Panel data analysis of the inbound tourism demand and tourism policy in Laos

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December 2017

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The purpose of this research is to investigate the determinants of the inbound demand in Laos by using a gravity model with panel data from 2000–2014. Our model includes not only income and price factors considered in previous studies but also the factors pertaining to three tourism policies: (1) visa easing, (2) development of economic corridors within GMS, and (3) the registration of UNESCO World Heritage Sites in Laos in 2001. The results indicate that the number of tourists from Cambodia, Malaysia, Singapore, Thailand, Vietnam, and Myanmar can increase after implementing visa permissions; however, we cannot find accurate numbers for the Philippines, Brunei, and Indonesia. In addition, the establishment of the East-West and South-North Economic Corridors encourages the inbound demand from not only Thailand but also Vietnam and China. Eventually, this research suggests some initiatives required for long-term growth in the tourism sector based on the results, considering the "tourist area life cycle" hypothesis by Butler (1980).

Keywords: panel data; tourism policy; inbound demand; Laos

JEL classification codes: C33, D12, Z32, Z38

Introduction

Lao People's Democratic Republic (referred to as Laos hereafter) is a landlocked country surrounded by Myanmar, Thailand, Vietnam, Cambodia, and China in South East Asia. The tourism sector is one of the most important industries and the source of foreign currency in Laos (Yamauchi & Lee, 1999). According to World Travel & Tourism Council (2017), the tourism market constituted about 14.2% of the GDP and 12.4% of the total labor in 2016. The number of inbound tourists in Laos has been increasing since the government started admitting foreigners into the country in October 1989 (Harrison & Schipani, 2009). According to the Tourism Development Department (2017), the number of inbound tourists was over four million and the revenue was 724

million USD in 2016 (refer to Figure 1).

In 1990, Laos's government made a master plan of their tourism strategy with support from the World Tourism Organization of the United Nations for encouraging the tourism industry to grow continuously. In addition, the tourism industry in countries along the Mekong River is expected to be developed by the economic cooperation program, "Greater Mekong Sub-region: GMS," in collaboration with the Asian Development Bank. The GMS countries include Myanmar, Laos, Thailand, Vietnam, Cambodia, and the Yunnan province and Jiangxi Zhuang Autonomous Region in China. The GMS program has implemented many projects such as the construction of three economic corridors (South-North, East-West, and South) to promote trade and investment among the intra-regions. Due to their efforts, Laos was ranked first among the countries people want to visit in 2008 by New York Times in 2007 (Lee, 2007, December 9). Moreover, in 2013, Laos was awarded "World's Best Tourist Destination" for 2013 by European Council on Tourism and Trade (ECTT) (ASEAN Secretariat News, 2013, May 22). ECTT honored the efforts to preserve natural and cultural heritages, including two UNESCO World Heritages; the "Town of Luang Prabang" in the Luang Prabang province and "Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape" in the Champasak province (Valentin and Schilcher, 2017).

Figure 1: Number of inbound and the Revenue
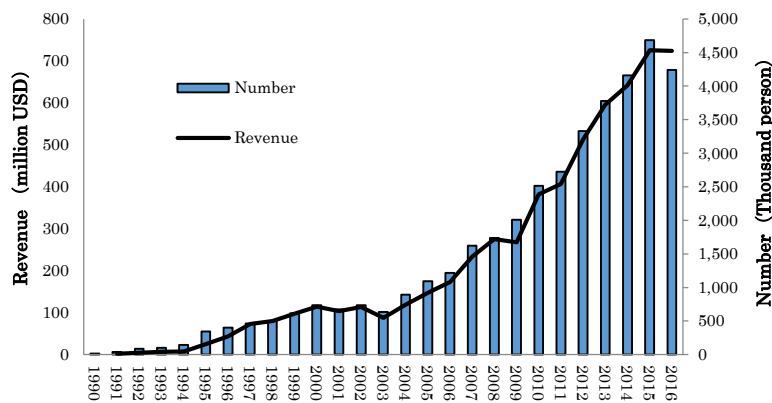
Source: Author's own construction based on the Tourism Development Department (2017).

However, Laos's government targets the number of foreign visitors to reach around six million in 2020 because of the decline in the number of tourists in 2016, and hopes that the number of inbound tourists will continuously increase (Souliyong, February 11, 2017). Moreover, the government has established the year 2018 as the "Visit Laos Year," and is attempting to promote the tourism industry toward 2018 and sustain the tourism growth in the future. However, the "tourist area life cycle" hypothesis by Butler (1980) indicates that the rate of the tourism demand grows rapidly

in the developing stage, and gradually decreases over time, eventually reaching stagnancy. The path of the growth rate after the stagnant stage has different possibilities: rejuvenation or decline. Accordingly, it is important to clarify the factors that influence inbound tourism in Laos, and suggest a strategy to maintain the sectoral growth, considering the future of Laos as a tourism-based country. Thus, the aim of this paper is to understand the demand trends for inbound tourism and demonstrate empirically the factors that influence demand.

