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The Dynamic Relationship between Economic Growth, Tourism Activity, and Real Exchange Rate in Indonesia

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Abstract

This study examines the effect of tourism activity on the economic growth in Indonesia for the period of 1984 - 2014. This study applies the vector autoregressive model, along with the Granger causality test and the persistence profile to analyze the dynamic relationship between tourism activity, economic growth, and real exchange rate in Indonesia. To examine the shock response of the variables, this study uses variance decomposition and impulse response function approach. Throughout analysis is performed based on the empirical literature of the tourism-led growth (TLG) hypothesis. The results show that, based on the co-integration test, there is no long-term relationship between tourism activity and economic growth, while the Granger causality test results no evidence of causality between observed variables, except for economic growth and real exchange rate. In addition, by using variance decomposition and impulse response function to analyze the response of each variable. In explaining the shock of tourism activity in Indonesia, economic growth is more important than the real exchange rate. Meanwhile, tourism activity and real exchange rates are equally important in explaining the shock of economic growth. The impulse response function states that the shock of economic growth and real exchange rate has a positive effect on the tourism activity in the short- and long-term. In addition, the shock of tourism activity has a positive effect on economic growth, while the real exchange rate shock has a negative effect on economic growth in Indonesia.

Keywords: tourism-led growth; Granger causality; tourism activity; exchange rate; Indonesia

JEL Classification: O40; O53

Introduction

Tourism is one of the main sources for stimulating economic growth and development through its impact on foreign exchange earnings, new business, employment opportunities and tax revenues (Elkan 1975, Clancy 1999, Belloumi 2010). Tourism is the third largest industry in the world, therefore, many developing countries rely on tourism to maintain the sustainable economic growth (Sinclair 1998). Globally, the direct contribution of tourism to GDP is approximately 3.1% of total GDP in 2014, rising by 3.7% in 2015, and is expected to rise 3.3% of total GDP in 2025 (WTTC 2015). At the end of 2015, nearly 300 million people were directly or indirectly employed in the tourism sector globally (WTTC 2015).

In accordance to the world tourism rapid progress, the tourism development in Indonesia showed the increasing of tourist arrivals from 8.04 million in 2012 to 8.80 million (2013) and 9.43 million (2014) or it increases by 8.6% and 6.7% in 2013 and 2014 respectively. In 2015, foreign tourist arrivals were approximately 10.4 million or above the target with an estimated growth rate of 7.2%. This was above world tourism growth of 4.4% and ASEAN tourism growth of 6%. According to the UNWTO World Tourism, destinations around the world receive 21 million international tourists in 2016 and total international tourists in the world reaches 561 million in 2016.

Entering the 21st century, the attention to the tourism is very widespread, because it brings benefits and advantages for the country, not only in terms of income but also in stimulating economic growth. Tourism development has a significant role in the economic, social, and environmental issues. Table 1 shows the statistic of foreign tourists visit to Indonesia from 2004 to 2014.

Table 1. Foreign tourist visits to Indonesia 2004 – 2015

Year	Number of tourists (Person)	Growth (%)	Average length of stay (Day)	Average spending per person (USD)		Foreign exchange earnings	
				Per day	Per visit	Million USD	Growth (%)
2004	5,321,165	19.12	9.47	95.17	901.66	4,797.90	18.85
2005	5,002,101	-6.00	9.05	99.86	904.00	4,251.90	-5.75
2006	4,871,351	-2.61	9.09	100.48	913.09	4,447.98	-1.63
2007	5,505,759	13.02	9.02	107.70	970.98	5,345.98	20.19
2008	6,234,497	13.24	8.58	137.38	1178.54	7,347.60	37.44
2009	6,323,730	1.43	7.69	129.57	995.93	6,297.99	-14.29
2010	7,002,944	10.74	8.04	135.01	1085.75	7,603.45	20.73
2011	7,649,731	9.24	7.84	142.69	1118.26	8,554.39	12.51
2012	8,044,462	5.16	7.70	147.22	1133.81	9,120.89	6.62
2013	8,802,129	9.42	7.65	149.31	1142.24	10,054.15	10.23
2014	9,435,411	7.19	7.66	154.42	1183.45	11,166.13	11.06
2015	10,406,759	10.3	8.53	141.65	1208.79	11,760.74	5.33

Source: Ministry of Culture and Tourism of Indonesia (2015)

Based on Table 1, it can be concluded that the number of tourist arrivals and foreign exchange earnings tend to rise annually, only in 2005-2006 decreased.

