

## Analysis of Market Structure and Passenger Transportation Performance: Case Study of Nong Khai Custom House, Thai-Laos Friendship Bridge, Nong Khai Province

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### Abstract

This study aimed to examine the situation, general management and performance of the international private transportation services of passengers between Thailand and the Laos PDR at the Thai-Laos Friendship Bridge. Other objectives were to analyze the market structure, competition behavior and the results of passenger transportation industry's performance. This study also aimed to propose policy recommendations in order to enhance efficiency and performance development. Both primary and secondary data were obtained by interviewing two entrepreneurs chosen by purposive sampling and analyzing monthly data obtained from related public and private organizations over the period July 2007 to June 2010. Entrepreneurs provided international bus services from cities within Thailand and the Lao PDR, regular shuttle buses at the bridge, and private hire vans and buses.

The results showed two companies operating in an oligopolistic market structure. The performance of both companies is nearly the same. The efficiency index measurement utilized for both companies were the same; however the results were slightly different. The levels of technology application within both organizations were also similar. Policy recommendations for efficiency and performance development are as follows. Entrepreneurs should increase the frequency of services as well as the number and variety of vehicles available to passengers and each vehicle should run at full capacity. Improving the services to be more convenient in terms of the speed, safety and efficiency is also necessary.

**Keywords:** Market Structure; Performance; Passenger Transportation DemandJEL: F15, F20, F23

### Introduction

Thailand and the Laos PDR have a very long border of 1,810 kilometers which has been involved with international economic transactions in terms of trade, investment, and tourism and passenger transportation over a long period. There are 36 custom check points allowing passenger transportation between the two countries. The transportation modes are by international bus, train and car private hire van. Currently there is international bus service from the Thai-Laos Friendship to the main cities in the northeastern region such as Udonthani and Khon Kaen. The trend of passenger transportation has recently increased because of the rise of tourists and investors as well as the supporting promotion policy of both countries for the passenger transportation business. The growth of this business can be attributed to the capacity of Nong Khai province with respect to tourist attractions and destinations, food, culture and natural environment. The attribution of demand solely to the asserted attributes of Nong Khai province is not only for business. There are other reasons for the demand for cross-border travel, including kinship links and travel to other parts of Thailand.

The more transparency competition between service providers or entrepreneurs is the one essential key factor to promote the industry expansion and benefits to consumers. Currently, there are only two entrepreneurs in the passenger transportation market between Thailand and Laos PDR. The studies in this research area mostly focus on market between other countries. The number of passengers travel between Thailand and Laos PDR has increased because of the transportation convenient by crossing the Thai-Laos Friendship Bridge. The scope of this study concentrates on the market structure and competition perspectives.

There are only 2 firms in the market. Consequently, it can be affirmed that the market is clearly concentrated. It is useful to calculate the indices. A concentrated market increases the potential for oligopolistic behavior by the two firms via how the market works in practice e.g. price setting behavior and service scheduling.

Therefore, it is very useful to study the market structure and performance in order to implement effectiveness enhancing strategies for entrepreneurs to be mutual benefits as well as to consumers. Moreover, the results of this study can be used as guidelines for both entrepreneurs and related government organizations. The structure of article consist of objectives and scope of the study, conceptual framework, research methodology, results of the study, discussion,

policy implications and recommendations, conclusion and suggestion for further studies.

