

The Effect of Exchange Rate and Crisis on the Number of Tourist Visits in Indonesia

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Abstract Foreign exchange is a transaction tool in an international market. Therefore, changes in domestic currency exchange rates on foreign currencies will affect macroeconomic variables. Besides, a crisis that occurs will also have an impact on the economy, especially the tourism sector. This study aims to examine the effect of the Rupiah exchange rate on the USD Dollar and the crisis on the number of tourists visits Indonesia. The data used to test this effect were annual time series data from 1990-2022. The results of data analysis using Autoregressive distributed lag (ARDL) model show that there is a long-term effect of exchange rates and crises on the number of tourists. Furthermore, the crisis has a short-term effect on the number of tourists.

Keywords: Exchange rate, crisis, tourism, ARDL

1. Introduction

A tourism sector is important for Indonesia as a source of foreign exchange, in addition to exports of natural resources to cover the current account deficit which is getting bigger over time [1]. The tourism sector's foreign exchange reached USD 6.9 billion in 2018 with a contribution to Indonesia's PDB of 5.3 percent. If the multiplier effect is calculated, it can reach 9 percent [2] The number of workers absorbed in Indonesian tourism sector reaches 12.7 million people [3]

Indonesia is an exotic archipelagic country that has natural destinations and cultural diversity from a mix of ethnic groups which is an attraction for foreign tourists. However, its utilization has not been optimal, considering the number of foreign tourists who come to Indonesia is only 16 million people which is still below Thailand reaching 39 million people and Malaysia reaching 25 million people. The opportunity to increase the number of visitors needs to be addressed by Indonesia considering the tourism prospects, especially in ASEAN projected to grow to 10.3 percent in 2030. [4]

Depreciation of the exchange rate of the domestic currency on USD dollar is a driving factor for foreign tourist arrivals as a result of declining tourism prices [5], [6]. From 1990 to 2022, the depreciation of Rupiah exchange rate on USD achieves 14.08 percent per year. Thus, the cost of spending tourists in Indonesia is cheaper because, theoretically price is negatively correlated with demand. So, the average expenditure of tourists in Indonesia is only USD 1000-1200 per 30 days [7].

Studies on the relationship between the exchange rate and the number of tourist arrivals have been carried out by previous researchers, but their findings are mixed. First, there is a positive effect of the exchange rate on the number of tourist visits [8], [9], [10], [11]. Second, there is a negative effect of the exchange rate on the number of tourist visits [12],[13], [14]. Third, there is a positive/negative effect of the exchange rate on the number of tourist visits [15], [16], [17], [18]

Theoretically, the exchange rate has a positive correlation with tourist visits in a country because the price decreases when it is calculated in foreign currency. As shown by the results of studies by [9], [10], they found a positive and significant effect of the exchange rate on the number of tourist arrivals in Indonesia. However, [8] found that the effect of Rupiah exchange rate is positive and not significant on tourist visits. [11] also found that an increase in the exchange rate leads to a higher increase in the number of international tourist arrivals in 47 developing countries.

On the other hand, the result of a study by [12] has found a negative effect of the destination country's currency exchange rate on the Australian Dollar for Australian tourist who visits Indonesia, Malaysia, Singapore, Thailand and the Philippines. Then [13] found a short-term negative effect of changes in exchange rates on tourist visiting Gambia. Furthermore, [14] found empirically that relatively effective exchange rate volatility has a negative and significant effect on the demand for international tourism in Turkey.

The effect of the exchange rate on the demand for foreign tourists can be asymmetrical and symmetrical as well as positive and negative depending on the country and group of countries that are the object of research such as a study by [15] found that there is not relationship between changes in exchange rates (Euro/Lira) and (USD/Lira) on the number of tourists from Germany and the United States to Turkey. However, there is a two-way causality relationship between the exchange rate (Pound/Lira) and the number of tourists from England.

