Chapter 3

Methodology

3.1 Research Designs, Scope and Method

3.1.1 Scope of Study

This research focuses on the period of annual reports from 2005 to 2013.Most of the data used in this research are secondary data and also the countries analysis are ASEAN region major tourism market of Lao PDR such as Republic of Indonesia (Indonesia), Federation of Malaysia (Malaysia), Republic of Philippines (Philippines), Republic of Singapore (Singapore), The Kingdom of Thailand (Thailand), Nation of Brunei (Brunei), Socialist of Vietnam (Vietnam), and King of Cambodia (Cambodia) All of these countries have significant impact on the international tourism industry of Lao PDR. The variables used in this research are the number of intevnatmonal tourists' arrivals in Lao PDR, the GPD per capita (constant 2005) from selected Asian countries, the international price of aviation fuel, and the exchange rates of Lao PDR currency in comparison with selected Asian currencies.

3.1.2 Ãïncåðt Framework

Since 1950, there has been the concept framework of theories concerned with international tourist demand and but since 1972, Artus began investigation using the econometric method estimated international tourist demand which caused many researchers interested in international tourist demand function using the econometric method and statistical program seeking to answer how factors affect international tourist demand. There are many papers were reviewed, including Lim C(1997) Review of the international tourist demand model, Sara A et. al., (2005) studied demand for tourism in Portugal; E.I.Lelwala and L.H.P Gunaretne(2008) adopted modeling tourism demand; Choketarworn et. al., (2010) investigated international tourist arrival in Thailand and so on.

The previous studies about tourism in Lao PDR, conducted by Phakdisoth and Kim(2007); the authors identified exogenous variables covering communication, transportation, infrastructure, destination risk, bilateral trade and distance between country. So drawing from theories concern with factors influencing international tourist arrivals to Lao PDR, this thesis studies about international tourism demand by using the panel ARDL approach; Lao PDR tourism demand function can assume the Lao PDR equation of the international tourism demand in the ASEAN region as shown on the following:

$$D_{it} = f(GDP_{it}, PO_{it}, TP_{it}) \qquad (3.1)$$

Lao PDR equation on above (3.1) explains why the variables influence to demand of tourist arrivals in. The concept framework on figure 1 shows the process to determine about three selected factors at macro model of Lao PDR international tourism demand.

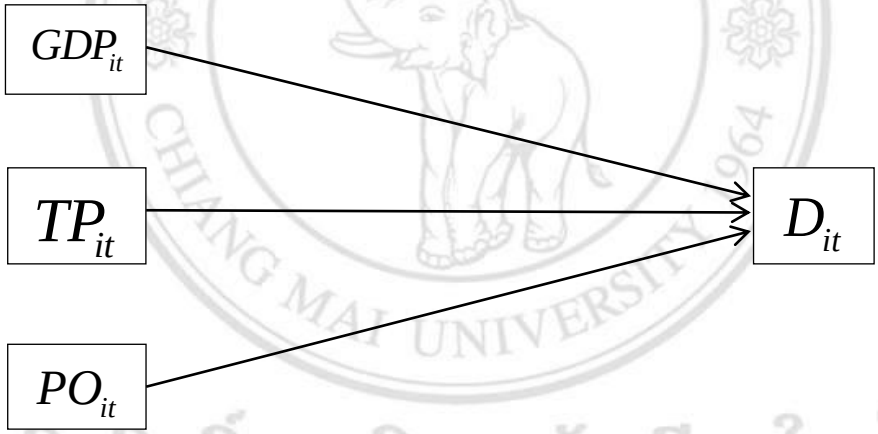

Figure 3.1 concept framework of analysis

From the figure of concept framework on figure 1, assume that (+ GDPit), (- TPit), (- POit) were influenced factors on Lao PDR international tourism demand. to determine for and these variables define that when GDP per capita of the original country at time t is increasing then the demand for international tourism is increasing concurrently. When the tourism price at time t is increasing then the demand for international tourism decreases too. And also when price of flue is increasing then the demand for international tourism is decreasing simultaneously.

