3. Research Design and Methods

Within the particular context of this dissertation, exploring market integration thus necessitates both a well defined empirical setting and a research design to manage the challenges and complexity of the studied process. The main objective with this dissertation is to find determinants for the differences in prices between locations and quantify the importance of freight tariffs for the final price of the homogenous retail product in Lao PDR. The main focus will be on the national market for domestic freight services and the spatial price pattern of a homogenous retail product.

3.1 The Empirical Setting

This dissertation seeks to understand how the domestic market integration functions and in particular how the levels of market integration relates to Lao PDR's markets for freight services. Hence, an explorative quantitative research approach will be applied. The dissertation is explorative in the sense that it is not clearly given to what extent transport costs influence the domestic market integration. The dissertation seeks to shed light not only upon the relationship between market integration and freight transport costs in Lao PDR; it will also investigate the underlying variables influencing the costs of transport within the freight transport service sector.

The choice of empirical setting is introduced in Chapter 4. Lao PDR provides an unique setting as a country with very large regional differences in economic growth and in access to transport infrastructure. Hence, its fragmented national market has been argued to come from the low levels of transport infrastructure development (Bourdet 2000). The pattern of large disparities in economic development between provinces and regions has been targeted by government policies but is still persistent.

As identified in Chapter 2 the relationship between market integration and transport costs is of large importance. In order to investigate this complex relationship there is a need to study the underlying variables influencing the cost of freight transport

in order to get a better picture of how the market for freight is constructed and to identify factors determining the price of freight transport.

3.2 Research Approach and Methods

Research methods consist of systematic tools and techniques to make and interpret empirical observations (Vafidis 2002). However, research methods are instruments with specific fundamental ontological and epistemological assumptions with separate ways of influencing the studied objects (Solem 2003). As the choice of methods is not purely a technical question, but also a reflection of the researcher's beliefs and ideals, its dissemination is of importance. Traditionally, quantitative methods have been associated with a positivistic or deductive approach (Näslund 2002), while qualitative methods are often linked to inductive research paradigms (Mentzer & Flint 1997). However, these distinctions are not absolute. In fact, a variety of different research approaches can be used for the empirical testing phase of deductive research. These range from quantitative methods including model building, simulations, and statistical analysis (Halldorsson & Aastrup 2003) to qualitative structured interviews (Hyde 2000) or triangulation, which is a combination of multiple research methods (Denzin 1970; Denzin and Lincoln 1998; Ellram 1996; Yin 1994).

3.2.1 Triangulation

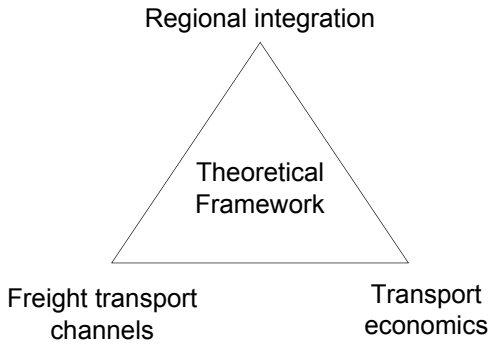
The method employed for this research is triangulation because of the complexity of the research questions and the context in which the research takes place. Yin (2003) suggest a quantitative research method in order to answer research questions seeking to know more about which, what and how many. Denzin (1970) identified four basic types of triangulation:

- *Data triangulation:* involves time, space, and persons;
- *Investigator triangulation:* consisting of the use of multiple, rather than single observers;

- *Theory triangulation:* involves using more than one theory in the interpretation of the phenomenon studied;
- *Methodological triangulation:* involves using more than one method to gather data.

The theoretical foundations on which market integration and the formation freight tariffs have their origins suggest a number of different variables influencing the degree of integration of domestic markets. In order to ease the understanding of the issue at hand and interpreting the complexity within the system studied, this dissertation applies a theoretical framework drawing on several existing theories. Figure 3.1 provides a summarizing illustration of the triangulation of the theories used in the dissertation.