[16] found that there is a long-term relationship between tourism demand and asymmetric exchange rate fluctuations in Denmark, Norway, Sweden, Switzerland, Poland, Czech Republic, Croatia, Hungary, Romania, and the Russian Federation. Thus, depreciation and appreciation affect tourism demand differently both in sign (positive and negative) and size. Furthermore, [19] found that tourists visiting Australia are sensitive to exchange rate fluctuations only three weeks before departure.

Furthermore, [17] found a negative relationship between real exchange rates and demand for 10 destinations in Europe, with mixed effects for several countries. The effect of the appreciation/depreciation of the exchange rate is greater on the demand for French, Dutch, Polish and Turkish tourists asymmetrically. As for Austria, Greece and Italy tourists, there is a long-term effect of asymmetric exchange rates. Tourist arrivals in Spain, Germany and the UK are asymmetrically insensitive to exchange rates.

Then [18] found a long-term nonlinear relationship between the exchange rate and tourism demand, positive exchange rate shocks have a greater long-term impact on tourist arrivals than negative exchange rate shocks in India. Positive shocks have a short-term significant impact on tourism demand.

Tourists need comfort and security because the purpose of a vacation is to rest and to have fun or business purposes [20]. Tourism development requires the support of a political-legal system [21]. Countries that are unstable in politics, war, economy and finance, terrorists, crime, pandemics etc. can lead to insecurity and discomfort, foreign tourists will be shunned. Several countries will implement travel warnings for unsafe countries [22].

The results of studies on the impact of the crisis on the visit of foreign tourists have been carried out by; [23], [24], [25], [26], [9], [27] whose results vary and factors causing crisis also vary.

The results of the study by [23] found that perceptions of risk influence the choice of international tourist destinations, high-risk destinations are avoided by tourists. Then, [9] identified seven tourist risks including; health, political crises, terrorism, strange foods, cultural barriers, political & religious dogma, and crime.

An increase in oil price can affect international tourism because these activities are oil-intensive and the distance factor from the tourist's country of origin. Meanwhile, the results of [9] study, found a short-term negative effect of oil prices on the number of tourist visits to Indonesia.

The results of a study by [26] found that in September 2001 in the WTC US and acute respiratory syndrome and avian flu hurt tourist demand in Malaysia. In line with those findings, terrorists and Arab Spring crisis cause the decline of Egyptian tourism. Political and security crisis have caused the visit of tourists to decline for five years [27]. Then [28] prove that tourism is one of the worst industries hit by the COVID-19 pandemic and it takes time for tourists to return to their initial mobility even after the crisis is over.

Based on the diversity of findings from previous researchers in various countries regarding the relationship between exchange rates as well as crises and tourism, a study on the effects of exchange rates and crises on the number of tourist visits in Indonesia is interesting.

2. Literature Review

Tourism is a social, cultural and economic phenomenon involving the movement of people to countries or places outside the usual environment for personal, business and professional purposes [29]. Tourism is an important sector in the economy because it has multi-sectoral links with broad impacts if the economic multiplier effect is taken into account [30].

The exchange rate is a macroeconomic variable that theoretically has a positive effect on exports because currency depreciation can increase the competitiveness of export commodities (tourism) comparatively with reduced prices (costs) and can encourage increased demand [31]. Studies on the relationship between the exchange rate and the demand for tourists to Indonesia have been carried out by; [32] who found that Rupiah exchange rate on Singapore dollar has a positive and significant effect on Singaporean tourists visiting Indonesia, and it did not have an effect on per capita income for data from 2003 to 2013.

Then [9] studied the effect of exchange rates on the number of tourists visiting Indonesia for data from 1995 to 2018. Based on the ARDL and ECM_AARDL models it is found that the exchange rate and oil price volatility have a short-term negative effect on the number of tourist visits in Indonesia, and a long-term effect on the internet.

[33] studied the relationship between exchange rates and flight costs, employment and tourist visits to Indonesia for the data period 2000.1-2018.4. The results of the VECM model test show that; the exchange rate contributes to stimulating tourist visits, air transportation and employment in Indonesia in the long and short-term. Then air transportation does not contribute to exchange rate shocks, tourist visits and employment. Furthermore, tourist visits only play a short-term role in air transportation.