A number of empirical studies have been conducted to investigate the importance of tourism to economic growth, covering the case for developed and developing countries including Indonesia. However, those empirical results failed to provide a clear evidence of a causal relationship between tourism and economic growth. Some studies on tourism such as Oh (2005) for Korea, Tang and Jang (2009) for the United States, Narayan *et al*. (2010) for Pacific Islands, and Tang (2011) to Malaysia claimed that economic growth led to the growth of tourism. For countries with high economic growth may have a large of business activity and employment opportunity. However, other studies state that tourism causes economic growth through their impact on foreign exchange earnings, employment, tax revenues and other potential benefits to countries of destination (Lau *et al*. 2008, Lean and Tang 2010, Lee and Hung 2010, Belloumi 2010). The relationship between tourism and economic growth remains challenging empirical question that has not been clearly verified whether tourism development actually cause

economic growth or vice versa. Knowing the direction of causality is not only to understand the process, but it is also important to design appropriate tourism policies (Oh 2005).

Regardless of the different results of causality, the main motivation for revisiting the relationship between tourism and economic growth in Indonesia starts with the selection of tourism variables and the weaknesses in estimation technique used in the previous studies. The existing literatures tend to use the international tourist arrivals as a proxy for tourism and to know the benefits of tourism for economic growth (Lau *et al*. 2008, Lean and Tang 2010, Tang 2011). Not all the international tourist arrivals contribute directly for holiday purposes. A number of international tourist arrivals are looking for business and employment opportunities. Therefore, a country may experience high international tourist arrivals but low-level tourism income (Tang 2011).

Motivated by these imperfections and important implications of tourism to economic growth, the aim of this study was to determine the relationship between economic growth, tourism activity and real exchange rate in Indonesia during the period of 1984 to 2014. This study is more comprehensive than the earlier study of tourism and economic growth in Indonesia and it will be presented through systematic steps. First, do a thorough examination of the nature of time series data, specifically by using augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) for unit root test. Second, is to determine the causal relationships between variables using Granger causality test. Finally, this research applies the variance decomposition and impulse response function to determine the dynamic interaction between variables and the speed of convergence to analyze long-term equilibrium in event of shocks.

1. Literature review

The role of tourism development on economic growth has become a scholarly debate among academician, international organization, and practitioner. Various studies have addressed a strong potential of tourism development to create opportunities to promote economic growth, job creation, forward and backward industrial linkage, and tax revenue for the government (Akinboade and Braimoh 2010, Balaguer and Cantavella-Jordá 2002, Belloumi 2010, Croes and Vanegas 2008, Fayissa *et al*. 2011, Khadaroo and Seetanah 2008, Manuel Sr. 2012, Sinclair 1998). Despite the fact today, tourism sector is the most important sector for the world economy and it has been promoted in developing countries because it is recognized as one of the sector's largest foreign exchange earner and able to create jobs.

A lot of empirical studies that explore the relationship between tourism and economic growth found various results. For example, Hazari and Sgro (1995) developed a growth model to include tourism as an additional component to the domestic aggregate demand. As a result, tourism has a positive impact on long-term economic growth. This result is in line with the study performed by Balaguer and Cantavella-Jordá (2002), which using the data from 1975 -1997 for Spain. Both results of study support the tourism-led growth hypotheses. Accordingly, empirical investigations made by Dritsakis (2004) for the case of Greece in 1960-2000, Durbarry (2004) for case of Mauritius in 1952-1999, and Gunduz and Hatemi-J (2005) for the case of Turkey, showed the same direction. With various countries samples, other studies that provide a positive relationship between tourism and economic growth also conducted by Eugenio-Martin, Morales and Scarpa (2004), for the case of Latin America in 1985-1998. Similarly, Fayissa *et al*. (2011)show that revenues from tourism industry significantly contributes to level of GDP and economic growth of 42 African countries during 1995 – 2004. Different with the empirical testing that support the tourism led growth hypothesis, Oh (2005) found the opposite results and explained that the existence of tourism led growth hypotheses in Spain, as stated by Balaguer and Cantavella-Jordá (2002), solely because of Spain is recognized as one of the largest tourism country in the world. Meanwhile, Oh (2005) used tourism data of South Korea. Even though both countries are comparable in the economic development, but South Korea's tourism industry not as strong as Spain. It is proved by the contribution of tourism sector in South Korea, which only 3.5 percent of GDP. Oh (2005) concluded that there is no long-term relationship between tourism and economic growth in South Korea.

Brida *et al.* (2008) examine the contribution of tourism to economic growth in Chile using the Johansen cointegration test and a modified version of the Granger causality test. The results show that, during that period, economic growth in Chile was due to the expansion of international tourism in support of the tourism-led economic

growth hypothesis. Brida *et al.* (2008) in the case of Mexico, used Granger's causality test to analyze tourist spending, real exchange rate and real GDP from 1980 to 2007. This study found a direct cause of the development of tourism to economic growth. Akinboade and Braimoh (2010) examined the causal relationship between international tourism revenue and long-term economic growth in South Africa using Granger's causality test. The results show that international tourism revenue causes real GDP in the short and long term. Hye and Khan (2013) used bounds testing approach in the case of Pakistan and the result show that tourism and economic growth have long-run unidirectional causality.