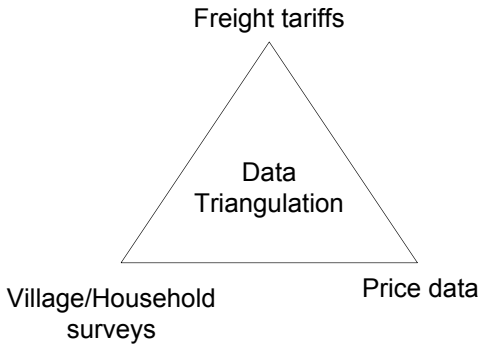
Figure 3.1 Triangulation of Theory Transport Economics –Regional Integration – Freight Transport Channels



In order to fully interpret the freight service sector and the process of market integration, it is also necessary to use multiple data sources. Data on spatial price pattern for a homogenous retail product and freight tariffs are two of the most important data series used. These data originate from secondary sources (data collected as part of a larger a household survey) but include also primary data on freight tariffs and information about the method of calculating freight tariffs collected during semi-structured interviews with stakeholders in the freight service sector. By using several

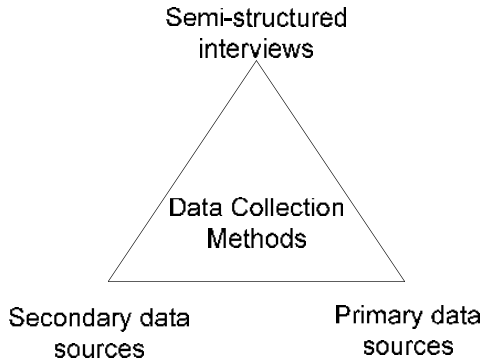
sources of data the author is able to increase the reliability by cross-checking different data sources (Denzin 1989).

Figure 3.2 Data Triangulation



Data triangulation as shown in Figure 3.2 can achieve higher validity particular when conducting quantitative research in a context, such as in a developing country, where the availability and/or the reliability of data are low or when the research conducted makes use of confidential and sensitive information, such as prices and rates.

Figure 3.3 Methodological Triangulation



Methodological triangulation involves using more than one method to gather data. Figure 3.3 illustrate three different methods to gather data is used, semi-structured interviews for the collection of freight data, usage of secondary data from a household survey implies methodological triangulation together with primary data sources.

3.3 Data Sources

It is important to consider the data availability when developing a model. Naturally, it is of limited use to develop a model just to find that there is no data of satisfactory quality to use as input in the model. Data sources can be of two well known types; primary data sources and secondary data sources. There is a limited secondary data sources available for parts studied context whereas other parts are well covered by earlier secondary data. As the main purpose of this dissertation is to conduct an explorative study combining several theoretical dimensions there is a need to be flexible and use several types of data giving use of data triangulation. The theoretical framework together with the structure and sequence of the research imply utilisation of a variety of data sources, both primary and secondary.

3.3.1 Secondary Data

In order to ease the problem associated with collecting and conducting research with in the research setting and the studied phenomena of market integration and the freight transport service sector. The research setting which is investigated and studied in Chapter 4 where a quantitative data is utilized to measure, study and analyse the provincial disparities in economic growth. The role of the dataset and the quantitative analysis is to provide a well grounded setting and illustrating how fragmented regional development Lao PDR experience. Data to calculate poverty rates were complied from the household surveys LECS 1, 2, and 3. The datasets was provided by Department of Statistics (formerly the National Statistics Centre) and a more detailed presentation of the components used will be presented in respectively analysis. The poverty rates calculated from the household surveys were used for the mapping of the regional and provincial

development in Chapter 4. The geographical data used to construct statistical maps was provided by the National Geographical Department. Although the household surveys were conducted before the Special Administrative Region Xaysomboune was integrated into the province of Vientiane it was decided to follow the present administrative division.

Data on transport development presented in Chapter 5 was obtained from United Nation Economic Commission for Asia and Pacific (UNESCAP) Asian Highway Database and made available in electronic format by the Transport Division at UNESCAP. Ministry of Public Works and Transport (MPWT) provided secondary data on transport development through its National Transport Committee.