Furthermore, [34] examined the relationship between exchange rates and tourist visits by using panel data from 2010-2020 and 16 countries of origin of tourists. Based on the fixed effect model, it was found that there is a positive and significant effect of exchange rate, per capita income on tourist demand in Indonesia, and it does not affect prices. In contrast to the results of [35] based on the OLS model, it found a negative and not significant effect of Rupiah exchange rate and inflation on the number of tourist visits in Indonesia for data from 2006 to 2020.

The results of a study by [10] using panel data for data from 1995-2016 and three ASEAN countries found the exchange rate has a positive and significant effect on the number of tourist visits in Indonesia, Malaysia and Thailand based on the fixed effect mode, while the dummy variable has a negative effect.

Studies on the effect of the exchange rate on the number of tourist visits for international scope were carried out by; [16] who has studied the relationship between tourist demand and exchange rate fluctuations in Denmark, Norway, Sweden, Switzerland, Poland, Czech Republic, Croatia, Hungary, Romania, and the Russian Federation from 1995 to 2016 period. The results of the non-linear regression model test found that depreciation and appreciation asymmetrically affect tourism demand differently both in sign (positive and negative) and size.

Then [11] used data from 1995 to 2020 panel with data from 47 developing countries to study the effect of exchange rates on the number of tourist visits. The results of the Fixed Effect model test show that exchange rates, income, infrastructure and institutions have a positive and significant effect on the number of tourist visits, while pollution has a negative effect. Furthermore, [14] studied the effect of effective exchange rate on the number of tourist visits using data from 2002 to 2018 from 29 OECD countries. Based on the nonlinear model, it was found that effective exchange rate volatility (foreign exchange/Lira) and population growth spoil tourist visits to Turkey, while the PDB of the country of origin has a positive effect.

[36] studied the effects of the monetary crisis and Bali bombings I and II from 1989 to 2007. The ARIMA model test results found that the effect of the monetary crisis on tourist visits to Bali is permanent, while the effect of the bomb crisis is only temporary.

[26] used data from 1989 to 2010 paneled with 12 Malaysia's main market countries (Australia, Brunei, China, Germany, Indonesia, Japan, Singapore, South Korea, Taiwan, Thailand, England and the United States). The results of the FMOLS model test showed that terrorist attacks in September 2011, as well as the outbreak of the SARS-virus and prices have a negative effect on demand for Malaysian tourism. Meanwhile, income has a positive effect.

[25] examined the effect of rising international oil prices on tourist visits to New Zealand from 18 main market countries based on a two-stage CGE model with a simulation of a 100 percent increase in oil prices from 2008 to 2009. Their findings show that; there is a strong negative effect on international tourism, especially in the long-haul market. Oil-intensive international tourism activities are more vulnerable to rising oil prices. On the other hand, for oil-producing countries, an increase in oil price increases income, which in turn increases the demand for their tourism.

Then [9] studied the effect of oil price volatility and internet on the number of tourist visits to Indonesia for data from 1995 to 2018. Their findings, based on the ECM-ARDL model found that oil price volatility only has a negative effect on the number of tourist visits, while the exchange rate has a short-term positive effect. Finally, internet has a long-term positive and significant effect.

Research on crises that might affect foreign tourist visits to Indonesia has been carried out by; [37], She studied the demand for tourists to Bali based on data from 1990 to 2012 for 6 of Indonesia's main market countries. The OLS model test results show that unlike tourists from Malaysia and Africa, tourists from America, Europe, and Australia concerned Bali bombing crisis. Furthermore, [36] studied the effect of the monetary crisis and Bali bombing crisis I and II on tourists entering Ngurah Rai airport for data from 1989 to 2007. Based on the results of the ARIMA model test, it was found that there is a negative effect of monetary crisis and bombs on tourist visits to Bali permanently and temporarily.

