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THE EFFECTS OF EXCHANGE RATE, POLITICAL STABILITY AND REGIONAL OPENNESS ON INDONESIA INBOUND TOURISM: A PANEL REGRESSION APPROACH

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Abstract
This study aims to examine the impact of exchange rate dynamics, political environment and regional openness on Indonesia's inbound tourism using panel regression approach by investigating to what extent the changes of these factors will affect Indonesia's inbound tourism from 2003 to 2013. The results suggest that regional openness has the most significant impact on the inbound tourism in Indonesia, followed by the stable political environment. The presence of the international airport in the region has a strong positive impact on the increase of inbound visitors to Indonesia. With one unit increase in the regional openness, the number of inbound visitors will increase by 3.83 units. The political stability also contributes positively to Indonesia's inbound tourism. A one unit increase in the political stability index will attract inbound visitors by 0.78 units. However, there is no evidence that exchange rate is significantly impacting on the decisions of overseas visitors to travel to Indonesia.

Keywords: Inbound tourism, exchange rate, regional openness, political stability, panel data

1. INTRODUCTION

The tourism industry in Indonesia has a pivotal role in the economy both as a source of revenues and employment opportunities. In 2014, the direct contribution of tourism to GDP is at 3.35 percent of GDP[1]. It reflects all tourism activities from hotels, travel agents, airlines, restaurant, leisure industry and transportation services. As tourism industry may also include other sectors such as tourism supply chain and investment, the total contribution of travel and tourism of GDP is even higher at about 9.4 percent.

Domestic tourism revenues in Indonesia accounts for 78.2 percent of the tourism GDP compared to 21.8 percent of foreign tourism revenues. Visitor exports (revenues from foreign visitors as a percentage of export) generate Rp107 trillion or 5 percent of total exports in 2013. Even though domestic tourism dominates tourism revenues in Indonesia, inbound tourism revenues continue to increase. With regards to the labor force, tourism industry creates 9.5 million jobs in 2014 or 8.5 percent of total Indonesia's national employment.

Foreign visitor arrivals to Indonesia continue to increase in recent years and is expected to continue in the next few years. From 2003 to 2013, the average annual rate of inbound arrivals is at about 10 percent. Singaporean visitors are the largest contributors of about 18.57 percent of the total arrivals, followed by Malaysian (16.26 percent), Australian (11.34 percent), Chinese

[1] Travel and Tourism, Economic Impact 2014 Indonesia. World Travel and Tourism Council

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(9.17 percent) and Japanese (5.58 percent). Asian visitors remain the largest contributors for inbound visitors about 67.19 percent of the total arrivals in Indonesia[2].

With regards to the mean of transportation, inbound visitors arriving by air consists of 73.04 percent of the total arrivals in 2013, followed by sea (26.41 percent) and land (0.55 percent). Inbound visitors arriving by air mainly from Asia of about 59.21 percent, followed by Europe (17.15 percent), Oceania (15.56 percent) and America (4.46 percent). This high growth of air passengers may be due to the widespread use of low-cost airlines. The direct flights between major Indonesia and overseas airports have contributed to the significant increase of inbound visitors in recent years.

This study contributes in two ways. First, this is the first study that investigates the impact of the exchange rate, regional openness and political environment on the inbound tourism in Indonesia. Most of earlier studies focus on at the country level, but this study examines at the regional level. Second, this study uses panel data to investigate factors that may contribute to the number of inbound tourism such as exchange rate, political stability, and regional openness. The aim of this study is to examine the impact of the exchange rate, regional openness and political environment on inbound tourism in Indonesia by investigating to what extent the changes of Indonesian Rupiah, regional openness, and political environment will affect Indonesia's inbound tourism from 2003 to 2013.

The paper is organized as follows. Section 1 provides an introduction. Section 2 describes the relevant literature about the relationship between exchange rate, regional openness and political environment on inbound tourism. Section 3 is the research method and data. Section 4 discusses result and discussion. Section 5 concludes.