## Objectives and Scope of the Study

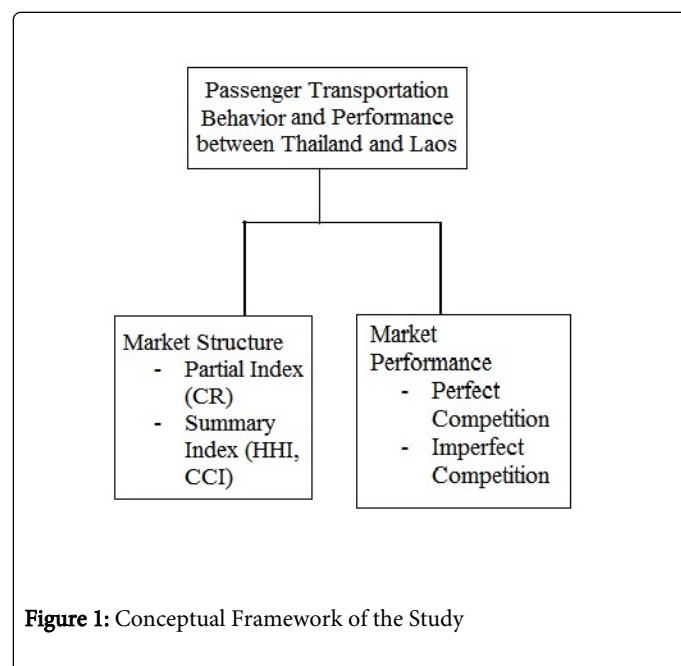
This study aims to examine and analyze the market structure and competition and market performance of passenger transportation between Thailand and Laos. This study also aims to propose policy implications and recommendations to improve the efficiency, effectiveness and quality of services provided.

The scope of study covers entrepreneurs who own passenger transportation business of bus and van. The study period is between July 2007 and June 2010. The data used to estimate model is monthly data.

## Conceptual Framework

In drawing up the conceptual framework undertaken in this study, related industrial organization concepts and market competition theory were considered as follows in Figure 1.

As can be seen, there are two key elements that need to be reviewed, analyzed and examined to answer the key research questions subject to the objectives of study. These two key elements consist of market structure and market performance. Market structure is aimed to measure the concentration level of the industry via partial and summary indices, while market performance is identified by market characteristics and competition.



There are three key research questions which need to be answered in this study:

- What is the market structure of passenger transportation industry between Thailand and Laos?
- What and why are the suitable instruments or indices required to measure the market structure of the passenger transportation industry between Thailand and Laos?

- How does the passenger transportation market between Thailand and Laos perform?

## Research Methodology

This study is applied research as both qualitative and quantitative research is undertaken. As a result, it was necessary for both primary and secondary data to be collected and analysed to answer the objectives of the study.

## Population and sampling

The population used for this study consisted of two entrepreneurs providing passenger transportation services at the . This population provided quantitative data. Quantitative data includes number of passenger, national income, pay rate, population, exchange rate and consumer price index. These qualitative data are collected from the related government organizations.

## Research instruments

It was essential to develop and use appropriate research instruments to assure the reliability of the results of the study. As a consequence, the research action plan was divided into two steps. The first step was to examine the market structure and performance, while the second step was to use a questionnaire as an instrument to collect qualitative data from the two entrepreneurs.

## Data collection and analysis

Qualitative data was collected by conducting an interview process using a questionnaire for purposive sampling technique. These data consist of the competition strategies and environment and the related government policies. The quantitative data was collected from various secondary data source of the annual report. These data contains with income, market share and the number of customers. Appropriate indices were applied to analyze and examine the market structure and performance as follows [1-3]

## Partial Index

### Absolute concentration ratio or Concentration ratio (CR):

This index is used to measure the market concentration of an industry by considering the leading entrepreneurs in that particular industry. The value of this index is between zero and one. The more the value approaches zero means the industry has high competition in the market, while on the other hand, if the value approaches one then the market is more probably a monopoly or an oligopoly.

The Absolute Concentration Ratio or Concentration Ratio (CR) can be written as follow.

$$CR_n = \dots\dots\dots (1)$$

CR n is absolute concentration ratio or concentration ratio for industry n

$X_i$  is market share of business unit i and i is business unit 1, 2, 3,..., n respectively

n is the number of selected large business unit and N is the total number of business units in the industry

For the CR, a value of 1 is a monopoly, with the potential for an oligopoly arising for CR=0.5 and by 0.8 almost certainly being an oligopoly.

### Summary index

This index is constructed to measure the market concentration of an industry by selecting all business units in each industry. This index can be explained by using the following indexes.