Nonthapot and Lean (2013) and Phakdisoth and Kim (2007) are typical research studies that use the quantitative approach. Nonthapot and Lean (2013) focuses only on the inbound demand from Thailand because Thailand's tourists occupy the highest market share among the inbound tourists in Laos, and they analyse it with the time series data. However, for developing a strategy about the tourism industry based on the results, the implication of this research can apply only to the tourists from Thailand, and not the total inbound demand in Laos. For this, we need to estimate the inbound demand with panel data, and not time series data or cross-section data.

Phakdisoth and Kim (2007) specifies the inbound demand with a panel data analysis spanning ten years, from 1994 to 2004. Phakdisoth and Kim (2007) estimates the inbound demand with not only the factor of origin countries but also that of the destination country. Their estimation adopts the factor of demand (price and income) as the variable for origin countries, and the factor of supply (length of road, telephone mainline, and so on) as that of the destination country. However, the estimation of the demand function with the variable of the supply side is considered biased because of the endogeneity. The system in the endogeneity has an identification problem (Greene, 2002).

The gravity model is a typical methodology to analyze international tourism with both factors of origin and destination countries without the bias as described earlier. According to Morley, Rosselo and Santana-Gallego (2014), the gravity model assumes that bilateral flows between two countries are directly proportional to the countries' economic masses and inversely proportional to the distance between them. This study uses the gravity model with flows from various origin countries into a specific destination country. Although such a model cannot identify common factors and the impact to affect bilateral flows between two countries (Morley et al., 2014), the purpose of this study is to grasp the inbound demand in Laos so that we could estimate flows from various origin countries into Laos.

Furthermore, previous studies do not consider the effect of the tourism policy on demand. The tourism policy is expected to also encourage inbound tourism to increase. Focusing on the tourism policy, we clarify that the travel policy will have a significant effect on increasing inbound tourism as well as income and relative price. We will consider this aspect in the next section.

From the abovementioned information, we try to quantitatively analyze the inbound demand in Laos with the gravity model, taking the tourism policy into the estimation. The remainder of the paper is organized as follows. Section 2 explains the tourism policy in Laos to influence sufficiently the inbound demand in the country. Section 3 presents the research method and the variables used. Section 4 shows the results of the estimation. Section 5 discusses the feature of the inbound demand in Laos and suggests some implementations by the "tourist area life cycle" hypothesis (Butler, 1980). Section 6 concludes and presents potential avenues for further research.

Tourism policy in Laos

Laos's government develops various strategies and implements many kinds of tourism policies. Of them, we focus on three implementations that largely influence the rise of the inbound demand: (1) visa easing, (2) development of economic corridors within GMS, and (3) the registration of UNESCO World Heritage Sites in Laos in 2001. Table 1 presents the history of the three implementations in Laos.

Laos's government has released the visa restriction for foreign countries. The visa permission has the different purposes of passports (diplomatic, service, and ordinary). This study considers visa permission for ordinary passports. In 2004, Laos's government eased the visa restrictions for Thailand, Vietnam, Cambodia, Malaysia, and Singapore only for a stay of thirty days. After this, visa easing was implemented for other countries as well, including Philippines and Brunei in 2005, Japan and Russia in 2007, the Republic of Korea in 2008, Myanmar and Switzerland in 2009, and Indonesia in 2011. It is thus expected that the inbound demand of these 11 countries increased after their respective years of visa easing.

Table 1: History of the Tourism Policy in Laos

Year	Contents
1994	First Friendship bridge was built and permitted and released the regulation which Lao people move within Laos.
2001	The registration of "Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape" in Champasak province as UNESCO World Heritage.
2004	Visa easing for Cambodia, Malaysia, Singapore, Thailand and Vietnam as long as staying for thirty days.
2005	Visa easing for Philippine and Brunei as long as staying for thirty days.
2007	Second Friendship bridge was permitted.
	Visa easing for Japan and Russia as long as staying for thirty days.
2008	Visa easing for Rep. of Korea as long as staying for fifty days.
2009	Visa easing for Myanmar and Switzerland as long as staying for thirty days.

2011	Third Friendship bridge was built and permitted.
	Visa easing for Indonesia as long as staying for thirty days.
2013	Fourth Friendship bridge was built and permitted.

Source: Author's own construction based on Fujimura (2016), Japan External Trade Organization (2015) and the Lao Airlines website.

Some travelers from the neighboring countries of Thailand, Vietnam, Cambodia, Myanmar, and China enter through the land route (refer to Table 2). Specifically, many travelers enter Laos through the land route from Thailand, which has the most share of inbound tourism in Laos. As of 2016, Laos had ten entry points across Thailand. Of them, four friendship bridges were present between Laos and Thailand until 2016. The first friendship bridge was built to connect Vientiane and the Nong Khai province in Thailand in 1994. The second bridge was built to connect the Savannakhet province in Laos and the Mokdahan province in Thailand in December 2016, and passage by vehicle was officially permitted in January 2007. The second friendship bridge is included as a part of the East-West Economic Corridor to link Da Nang city in Vietnam to Mon state in Myanmar. The third friendship bridge to connect the Khammouane province in Laos to Nakhon Phanom province in Thailand was opened for traffic in 2011. The construction of this fourth bridge was completed in 2013, and connects Bokeo province in Laos to Chaing Rai province in Thailand, and is a part of the South-North Economic Corridor connecting Kunming city in Yunnan province, China to Bangkok city in Thailand, and the Asian Highway.