The results of [8] has study are based on panel data for data from 2002 to 2011 and 34 countries in the world. The results of the Fixed Effect model test show that, unlike ASEAN, the demand of Western tourists has decreased to Indonesia after Bali bombing incident. Distance has a negative effect and income has a positive effect on tourist visits to Indonesia.

Studies on the effect of the crisis on international tourist demand have been carried out by; [26] who examine the safety level factor in choosing tourist destinations using non-stationary Panel data for data from 1989 to 2010 with 12 countries ranking the highest visits. Their findings show that terrorist attacks and the bird flu epidemic (SARS) have a negative and significant effect on tourist demand in Malaysia.

Then, [28] found online that the Covid-19 Pandemic has had an impact on tourist visits from Europe, America and Asia all over the world. Based on information from the media about the pandemic, almost all of the visitors canceled their trips causing Turkey's tourism sector to decline.

[10] study is based on panel data from 1995 to 2016 with three ASEAN countries. Based on the results of the fixed effect model test, it was found that HIV prevalence and the 1997/1998 dummy monetary crisis spoil tourist visits to Indonesia, Malaysia and Thailand.

3. Data and Method

3.1 Data

There were three time series data used in this study, namely: exchange rates, dummy, and the number of tourists visiting Indonesia (abbreviated as the number of tourists). The proxy of the exchange rate was USD/IDR. The unit of the exchange rate was Rupiah and the unit for the number of tourists was people. Dummy (D) was defined with

$$DU(TOU) = \begin{cases} 1 & \text{if } TOU \text{ decreases (crisis)} \\ 0 & \text{if } TOU \text{ increases – fix (non crisis)} \end{cases}$$

TOU referred to the number of tourists. Data were obtained through Central Agency on Statistics website.

3.2 Method

To analyze the data, the ARDL model was used. The three variable notations used were EXC (exchange rate), number of tourists (TOU), and dummy (DU). The autoregressive distributed lag (ARDL) model with the length of the time lag p, q, r written ARDL (p,q,r) [38] was as follows

$$TOU_t = C_0 + \sum_{i=1}^p \theta_i TOU_{t-i} + \sum_{j=0}^q \alpha_j EXC_{t-j} + \sum_{k=0}^r \beta_k DU_{t-k} + \varepsilon_t \quad (1)$$

Equation 1 (1), C_0 , θ_i ($i = 1, 2, \dots, p$), α_j ($j = 0, 1, \dots, q$), β_k ($k = 0, 1, \dots, r$) was the parameters of the ARDL equation, and ε_t was the residual. This residue had the following assumptions: normally distributed, free of autocorrelation and homoscedasticity. Equation (1) was also known as long-term model.

To determine the long-term relationship between the exchange rate as well as crisis and the number of tourists, it was necessary to test the cointegration between the exchange rate as well as crisis and the number of tourists. The ARDL cointegration model [39] was as follows:

$$D(TOU_t) = C_0 + \sum_{i=1}^{p-1} \theta_i D(TOU_{t-i}) + \sum_{j=0}^{q-1} \alpha_j D(EXC_{t-j}) + \sum_{k=0}^{r-1} \beta_k D(DU_{t-k}) + \tau_1 TOU_{t-1} + \tau_2 DU_{t-1} + \varepsilon_t \quad (2)$$

τ_1 and τ_2 were parameters, notation D in front of the variable denoted the operation of differentiation. The existence of cointegration was indicated by the significance of τ_1 and τ_2 . In this case, exchange rates and crises were cointegrated with the number of tourists.

The above cointegration test was carried out if one or both of the independent variables were stationary in the first differential. Therefore, the stationary test was performed before testing cointegration to ensure that there were not stationary independent variables in the second

differential as a condition for using the ARDL model. To test the stationary of the variables, the test used was the augmented Dickey-Fuller (ADF) test.