### Hirschman-Herfindahl Index (HHI)

This index can be calculated by using the comparison of the sum of the square of the market share of each business unit in the industry as follows:

$$HHI = \sum_{i=1}^n S_j^2 \dots\dots\dots (2)$$

HHI is Hirschman-Herfindahl Index

S<sub>j</sub> is the market share of a selected business unit in the industry

j is the number of business units in the industry from 1 to n

Both partial and summary index are calculated by using the quantitative data and the above formula. It is also necessary to interpret the value of calculated number. The value of this index is between 0 and 1. If the value approaches zero then the industry has intense competition. If the value approaches 1, there is a high probability of a monopoly or oligopoly industry (4).

### Comprehensive Concentration Index (CCI):

This index was developed to solve the problem caused by HHI being an index used to gauge an entire market.

Comprehensive concentration index can be expressed by follow.

$$CCI = + \dots\dots\dots (3)$$

CCI is the comprehensive concentration index

X<sub>i</sub> and X<sub>j</sub> are market share of business units i and j respectively

j is the total number of business units in the industry equals to 1, 2, 3,..., n respectively

n is the total number of business units in the industry

It is very essential to use each of these indices to analyze the market behavior and performance lead to the accurate result.

### Market Behavior and Performance

Market behavior and performance can be analyzed and measured by using the market structure and competition theory [4]. There are two different types of market according to the market structure and competition theory: perfect and imperfect competition markets. An imperfect competition market can be divided into monopoly market, oligopoly market and monopolistic market. Nevertheless, there are other forms of imperfect completion, e.g. monopsony and oligopsony [5,6].

## Results of the Study

### Passenger transportation system between Thailand and Laos

There are nine buses provide the service for passenger and there are only four air conditioned buses. There are forty-five rounds for every day. There are twenty passengers per round. As a result, there are nine hundred passengers by approximately use the service. The fee is fifteen baht per round. More passengers use the service on weekends. Therefore, the total passenger is increase to 1,350 passengers and the fee is also increase to twenty baht per round. Moreover, there are four vans provide the service for forty rounds. The fee is higher than the bus service which is two hundred baht.

Both buses and mini-vans provide a cross border shuttle service. There are nine buses, of which four are air-conditioned, that make a total of 45 crossings per day. On an average weekday each bus averages 20 passengers per crossing giving approximately 900 passengers per weekday. The weekday fare is 15 Baht per passenger. At the weekend, which is busier, the number of passengers rises to approximately 1,350 per day whom pay an increased fare of 20 Baht. In addition to the nine buses, there are also four mini-vans that make a total of 40 crossings per day, charging each passenger 200 Baht.

### Industry performance

There are two large entrepreneurs in the market although there is significant difference in the levels of income of each company. One has a yearly income of 17.9 million Baht, while the other one earns 7 million baht per year.

### Market share

The market share of first company is 71.9% which is very high when compared to that of its main competitor. If there are any other small operators, the share will be less.

### Market structure analysis

Regarding the results of the analysis using both partial and summary indexes, it can be concluded that the Concentration Ratio (CR) is inappropriate for this case. Consequently, the HHI and CCI are appropriate in order to obtain accurate and reliable results because the market structure can be explained clearly by using both indexes.

Based on the calculation of HHI and CCI, it cannot be concluded that the market structure of passenger transportation between Thailand and Laos is an oligopoly market because the HHI is 0.65147 and the CCI is 0.8536. These indices strongly indicate strong market concentration. The regulatory conditions of the cross-border public transport also effect market. It is possible that government regulators have to set fares, which could explain why fares are the same for both operators, i.e. evidence of price leadership is needed to show that the operators behave in an oligopolistic manner. Government controls and intervention on the number of operators could explain the market concentration. However, this may not be the case, but there needs to be a complete section on government regulation of the road-based cross-border public transport market.

### Market Behavior

This section is divided into two parts: market behavior and market performance.

## Market behavior

It can be stated that passenger transportation market between Thailand and Laos is an oligopoly market as there are only two competitors and both of these companies provide different services in terms of air conditioned bus and normal bus. In addition, one company has an obvious high market share of the industry.