Table 2: The Whole Tourist and Tourists on Land Route in 2016

| Countries	(A) Total Tourists (Ratio of the whole travelers)	Tourists on land route (Ratio of (A))
Thailand	2,009,605 (47%)	949,536 (47%)
Vietnam	998,400 (24%)	69,441 (7%)
China	545,493 (13%)	162,874 (30%)
Cambodia	16,536 (0.4%)	2,300 (13%)

Source: Author's construction based on Tourism Development Department (2017).

The construction of these friendship bridges could increase the number of tourists from Thailand. Moreover, because two economic corridors have been expanded due to the construction of the second and fourth bridges, the human flow among Vietnam, Laos, and Thailand, and among China, Laos, and Thailand could increase.

Some empirical research studies attempt to analyze the influence of the development of an economic corridor on the intra-regional economy (Brunner, 2013; Fujimura, 2016; Susan & Anna, 2009). Fujimura (2016) quantitatively evaluates the

impact on the growth of GDP per capita and the trade value in the electric and transport machinery based on econometric methodology, panel data analysis, and the gravity model. Nonthapot (2016) studies the relationship between tourism and economic growth in intra-GMS countries, but not in each country. Nonthapot (2016) also shows that the tourism expenditure for passenger transport mediates the path from economic growth to the tourism's contribution to the GMS, and suggests that all GMS countries should invest resources to develop the transport sector. However, the previous studies do not consider the introduction of tourism policy influences on the tourism sector. Thus, this is a significant contribution of our investigation.

Figure: 2 Friendship Bridges between Laos and Thailand
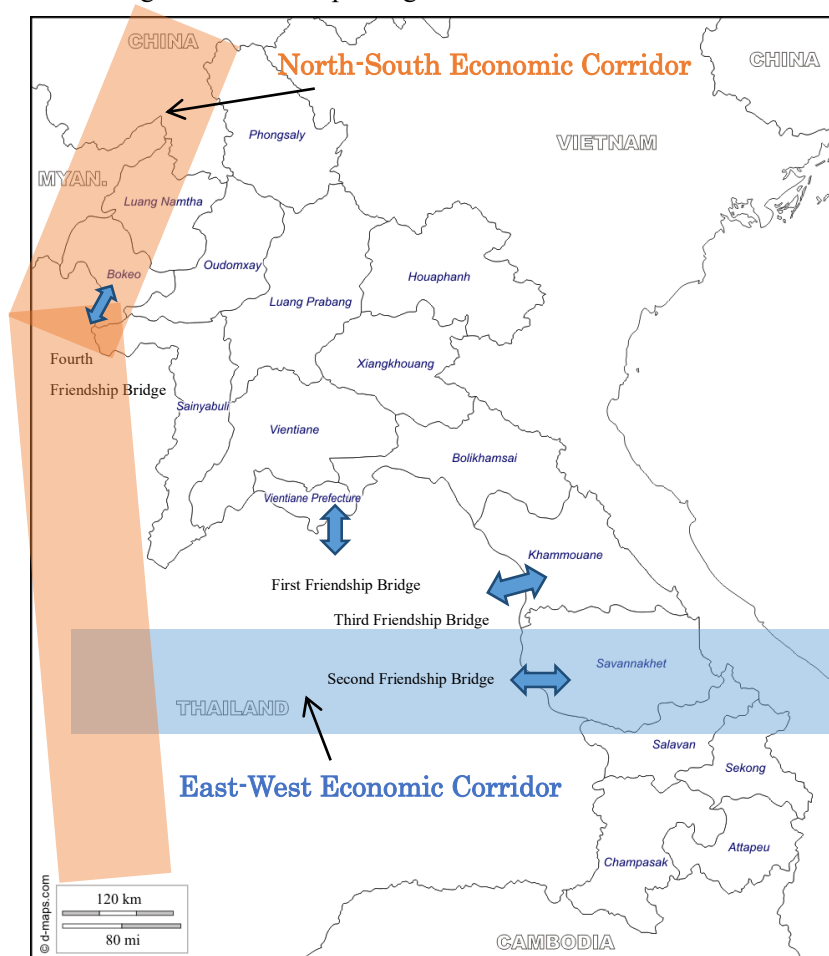
Sources: Author's construction based on the blank map data obtained from d-map.com (http://d-maps.com/index.php?lang=en).

As mentioned before, Laos has two UNESCO World Heritage Sites: the "Town of Luang Prabang" in the Luang Prabang province and "Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape" in the Champasak province. The "Town of Luang Prabang" was registered in 1995 and "Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape" in 2000.

Since information is not available on the number of tourists from each foreign country before 1995; therefore, this research attempts to examine the effect of the UNESCO registration in 2000 because we cannot have the data.

Based on the preceding, to consider comprehensively the inbound demand in Laos, this study adopts three tourism policies as the independent variable, as well as the income factor and the relative prices in origin countries.