Chapter 6 use LECS 3 with a special focus on the data collected and compiled on the village level (for detailed information on LECS 3 see Appendix 4). The village level data consists of 540 villages. The village survey contains information on the development level of the village with a large number of variables collected. While LECS 3 provides a unique and valuable source of information for analysis it should be noted that there are some weaknesses in the dataset. One problem is that the coverage and stratification of the LECS samples has changed over time, which means that it is difficult to construct data panels on basis of the three existing surveys. This creates problems over time to follow developments and change over time at a disaggregate level. This is exacerbated by the scarcity of reliable information on variables like production, growth and structural change from other sources. Given the focus on spatial price patterns on retail commodities it would be highly valuable to access price data from all three surveys. However, only LECS 3 contain a full sample of prices collected on village level giving the reason for the usage of only LECS 3 in the analysis in Chapter 6. However, the dataset used to conduct the statistical analysis was constructed by variables related village characteristics and prices collected from LECS3 whereas variables related to travel time was provided by the Swiss National Centre of Competence in Research (NCCR) North- South. NCCR shared

data on travel time from their Socio-Economic Atlas of the Lao PDR (Messerli *et al.* 2008).

The last empirical chapter combines foreign trade statistics with official trade statistics collected by Lao authorities. The official trade statistics collected by Lao authorities do not provide any accurate description of the structure of imports and exports. There are two main national sources of trade statistics in Lao PDR, the customs administration collects export and import data at each border crossing Lao authorities and data collected on provincial level the Provincial Department of Import and Export which monitor value, volume together with destination and origin of the export and import. This data started to be reported to the Department of Import and Export at the Ministry of Industry and Commerce during 2006.

The problems with data availability is connected to the weak capacity of the statistical authorities in Lao PDR and the high share of informal trade, which is partly facilitated (or caused) by an inefficient customs administration. The fact that much trade if informal makes it difficult to double-check the Lao export records by examining import data from the country's trade partners: the lack of formal export and import records spills over to the trade statistics of the neighboring countries. Hence, there are substantial discrepancies between the export data recorded by the Department of Import and Export and data provided by the customs administration at the Ministry of Finance (see e.g. IMF 2000) and the import data registered by the trade partners of Lao PDR. These discrepancies do not follow any systematic pattern – some years, partner data show much lower trade volumes than official Lao records, other years the opposite is true.

Therefore the main sources of data for this chapter are the IMF's Direction of Trade Statistics (DOTS) and UN Comtrade[1], which presents official statistics provided by

[1] The data on imports by most of the trade partners of Lao PDR are recorded in the UN Comtrade database. Lao PDR is not included as a reporter in Comtrade because of problems with data availability and quality

national authorities and/or statistics derived from partner records. The main reason for the decision to make use of the IMF statistics is the frequent updating of data and the relatively short time lags; and the fact that statistics provided by other sources are usually solely based on national official data, whereas the IMF conducts crosschecks and adjustments, e.g. by making use of partner data.

3.4 Qualitative Research on Freight Transport Service

The proceeding section will discuss following issues occurring in relation to methodology used in Chapter 5. This section focuses its attention on the complexity occurring when collecting primary data from the freight transport service sector. Moreover the present section defines the population of interest for the study of the freight transport service sector, defining the sampling unit, the size of the sample together with the sampling method.