3.2 Variables Used in Model

Influence of effect on international tourism demand in the Lao PDR country to consider the economic factors affecting tourism demand. The variables used in this study consist independence and dependence variables such as: dependent variable is international tourism demand; independent variables include income level of the population in origin country, the cost of traveling in price level comparison between Lao PDR and countries, foreign exchange rates will affect to travel decision of tourists from origin to destination countries. In a study converted into a form of Logarithm which details the variables as following:

A. Dependent Variable

The growing of tourism demand studies has attracted academic and professional researchers to draw various dependent variables, such as tourist arrivals, expenditures, departures, tourism receipts, travel demand, tourist visits, average length of stay, nights spend at tourist accommodation. These are found in Chaiboonsri et al. (2010), Song et al. (2009), Lee et al. (1996), Lim (1997), Sr and R.Croes (2000), Han et al. (2006), Alegre and Pou (2006), Gokvali (2007), and Allen et al. (2009). Lim (1997) review more published empirical tourism studies, which find that the most dependent variable used is tourism arrivals and departure followed by tourist expenditures and/or receipts.

The dependent variable is the international tourism demand (DT) including a number of foreign tourists arrival to Lao PDR in the unit.

Therefore, when converted to the form of the logarithm is.

lnDT = the Natural Logarithm of the number of tourists arrivals to Lao PDR
or international tourism demand in Lao PDR.

B. Independent Variable

The previous studies have endowed explanatory variables to explain the tourism demand. There are income variables, tourism prices or relative prices variable, transportation cost, exchange rate, substitute price and other qualitative factors used in the international tourism demand. In reviewing of international tourism demand models, Lim (1995) classifies independent variables into the following categories: income, relative price/tourism prices, transportation costs, exchange rates,

competing destinations/goods, seasonal factors, and other factor. More detailed relevant to those studies can be found in Witt and Witt (1995), Song and Witt (2000), and Louviere (2000). Therefore, there is enough reason to choose the variables in this study as reviewing more detailed below:

Independent variables are the factors influencing tourism demand of foreign tourists in Lao PDR as following:

1) GDP per capita

GDP per capita of origin country is the most leading exposure variable to explain the foreign travel demand as many empirical studies suggested. GDP per capita is very necessary to the tourism demand function, as reported by Lim (1997), Song and Witt (1997), and Dritsakis (2004). With reference to the demand theory, the relationship between income and quantity demand can possibly positive or negative based on the type of goods or services under consumer's consideration. Customers will consume more goods and services, when their income increases; vice versa, consumers consume less goods and services when their income decreases. However, tourism is a well-known considered as the luxury goods (Schiff & Becken, 2011).

GDP per capita in country of origin (Disposable tourism income of individual coming from origin country), can be explained that when GDP per capita of origin at time is increasing then demand for international tourism in Lao PDR is creasing simultaneously that is positive relationship.. So, when converted to the form of the logarithm as follows:

lnGDP = the natural logarithm of gross domestic product. Country's real per capita or income level of the population in the origin. (GDP at constant price 2005).

2) Tourism Price

The Tourism price, in the case of tourism, particularly represents two main prices , namely the cost of living in destination country (tourism price/relative price) and cost of travelling from origin country to destination country (transportation cost). These costs are very difficult to compute and find data from any specific database sources. Tourism price is the most critical concern on tourists' decision-makings to visit the destination country (Gonzalez, 1995). The tourism price is the price of bundle of goods and services bought by tourists, yet most of the countries do not have the tourism price index for goods and services purchased by tourists. Hence,

consumer price index is very common for using in many papers as a proxy, according to Asemota and Bala (2012), Song et al. (2009), Song et al. (2009), Song et al. (2003), Lee et al. (1996).

According to Dritsakis (2004) and Lim (2004), relative price is measured by the consumer price index (CPI) of the destination divided by the consumer price index (CPI) of the country of origin. Tourism price is the cost of travel between origin countries and destination countries (TP), including costs, average per person mmeasured in U.S. dollars. CPI Lao PDR / CPI origin country (Data from IMF and Bank of Lao PDR). This variable explains that when tourism price at time is increasing then demand for international tourism is decreasing that is negative relationship.

