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by Firmansyah

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Effect of economic growth and environmental quality on tourism in Southeast Asian Countries

Firmansyah

Department of Economics, Diponegoro University, Jl, Prof Sudharto SH, Tembalang, Semarang, Jawa Tengah Province, Indonesia

firmansyah@live.undip.ac.id

Abstract. The tourism is an important sector in generating income for a country, nevertheless, tourism is sensitive toward the changes in economy, as well as changes in environmental quality. By employing econometric models of error correction on annual data, this study examines the influence of environmental quality, domestic and global economic growth on foreign tourist arrivals in selected Southeast Asian countries, namely Indonesia, Malaysia, Thailand, Philippines, and Singapore. The findings of this study showed that all of countries long run model were proved statistically, indicated that world economic growth as well as environmental quality affect foreign tourism arrivals.

1. Introduction

Tourism is one of the most important activities in the world, involving millions of people and a large amount of money (foreign exchange). As a labour intensive sectors, tourism provides and expands the employment opportunities both skilled and unskilled labour, in both the developed and developing countries.
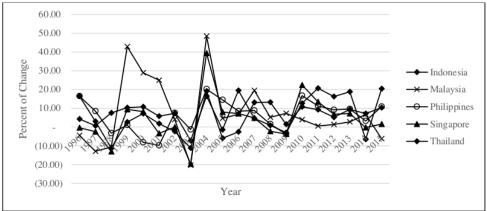
However, the tourism is vulnerable to face the change of the world economy. The contraction of the world economy due to the crisis, reduces the real per capita income of the people in every country, further causes in a tightening of public spending, including recreational expenditures. The recession such as the 2008-2009 world financial crisis which was triggered by the United States financial crisis - demonstrated by the negative growth of the world economy by 1.24 percent - causes the decrease of foreign tourists around the world by 4 percent, and the tourism expenditure lowers by 6 percent in 2009 [1].

Besides the world financial crisis, the decrease in number of tourists is also caused by some other external factors. The war in Iraq, the issue of health such as Severe Acute Respiratory Syndrome (SARS), the 2003 global economic slowdown, and the surge of world oil prices in 2005, also declines the number of foreign tourist arrivals in various countries [1]. The decrease of tourists' number also occurred in the Southeast Asia countries such as Indonesia, Malaysia, Philippines, Singapore, and Thailand. The changes in tourists number in these countries is presented in figure 1.

The influence of external factors on tourism have been widely studied, such as [1], [2], [3], [4], [5], and [6]. [1] proves that all regions of the world experienced negative growth in the number of foreign tourists, except Africa, as the impact of the 2009 world financial crisis. [2] analyses the impact of the global economic changes against the arrival of foreign tourists to Indonesia and measures the multiplier effect on other domestic industries. [3] investigates the impact of global economic crisis toward Greek

tourism, [24] examines the impact of the global crisis which lowers the foreign tourists visit, and [6] discusses the impact of the crisis on the tourism decline in Hawaii.

Source: [7], processed

Figure 1. The number of foreign tourists visiting the countries of Southeast Asia (1996-2014)

Besides the external factors, foreign tourist arrivals are also influenced by factors derived from the destination country itself or can be classified as internal factors. These factors include the cultural charms and beautiful nature, the cost of living, the level of security, the environmental quality, and other domestic factors. These factors may affect tourists' satisfaction and further affect tourist arrivals.

The attention to environmental factors that affect the tourism has not been widely studied. The specific destination tourist arrivals such as beach and mountains, or destination places that require the clean air and beautiful environment, so that the attention of the environmental sustainability, cleanliness, and freshness of the air are very decisive on tourism sustainability. Some studies especially on China tourism were conducted by [8], [9], and [10]. They investigates the importance of the effect of pollution on tourists' satisfaction.

