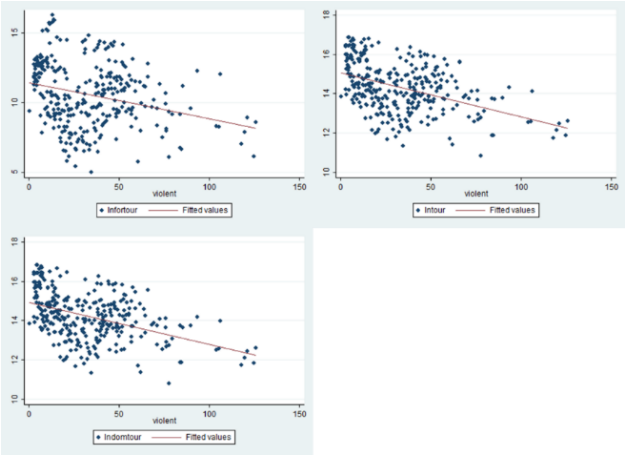

Figure 3. Correlation between Violent Crime and Number of Foreign, Domestic, and Overall Tourist Arrivals.

Source: Research Data, processed using STATA 13

Table 7
Estimation Result using Fixed Effect Within-Group Model for Interaction between Total Crime Rate and Popular Tourism Destination Areas

Variable	(1) lntour	(2) lndomtour	(3) lnfortour
0.popdest#c.crime	-0.000457	-0.000493	-0.0000168
	(0.000634)	(0.000639)	(0.000985)
1.popdest#c.crime	-0.000484	-0.000473	-0.00120
	(0.000364)	(0.000365)	(0.00109)
road	0.554***	0.531***	0.965**
	(0.189)	(0.192)	(0.442)
policy	0.365***	0.377***	0.154
	(0.0672)	(0.0648)	(0.160)
lngrdpk	1.613***	1.585***	2.119***
	(0.290)	(0.282)	(0.679)
Constant	-13.97***	-13.56***	-26.66**
	(4.953)	(4.826)	(11.64)
Observations	310	310	310
R-squared	0.646	0.646	0.290
Number of id	31	31	31
Prob > F	0.0000	0.0000	0.0000

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Research Data, processed using STATA 13

Table 7 presents the results of the Fixed Effect Within-Group (FEM WG) regression estimation for the model of the interaction between crime and popular tourist destinations. The estimation results are presented using all three tourism variables and all control variables

used in this study. The results indicate that overall crime has a negative effect on the number of tourist arrivals, particularly in popular tourist destinations. An increase in crime by one unit will decrease the overall number of tourist arrivals by 0.0484 percent, domestic tourist arrivals by 0.0473 percent, and foreign tourist arrivals by 0.120 percent, assuming all other variables are constant. However, the estimation results also show that the negative impact of crime on tourist arrivals, both in popular tourist destinations and non-popular tourist destinations, is not statistically significant. The significance of the interaction between crime and popular tourist destinations is 19 percent for overall tourist arrivals, 20 percent for domestic tourist arrivals, and 28 percent for foreign tourist arrivals. On the other hand, the significance of the interaction between crime and non-popular tourist destinations ranges from 48 percent to 90 percent. These results indicate that while overall crime has a weak negative impact on the number of tourist arrivals, it has a larger negative impact in popular tourist destinations. Based on the coefficient of the interaction variable, overall crime has a larger negative effect on foreign tourist arrivals compared to other types of tourists. This suggests that foreign tourists are more sensitive to security conditions in tourist destinations, and any form of security crisis in those areas can significantly impact foreign tourists' decisions to visit them.

4. Discussion

Safety and security are crucial factors in tourism as they can significantly influence the motivation of travelers to visit specific tourist destinations. Safety represents the second level of needs in Maslow's Hierarchy of Needs. While tourism activities are pursued to fulfill the physiological needs of travelers, which are at the first level of the hierarchy, tourists also need to consider their safety while visiting a tourist destination. Potential tourists must ensure that the destination they plan to visit can provide a sense of security and freedom from fear and anxiety, allowing them to achieve their objectives in engaging in tourism activities.