Casavant *et al*. (1995) stress three distinctive aspects why it may be difficult to collect data for a study of freight transport services. First, the identification of the actor (operator) who actually makes commodity shipping and service decisions is not always straight forward (in the passengers case the identification is clear). Second, most of the relevant variables used to describe goods movements are very different from those used to describe passenger flows (weight/volume of a shipment, distance transported, annual tonnage transported, value of commodity, potential risk involved in the movement of the goods and ownership of the transported good). In addition to these factors it is often difficult to find the right person with the correct knowledge of the whole freight channel willing to be interviewed. Finally, different service provider's knowledge and perceptions about the characteristics and attributes of various transport modes may be significantly different from objective measures of the level of service properties. In the case of freight transport, the knowledge of the level of service offered by a mode not being used by the shipper is rather limited compared to the passenger counterpart as the operators focus on their mode and its rare to see intermodal transport solution from domestic transport in developing countries (Garrido 2000). For instance, in the passengers case, commuters

have relatively accurate knowledge of travel time, cost and comfort for all the available modes, whereas in the freight sector, the shipper would need to actually use the available alternatives to find out the level of service attributes, which may result in large unwanted costs.

Daughety (1979) also emphasises the concept of total distribution logistics of a firm, when freight transport is analysed and measured. Thus, shipment decisions and service characteristics should be analysed beyond the transport function, i.e. imbedded in the context of the total transport supply environment, including interactions between routes, inventory, vertical integration and other strategies of the companies participating in the corresponding supply chain. The latter is equivalent to the consideration of activities instead of simply trips as in the passenger's transport case. Daughety (1997) and Garrido & Mahmassani (2000) provide general recommendations with regard to data collection from the freight transport service sector, which are of interest to this study. In many studies, there is a need for surveys aiming to understand the nature of shippers, carriers and facilitator's behaviour, together with the collection of formal quantitative data on freight rates. Surveys of service providers, carriers and facilitators usually involve personal interviews with a knowledgeable set of respondents (Hancock 2000). The interviewers should be specialists in freight transport since they will probably use semi-structured interviews with the interviewees.

3.4.1 Sampling Frame, Population, Unit and Size

The purpose of Chapter 5 is to highlight interacting factors behind differences in tariffs for freight transport between Vientiane and the provincial centers. It is important to note that this section relates to research design used in Chapter 5. Chapter 5 is divided into two parts in order provide a well grounded study of the freight system in Lao PDR. Part 1 utilize qualitative research methods to analyse and identify stakeholders and actors of the Lao national freight system and with a quantitative second part trying to identify and quantify determinants of freight tariffs. The choice of using both quantitative and qualitative research methods to study the freight system is related to the above discussion

about the complexity of a national freight system. For example Daughety (1979) highlight the importance of understanding how actors within the freight system interact. Therefore multiple research methods facilitate the understanding of this complex research objects.

The sampling frame of the qualitative study in Chapter 5 is designed to cover a wide range of actors and stakeholders within the national freight system. The sample units are defined as stakeholders in the freight transport sector in Lao PDR and persons with special knowledge about freight transport in Lao PDR. Firms involved in freight transport service in between Vientiane and the provincial centers, freight transport service providers located in Bokeo Province and Savannakhet Province, customers using freight transport service in Vientiane, government regulators on four administrative levels; national, provincial, district and municipality levels, experts in academia and international organisations, and government officials from neighboring Thailand. The size of the sample is 69 respondents (see APPENDIX 1 List of Interviews - List of Interviewees Consulted for Study of Lao Freight Sector in Chapter 5)

3.4.2 Sampling Method

A critical stage in the sampling process is the choice of method used to choose sample units. Chapter 5 use stakeholders in the freight transport sector in Lao PDR). The study in Chapter 5 uses a non-probability sampling. The type of non-probability sampling use is purposive with the researcher selects the sample units based on background knowledge. The sample units were selected together with National Transport Committee at Lao Ministry of Public Works and Transport (MPWT).

3.4.3 Data Collection Process

The collection process has been divided into several phases and has been based on interviews with key stakeholders and actors within the Lao freight transport industry.

The data collection process in Lao PDR benefited by using semi-structured interviews and more importantly by consultation meetings arranged by the Lao Ministry of Public Works and Transport and the Swedish Embassy in Vientiane.