Research method and data

This study makes two estimations with the panel data from 2000 to 2007 and from 2007 to 2014: thirty two countries and eight years[1]. This is because we would like to reduce time trends and avoid problems such as unit root or cointegration. we need to address their issues in the case of the estimation used for long term and establish a complex model.

Some studies criticize that the gravity model applied to international tourism does not have a theoretical foundation (Morley et al., 2014). Morley et al. (2014) modifies the gravity model for international tourism in the context of a consumer's utility theory in economics. The model based on a consumer's utility theory focuses on the income and price factors. This research estimates an expression of a linear logarithmic model (1) based on the prior section.

$$\ln ID_{it} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln RP_{ijt} + \beta_4 \ln Pop_{it} + \beta_5 \ln Pop_{jt} + \beta_6 \ln Dist_i$$
$$+ \beta_7(Visa_i \times AFTER_t) + \beta_8(GMS\ country_i \times AFTER_t) + \beta_9 Visa_i + \beta_{10} AFTER_t$$
$$+ \beta_{11}\ GMS\ coutry_i + \beta_{12} Yr_t + \mu_i + \varepsilon_{it} \ (1)$$

The dependent variable ID_{it} represents the inbound demand in Laos. In general, the gravity model adopts the number of tourists and their expenditure as the proxy of ID_{it}. However, since the panel data regarding the expenditure of tourists is not available, we use the number of tourists as the proxy of ID_{it}.

Regarding the independent variable, we adopt real GDP per capita in origin countries Y_{it} as the proxy of the income factor of tourists in the origin country, and real GDP per capita in the destination country Y_{jt} as the proxy of the destination quality indicator according to Morley et al. (2014). Both factors are considered to positively influence the inbound demand. Besides, $Dist_i$ is the distance between two countries. It is regarded as a kind of travel cost. In addition, the relative price between the origin and the destination is an important factor for determining the demand for inbound tourism. RP_{ijt} is the relative price, representing the expenditure in the destination country relative to that in the origin country. The relative price is represented as follows:

$$RP_{ijt} = \frac{\left(CPI_i/EX_i\right)}{\left(CPI_j/EX_j\right)} = \left(CPI_i/CPI_j\right) / \left(EX_i/EX_j\right) \qquad (2)$$

CPI_i and CPI_j represent the consumer price indexes in the origin country i, and the destination country (Laos), respectively. EX_i and EX_j represent the exchange rates of the domestic currencies in i and j in terms of the US dollar, respectively. The relative price has a negative influence on inbound tourism demand.

The other variables are population and specific events such as festivals, disasters, and political disturbances. Pop_{it} and Pop_{jt} represent the populations in i and j, respectively. Culiuc (2014) concludes that the populations in the origin and destination countries have a negative effect on inbound tourism demand. Culiuc (2014) explains that this is because residents in richer countries travel more to foreign countries and tourists prefer richer countries given that countries with a lower population growth are relatively richer compared with those experiencing a higher growth.

However, some research studies find that the population in origin countries encourages an increase in the number of international tourists (e.g., Hanafiash & Harun, 2010; Lorde, Li & Airey , 2015; Massidda & Etzo, 2012). The research of Lorde et al. (2015) regarding the inbound demand for Caribbean countries indicates that the population growth in the origin countries increases the inbound tourists, and that the number of foreign tourists declines more as the population in the destination country increases. Lorde et al. (2015) suggests that countries with a small population, such as the Caribbean countries, need to allocate more resources in sectors other than tourism because the population of the destination increases. Therefore, prior studies do not have any common consensus about the estimators of the population.

$Visa_i$ is the dummy variable, which is 1 if visa restrictions are eased and 0 otherwise. $AFTER_t$ is the time dummy variable, which is 1 after visa restrictions are eased and 0 before they are eased. The cross term $Visa_i \times AFTER_t$ is the difference between a country that eases visa restrictions and other countries.

$GMS\ country_i$ is also a dummy variable, which is 1 if country i is Thailand, Vietnam, or China, and 0 otherwise. The cross term $GMS\ country_i \times AFTER_t$ implies the effect of the friendship bridge on the inbound demand since the bridge is completed. Although the second friendship bridge was built in December 2006, we consider it functional since 2007, being the year when Laos first permitted traffic on it.

Yr_t is the time dummy variable. This study considers the UNESCO World Heritage time dummy in 2001 as the tourism policy and the SARS time dummy in 2003. μ_i refers to a specific fixed country and the time-invariant effect. ε_{it} is the error term.