Kibara *et al.* (2012) examine the relatitionship between tourism and economic growth in a multivariate setting with trade as an intermittent variable using time series data from Kenya and the ARDL-bound testing approach. The results of this study are the direct cause of the development of tourism to economic growth in the long term and short term. Kreishan (2015) examine the tourism-led growth hypothesis for Bahrain using the Autoregressive Distributive Lag Model (ARDL) from 1990 to 2014 and found unidirectional causal relationship from tourism to economic growth.

Tang and Tan (2013) examine tourism-led growth hypothesis in Malaysia validates the foreight of twelve tourism markets using Granger causality test. Mishra *et al.* (2011) uses annual time series data for Indian and Granger causality tests and find long-run unidirectional causality from tourism activities to economic growth. Jalil *et al.* (2013) used the Autoregressive Distributed Lag (ARDL) model in Pakistan during the period 1972 to 2011 and found that unidirectional causalty from tourism to economic growth.

Bento (2016) used the quarterly series cointegration test for the period 1995 to 2015 to examine temporal causal relationship between tourism and economic growth in Portugal. This study separates between domestic and foreign tourists. The study confirmed tourism-led growth hypothesis. Brida *et al.* (2016) explores nonlinear relationship between tourism and economic growth for Argentina and Brazil. Following research results that validate tourism-led growth hypotheses and add a specify nonlinear formats in the case of Brazil but no model specifies nonlinear models correctly in the case of Argentina.

Chiu and Yeh (2016) examined the threshold effects of tourism-led growth hypotheses based on cross-sectional data from 84 countries. This study investigates the development of tourism - the relation of economic growth and found a positive linear impact of international tourism's acceptance of economic growth, which confirms evidence of a tourism-led growth hypothesis. Vita and Kyaw (2016) examine the relationship between tourism specialization and economic growth while taking into account the absorption rate of host countries (tourist destinations), which are defined in the form of financial system development. This study uses System Generalized Method of Moment (SYS-GMM) estimation to investigate the relationship for 129 countries during the period 1995-2011. The results conclude that the relationship between tourism specialization and economic growth is found to be positive and significant for middle- and high-income countries as it appears more benefit from tourism specialization than low-income countries. In addition, the effect of increasing the level of tourism specialization is increasing to countries with more advanced financial systems that are able to support the absorption of these countries from inbound tourism but at a high level of specialization, its influence on GDP growth begins to decline.

2. Method

Data used in this study is based on a time series of secondary data from 1984 to 2014, which includes Gross Domestic Product (GDP), tourism receipts, and real exchange rate. The required data is sourced from the Central Statistics Agency of Indonesia, Ministry of Culture and Tourism Indonesia, and World Bank.

This study uses a model equation TLG, where international tourism is assumed an important factor of economic growth (Balaguer and Cantavella-Jordá 2002, Gunduz and Hatemi-J. 2005, Katircioglu 2009, Katircioğlu 2010). Besides exchange rate is considered as most important variables affecting international tourism and its relationship with real income. The model used in this study can be specified in the following equation:

$$\ln GDP_t = \beta_0 + \beta_1 \ln TR_t + \beta_2 \ln RER_t + \varepsilon_t \quad (3.1)$$

where: GDP = national income (GDP) as a proxy for economic growth, TR = tourism revenue, RER = real exchange rate, β = coefficients to be estimated, ε = disturbance error, and t = time.

This research uses co-integration and Granger causality test analysis. Co-integration test to analyze the relationship between tourism and long term economic growth in Indonesia. Granger causality test to analyze reciprocal (causal) relationship between tourism and economic growth in Indonesia.

In relation to the above method, in its examination of time series data behavior and its integration can be viewed as a prerequisite test for its use in co-integration test and Granger causality test. Before making a model estimation of these methods, the first steps should be taken as follows:

Unit Root Test

Unit root test by Dickey Fuller and Phillips-Perron is used to view the timezone of the time series data. The formula used for Augmented Dickey Fuller (ADF) test is expressed as follows:

$$DY_t = a_0 + \gamma Y_{t-1} + \sum_{i=1}^{\rho} \beta_i DY_{t-1+1} + \varepsilon_t \quad (3.2)$$

where: D is differential.

Null hypothesis used two tests above is, H0: γ = 0 for ADF, and λ = 1 for PP. The stationarity of the data is based on the statistical value comparison of Mackinnon. If | ADF_{stat} | and | PP_{stat} | > Mackinnon critical value, then the data is stationary and if otherwise the data is not stationary.