The interviews laid a foundation of knowledge about the context which was necessary when holding consultation meetings with the key stakeholders in the freight sector. The consultation meetings was arranged with the assistance of MPWT and provided an opportunity to utilize data triangulation technique by gather data from policymakers, service providers and local shipper and consignees. Most of the respondents were high ranking official or business owner. Here local language was used to ease the understanding and the discussions between the respondents. The depth of the discussion was facilitated by the respondents' knowledge and experience from working within the freight sector.

Freight surveys should recognise that quantitative data may be difficult to obtain due to their commercial value. On the other hand, qualitative data elicited from expert panels might be an initial way of understanding freight transport processes. However, in during the consultation meetings it was hard to access quantitative data from the service providers as they were reluctant to reveal data related to freight tariffs and the composition of their costs. Therefore it was very important to during the consultations identify person with specific knowledge with a possibility to be quantified.

A key issue for the analysis is the identification of the population of interest. The identification of key stakeholders was made during the consultation meetings. The identification was made and more importantly a relationship with the respondents can be established. In a context where access to information can be difficult and the interviewer need to gain trust from the respondents. This is particular true with government officials who need be very careful when providing data or offering their perspective. Therefore consultation meetings might not be enough to gain full understanding of the studied context. Considering the sensitive nature of the researched context, interviews of government officials, so-called "elite" interviews, were highly significant for

understanding the context and roles and the functions of different actors in the freight sector. Interviews of this kind are based on lists of themes or key issues rather than set of questions. With little or no direction from the interviewer, respondents are encouraged to relate their experiences to describe whatever seems significant to them, to provide their own definition of situations, and to reveal their opinion and attitudes as they see fit. The interviewer has a great deal of freedom to probe various areas and to raise specific queries during the course of the interview. This means that the same broad topics will be introduced during each interview but the questions may change over time. Although the encounter between the interviewer and respondent is structured and the major aspects of the study are explained, respondents are given considerable liberty in expressing their definition of a situation that is presented to them.

The next step in the data collection process involved close interaction with key stake holders on a more occasional basis by attending meetings and conference in Lao PDR and Thailand. Lindberg (2007) stress that as a researcher working with government officials has to gain basic knowledge it is useful to spend time in the government departments. This give knowledge of how things work, the decisions are taken, the politics of power thus giving important information about how the government exercise its power. Lao PDR are often referred to as difficult context to conduct research in. Lindberg (2007) provide an example from the Lao Ministry of Industry and Commerce where the researcher was given trade statistics published by the Asian Development Bank instead of getting access to national statistics. This shortcoming was avoid during the data collection process by regular visits to ministries and by frequent participation in national and regional meetings covering the topic of trade statistics, transport development and the regionalisation process in the Greater Mekong Subregion. The level of trust between the researcher and the responsible government officials grew and there were no problems in accessing data. As a matter of fact both the Ministry of Industry and Commerce and the Ministry of Public Works and Transport were very helpful in providing data and organising meetings inside the government sector but also with private sector stakeholders.

3.5 Data Analysis Methods

Data analysis techniques vary depending upon the underlying research objectives and research questions which are specified under each chapter.

3.5.1 Regression Analysis

Regression analysis has been used in many studies to determine whether infrastructure developments influence the economic development of a geographical area (Deaton 1997; van de Vooren 2004). Also, this methodology has been used in several studies to determine the composition of factors influencing the efficiency of a specific transport infrastructure project or a mode of transport.

In order to determine the relationship between price and factors influencing the collected prices it would be necessary to compare different geographical locations, especially as the studied context consists of fragmented markets with limited connectivity. The degree of market integration has strong implications on people's livelihood. By identifying village specific characteristics that influence the final price of a homogenous retails product at the village level, it may be possible to forecast the transmission of price fluctuation stemming not only from events in the national economy but also global developments, like increasing fuel prices.