So, when converted to the form of the Natural Logarithm, it is:

lnTP = the natural logarithm of CPI Lao PDR / CPI origin country (Data from IMF and Bank of Lao PDR)

Foreign exchange rate is denominated currency (Nominal Exchange Rate) between Lao PDR and origin countries. The ER is the exchange rate between the foreign currencies of origin countries (LAK per 1 unit of currency origin countries). This variable explains that when exchange rate at time is increasing then demand for international tourism in Lao PDR is decreasing, that is negative relationship.

3) Price of fuel

The price of fuel likely transportation cost or price of ticket has been included in many published papers to understand international tourism demand. These can be seen at the works of A.Rodriguez et al. (2012), Divisekera and Kulendran (n.a), and Song et al. (2010). Generally, tourists always take into account on the travel cost from their home to the targeted tourist destination. The tourists' decision-makings usually consider about the cost of their travel based on their level of income. High price of transportation offered by airline is exposed to the strictly tourist's decision. This study includes this variable for exploring the determinant factors that impact on international tourism behavior reflecting Lao PDR as a destination choice.

So, when converted to the form of the Natural Logarithm, it is:

lnPO = the natural logarithm of price of Jet Fuel. This variable explain that when price of Fuel at time is increasing then demand for international tourism in Lao

PDR is decreasing, it is negative relationship (Data from Bureau of Transportation Statistics).

3.3 Data Collection

Based on the above methodology yearly data were collected from various sources as follows: the secondary data using annual data from the period 2005 to 2013, and 72 observations for analyzing international tourism demand. The data of both independent variables and dependent variable are collected from the Tourism Authority of Lao PDR (report 2011), the Bank of Lao PDR (BOL), and Immigration Bureau (Police Department).

Cross-section data of eight ASEAN countries including Republic of Indonesia (Indonesia), Federation of Malaysia (Malaysia), Republic of Philippines (Philippines), Republic of Singapore (Singapore), The Kingdom of Thailand (Thailand), Nation of Brunei (Brunei), Socialist of Vietnam (Vietnam), and Kingdom of Cambodia (Cambodia) consist of GDP per capita, exchange rates, prices of fuel, tourism prices and the number of tourist arrivals in Lao PDR.

Time series data are annual value data in total of 7 years of GDP per capita, exchange rates, prices of fuel, tourism prices and number of tourist arrivals from the period 2005 to 2011collecting from the World Bank, IMF, Department Tourism of Lao PDR. The identified sample of observations would be equal to N x T, that is 72 observations.

3.4 Research Methodology

This research of the tourist demand in Lao PDR was adopted econometric procedures to test the stationary of the data (Panel Unit Root Test) and to estimate using the total average (Pooled Mean Group: PMG).

3.4.1 Methodology and Data Description

This study performed quantitative analysis on the panel data. Panel data test for consistency time between series and cross sectional data. Before estimating data further, it is important to test whether or not panel data is stationary. Panel data are

often characterized as unstable (or non-stationary), and incorrect estimation of relationships by OLS led to false conclusion about relationship (spurious regression). There are many approaches to test panel unit root. This paper conducts the panel unit root tests based on the LLC test, IPS test, ADF test and PP test.

The hypothesis for panel unit root test in order to distinguish whether data are stationary or non-stationary and to determine the predictable data shown as follows:

Table 3.1 Hypothesis of testing the Unit root

Panel Unit Root Test			
Methodology	Null Hypothesis H0	Alternative hypothesis H1	Statistics value test
LLC test	Has unit root	Has no unit root	t - statistic
IPS test			t – statistic
PP test			t - statistic
ADF test			t – statistic

After the data was investigated by conducting statistical hypothesis tests, the results were compared and a selection process of the best t-statistic value relative to positions 1 or I(1) was identified (Im, Perasan and Shin 2003). Next the panel data was tested by using panel ARDL approach to estimate the long run relationships.