The estimation results showing the negative impact of total crime and crime based on its types on the number of tourist arrivals are consistent with previous research findings, which have also indicated that crime has a negative influence on tourist arrivals. The significant negative effect of total crime on the number of tourist arrivals, as found in this study, is in line with the findings of Lorde & Jackman (2013) in Barbados, where an increase in total crime rates significantly decreased the number of tourist arrivals. The estimation results from this research demonstrate that safety and security are essential factors in tourism, as they can influence travelers' motivation to visit specific tourist destinations. Safety

represents the second level of needs in Maslow's Hierarchy of Needs. While tourism activities primarily aim to fulfill tourists' physiological needs, which are at the first level of the hierarchy, tourists also consider their safety during their visits to tourist destinations. Prospective travelers must ensure that their chosen tourist destination can provide a sense of security and freedom from fear and anxiety, enabling them to achieve their tourism objectives successfully.

The estimation results from this study indicate that violent crime does not have a significant negative impact on the number of tourist arrivals. This finding is inconsistent with the theory and previous research findings that violent crime has a significant negative influence. In their research, Mohammed & Sookram (2015) found that in Jamaica, violent crime and property crime had a significant negative impact on tourist arrivals, with violent crime having a greater effect than property crime. However, Mohammed & Sookram (2015) found contrasting results in their research on Trinidad and Tobago, where property crime had a significant and stronger negative impact compared to violent crime. The differences in findings suggest that property crime has a stronger negative influence on the number of tourist arrivals compared to violent crime in Indonesia. Tourists in Indonesia, both domestic and foreign, may be at higher risk of becoming victims of property-related crimes rather than violent crimes. Consistent with the findings of Mohammed & Sookram (2015) in Trinidad and Tobago, the estimation results in this study also align with the findings of Johnny & Jordan (2007) in Saint Lucia, where tourists are more likely to be targeted for property crimes rather than violent crimes. However, the negative impact arising from property crime is not statistically significant.

On the other hand, fraud crime also shows a negative influence on the number of tourist arrivals, both domestic, foreign, and overall. In terms of magnitude, fraud crime has a greater negative impact compared to property crime. This is indicated by the larger coefficient of fraud crime. Additionally, fraud crime has a significant negative impact on the number of foreign tourist arrivals. This indicates that foreign tourists are highly sensitive to fraudulent activities in tourist destinations. The higher the tendency for fraudulent actions targeting foreign tourists in a tourist destination, the more reluctant foreign tourists are to visit that area. Both property crime and fraud crime typically occur due to economic motives of the criminals, targeting properties and money as objects of crime. The occurrence of such crimes can lead to a reduction in the wealth of the crime victims. Property crime and fraud crime may create anomie in the tourist destinations. Anomie arises due to differences in prosperity, race, and/or social status between tourists and local residents in the tourist destination. This anomie

can provide opportunities for criminals to commit crimes against tourists because of the "lack of rules" in such an environment, giving criminals a justification for their actions against tourists.

Despite the significant positive influence at the 10 percent significance level from the estimation results of the impact of violent crime on the number of foreign tourist arrivals, the correlation between violent crime and the number of foreign tourist arrivals is negative. The significant positive influence may be due to the influence of other factors not explained by the model. This significant positive influence occurs because of an increasing trend in violent crime rates, which coincides with an increase in the number of tourist arrivals. The increase in violent crime rates can be influenced by various factors, such as economic prosperity conditions in each province and unique events in each province. The significant positive influence may be caused by omitted variable bias (OVB) issues in the regression. There may be specific variables that affect violent crime but are not included in the model. This indicates the presence of endogeneity issues with the violent crime variable, where violent crime is correlated with the error term. Based on the estimation results using the IV-2SLS model, the variable "number of police stations," which serves as an instrumental variable, is unable to address the endogeneity issue of the violent crime variable. Therefore, the estimation results on the impact of violent crime on the number of foreign tourist arrivals are biased and may lead to reverse causality issues in the estimation results.