In regression analysis, an initial theoretical hypothesis is made in which a factor or factors (independent variables) have an impact on the factor of interest, the dependent variable (Lewis-Beck 1980). A multiple regression implies more than one independent variable. Data on all variables are collected, and commonly a least square fit is performed. Statistical parameters from this initial analysis then indicate if there is a statistically significant association between each separate independent variable and the dependent variable, together with an indication of the nature of this relationship, as indicated by the regression coefficient. It should be noted that regression analysis is a statistical method to determine relationships between given variables, but does not

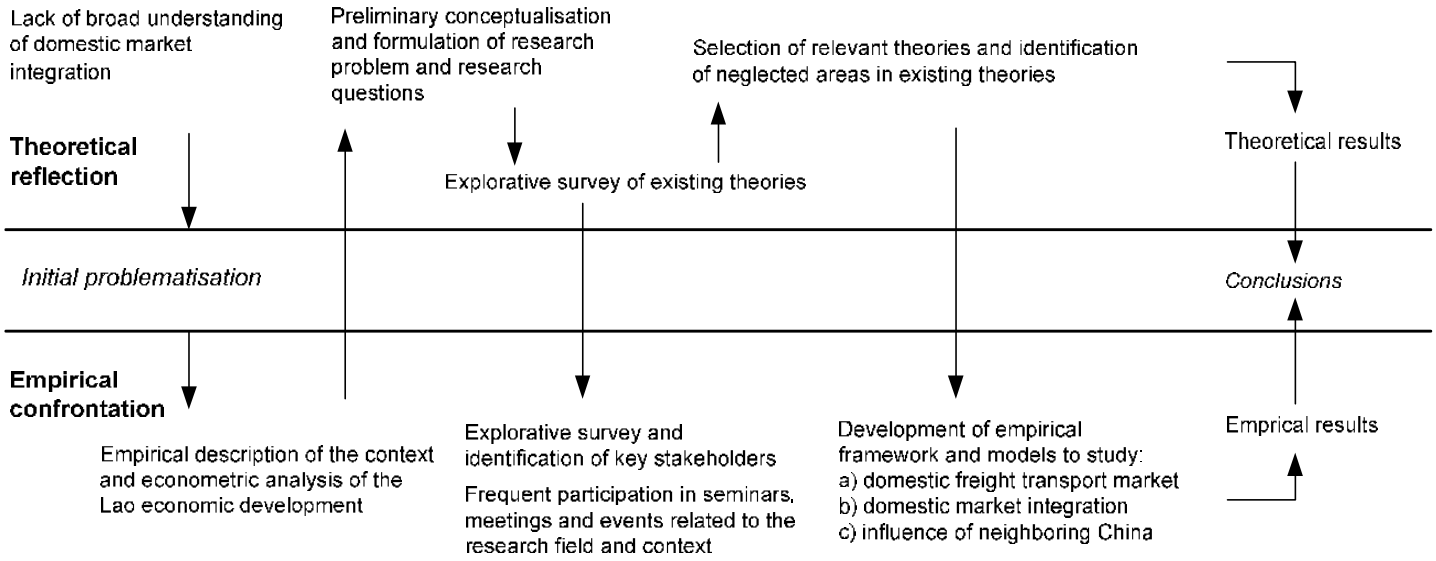
necessarily imply that the independent factors caused the dependent factor to respond the way it did. However, causality has to be postulated in the theoretical framework and in the original definition of the variables used in the analysis (Shaw & Wheeler 2000).

3.6 Summary and Conclusions

In introducing the empirical context, research design and methods and the main statistical method, this chapter has sought to combine the conceptual and explorative theoretical discussions in Chapter 2. Figure 3.4 provide an overview of the research process which highlights the importance of interaction between the theoretical reflections and the empirical confrontation. The path which the research follows is dually dependent on the development of the theoretical reflections and continues advancement of the empirical knowledge of the research setting.

The chapter can, therefore be seen as a starting point for the subsequent chapters. The idea has been to give the reader a road map by which to understand and interpret the empirical data presented in Chapters 4, 5, 6 and 7. It is import to note that this chapter provide an overview of the methods used in the dissertation. Each individual chapter provide more detailed discussion and presentation of the methods used in the specific studies.

Figure 3.4 Research Process



Source: Author´s elaboration based on Lindberg 2007