2. LITERATURE REVIEW

There are numerous empirical studies investigating the relationship between tourism and economic growth (Lanza, Temple, & Urga, 2003), (Dritsakis, 2004), (Oh, 2005), (C.-C. Lee & Chang, 2008), (Brida, Lanzilotta, Lionetti, & Risso, 2010) and (C. G. Lee & Hung, 2010). However, research on the relationship of tourism, exchange rate, regional openness and political environment has received a little attention. For example, Gil-Pareja, Llorca-Vivero, & Martínez-Serrano (2007) analyze the relevance of a currency union and exchange rate arrangements on the European tourism, and the results show that euro currency has a positive and statistically significant effect on tourism, but exchange rate volatility does not have a significant effect on tourism. Anastasopoulos (1989) examines the impact of the fluctuations of the US Dollar on inbound tourism in the US. The findings suggest that incomes and exchange rates are the most significant determinants of inbound tourism in the US and the majority of inbound travelers are shown to be more sensitive to the US currency fluctuations. Chadeeand and Mieczkowski (1987) estimate the effects of the depreciation of the Canadian dollar on the Canadian tourism industry. The results show that the impact of exchange rate on Canadian tourism receipts is found to be modest.

[2] International Overseas Visitor Statistics 2013, Indonesia's Central Agency of Statistics

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Many empirical studies documented that political instability has a negative impact on tourism. The higher degrees of political instability may lower inbound tourism due to higher travel risk for overseas visitors. Furthermore, traveling to the politically unstable economy, the home country will likely to issue travel warnings to their citizens to not visiting the destination country, hence even reducing the number of inbound visitors. Seddighi, Theocharous, & Nuttall (2002) find the existence of political instability on a regional level can lead to a negative spillover effect on the tourism industry of a nearby region and country. Tang & Abosedra (2014) examine the impacts of political instability on economic growth and tourism in the Middle East and North African (MENA) regions from 2001 to 2009 and found that political instability impedes economic growth and tourism. Saha & Yap (2014) analyze the effects of interaction between political instability and terrorism on tourism development using panel data from 139 countries for the period 1999–2009 and the results show that the effect of political instability on tourism is far more severe than the effects of one-off terrorist attacks. A high level of political risk may detriment the tourism industry.

Studies examining the relationship between regional openness on inbound tourism, however, are also scarce. Mitríková (2014) finds that transport accessibility is an important factor influencing the development of tourism in the Polish-Slovak borders, while Wong & Tang (2010) analyze the relationship between tourism and openness to trade in Singapore and find that there is a causality bidirectional relationships between tourism and openness to trade.

3. RESEARCH METHOD

This study adopts a static and dynamic panel estimation technique to estimate the number of inbound tourism in Indonesia. The static panel estimation technique includes a pooled Ordinary Least Squares (OLS), random effects (RE) and fixed effect (FE) model. The dynamic panel estimation uses a Generalized Method of Moment (GMM) estimator including a one-step and two-step of the Arrellano-Bond algorithm.

The dependent variable used in the study is the number of inbound tourism (*IN*), while exchange rate Rupiah against USD (*XR*), political stability index (*POL*) and regional openness (*OPEN*) are explanatory variables. Table 1 present variables used in the study.