The estimation results using the IV-2SLS model indicate the presence of endogeneity issues with the variables suspected to be endogenous, which are all the crime variables used in this study. The number of police stations is used as an instrumental variable to address the endogeneity problems of these crime variables. However, the results of the endogeneity test show that the number of police stations is not sufficient to address the endogeneity issues of the crime variables. The following Table 8 shows the estimation results of the IV-2SLS model to test the endogeneity of the four variables of interest on the total number of tourist arrivals.

Table 8
Estimation Result using IV-2SLS Model to Test the Endogeneity of Variable of Interest on the Number of Overall Tourist Arrivals

Regressor tested	crime	violent	property	fraud
Instrument var.	lnpol	lnpol	lnpol	lnpol
Cragg-Donald Wald F Statistic	0.411	14.017	27.741	1.779
Chi-sq(1) P-val	0.0001	0.0001	0.0001	0.0001

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Research Data, processed using STATA 13

Based on the value of the Cragg-Donald Wald F Statistic in Table 8, which indicates the strength of the instrumental variables on the endogenous variables, the estimation results show that the variable "number of police stations" is a weak instrument for both the total crime rate and fraud crime rate variables. Although it is weak for the total crime rate variable, this instrumental variable can only address the endogeneity issue of the total crime rate variable in the international tourist model, as indicated by the non-significant Chi-sq(1) P-val of 0.0232. The endogeneity issue can indeed affect the validity of the estimation results, necessitating further research to address the endogeneity problem of the crime rate variables used in investigating the topic of this study.

5. Conclusion

The total crime rate has a significant negative impact on the number of domestic, foreign, and overall tourist arrivals. This indicates that overall criminal activities have a detrimental effect on the performance of the tourism sector in Indonesia. The total crime rate has a larger negative impact on foreign tourist arrivals compared to domestic tourist arrivals. Fraud crime has a more substantial negative influence on tourist arrivals compared to other types of crimes. It significantly affects foreign tourist arrivals and has a non-significant negative impact on domestic and overall tourist arrivals. In terms of magnitude, fraud crime has a larger negative impact on foreign tourist arrivals compared to domestic tourist arrivals. This suggests that fraud crime is the most impactful type of crime on tourist arrivals in Indonesia. Property crime has a negative impact on tourist arrivals, but the negative effect is weak. Violent crime does not show a negative influence on tourist arrivals in Indonesia and even exhibits a positive impact. This positive effect might occur due to a trend of increasing foreign tourist arrivals accompanied by an increase in violent crimes. This relationship could be influenced by unexplained variables not accounted for in the empirical model used. However, despite the positive impact, the correlation between violent crime and foreign tourist arrivals is negative. Tourists appear to be more sensitive to crime in popular tourism destinations, as indicated by the significant effect of crime on tourist arrivals in these areas. Transportation infrastructure plays a crucial role in the tourism sector to improve accessibility to tourist destinations. The positive impact of government policies on tourist arrivals suggests that government interventions in the economy and tourism sector development initiatives can influence the performance of the tourism sector in Indonesia, leading to an increase in both domestic and foreign tourist arrivals. An increase in per capita GDP indicates an improvement

in the economic well-being of the local population, enabling them to create products, including tourism products, and engage in tourism activities.

The results of this study indicate that improving security in tourist destinations by law enforcement is necessary to maintain a conducive environment for tourism activities, particularly in popular tourist destinations. This can be achieved by increasing the number of police and security personnel in these areas. The government should also develop a contingency plan to recover the tourism sector in case of a security crisis. Fraud crime have a larger negative impact on the number of tourist arrivals, both domestic and foreign. Foreign tourists are more sensitive to crime in tourist destinations, especially fraud crime. Therefore, increased surveillance of tourists at tourist attractions is necessary to prevent fraud targeting tourists, particularly foreign tourists.

The estimation results using the IV-2SLS model indicate that there is an endogeneity problem with the crime variables used in this research topic. The number of police stations variable was unable to address the endogeneity issue with the crime variables. Further research is needed to identify suitable instrumental variables for both total crime and crime by type to effectively address the endogeneity problem.

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