According to the preconditions, this study objective is to analyse empirically the dynamic effect – long and short run – of the global economic and environmental quality changes to the tourism in five Southeast Asia countries, namely Indonesia, Malaysia, Thailand, Singapore and the Philippines. The selection of these countries based on the consideration of the geographical adjacent as placed in one region areas, the high inter-linkages in economy as the members of the Association of South East Asian Nation (ASEAN), and cultural as well as the natural contours are similar. In addition, these countries are being very intensively develop tourism in their countries.

2. Method

2.1. Data and variables

Suppose a tourist destination country in Southeast Asia is referred as country A, the definitions of the variables that are used in this study as follows:

a. The tourism demand by global to the country A is approached by the number of foreign tourist arrivals in A, the unit of measurement is the number of people per year, T.

b. The changes in the world economy that is faced by country A, is approached by the real world Gross Domestic Product, with the unit of measurements is the US dollar, WGDP.

c. The quality of environment in the country A, is approached by the level of CO2 pollutant, the unit of measurement is kilotons, Z.

The data are collected annually which are varies between countries due to limited publications. The data of Indonesian model covers 1982-2014, Malaysia (1995-2014), Thailand (1996-2014), the Philippines (1993-2014), and Singapore (1982-2014). The data collects from [11], [7], [12], [13], and other sources.

2.2. Empirical models

To achieve the research objective, this study employs a dynamic econometric model, the error correction model (ECM), which is a useful theoretical approach to estimate the effect of short run and long run of a time series with other time series variables. The model used this study is developed by Granger representation theorem, which states that if two variables X and Y are cointegrated, the relationship between the two can be expressed as ECM.

Cointegration occurs in two (or more) time series variable shows the long run relationship or balance (equilibrium) between these variables. In the short run, there may be a disequilibrium), and the "error" can be treated as an "error disequilibrium". This mechanism is called error correction. The cointegration test uses Engle-Granger (EG) and augmented Engle-Granger (AEG) test on the residual of long run equation, then the ECM equation is derived [14].

This is the long run equation in each country:

$$LT_t = \beta_0 + \beta_1 LWGDP_t + \beta_2 LZ_t + u_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

EG test is conducted to test the cointegration of the residual u_t, with using the Dicky-Fuller (DF) stationary test [14]:

$$\Delta u_t = \delta_1 u_{t-1} + v_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

Once the equation is cointegrated, it would be set up the error correction model (ECM):

$$\Delta LT_t = \alpha_0 + \alpha_1 \Delta LWGDP_t + \alpha_2 \Delta LZ_t + \alpha_6 u_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

where L indicates the natural logarithm operator, ε_t is the error term, u_{t-1} is the error correction term of equation (1), as α_6 is a discrepancy of T – from the robust estimation – to achieve equilibrium, and subscript t indicates the time series observation.

3. Results and discussion

3.1. Estimation results of the long run model and cointegration

Table 1 displays a summary of long run model estimation. From table 1, it can be seen that all of countries show a similar pattern regarding the influence of the global economy (WGDP) and CO2 pollution (Z) to the number of tourists' arrival (T). In all countries, WGDP statistically significant affects T in a positive direction, but only in Indonesia the Z is proved affect T.

The positive magnitude of the parameter indicates that the increase in the world economy, the arrival of foreign tourists increase, vice versa. The WGDP grows by 1 percent, the number of foreign tourist arrivals in Indonesia increase by 0.712 per cent, and the increase of 1 percent of WGDP, boosts foreign tourist arrivals in Malaysia by 1.652 percent. The same explanation applies to other countries in accordance with the each county parameters. Tourists' arrival on Malaysia are the most sensitive to changes in the world economy, while Thailand's is the most inelastic. It can be said that tourism in Thailand is least affected by the world economic changes compared to other countries.

The long run results are supported by cointegration test, as shown in Table 2. From the result, it can be proved that equilibrium relationship of these variables are proved statistically, which are indicated by the stationery of the long-term residual at level 0.