Table 3: The Basic Descriptive Statistics

		Size	Min.	Max.	Med.	Ave.	S.E.
$\ln ID_{it}$	2000-2007	256	4.934	13.764	8.333	8.643	0.096
	2007-2014	256	5.283	14.538	8.955	9.298	0.108
$\ln Y_{it}$	2000-2007	256	2.740	2.747	2.744	2.744	0.000
	2007-2014	256	6.584	11.425	10.552	9.981	0.078
$\ln Y_{jt}$ (Laos)	2000-2007	256	-10.028	6.861	-8.796	-7.109	0.197
	2007-2014	256	6.861	7.280	7.068	7.069	0.009
$\ln Dist_i$ (mile)	2000-2007	256	4.742	8.098	7.531	7.043	0.057
	2007-2014	256	4.742	8.098	7.531	7.043	0.057
$\ln RP_{ijt}$	2000-2007	248	-10.028	0.746	-8.796	-7.109	0.197
	2007-2014	253	15.597	15.716	-8.660	-6.878	0.193
$\ln Pop_{it}$	2000-2007	256	12.709	20.999	17.172	17.160	0.107
	2007-2014	256	12.833	21.034	17.261	17.223	0.107
$\ln Pop_{jt}$ (Laos)	2000-2007	256	15.491	15.597	15.542	15.543	0.002
	2007-2014	256	15.597	15.716	15.658	15.657	0.002
Yr_{01}, Yr_{03}	2000-2007	256	0.000	1.000	0.000	0.125	0.021
$After_{04}$	2000-2007	256	0.000	1.000	0.500	0.500	0.031
$After_{05}$	2000-2007	256	0.000	1.000	0.000	0.375	0.030
$After_{07}$	2000-2007	256	0.000	1.000	0.000	0.125	0.021
$After_{08}$	2007-2014	256	0.000	1.000	1.000	0.750	0.027
$After_{09}$	2007-2014	256	0.000	1.000	1.000	0.750	0.027
$After_{11}$	2007-2014	256	0.000	1.000	0.500	0.500	0.031
$After_{13}$	2007-2014	256	0.000	1.000	0.000	0.250	0.027
$Visa_{04}$	2000-2007	256	0.000	1.000	0.000	0.121	0.020
$Visa_{05}$	2000-2007	256	0.000	1.000	0.000	0.063	0.015
$Visa_{07}$	2000-2007	256	0.000	1.000	0.000	0.063	0.015
$Visa_{08}$	2007-2014	256	0.000	1.000	0.000	0.031	0.011
$Visa_{09}$	2007-2014	256	0.000	1.000	0.000	0.031	0.011
$Visa_{11}$	2007-2014	256	0.000	1.000	0.000	0.031	0.011
$Thai, Viet, China$	2000-200 2007-2014	256	0.000	1.000	0.000	0.031	0.011

Table 4: Data Sources

Variable		Data Sources
ID_{it}	The Arrival numbers	2011-2016 Statistical Report on Tourism in Laos
		1975-2005 Basic Statistic of the Socio-Economic Development in Laos
Y_{it}, Y_{jt}	Real GDP per capita	World Bank Indicator, World Bank
RP_{ijt}	CPI	World Bank Indicator, World Bank
	Exchange rate	World Bank Indicator, World Bank

Pop_{it}, Pop_{jt}	Population	World Bank Indicator, World Bank

Table 5: List of 32 Origin Countries

Brunei, Indonesia, Cambodia, Malaysia, Philippine, Singapore, Thailand, Vietnam, Australia, China, India, Japan, Republic of Korea, New Zealand,

Austria, Belgium, Denmark, Finland, France, German, Greece, Italy, Netherlands, Norway, Russia, Spain, Sweden, Switzerland, United Kingdom,

Canada, United States, Israel

Table 3 shows the basic descriptive statistics of each variable, Table 4 presents the data sources, and Table 5 describes the 32 origin countries. This investigation does not include Myanmar in the sample although the number of tourists from Myanmar is expected to increase because the military regime ended in 2011 and a new friendship bridge was built between Laos and Myanmar in 2015 (Ministry of Planning and Investment of Laos, 2017, July 4). Nevertheless, the reason we exclude Myanmar from the sample is that the country changed from the multiple exchange rate to the controlled floating exchange rate in 2012, making it difficult to calculate the value in expression (2).

Results of estimation

Table 6 demonstrates the result of each model. In the estimation with the panel data, we have to determine the best among three models: fixed effect, random effect, and pool models. Hence, this investigation chooses the best model by the Breusch-Pagan test (random effect model vs. pool model) and the Wu-Hausman test (random effect model vs. fixed effect model). First, the Breusch-Pagan test indicates that the random effect model is more appropriate than the pool model. Second, we attempt Wu-Hausman test. However, the result of the Wu-Hausman test shows that the probability is 1.00 because the cross section test variance is invalid and the Wu-Hausman statistics are set to zero[2]. Thus, this paper shows the result of both random effect (RE) model and fixed effect (FE) model. Additionally, this study also adopts first-order difference (FD) model which removes the time-invariant effects as well as fixed effect model though the sample size of the first difference model is smaller than the other models. As seen in the table 6, three models demonstrate mostly similar estimations although the result with the first-order difference (FD) model has some insignificant estimators than other models due to smaller sample size.