Co-integration Test

The co-integration test is aimed to find out the long-term equilibrium relationship between tourism and economic growth in Indonesia by using the Johansen test. This method requires two statistic tests, ie by trace test (λ_{trace}) that is testing the null hypothesis that requires a sum of co-integration direction is ≤ ρ. This test can be carried out using the following formula:

$$\lambda_{trace}(r) = -T \sum_{i=r+i}^{\rho} in\,(1 - \lambda i\,) \quad (3.3)$$

where: $\lambda_{r+1}, \ldots \lambda_n$ is smallest eigenvectors value $(\rho - r)$. Null hypothesis used sum of co-integration direction equal to number of r, or a sum of co-integration vectors ≤ r, where r = 0, 1, 2 and so on.

Second statistical test is maximum eigenvalent test (λ_{max}):

$$\lambda_{max}\,(r, r+1) = -T\,in\,(1 - \lambda_{r+1}) \quad (3.4)$$

Based on null hypothesis test there is *r* of opposite cointegration vector (*r* + 1) with cointegration vector. To be able to see co-integration relationship from ratio of value of trace statistic and max-Eigen statistic with value of critical value at *α* = 5%.

Granger Causality Test

Granger causality test is used to see two-way relationship of two variables. Whether it has a direct relationship or no relationship at all.

Granger causality test method:

$$I_t = \sum_{i=1}^{m} a_i I_{t-i} + \sum_{j=1}^{n} b_j Y_{t-j} - \mu_t \quad (3.5)$$

$$Y_t = \sum_{i=1}^{r} c_i I_{t-i} + \sum_{j=1}^{s} d_j Y_{t-j} - v_t \quad (3.6)$$

where: μ_t and v_t are error terms that are assumed serial correlation, and *m* = *n* = *r* = *s*. Based on regression results of two forms of equation models (5) and (6) above will yield four possibilities regarding value of regression coefficients as follows:

$$\sum_{j=1}^{n} b_j \neq 0\ dan\ \sum_{j=1}^{s} d_j = 0 \quad (3.7)$$

There is one-way causality from Y to X:

$$\sum_{j=1}^{n} b_j = 0 \; dan \; \sum_{j=1}^{s} d_j \neq 0 \quad (3.8)$$

There is one-way causality from X to Y:

$$\sum_{j=1}^{n} b_j = 0 \; dan \; \sum_{j=1}^{s} d_j = 0 \quad (3.9)$$

Then there is no causal relationship between X and Y (X and Y are independent of each other)

$$\sum_{j=1}^{n} b_j \neq 0 \; dan \; \sum_{j=1}^{s} d_j \neq 0 \quad (3.10)$$

Then there is a two-way causality between Y and X.

3. Results and discussions

Unit Root Test

Based on ADF unit root test showed that real exchange rate is stationary or does not have a unit root level, while GDP and tourism receipts are not stationary or have a unit root level. Therefore, it must be tested at first difference in stationary test.

Table 2. Unit Root Test

Variables	Augmented Dickey-Fuller (ADF)		Phillips-Perron (PP)	
	Levels	First Differences	Levels	First Differences
lnGDP	-0.0484	-5.4255	-0.122	-4.337
	(0.9464)	(0.0001)	(0.934)	(0.004)
lnTR	-2.6519	-3.8405	-0.326	-5.414
	(0.0942)	(0.0068)	(0.904)	(0.000)
lnRER	-1.3284	-5.6751	-5.509	-4.426
	(0.6031)	(0.0001)	(0.000)	(0.003)
Critical Values				
1%	-3.6702	-3.6793	-3.832	-3.857
5%	-2.9639	-2.9678	-3.029	-3.040
10%	-2.6210	-2.6229	-2.655	-2.661

First difference test by using ADF test shows that three variables stationary at 10%, 5% and 1% of significance level. Based on results of unit root tests can be stated that data has been qualified of stationary test and equations that have been previously specified can be estimated using a model of a vector autoregressive (VAR).

Optimal Lag Length

Optimal lag length is used to determine the length of the response period of a variable to its past variable and to other endogenous variables, by using the Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan Quinn (HQ). The results of lag length can be seen in Table 2.

Table 3. Optimal Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-44.58434	NA	0.009034	3.806747	3.953012	3.847315
1	69.56952	191.7785*	2.02e-06*	-4.605562	-4.020501*	-4.443291*
2	71.88751	3.337905	3.59e-06	-4.071001	-3.047145	-3.787027
3	76.75249	5.837977	5.49e-06	-3.740199	-2.277548	-3.334522
4	91.81486	14.45988	4.12e-06	-4.225189	-2.323743	-3.697809
5	102.6355	7.790858	5.16e-06	-4.370840	-2.030598	-3.721756
6	118.0102	7.379845	6.29e-06	-4.880814*	-2.101777	-4.110027

Note:* indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

Based on Table 2, according to criteria of optimal lag LR, FPE, AIC, SC and HQ smallest and most designated lag 1 as indicated with an asterisk (*). Therefore, for next estimate will be used lag 1 on the VAR equation.