Table 1. Estimation results of long-run model: Dependent variable is LT

Country	LWGDP		LZ	
	Coefficient	t statistic	Coefficient	t statistic
Indonesia	0.712	2.494*	0.489	2.178**
Malaysia	1.652	3.44*	-0.144	-0.265
Thailand	0.237	3.028*	0.573	1.686
Philippines	0.807	3.684*	0.701	0.423
Singapore	0.828	27.950*	0.038	0.816

Notes: *) significant at 1%, **) significant at 5%, ***) significant at 10% level of confident

Table 2. Estimation results of Engle-Granger Cointegration test

Country and variable	Cointegrated or not
Indonesia	Cointegrated
Malaysia	Cointegrated
Thailand	Cointegrated
Philippines	Cointegrated
Singapore	Cointegrated

3.2. Estimation results of error correction model

In general, the short run model can be proved by the ECM due to the negative significant of u_{t-1}, except for Indonesia and Thailand. Only the Malaysian model that showed the significant of individual parameters of WGDP and Z. Z is statistically significant in the Philippines in positive direction.

Table 3. Estimation results of ECM: Dependent variable is ΔLT

Country	ΔLWGDP		ΔLZ		u_{t-1}	
	Coefficient	t statistic	Coefficient	t statistic	Coefficient	t statistic
Indonesia	0.710	1.589	0.296	0.784	-0.089	-0.904
Malaysia	2.335	2.377**	-1.384	-2.713*	-0.550	-2.663*
Thailand	0.321	0.849	0.386	1.142	-0.262	-1.388
Philippines	-0.590	-0.904	1.931	3.286*	-1.022	-6.880*
Singapore	0.416	1.380	0.025	0.386	-0.524	-3.139*

Notes: *) significant at 1%, **) significant at 5%, ***) significant at 10% level of confident

From the significant value u_{t-1}, it can be demonstrated that T adjust WGDP and Z with lag. For Malaysia, it can be explained that 55 per cent discrepancy of long run and short run T can be corrected in one period. For Singapore, 52.4 percent of the discrepancy can be corrected in one period, while for the Philippines, the discrepancy were corrected during the period.

The influence of WGDP and Z to T in the short run can be explained only on ECM estimation of Malaysia; the WGDP increases by 1 percent and T increases by 2.335 percent. The increase of Z by 1 percent, lowers the T in Malaysia by 1.384 percent.

Based on the diagnostic test results on the long run and the ECM model, it can be indicated that the estimator of the long run and short run are homoscedastic and non-autocorrelation.

4. Conclusion

By employing annual data with variation of period on each countries observed, it can be empirically proven by the study that the effects of the global economic changes on tourism in Indonesia, Malaysia, Thailand, the Philippines and Singapore in the long run is real, and only on Indonesia estimation model the environmental quality affects tourism. It should be concerns by stakeholders and the policy maker of these countries, particularly Malaysia, the impact of the world economic contraction, which can suppress the number of foreign tourists visiting.

Related to factors which are influence the tourism, the policy makers has to restrain the impact of the world economic crisis by enhancing the attractiveness of the country, such as development of public facilities and other facilities related to improving the convenience of tourists, increasing the international cooperation among institutions and agents of tourism, promoting more cultural attractions and art. It is also important to be noticed by the governments, the stability of the domestic economy includes prices and costs, ensuring the availability of goods, maintaining the good level of security and the legal certainty. Especially for Indonesian government, the awareness of sustainable environmental quality including the conservation strategy should be placed as an important policy.

To produce a more comprehensive study in the future, by some limitations of method and data availability in this study, it can be done some developments. For the improvement of the data and variables, it can be extended the data coverage, and added other independent variables that are considered affecting the foreign tourists arrival, include both economic and social variables, such as exchange rates, the level of security, the cost of living and others. To investigate the tourism development in the region level, it can be developed the data panel model. For the purposes of forecasting, the future study can use the time series models that are more complicated, for example, the model which accommodate seasonal factors, volatility and so on.

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