Table 1 Variable Definition and Descriptions

Variable	Description
$LnIN_{i,t}$	Natural logarithm of number of inbound visitors for each province i at time t
$Ln\,XR_{i,t}$	Natural logarithm of exchange rate IDR against USD for each province i at time t
$LnPOL_{i,t}$	Natural logarithm of political stability index for each province i at time t
$OPEN_{i,t}$	A dummy variable of regional openness for each province i at time t
λ_i	Regional-specific effect
μ_t	Time-specific effect t

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$\varepsilon_{i,t}$	Error term

3.1 Static Panel Model

To analyze the impact of the exchange rate, regional openness, and political stability on inbound tourism, a static panel model is used with the following model specification:

$$\mathrm{LnIN}_{i,t} = \beta_0 + \beta_1 \mathrm{LnXR}_{i,t} + \beta_2 \mathrm{LnPOL}_{i,t} + \beta_3 \mathrm{OPEN}_{i,t} + \lambda_i + \mu_t + \varepsilon_{i,t} \qquad (1)$$

Where $LnIN_{it}$ is the natural logarithm number of inbound visitors for each province i at time *t*; $LnXR_{it}$ is the natural logarithm of exchange rate IDR against USD for each province *i* at time *t*; $LnPOL_{it}$ is a political stability score for each province *i* at time *t*; $LnOPEN_{it}$ is a dummy variable of regional openness for each province *i* at time t; λ_i is the regional-specific effect; μ_t is the time-specific effect and ε_{it} is the error term. Table 1 summarizes variables used in the study. The panel data series consists of 33 provinces in Indonesia with annual data from 2003 to 2013. The number of inbound visitors is collected from International Overseas Visitor Statistics, Indonesia's Central Agency of Statistics.

Table 2 shows that the average number of inbound visitors in Indonesia is 196,142 with a relatively large standard deviation of 624,939. The top destinations for inbound visitors are Bali and the capital of Jakarta. Bali alone contributes about 50 percent of inbound visitors, followed by Jakarta of about 13.40 percent. Within our observation periods, the average value of Rupiah against USD is Rp 9450/USD with a relatively small standard deviation of Rp567. The political stability index varies across the year, while during the Presidential election year in 2003/2004 of being the period of lowest political stability index. The degree of openness of region also varies across regions. The region with the existence of international airport will attract more inbound visitors compared to those without the international airport.

Table 2 Summary Statistics of Variables

Variable	Mean	Stdev	Min	Max
Inbound visitors	196,142	624,939	1	6,362,093
Exchange rate	9,450	567	8,742	10,430
Political stability index	17	8	4	29
Regional openness	1	1	-	1

Source: Author's own estimates

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The choice of appropriate estimation model will highly depend on the behavior of λ_i and μ_t. In the event where both region and time-specific effects are absent, then the pooled OLS estimation is appropriate to estimate the parameters in the model (1). If the time-specific effects are absent, but there are regional-specific effects, the estimation results with the Fixed Effect model should be chosen with an approach of LSDV (Least Square Dummy Variable). However, if the time-specific effects are absent but the regional-specific effects are present, Random Effect (RE) model will be used.

The Generalized Least Squares (GLS) estimator can also be used to estimate the RE model. This study also applies several statistical tests to determine the suitability of model selections. The Breusch–Pagan Lagrange Multiplier (LM) test is used to test model selection between the pooled Ordinary Least Square (OLS) and the RE model. To choose between RE and FE model, the Hausman test is then used.

It is argued that depreciation of domestic exchange Rupiah against USD will increase the number of inbound tourist arrivals. Thus β_1 coefficient is expected to be negative. The higher political stability index indicates a more stable political environment; therefore β_2 is also expected to be positive. Since the political stability index is only available at the country level, it is assumed that all regions to have the same value of the political stability index in a given year. The openness of region (β_3) as reflected by the existence of international airport in the region, is also expected to be positive, as the presence of international airport will promote and attract more overseas visitors.