Cointegration Test

In this study, co-integration test use Johansen co-integration test. The variables that are tested should be stationary variables at the same level or *d* order. The results of co-integration tests:

Table 4. Johansen Cointegration Test

Null Hypothesis	Eigenvalue	Trace Statistic	5% critical value (trace)	Max-Eigen Statistic	5% critical value (Max-Eigen)
None (r=0)	0.3853	21.7282	29.7971	14.1102	21.1316
At most 1 ($r \leq 1$)	0.1707	7.6179	15.4947	5.4288	14.2646
At most 2 ($r \leq 1$)	0.0727	2.1892	3.8415	2.1892	3.8415

Table 3 shows that the trace statistics and maximum eigenvalue at $r = 0$ is smaller than the critical value of 5%. This means that null hypothesis which states that no co-integration cannot be rejected and alternative hypothesis which states that there is co-integration is rejected.

Based on the above analysis, it can be seen that among three variables in this study there is no co-integration. Thus, result test indicates that co-integration between economic growth (GDP), tourism receipts (TR), and the real exchange rate (RER) does not have a long-term equilibrium.

Granger Causality Test

Causality test results can be seen by looking probability value. Decision criteria H_0 is rejected if the probability is less than 5% (test level used in this study was 5%). If H_0 is rejected, then there is a causal relationship. Lag length criteria used is in accordance with the test results lag has been done before, namely lag 1.

Table 5. Granger Causality test

Null Hypothesis	Obs	F-Statistic	Prob.
LNRER does not Granger CauseLNPDB	30	5.43621	0.0274
LNPDB does not Granger Cause LNRER		1.53126	0.2266
LNTR does not Granger Cause LNPDB	30	0.22887	0.6362
LNPDB does not Granger Cause LNTR		1.17192	0.2886
LNTR does not Granger Cause LNRER	30	2.70008	0.1119
LNRER does not Granger Cause LNTR		0.05199	0.8213

From the results can be concluded that the variable of economic growth (GDP) was statistically significant influence in the real exchange rate (RER), while the real exchange rate (RER) were not statistically significant

influence economic growth (GDP). Thus, it was concluded that there is a unidirectional causality between economic growth (GDP) to the real exchange rate (RER).

Economic growth (GDP) was not statistically significant influence tourism receipts (TR) and tourism receipts (TR) were not statistically significantly affect economic growth (GDP). Thus, it was concluded that there was no causal relationship between economic growth (GDP) and tourism receipts (TR).

Real exchange rate (RER) were not statistically significant influence tourism receipts (TR) and tourism receipts (TR) were not statistically significant influence in the real exchange rate (RER). Thus, it was concluded that there was no causal relationship between the real exchange rate (RER) and tourism receipts (TR).

VAR Model Estimation

From the estimation of the VAR model obtained a description that the exchange rate in the current period (Ln ERT) is influenced mainly by the exchange rate in the previous period (Ln-1 and Ln ERT ERT-2). The influence of these two variables is statistically significant. Another variable that also has a positive influence on changes in the exchange rate for the period is the tourism receipts in the previous period (Ln TRT-1) and the GDP growth in the two previous periods (Ln GDPT-2). But a statistically significant effect of foreign exchange growth of tourism and the number of tourists does not seem significant to change the exchange rate for the period (Table 5).

Table 6. VAR model estimation

	C	Ln PDB_{t-1}	Ln PDB_{t-2}	Ln RER_{t-1}	Ln RER_{t-2}	Ln TR_{t-1}	Ln TR_{t-2}	R^2	F-stat
Ln PDB_t	0.624	1.379	-0.441	0.625	-0.424	0.274	-0.361	0.947	62.084
t-stat	[0.308]	[1.194]	[-0.396]	[0.709]	[-0.464]	[0.794]	[-1.149]		
Ln RER_t	-0.082	-0.132	0.183	0.527	0.235	-0.378	0.492	0.926	44.032
t-stat	[-0.032]	[-0.093]	[1.373]	[0.485]	[0.209]	[-0.889]	[1.272]		
Ln TR_t	-0.819	0.857	-0.762	0.104	0.550	0.831	-0.006	0.962	88.101
t-stat	[-0.509]	[0.933]	[-0.859]	[0.080]	[0.784]	[3.029]	[-0.022]		

Impuls Response Function

IRF is needed to know how the effect of shock in the economy. IRF describes how the rate of the shock of a variable against other variables. Thus, it can be known the influence of the occurrence of a shock or shock a variable against other variables.