Table 6: Estimates of Gravity Models

Main Variables	2000-2007			2007-2014		
	RE	FE	FD	RE	FE	FD
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
C	165.96* (99.77)	180.54 (110.61)		1099.55*** (305.12)	1056.27*** (354.59)	
$\ln Y_{it}$	0.77** (0.32)	0.34 (0.93)	0.47 (0.73)	1.38*** (0.25)	1.98*** (0.51)	2.07*** (0.39)
$\ln Y_{jt}$ (Laos)	4.25** (2.01)	4.96** (2.42)	4.31** (2.18)	24.45*** (6.19)	23.19*** (7.29)	18.40*** (3.79)
$\ln Dist_i$ (mile)	-1.48** (0.60)			-2.06** (0.60)		
$\ln RP_{ijt}$	- 0.13*** (0.02)	-0.14*** (0.03)	-0.09*** (0.00)	- 0.12 (0.09)	0.01 (0.54)	-0.06 (0.26)
$\ln Pop_{it}$	0.61*** (0.19)	0.57 (2.60)	0.03 (1.80)	0.84*** (0.17)	-1.57 (2.51)	-1.80 (1.57)
$\ln Pop_{jt}$ (Laos)	-12.52* (7.19)	-14.10* (8.14)	-11.63 (7.70)	-81.62* (22.25)	-76.87*** (25.34)	-59.29*** (12.96)
$Visa_{04} \times After_{04}$	0.28** (0.13)	0.286* (0.15)	0.29 (0.19)			
$Visa_{05} \times After_{05}$	- 0.17 (0.48)	-0.17 (0.54)	0.05 (0.15)			
$Visa_{07} \times After_{07}$	- 0.02 (0.10)	0.02 (0.11)	0.17*** (0.03)			
$Visa_{08} \times After_{08}$				0.74** (0.05)	0.63*** (0.12)	0.17*** (0.07)
$Visa_{09} \times After_{09}$				0.13** (0.04)	0.18*** (0.05)	0.05 (0.04)
$Visa_{11} \times After_{11}$				- 0.18*** (0.05)	-0.14** (0.06)	0.02 (0.03)
$Thai \times After_{07}$	0.51*** (0.05)	0.54*** (0.08)	0.35*** (0.03)			
$Viet \times After_{07}$	0.200*** (0.04)	0.19*** (0.07)	0.08*** (0.028)			
$Thai \times After_{11}$				0.18*** (0.05)	0.144* (0.08)	0.11*** (0.03)
$Thai \times After_{13}$				0.18*** (0.04)	0.17** (0.06)	0.09** (0.03)
$China \times After_{13}$				0.20*** (0.05)	0.17 (0.11)	-0.02 (0.04)
Yr_{01}	- 0.14*** (0.03)	-0.14*** (0.03)	-0.14*** (0.03)			
Yr_{03}	- 0.23*** (0.05)	-0.23*** (0.05)	-0.23*** (0.05)			
$Thai$	2.19** (0.94)			2.92*** (0.95)		
$Viet$	0.89*** (0.24)					
$China$				0.50 (0.70)		
$After_t$				Yes		
$Visa_i$	Yes	-	-	Yes	-	-
Sample Size		248	217	253		
Adjusted R squared	0.571	0.98	0.40	0.667	0.99	0.31

* The level of statistical significance: ***1%, **5%, *10%. The numbers in parentheses are robust standard errors.

The coefficients of Y_{it}, Y_{jt}, and $Dist_i$ are consistent with the hypothesis assumed in the gravity model except of Y_{it} for 2000-2007. As mentioned above, their results demonstrate that the income level in an origin country (Y_{it}) promotes the travel to Laos as a push factor, the real GDP per capita in Laos (Y_{jt}) represented as the quality of the destination encourages the flow from foreign countries as the pull factor.   On the

contrary, the income level in an origin country doesn't effect on the demand much for 2000-2007 in that the coefficient of Y_{it} is not large on RE model and not significant on FE model and FD model. This result is similar with prior studies. Moreover, the distance between two countries reduces the inbound demand as the travel expenditure.

RP_{ijt} negatively influences the flow from origin countries as the other travel cost in three models for 2000–2007. In our estimators, RP_{ijt} slightly reduced the number of tourists during 2000–2007 with statistical significance. On the other hand, it did not show statistical significance during 2007-2014. This indicates that RP_{ijt} does not influence much the determinant of foreign tourists. The efficiency of RP_{ijt} in the result estimated by Phakdisoth and Kim (2007) is also not large (-0.072 ~ -0.087). According to Phakdisoth and Kim (2007), because prices for goods or services and accommodation in the less developed country are cheaper and the travel expenditure is not very expensive, foreign tourists do not respond sensitively to the change in RP_{ijt}.

The coefficient of Pop_{it} is not statistically significant in FE model and FD model, and that of Pop_{jt} significantly negative in most models. The signs of their efficiencies in our results are similar to those by Lorde et al. (2015). As Lorde et al. (2015) mention, countries with a small population experience physical and financial constraints, so that many resources may not be invested into the tourism sector. On the other hand, as Lorde et al. (2015) do not interpret the sign of Pop_{jt}, the negative sign of Pop_{jt} is against some previous studies mentioned above. One interpretation regarding the result is that the population growth in origin countries can increase the potential inbound tourists in Laos.

The disturbance of SARS in 2003 significantly decreased 0.235% of the inbound tourists compared with other years. Phakdisoth and Kim (2007) also show similar results (-0.678 ~ -0.567) despite their usage of different time series data.