3.2 Dynamic Panel Model

The dynamic panel model is used to capture the short-term effects of local government debt on growth in 33 provinces. In many economic relationships, the dependent variable depends not only on the exogenous variables but also on its own lag values (Pasha et al., 2007). This model includes the same dependent variable and control variables that have been used in the baseline static model, but a one-year lagged term of the number of inbound tourism is used as an explanatory variable. The dynamic model specification is as follows:

$$\mathrm{LnIN}_{i,t} = \beta_0 + \gamma \mathrm{LnIN}_{i,t-5} + \beta_1 \mathrm{LnXR}_{i,t} + \beta_2 \mathrm{LnPOL}_{i,t} + \beta_3 \mathrm{OPEN}_{i,t} + \lambda_i + \mu_t + e_{i,t} \quad (2)$$

Where k is the number of lag from 1 to 5

The dynamic model specification provides an intuitive appeal that the dynamic mode allows us to track the short-run effect of inbound tourism to the overall model. The inclusion of lag term might trigger endogeneity problem between the lagged dependent variable and the error term. Thus the GMM estimator proposed by Arellano and Bond (1991) is used. The GMM model can capture dynamic relationship among variable of interests as well as solve endogeneity problem. The GMM approach of (Arellano & Bond, 1991) allows controlling

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individual and temporal-specific effects with short-run dynamics, solving variable endogeneity bias, simultaneous bias and inverse causality.

3.3 Test of Stationarity

The unit root test is used in the study to provide information about the data being stationary or not. The presence of unit roots makes hypothesis test results unreliable; thus the unit root test is required to examine the presence of unit roots and to determine appropriate order of difference to obtain the stationary series. The Augmented Dickey-Fuller (ADF) is used to test stationarity of the data series. The unit root tests are classified into series with and without unit roots, according to their null hypothesis of being stationary or not. The ADF tests for each series include intercept and trend. The ADF tests find the presence of a unit root in *XR* and *POL*; and also suggest that all variables are stationary at first difference.

Table 3 Augmented Dickey-Fuller Test

	ADF Test Level			ADF Test First Difference			Result
Variable	Individual intercept	Individual intercept with trend	None	Individual intercept	Individual intercept with trend	None	
IN	-17.81***	-17.93***	-16.38***	-15.82***	-15.81***	-15.85***	I(1)
XR	-1.77	-2.1	0.69	-18.98***	-18.95***	-18.97***	I(1)
POL	-0.52	-3.86**	2.04	-19.31***	-19.28***	-18.97***	I(1)
OPEN	-7.94***	-7.93***	-1.70*	-5.39***	-5.39***	-5.39***	I(1)

Source: Author's own estimates

Notes:
* significant at 10%,
** significant at 5%
*** significant at 1%

IN is the number of inbound visitors; *XR* is the exchange rate Indonesian Rupiah against USD; *POL* is a political stability index, and *OPEN* is a regional openness.

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3.4 Coefficient of Correlation

The correlation matrix is used to investigate relationships among explanatory variables. Of the explanatory variables: *LNIN*, *LNPOL*, *OPEN*, thus there are total nine paired correlations. The correlation between LNXR and *LNPOL* is modest at about 53.8 percent. Since the regional openness is a dummy variable and the correlation coefficient only applies to the continuous variables, thus it is hard to interpret the correlation coefficient between *OPEN* and *LNXR*; and *OPEN* and *LNPOL*. The correlation coefficient among explanatory variables is relatively modest, thus reducing the risk of multicollinearity.

Table 4 Correlation Matrix

	LNXR	LNPOL	OPEN
LNXR	1		
LNPOL	0.54	1	
OPEN	0	0	1

Source: Author's own estimates

4. RESULT AND DISCUSSION

The results from static panel model for 33 provinces in Indonesia are presented in Table 4. First, a static panel model with pooled OLS is used. The findings suggest that the coefficient of political stability index (*POL*) and regional openness (*OPEN*) have the correct signs and both statistically significant at the 1 percent level, but exchange rate (*XR*) has not a significant impact on inbound tourism. Among three explanatory variables, it is found that regional openness *(OPEN)* has the greatest impact on the inbound tourism in Indonesia, followed by the political stability index (*POL*). In other words, the presence of the international airport in the region has a strong positive impact on the increase of inbound visitors to Indonesia. With 1 unit increase in the regional openness *(OPEN)*, inbound visitors will increase by 3.83 units. The political stability also contributes positively to the inbound tourism. A one-unit increase in the political stability index *(POL)* will increase the number of inbound visitors by 0.78 units. The exchange rate (*XR*) may also be an important indicator to predict inbound tourism. It is expected thata depreciation of the domestic currency, Rupiah, can induce more inbound tourism. However, the exchange rate does not have any significant effect on the inbound tourism for the case of Indonesia.