Figure 1. Impulse Response Functions (IRF) of economic growth to real exchange rate and tourism receipts

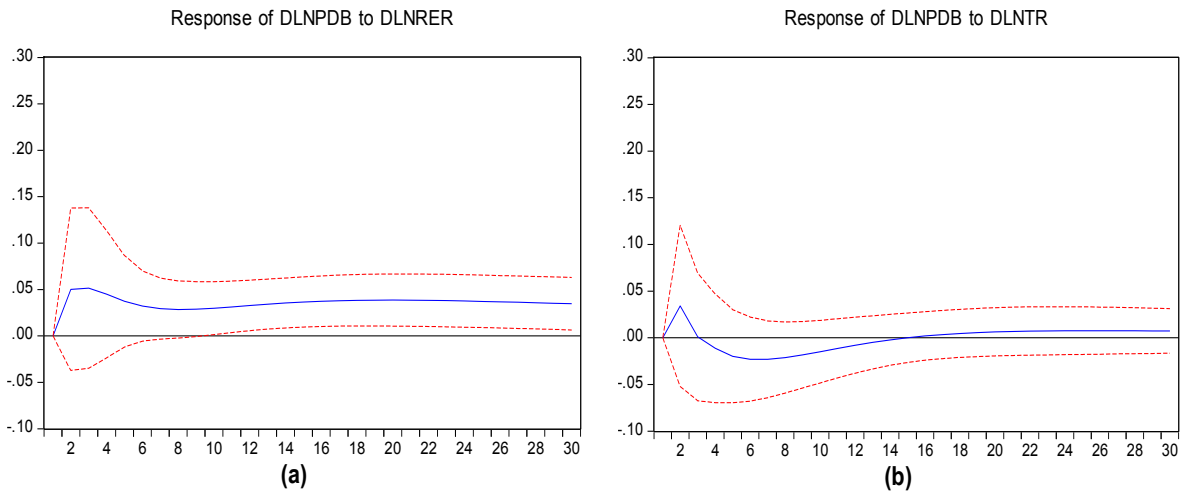

Figure 1 shows that the changes in economic growth in response to the presence of shock or change in the real exchange rate and tourism receipts. At the beginning of the period, the shock on the real exchange rate responded positively and negatively (up and down) by periods of economic growth until the sixth period. After the sixth period reaches the point of equilibrium. When there was shock in tourism receipts in the first period responded by economic growth until the second period positively. After the second period until the seventh period responded with economic growth negatively and back into positive and reach the point of equilibrium after the seventh period.

Figure 2. Impulse Response Functions of real exchange rate on economic growth and tourism receipts

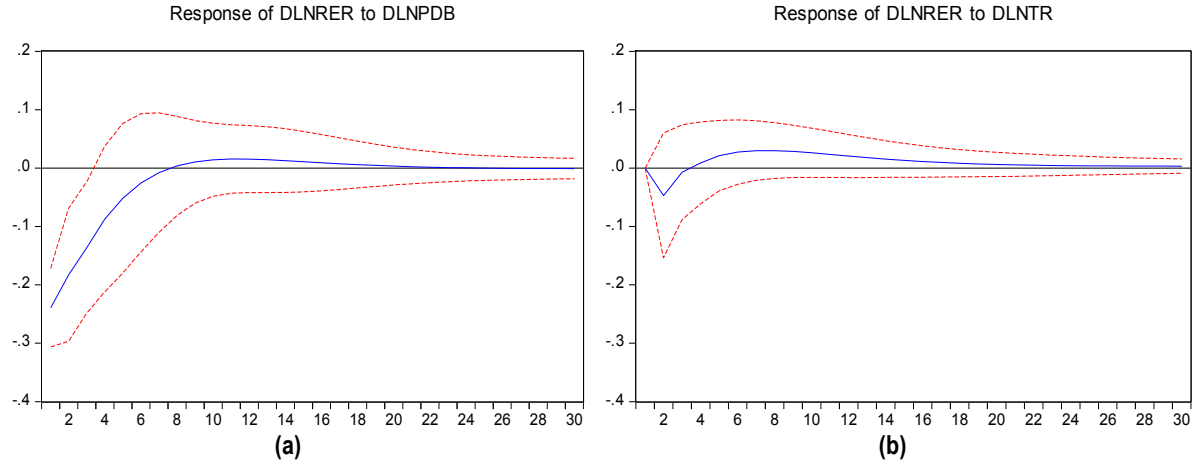

Figure 2 shows that the changes in the real exchange rate in response to the presence of shock or changes in economic growth and tourism receipts. Figure 2 (a) shows that the shock on economic growth responded by the real exchange rate for the seventh period positively, then move closer to the balance point. Figure 2 (b) shows that the shock of tourism receipts responded by the real exchange rate negatively, at the beginning period to the second period. After the second period responded by the real exchange rate positively until the seventh period, then move closer to the balance point.