In following paragraphs, we will investigate results of the tourism policy. First, we consider the results of the visa easing policy. The visa easing for Cambodia, Malaysia, Singapore, Thailand, and Vietnam in 2004 significantly increased the inbound demand. In addition, the permission for the visa restriction for the Republic of Korea in 2008 and for Switzerland and Myanmar in 2009 positively increased the number of flows from foreign countries. However, the visa easing in 2005 and 2007 was not significant. The visa easing for Indonesia in 2011 had a significantly negative effect against the hypothesis, which may be related to the European financial crisis after 2011.

Secondly, we demonstrate the influence of constructing the friendship bridges on tourism demand from neighboring three countries, Thailand, Vietnam and China. the coefficients of $Thailand \times AFTER_{07}, Thailand \times AFTER_{13}, Vietnam \times AFTER_{07}$ are statistically significant and positive. However, we can't clearly conclude that $China \times AFTER_{13}$ effects on the inbound demand because it is not statistically significant in FE model and FD model. As explained before, the second and fourth

friendship bridges are part of the economic corridors. Hence, their results of $Thailand \times AFTER_{07}, Thailand \times AFTER_{13}, Vietnam \times AFTER_{07}$ imply the economic effect of the economic corridor project on the tourism sector in Laos. Their results show that the construction of the four bridges to connect Laos with Thailand contributes to the increase of foreign tourists from Thailand and Vietnam also has a positive impact on the growth of tourism.

Thirdly, the registration of the UNESCO World Heritage Sites in Laos in 2001 could not encourage the inbound demand, possibly because the global economy slowed down during that time. Alternatively, one of the other reasons may have a difficulty to access these heritage sites from the center city in Champasak province. Also, this Heritage has a rivalry to other UNESCO World Cultural Heritage Sites in neighboring countries, such as "Angkor Wat" in Cambodia, "Hoi An Ancient town" in Vietnam, and the "Ban Chiang Archaeological Site" in Thailand. Actually, the market share of tourists in Champasak province are occupied with those of Thailand (almost 75% in 2014) through three entry points (Vang Tao and Nong Nok Khain are the entry points on the land route, and the Pakse international airport). Thus, Thai tourists may not be much interested in this heritage site because the cultural and historical aspects between the two countries are similar.

Discussion

Taking the result of the panel data regression into account, this section discusses the initiatives required for the long-term tourism growth in Laos. Wherever the research in the tourism and hospitality fields discusses the long-term growth in the tourism sector, the "tourist area life cycle" hypothesis by Butler (1980) is usually referred to. According to this hypothesis, the growth in the tourists' number has progressed like an S-shaped curve over time, as shown in Figure 3. First, the rate of growth proceeds slowly, and then increases rapidly. Eventually, the number of tourists becomes stable and then subsequently declines as it exceeds the carrying capacity in the tourism sites. This carrying capacity depends on several factors: environmental (e.g., water quality, air quality, landscape), physical (e.g., transportation, accommodation, other public service), and social (e.g., crowding, discontent of the local community) (Butler, 1980).

Laos's tourism may complete the development stage, referring to Figure 1, due to the reduction of tourists in 2016, although we do not have accurate information on whether the number in 2016 is accidental or not. As follows below, we suggest three challenges that Laos's government and the related administration should address so that the growth rate of tourist numbers can reach the rejuvenation path (A or B), and not the path of decline (C, D, or E), after the stagnation stage.

Figure 3: A Tourist Area Cycle and Evolution
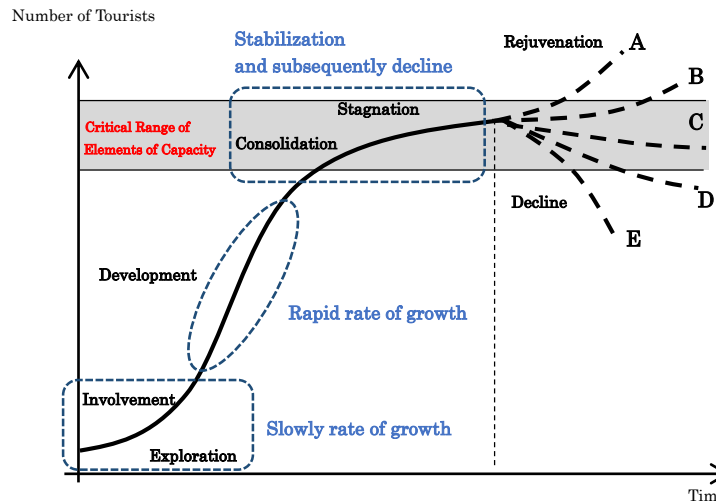
Sources: Author's own construction based on Butler (1980, p. 7, Figure 1)

First, it is necessary to allocate the benefit from the economic growth to the tourism sector and the related sectors for tourism growth in the future. As shown in the former section regarding results of estimation, while the income level in Laos positively influences the inbound demand, the population growth in the country decreases the number of foreign tourists. This is because small countries like Laos experience physical and financial constraints as the population grows. Laos has to address this challenge that the number of inbound tourists is somehow developed under the constraint of population growth.