To examine the short-term effect of exchange rates and crises on the number of tourists, the ECM-ARDL model was used as follows;

$$D(TOU_t) = \alpha_0 D(EXC_t) + \beta_0 D(DU_t) + \pi EC_{t-1} + \sum_{i=1}^{p-1} \theta_i^* D(TOU_{t-i}) + \sum_{j=0}^{q-1} \alpha_j^* D(EXC_{t-j}) + \sum_{k=1}^{r-1} \beta_k^* D(DU_{t-k}) + \varepsilon_t \quad (3)$$

θ_i^* , α_j^* dan β_k^* referred to parameters, and π error correction coefficient of the error correction variable EC_{t-1} .

The stability test used the Cusum test, while the assumptions that need to be checked were normality, autocorrelation and homoscedasticity checked with the Jarque Bera test, Breusch-Godfrey Serial Correlation LM, and Arch.:

4. Finding and Discussion

4.1 Finding of the study

4.1.1 Tourist Development

The number of foreign tourists coming to Indonesia had increased and fluctuated, with an average increase of 7.5 percent per year since 1990-2022, but in 1998 it contracted to -11.16. It increased after the crisis passed from 1999 to 2001. But, Bali bombing crisis and other crises in 2002 to 2003 caused the number of foreign tourist visits to contract again -2.33 percent and -11.25 percent respectively. In the following years it rose sharply, but from 2005 to 2006 there was an increase in world oil prices which resulted in a decrease in foreign tourist visits -4.32 percent and -5.61 percent, respectively because oil-intensive long-distance travel has an impact on rising tourist prices and a decrease in the number of foreign tourist requests to Indonesia. From 2007 to 2019 it increased rapidly, but the Covid-19 crisis caused the number of visits to contract very deeply, reaching double digits due to the Lockdown policy almost all over the world.



Figure 1. Number of tourist visits to Indonesia from 1990 to 2022 (Millions of People)

4.1.2 Test Result

At first, a stationary test of the three variables namely exchange rate, crisis and the number of tourists was carried out. Stationary result using the ADF test is given in Table 1. The three variables of exchange rate, number of tourists and crisis were stationary at first difference.

Table 1. ADF Stationer Test

Variable	Intercept	Intercept and trend
EXC	-1.735052	-1.455448
D(EXC)	-4.454229*	-4.567241*
DU	-1.230743	-1.139877
D(DU)	-8.057173*	-8.049084*
TOU	-1.991142	-5.519757*
D(TOU)	-7.433197*	-7.483633*

Note: * significant 1%.

The next step was to test the cointegration between the exchange rate as well as crisis and the number of tourists. The length of the time lag of the ARDL model using AIC criteria was $p=3$, $q=0$ and $r=2$. Therefore, to test cointegration, the ARDL bound model used was the ARDL model (3,0,2). The result of calculating the F statistic was 5.709 This value was greater than the critical value F at the upper bound at a significance level of 1%, namely 5.000. Thus, exchange rates and crises were cointegrated with the number of tourists. In other words, exchange rates and crises have a long-term relationship with the number of tourists.

The estimation results of the ARDL model (long-term relationship), and the ECM-ARDL model (short-term relationship) are given in Table 2.

Table 2: Estimation of long run and short run coefficients

Constant and independent variable	Coefficient	t-Statistics	P-value
Panel A: Long-term coefficient, Dependent variable: TOU			
EXC	0.542376	5.058440	0.0000
DU	-1.173961	-4.397493	0.0002
C	11.09949	11.17111	0.0000
Panel B: Short run coefficient, Dependent variable: D(TOU)			
D (TOU (-1))	0.872502	5.163926	0.0000
D (TOU (-2))	-0.979453	-5.434952	0.0000
D (DU (-1))	-0.452125	-3.627479	0.0015
ECT(-1)*	-0.745798	-5.094278	0.0000

Note: P-value of assumption test Jarque Bera, Breusch-Godfrey Serial Correlation, dan Arch respectively 0,135, 0,395 dan 0,479.

The coefficients of all variables in Table 2 were valid because normality, autocorrelation and homoledastic assumptions of the residuals model ARDL(3,0,2) and ECM-ARDL(2,0,1) and the stability of the model based on the cusum tests were fulfilled and the graph was not out of the red line for a significant 5%. The results of the estimation are as follows. Exchange rates and crises have a long-term effect on the number of tourists. The exchange rate does not have a short-term effect on the number of tourists, while the crisis affects the number of tourists.