The following model is used to estimate tourism demand in Lao PDR PDR within the ASEN region:

$$\Delta \ln D_{it} = \phi_i \ln D_{i,t-1} + \beta_1' \ln GDP_{i,t-1} + \beta_2' \ln PO_{i,t-1} + \beta_3' \ln TP_{i,t-1} +$$
$$\sum_{j=1}^{p} \lambda_{ij} \ln D_{i,t-j} + \sum_{j=1}^{q} \delta_{ij}' \ln GDP_{i,t-j} + \sum_{j=1}^{q} \delta_{ij}' \ln PO_{i,t-j} + \sum_{j=1}^{q} \delta_{ij}' \ln TP_{i,t-j} + \varepsilon_{it} \qquad (3.2)$$

Where:

$\ln D_{it}$ = tourist arrivals (or demand) from the origin country i to destination country at time t

$\ln GDP_{it}$ = GPD per capita in origin country i at time t

$\ln TP_{it}$ = tourism prices i (or CPI of destination country/CPI of origin country) at time t

$\ln PO_{it}$ = price fuel's jet air plane i at time t

ϕ_{1i} = Speed of adjustment to long-term equilibrium

β_i = Long- run coefficient

λ = Short – run coefficient of lagged both of dependent and independent variables

To define the factors that influence on the international tourism demand, the function was tested for a long run relationship. In order to empirically investigate factors that influence Lao PDR international tourism demand including eight ASEAN countries, two main PMGE and MGE approaches which originated from panel data are used in this study. These approaches are investigated with different statistical features for fulfilling the objectives of this study.

3.4.2 Panel ARDL (Pooled Mean Group Estimator)

The PMGE provides statistical features including short-run coefficient, containing the intercepts, the speed of adjustment to the long term equilibrium value, and error term to be heterogeneous country through country. The following steps of panel ARDL (Pooled Mean Groups Estimator), were conducted to analyze short-term relationship, long-term relationship and speed of adjustment estimated by a group. The short-term, long-term and speed of adjustment to long run equilibrium in the international tourism demand model including dependent variable and independent variables can be explained under hypothetical process.

Table 3.2 Hypothesis testing the ARDL

Equation	$\Delta \ln D_{it} = \phi_i \ln D_{i,t-1} + \beta_1' \ln GDP_{i,t-1} + \beta_2' \ln PO_{i,t-1} + \beta_3' \ln TP_{i,t-1} + \sum_{j=1}^{p} \lambda_{ij} \ln D_{i,t-j} + \sum_{j=1}^{q} \delta_{ij}' \ln GDP_{i,t-j} + \sum_{j=1}^{q} \delta_{ij}' \ln PO_{i,t-j} + \sum_{j=1}^{q} \delta_{ij}' \ln TP_{i,t-j} + \varepsilon_{it}$
Hypothesis: H0 ε_{it}	No adaptive to balance short-run equilibrium in the long run.
Hypothesis:H1 ε_{it}	Adaptive to balance short-term equilibrium in the long run.
Statistic test	t- statistic
Criteria test Prob. < 0.1	0.0 – 0.10

3.4.3 Mean Group (MG Estimator)

Peasaran and Smith (1995) proposed the method of Mean Group (MG Estimator) to estimate the long run relationship. The MG estimator allows differing across groups of the intercepts, slope of coefficients, and error variances. The coefficient of long run parameter estimated by MG estimator

$$\beta_{1i} = 8^{-1} \sum_{i=1}^{8} \beta_{1i} \ , \ \beta_{2i} = 8^{-1} \sum_{i=1}^{8} \beta_{2i} \ , \ \beta_{3i} = 8^{-1} \sum_{i=1}^{8} \beta_{3i} \ , \ \beta_{4i} = 8^{-1} \sum_{i=1}^{8} \beta_{4i} \qquad (3.3)$$

3.4.5 Hausman Test

Hausman test is the best method to select whether model reliable or effect in explaining the best results or to decide statistical judgment among PMG and MG (Pesaran et al., 1999). The tests of PMGE and MGE are familiar with Hausman test. If the true model is heterogeneity, PMGE is inconsistent; if the true model is homogeneity, MGE is inconsistent shown as follows:

$$H = (\hat{\beta}_{MG} - \hat{\beta}_{PMG})' D^{-1} (\hat{\beta}_{MG} - \hat{\beta}_{PMG}) \qquad (3.4)$$

Null hypothesis of Hausman Test

H_o: Difference in coefficients not systematic $\lambda^2 > 0.05$

H_o: other regression $\lambda^2 < 0.05$

When the factors influencing of international tourism demand function were defined, the demand function will be tested. The concept framework of panel unit root analysis and panel ARDL (Pooled Mean Group) and Mean Group can be shown as follows:

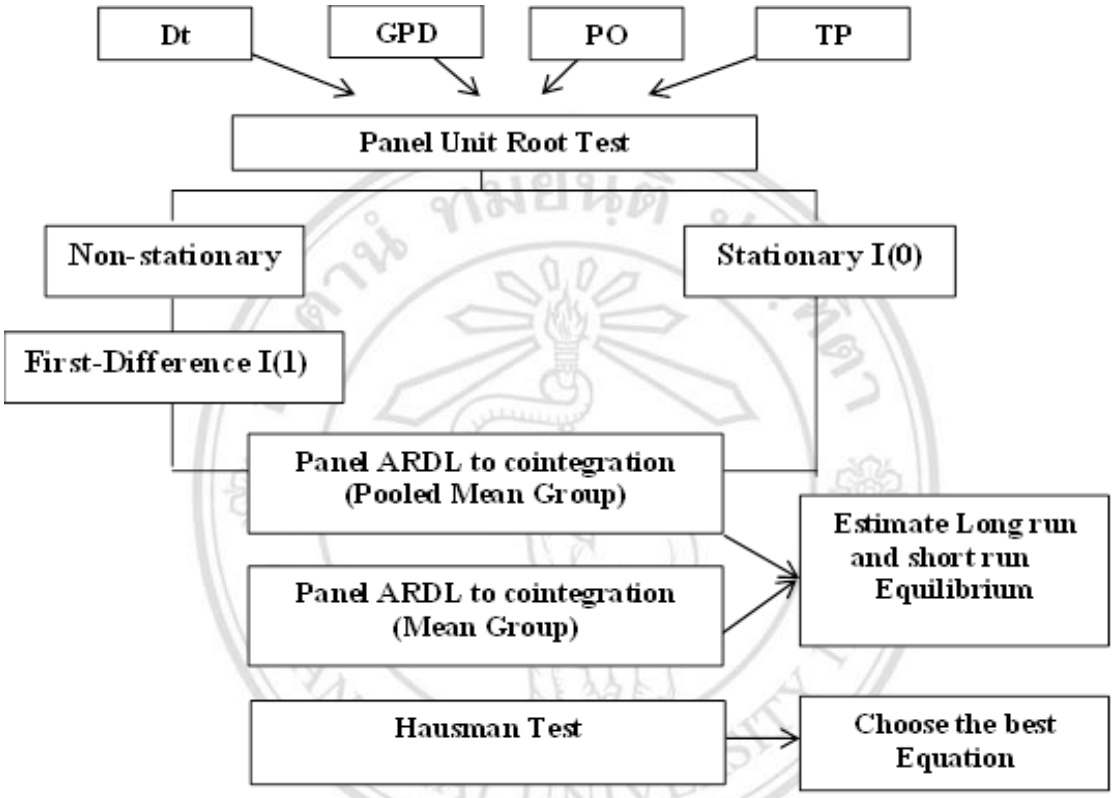

Figure 3.2 Methodology for analysis

Figure 3.2 the conceptual framework analysis can be estimated in to the following four steps:

Step 1: test the panel data by using panel unit root tests to test whether data are stationary or non-stationary using Lin and Chu Test or Im, Pesaran and Shin (IPS) Test and to know the data also can be adopted for an appropriate statistical approach.

Step 2: in case that the data both exogenous variables and endogenous variable are stationary by the order of integration is 0 or I(0) and, then data can be taken to estimate long-term relationship between exogenous variables and endogenous variable as shown on Table 1: Hypothesis of testing the Unit root..

Step 3: the data are not stationary I(1) , it can be solved by finding the first difference (1st Difference), which t-statistic value is less than the critical value. This means rejecting the null hypothesis that the data are stationary at that level as shown on Table 1: Hypothesis of testing the Unit root.

Step 4: estimate the data to determine short-term relationship, long-term relationship and speed of adjustment by panel ARDL (Pooled Mean Groups Estimator and Mean Groups Estimator), estimated by the group. The hypothetical relationships test between short-term, long-term and speed of adjustment to long run equilibrium, among both exogenous variables and endogenous variable of the international tourism demand model.