The first strategy could be to increase the skilled human resources in the tourism sector because there are insufficient workers and experts in Laos's tourism sector (Valentin & Schilcher, 2017). Moreover, Laos needs to improve the quality of the tourism sector for long-term development. To enhance the quality of the tourism sector in Laos, initiatives should be taken to invest in other sectors such as education and medicine, to conserve natural resources in the ecotourism sites, and to develop sustainably the regional economy in the tourism site and corroborate with the local residents there. The construction of transportation for economic development, without considering the sustainability in rural areas, could damage the natural environment and decrease the rural economic growth while the urban economy grows. In order to avoid such developments, the transportation project in GMS should aim for not only an "Economic Corridor" but also a "Green Economic Corridor" for sustainable development. In this context, it is important to promote "alternative tourism" such as ecotourism, cultural tourism, community-based ecotourism, and pro-poor tourism[3], and

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to enforce the governance of the local administration against unsustainable developments such as overexploitation, illegal logging, hunting, and corruption.

Second, to increase the number of tourists, Laos's government needs to cooperate with neighboring countries and invest in transport infrastructure to connect to these countries based on the results of the friendship bridge and the visa-permission policy. In addition, Laos's government should develop new tourism resources near the entry points and along the economic corridors to avoid any negative influence on the regional subsistence and the natural environment.

In addition, Laos should take initiatives to cooperate and collaborate with other ASEAN countries. The visa easing had a significantly positive effect on six ASEAN member countries (Cambodia, Malaysia, Singapore, Thailand, Vietnam, and Myanmar), but not on three countries (Philippines, Brunei, and Indonesia). Therefore, Laos's government needs to not only absorb more the inbound demand of the former six countries but also develop another strategy for the latter three countries and release the visa restriction for other countries that have not eased it as yet.

Third, Laos is bound to develop another tourism strategy to benefit from the UNESCO World Heritage Site in Champasak, although the registration of "Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape" as a UNESCO World Heritage Site in 2001 does not noticeably increase the number of foreign travelers compared with that in other years. As indicated in the section regarding results of estimation, this may be related to the economic crisis, the competition with neighboring UNESCO World Heritage Sites, or the few incentives for Thai travelers who represent the maximum share in Champasak. Thus, the tourism sector in Laos needs to devise other strategies such as a marketing strategy for Western foreign countries, and a differentiation strategy for distinction from nearby cultural heritage sites.

Conclusion

This paper examines the determinants of the inbound demand in Laos with the gravity model, considering three interventions for tourism development: (1) visa easing, (2) development of economic corridors within GMS, and (3) the registration of UNESCO World Heritage Sites in 2001.

Our results can help discover the floating of the number of tourists from Cambodia, Malaysia, Singapore, Thailand, Vietnam, and Myanmar after permitting visa regulations, although we cannot find those from Philippines, Brunei, and Indonesia. In addition, the construction of four friendship bridges between Laos and Thailand encourages the inbound demand from not only Thailand but also Vietnam and China. Because their bridge is located at key points in the East-West and South-North

Economic Corridors, their estimated results can be interpreted as the effect of their economic corridors on the tourism sector in Laos. However, we cannot confirm that the registration of the UNESCO World Heritage Site in 2001 positively influences the demand of foreign tourists.

Based on the results, this research suggests three actions required for long-term growth in the tourism sector, considering the "tourist area life cycle" hypothesis of Butler (1980). First, Laos should allocate the profits from economic growth for the sustainable development of the tourism sector. Second, Laos should necessarily cooperate with neighbor countries and ASEAN countries for tourism development. Third, Laos should develop another marketing strategy for promoting the UNESCO World Heritage site in the Champasak province.

The study has some limitations as well. This research analyzes the inbound demand at only the whole country (macro) level. We have yet to examine the inbound demand with the regional data to evaluate the tourism policy in detail. Laos has many entry points, 31 points on land routes and four international airports, as of 2016 (Tourism Development Department, 2016). Indeed, each province has some heterogeneous characteristics at the provincial (micro) level (e.g., natural environment, geography, culture, ethnic group, food). Future research could estimate the panel data regression at the provincial level and analyze the destination marketing strategy of each province for inbound tourism.

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* The author belongs to Institute of Economic Research Chuo University (IERCU) as a visiting researcher, and reported this paper in the public seminar hold by IERCU at 14 October, 2017.

1. We have the other reason to divide time series data into two terms. Actually, we attempt to estimate the panel data with the random model. However, E-views 9.5 shows the result that random effects estimation requires more number of cross sections than number of coefficients for between estimator for estimate of RE innovation variance. Therefore, this investigation deals with this problem by separating time series data.

2. This may be due to the introduction of many dummy variables into the estimation.

3. There are some researches regarding "alternative tourism" in Laos at the regional or village level. For example, refer to Travers (2007) about ecotourism; Khlaikaew (2015), Roverts (2015), Sosamphanh et al. (2013) about cultural tourism; Suntikul et al. (2009) about pro-poor tourism; and Douangphosy et al. (2015) about community-based tourism.

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