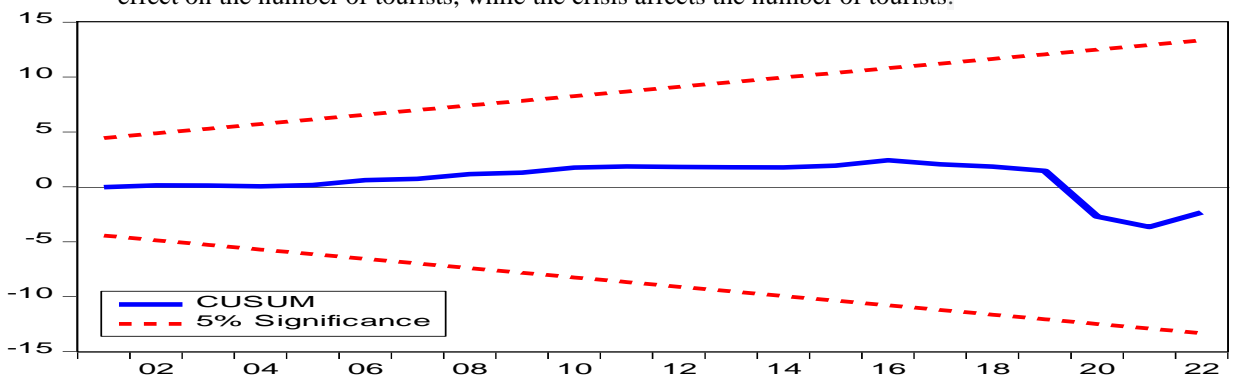


Figure 2. Stability test results of ARDL (3,0,2)

4.2 Discussion

The results of this study found that there is a long-term positive and significant effect of the exchange rate on tourist visits to Indonesia which can prove the theory of export demand for international tourism services where the depreciation of Rupiah exchange rate causes tourist prices to decrease calculated in USD Dollars and Indonesia's comparative advantage increases [31].

Meanwhile, the results of previous studies that support this finding are; [8], [9], [10] and [11]. However, the results of this study differ from several previous researchers who concluded that the effect of the exchange rate on the number of tourist visits was negative, including; [12], [13] and [14]. This difference can be caused by the time span of the data used and the social and economic conditions of the country where the research was carried out.

Then, the negative crisis dummy affected the number of tourist visits to Indonesia. Study results that are in line with these findings are; [25], [26], [27] and [28]. On the other hand, the results of studies that differ from these findings include; [36], [40] and [8]. These differences can be caused by differences in data, analysis tools and the location and scope of the area where the research was carried out.

5. Conclusion and Recommendation

5.1 Conclusion

Exchange rates and crises can affect macroeconomic variables including tourism. This study aims to examine the long-term and short-term effects of exchange rates and crises on the number of tourists in Indonesia. For this purpose, the data used are annual time series data from 1990 to 2022, and the model used to analyze this data is the autoregressive distributed lag model. Before testing the effect, the initial steps taken were to test the stationarity of the data and the cointegration between exchange rates and crises on the number of tourists. The stationary test results showed that the three variables namely exchange rate, crisis and the number of tourists were stationary in the first differential. Furthermore, the results of the cointegration test showed that exchange rates and crises were cointegrated (have a long-term relationship) with the number of foreign tourists. Results of the test showed that the exchange rate has a long-term positive and significant effect on tourist visits to Indonesia. Meanwhile, the crisis had a negative and significant effect. In the short-term, only the crisis will affect the number of tourist visits.

5.2 Recommendation

To increase the number of tourist visits to Indonesia, it is necessary to maintain exchange rate stability and to prevent a security crisis that affects tourists, especially those from countries with a relatively long length of stay and relatively large expenditures. So, Indonesia should be more aggressive in promoting destinations other than Bali to European and American tourists who have relatively higher spending and income per capita.

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