The Breusch–Pagan LM test rejects the null hypothesis of no random effect, implying the estimation results with the random effect (RE) model are more robust than the pooled OLS model. The RE results suggest that the coefficient of political stability index (*POL*) and regional openness (*OPEN)* are both statistically significant at one percent level, but the exchange rate (*XR*) remains insignificant. The RE model also suggests that 1 unit increase in the regional openness *(OPEN)* will attract more 3.83 units increase of inbound visitors, while one unit

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improvement in the political stability index (*POL*) will generate 0.78 unit of more inbound visitors.

The Hausman test is run to decide between random effect (RE) or fixed effect (FE) model to be used. The null hypothesis fails to reject which suggests that the RE model is more appropriate over FE model. The R^2 in the RE model shows that 45.18 percent of the variation of number inbound tourism can be explained by the exchange rate (*XR*), political stability index (*POL*) and regional openness (*OPEN*). This model is also relatively well-fitted, as all explanatory variables are statistically significant at one percent level, except for the exchange rate (*XR*).

In the dynamic panel model, results from the GMM estimator of Arellano-Bond is presented in Table 4. First, this study uses a one-step dynamic GMM estimator with a one-year lagged dependent variable as the independent variable. The Sargan test for a one-step dynamic GMM estimation fails to reject the null hypothesis of over-identifying restrictions suggesting that a one-step dynamic GMM estimator is a robust and standard error is unbiased. It also suggests that a two-step dynamic GMM estimator is not required. The one-step dynamic GMM estimation shows that the one period lagged dependent variable is statistically significant at the one percent level. The estimation results using one-step dynamic GMM estimator show that political stability (*POL*) and regional openness (*OPEN*) have a significant positive impact on inbound tourism in Indonesia, but exchange rate (*XR*) is not significant. A 1 unit increase in the political stability index (*POL*) will attract more inbound visitors from 0.38 to 1.01 unit. The findings suggest that the most important factors of inbound tourism in Indonesia are the stable political environment and regional openness as indicated by the presence of the international airport in the region.

There is mix evidence about the importance of the lagged terms of inbound visitors (*LNIN)*. The results show that the coefficient of the one-year lagged term of inbound visitors is positive and significant at one percent. It suggests that a previous year travel experience can contribute positively to the travel decision at the present year. At the second lag (*LNIN L2*), the coefficient remains positive and significant at one percent. However, at the higher lags, the coefficients become insignificant.

Table 5 Estimation Results

	Pooled OLS	Fixed Effect	Random Effect	GMM				
				1 lag	2 lag	3 lag	4 lag	5 lag
LNIN (Lag 1)				0.19***	0.73***	0.02	0.38***	0.31***
LNIN (Lag 2)					0.12*			
LNIN (Lag 3)						-0.02		
LNIN (Lag 4)							-0.01	
LNIN (Lag 5)								-0.01
LNXR	-0.32	-0.32	-0.32	-0.33	-0.49	0.37	0.29	0.34
LNPOL	0.78***	0.78***	0.78***	0.51***	0.38**	0.92***	0.87***	1.01***
OPEN	3.83***	0	3.83***	0	0	0	0	0
Constant	8.29	10.27	8.29	9.08	5.09	3.48	0.77	0.72

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R^2	0.45	0.15	0.45
Breusch-Pagan test	641.05***	641.05***	
Hausman test		0***	0***