An oligopoly market also has other important characteristics particularly in terms of the price reaction of competitors. Price can be changed although it is determined when competitors altered the price. For example, the volume of goods or services produce can not be able to increase even though the price is decreased because the competitors will decrease the price in the same rate or even more. Furthermore, if the entrepreneur increases the price but the competitors do not change the price will lead to less volume of goods and services consume by consumers. Consequently, both entrepreneurs in the industry remain to set the same price or gradual change during the period of study. According to the result of study by using the interview and questionnaire instruments, it can be the income after tax payment of both companies is apparently different because of oligopoly market structure, behavior and market share.

## Discussions

The market structure of passenger transportation between Thailand and Laos has the dominant characteristics and competition of an oligopoly market. Both companies try to enhance the quality of service provided by using technology adaptation. Nevertheless, not all entrepreneurs in industry have different ability to increase the level technology of technology adoption due to the limitation of increase investment funding. As a result, the kind of bus provides service is mostly normal bus. Furthermore, the ticketing system is still based on paper system.

## Policy Implications and Recommendations

Both related private and public organizations should encourage more entrepreneurs to participate in the industry to enhance competition.

More competition will lead to a higher level of service quality of services that entrepreneurs provide to customers.

Entrepreneurs should use technology in order to provide a more efficient service e.g. on-line ticketing system.

Customs and immigration procedures at the customs and immigration check points of both countries should be decreased to save time for passengers.

The market structure can be changed to be more monopolistic if the number of entrepreneurs increase via encourage strategies to attract more entrepreneurs enter to the market.

The attractive strategy can be the tax rate reducing.

Loading levels, fare regulation and willingness to pay are needed to be in consideration for not only the entrepreneurs but also the related private and public organizations. It requires the involvement and

approval of both of the Thai and Lao governments to implement the proposed policies. More relevant suggested policy would be to argue for deregulation or reduced regulation of the market by both the Thai and Lao governments [7]. It can be postulated that all policy implications and recommendations above are plausible. These policy implications and recommendations need the collective cooperation between the two countries to be the channel of trade and investment facilitation to support and enhance the success AEC.

## Conclusions

International passenger transportation is one of the essential industries that can enhance trade and investment between Thailand and Laos. Moreover, the rail transportation of both goods and passenger between these countries has currently operated from Nong Khai train station to Tha Na Lang train station close to Vientiane. The most important policy implications and recommendations are to improve the efficiency in terms of quality, frequency and use of technology e.g. on-line ticketing system. Another necessary policy recommendation is to develop the area to provide more convenience for passengers and improved cleanliness. Improvement in transportation efficiency for passengers is one way of trade and investment facilitation to enhance trade and investment expansion not only for both countries but for intra-ASEAN region [8,9].

## Suggestions for Further Studies

This study can be extended to analyze and examine an appropriate passenger transportation model between Thailand and Laos which could be used to measure the impact of passenger transportation service on economic growth of both countries. Additionally, the elasticity of passenger transportation demand model can be examined to analyze the optimum price to increase the market competition efficiency and benefit to consumers.

## References

1. Manusuk O (1998) *Industry Structure and Behavior*. Ramkhamheng University Press, Bangkok.
2. Mingmaneeakhin W (2002) *Preliminary Microeconomics*. Thammasart University Press, Bangkok.
3. Nonthapot S (2009) *Economic Regulation*. Khon Kaen University, Nong Khai Campus.
4. Chutiwong N (1999) *Microeconomics Theory*. Chulalongkorn University Press, Bangkok.
5. Jitthungwattananukul B (2005) *Passenger Transportation*. Chiangmai University Press, Chiangmai.
6. Krainate P (1998) *Passenger Transportation*. Ramkhamheng University Press, Bangkok.
7. Phiewthongkham K (2005) *Market Structure of Thai-Laos Cross Border Trade: Case study of Mukdaharn*. Faculty of Humanities and Social Sciences, Khon Kaen University.
8. Ruewmonkhon T (2001) *Introduction to Transportation*. Chiangmai University Press, Chiangmai.
9. Sakhuntaluk P (1986) *Economics of Transportation*. Chulalongkorn University Press, Bangkok.