Figure 3. Impulse Response Functions (IRF) of tourism revenue to economic growth and real exchange rate

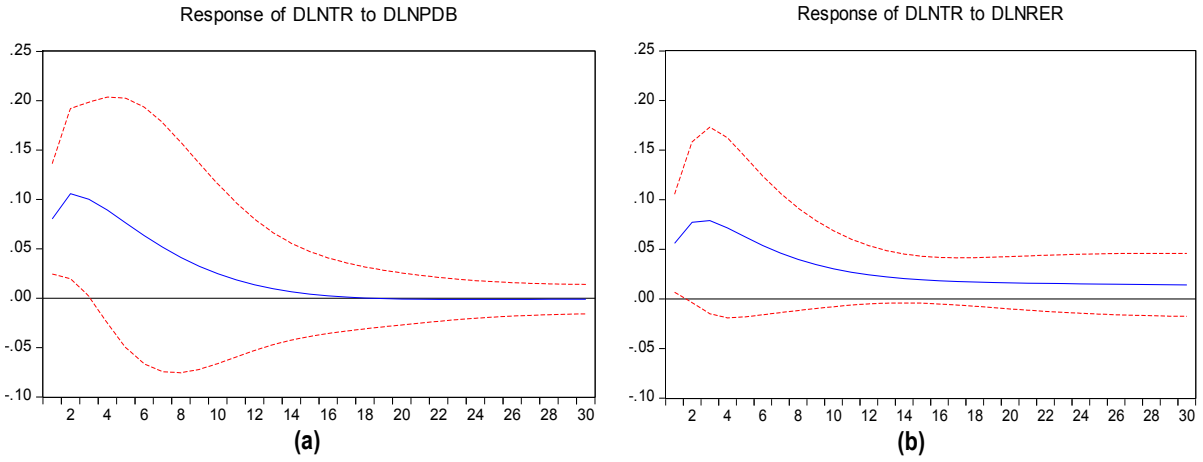

Figure 3 shows that the change in tourism receipts in response to the presence of shock or changes in economic growth and the real exchange rate. Figure 3 (a) shows that the shock on economic growth responded by tourism receipts positively from the first period until the second period. After the second period shock on economic growth responded by tourism receipts negatively until the fifteenth period, then move closer to the balance point.

Figure 3 (b) shows that the shock on the real exchange rate responded by tourism receipts positively from the first period until the third period. After the third period of shock on the real exchange rate responded by tourism receipts negatively until thirteenth period, then move closer to the balance point.

Variance Decomposition

Variance Decomposition (VD) is used to analyze the magnitude and how long the proportion shock of variable to the its own variable and then analyze the amount of shock proportion of other variables to the its own variable.

Table 7. Variance decomposition of economic growth, real exchange rate and tourism activity

Period	Variance Decomposition of Economic Growth			Variance Decomposition of Real Exchange Rate			Variance Decomposition of Tourism Receipt		
	PDB	RER	TR	PDB	RER	TR	PDB	RER	TR
1	100.0000	0.000000	0.000000	94.85757	5.142426	0.000000	25.67589	12.53523	61.78888
2	94.33486	3.874723	1.790420	94.39189	3.299817	2.308293	33.30915	17.20537	49.48548
3	91.87429	6.633991	1.491715	95.18853	2.835450	1.976021	35.90447	19.92011	44.17542
4	89.82436	8.630007	1.545632	95.19736	2.893324	1.909317	37.42435	21.49267	41.08298
5	88.03306	10.00430	1.962646	94.42668	3.364231	2.209088	38.29683	22.52072	39.18245
6	86.46456	11.00673	2.528712	93.11376	4.141483	2.744759	38.79661	23.26805	37.93534
7	85.12576	11.79155	3.082697	91.53314	5.089809	3.377049	39.05001	23.85799	37.09200
8	84.00058	12.47671	3.522711	89.92812	6.083482	3.988402	39.14273	24.34756	36.50971
9	83.03561	13.14563	3.818755	88.44614	7.037899	4.515966	39.13371	24.76498	36.10131
10	82.16421	13.85265	3.983143	87.15327	7.908785	4.937940	39.06468	25.12568	35.80964
11	81.32593	14.62723	4.046838	86.06118	8.680787	5.258028	38.96419	25.43971	35.59610
12	80.47684	15.47964	4.043523	85.15333	9.355196	5.491472	38.85081	25.71476	35.43443
13	79.59149	16.40654	4.001978	84.40220	9.941219	5.656584	38.73571	25.95741	35.30688
14	78.66048	17.39595	3.943571	83.77877	10.45080	5.770430	38.62485	26.17351	35.20164
15	77.68614	18.43141	3.882450	83.25692	10.89593	5.847147	38.52084	26.36815	35.11101
16	76.67809	19.49504	3.826863	82.81481	11.28752	5.897667	38.42423	26.54568	35.03008
17	75.64951	20.56974	3.780757	82.43499	11.63494	5.930060	38.33454	26.70970	34.95576
18	74.61428	21.64047	3.745249	82.10384	11.94607	5.950097	38.25081	26.86306	34.88614
19	73.58531	22.69491	3.719781	81.81084	12.22736	5.961801	38.17199	27.00796	34.82005
20	72.57348	23.72357	3.702959	81.54795	12.48411	5.967935	38.09715	27.14605	34.75680
21	71.58730	24.71961	3.693096	81.30903	12.72059	5.970374	38.02552	27.27853	34.69596
22	70.63297	25.67849	3.688538	81.08939	12.94023	5.970380	37.95652	27.40624	34.63724
23	69.71462	26.59756	3.687825	80.88541	13.14578	5.968805	37.88975	27.52976	34.58049
24	68.83464	27.47560	3.689758	80.69435	13.33943	5.966224	37.82493	27.64948	34.52559
25	67.99406	28.31253	3.693402	80.51408	13.52289	5.963024	37.76191	27.76565	34.47244
26	67.19291	29.10903	3.698059	80.34299	13.69754	5.959470	37.70057	27.87844	34.42099
27	66.43045	29.86632	3.703227	80.17981	13.86445	5.955740	37.64087	27.98795	34.37117
28	65.70547	30.58597	3.708564	80.02358	14.02446	5.951955	37.58279	28.09427	34.32295
29	65.01643	31.26973	3.713842	79.87358	14.17823	5.948194	37.52631	28.19743	34.27626
30	64.36160	31.91947	3.718923	79.72922	14.32627	5.944511	37.47142	28.29750	34.23108