Source: Author's own estimates

Notes:
*Significant at 10%
**Significant at 5%
***Significant at 1%
Number in parentheses indicates p-value

4.1 Endogeneity

Given the strong potential for the endogeneity of exchange rate (*XR*) variable with its dependent variable (*IN*), this study uses various instrumental variables estimation techniques. Some earlier studies are measuring the causal relationship between two variables using the instrumental variables (IV) approach to address the endogeneity problem (Checherita-Westphal & Rother, 2012). This study uses the IV approach to address endogeneity using two-stage least square (2SLS) and GMM estimators (Baum, Schaffer, & Stillman, 2002). The advantage of using 2SLS is that it does not require any distribution assumption of independent variables; it is computationally simple and does not require optimisation algorithms; and it easily caters for nonlinear and interaction effects (Bollen & Paxton, 1998), while the GMM estimator can correct for the possible heteroskedasticity and autocorrelation in the error structure by using a consistent estimator. The two-step GMM matrix also provides some efficiency gains over the 2SLS estimator derived from the use of optimal weighting matrix, over-identifying restrictions in the model, and the relaxation of the independent and identical distribution assumption (Baum et al., 2002).

The endogeneity may arise from the causal relationship between the number of inbound tourism (*IN*) and exchange rate (*XR*). It can be argued that variable *IN* and *XR* may have a bidirectional causal relationship. The *XR* variable is instrumented with other instrumental variables (*IV*). The choice of IV should have the property that changes in the IV is associated with changes in the *XR*, but do not lead to the change in *IN*

Some previous studies documented the relationship between exchange rate and other economic variables. (Branson, 1981) and (Hughes Hallett & Wren-Lewis, 1997) report that exchange rates and current account have a direct and positive relationship, while (Kandil & Mirzaie, 2008) find that there is a substantial relationship between exchange rates fluctuation and current account balance. This study instruments the *XR* variable with the current account (*CA*) following studies of (Branson, 1981), (Hughes Hallett & Wren-Lewis, 1997) and (Kandil & Mirzaie, 2008).

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The 2SLS approach regresses the dependent variable (*IN)* against the instrument variable (*CA*) plus all other explanatory variables. At the first stage, LNXR is regressed against *CA* and other explanatory variables. The results suggest that *CA* and *LNPOL* are both significant at one percent. The estimated coefficient of *LNXR* from the first-stage estimation is then regressed to the baseline model. In the second stage, the coefficient of *OPEN* is significant at one percent, while the coefficient of *LNXR* and LNPOL is not significant.

The GMM estimates suggest the coefficient of *OPEN* is significant at one percent with the coefficient of 3.83. It indicates that one unit increase in the regional openness will attract 3.83 more unit in the number of inbound visitors. However, the coefficient of *LNXR* and *LNPOL* are not significant.

Table 6 The 2SLS and GMM Results

	1st Stage SLS	2SLS	GMM
CA	-0.001***		
LNXR		14.29	14.29
LNPOL	0.04***	0.11	0.11
OPEN	0	3.83***	3.83***
Constant	9.05***	-123.64	-123.64
Adjusted R^2	0.31	0.45	0.38

Source: Author's own estimates

5. CONCLUSION

This study aims to examine the impact of exchange rate dynamics, political environment and regional openness on Indonesia's inbound tourism using panel regression approach by investigating to what extent the changes of these factors will affect Indonesia's inbound tourism from 2003 to 2013. The results suggest that regional openness has the largest impact on the inbound tourism in Indonesia, followed by the stable political environment. The presence of the international airport in the region has a strong positive impact on the increase of inbound visitors to Indonesia. With one unit increase in the regional openness, the number of inbound visitors will increase by 3.83 units. The political stability also contributes positively to

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Indonesia's inbound tourism. A one unit increase in the political stability index will attract inbound visitors by 0.78 units. However, there is no evidence that exchange rate is significantly impacting on the decisions of overseas visitors to travel to Indonesia.

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