During the first period, economic growth is strongly influenced by the shock of economic growth (100%), while the shock of the real exchange rate and tourism receipts are not given the effect. Furthermore, shock of economic growth gives the decreased effect gradually toward to the economic growth until the thirtieth period with contribution is approximately 64.36%, but still higher than the shock given by the real exchange rate and tourism receipts. Furthermore, the shock of the real exchange rate and tourism receipts contributed throughout the period increases. Starting from the seventeenth period, shock of the real exchange rate has contributed more than 20%

of the economy, while the shock of tourism receipts contributes about 3% to economic growth. It turned out that the magnitude shock of the real exchange rate gives a greater influence than the shock of tourism receipts.

In the first period of the variance decomposition of the real exchange rate give contribution of the shock of economic growth is approximately 94.86% of the real exchange rate. Then decreasing until the thirtieth period is approximately 79.73%. Furthermore, at the first period, the contribution of the shock of the exchange rate is approximately 5.14% and this value is increasing over the thirtieth period up to 14.33%. While the shock of tourism receipts in the first period has not contributed to the real exchange rate. Then, in the second period, the contribution of shock of tourism receipts is approximately 2.31% of the real exchange rate, and increase in this value is approximately 5.94% until the thirtieth period.

In the first period of the variance decomposition of the tourism receipts give contribution of the shock of economic growth is approximately 25.68%. Its increase until the tenth period is approximately 39.06%, and then decreased by 38.96% until thirtieth period is approximately 37.47%. The shock of real exchange rate gives the increasing effect to the tourism receipts. In the first period of the real exchange rate shock give effect approximately 12.54% of tourism receipts, this value increased until the thirtieth period until it reaches 28.29%. While its own tourism receipts shock gives a declining influence on the its own tourism receipt. In the first period, it gives effect approximately 61.79%. Then, in the second period decrease approximately 49.49%, the contribution of shock of tourism receipts is approximately 34.23% until thirtieth period.

Conclusions

The purpose of this study is to investigate the relationship of causality and the dynamic relationship between tourism activity, economic growth and real exchange rate in Indonesia from 1984 to 2014. Analyses were performed using Granger causality test and equipped with analysis of variance decompositions and impulse response function. The findings of this study are as follows. First, based on the co-integration test, there is no long-term relationship between tourism activity, economic growth, and real exchange rate. Second, based on the Granger causality test, there is caused between economic growth and real exchange rate, there is no causal relationship between economic growth and tourism activity, and there is no causal relationship between the real exchange rate and tourism activity. Third, based on the variance decomposition and impulse response function to analyze the response of each variable, both the shock of its own variable and the shock of other variables. In explaining the shock of tourism receipt in Indonesia, real income is more important than the real exchange rate. Meanwhile, real tourism receipt and real exchange rate are equally important in explaining real income shocks. The impulse response function states that the shock of real income and real exchange rate has a positive effect on the tourism receipt in the short and long term. In addition, the shock of tourism receipt has a positive effect on real income, while the real exchange rate shock has a negative effect on real income in Indonesia.

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