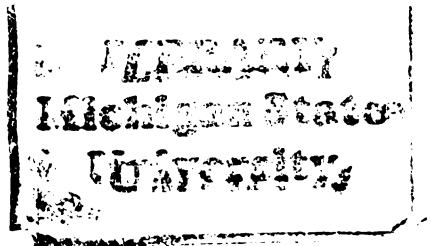
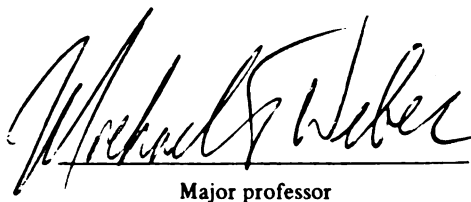


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THE ECONOMICS OF SMALL-SCALE FURNITURE PRODUCTION
AND DISTRIBUTION IN THAILAND

By

James J. Boomgard

A DISSERTATION

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ABSTRACT

THE ECONOMICS OF SMALL-SCALE FURNITURE PRODUCTION AND DISTRIBUTION IN THAILAND

By

James J. Boomgard

This study examines the economic viability of small-scale furniture manufacturers in rural Thailand. A "systems" perspective is used in which the small, rural firms are viewed as participants in a changwat (provincial) level production-distribution system, rather than in just one industry.

The changwat level system (the basic unit of analysis for this study) is composed of all of the actors involved in the vertical transformation of raw materials into finished furniture products in the hands of consumers, including input suppliers, manufacturers and distributors. These participants organized themselves into competitive and complementary vertical production and distribution channels, which, in turn, form the horizontal dimensions of the system.

The economic potential of the small, rural manufacturers depends on the outcome of competitive interaction among different vertical channels within the changwat level system, and between these and the rest of the furniture industry. The study identifies four major changes which bear most importantly on the development of the small-scale participants in the changwat furniture production-distribution system. These are: the growth in the demand for furniture, especially in rural areas; the

dramatic increase in furniture retailing by selected types of manufacturers, which has introduced new sources of competition into the changwat level system; the development of modern, large-scale manufacturing in Bangkok; and, the increasing difficulty associated with securing required supplies of structural wood and skilled labor by changwat level manufacturers. The most important factor found to affect the economics of manufacturers within the changwat level system was the way firms were organized to both produce and market. Firms which manufactured on a job-order basis were far less efficient and profitable than firms which were able to produce and market in batches. Job-order production was only profitable if other services such as interior decoration were sold together with furniture.

A particularly attractive organizational structure for the changwat level firms is the combination of production and retailing in the same business. Recommendations suggest ways to support the adoption of this organizational alternative and other methods by which firms can adapt to the dynamic environment. Methodological issues are also raised.

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CHAPTER 1

INTRODUCTION AND OVERVIEW

1.0 Introduction

Third World governments, interested scholars and international donor agencies are now directing attention towards development strategies which emphasize rural development, employment generation and more equitable distribution of the benefits of economic growth. In this context, considerable interest in small-scale, labor intensive, geographically distributed enterprises has emerged. Small-scale industry programs and projects are now advocated both as a partial solution to the burgeoning employment problems faced by many nations and as a progressive reform to enhance the economic attractiveness of rural areas. Small firms are generally more labor intensive than larger firms, levels of initial investment and other entry barriers are usually low and they are geographically widely distributed. They also encompass a broad range of activities, are relatively efficient users of scarce resources and, in many cases, produce goods and services which cater to the needs and demands of rural and lower income consumers. All of these features make the promotion of small enterprises a key target in economic development strategies.

In spite of this interest there remains much to be learned about how such activities can potentially contribute to economic development efforts. In a comprehensive review of the literature on

industrialization and employment generation, Morawetz pointed out that while "...small-scale industries employ over half the industrial labor force in most developing countries, remarkably little is known about its composition and characteristics." (Morawetz, 1974, p. 525). Even as recently as 1978 the World Bank noted that, "there is little concrete evidence" on many of the important characteristics of these activities (World Bank, 1978a, p. 34). This study is an attempt to add to the growing body of research on the desirability, implications and methods of promoting these types of activities.¹

The term "small industry" can and has been used to refer to a wide variety of types of economic activity. The breadth of its usage is not, however, without justification. A substantial range of dissimilar economic activities in a diverse range of contexts are undertaken on a "small scale" in underdeveloped countries. Without straining credulity, the term can refer to all types of manufacturing, construction, service and commercial enterprises. These may be organized as family use production systems, artisan homework, artisan workshops, industrial homework, quasi-independent small shops or small factories (Staley and Morse, 1965, p. 5). Furthermore, the term includes activities normally classified as the urban-informal sector (Sethuraman, 1981), the rural non-farm sector (Chuta and Liedholm, 1979) and the intermediate sector (Steel, 1977).

¹A recent review of much of what is known about the characteristics of small-scale enterprises can be found in Chuta and Liedholm (1979). A more general view of the role of nonfarm enterprise in rural development is presented in Anderson and Leiserson (1980).

Given this potential scope, it is perhaps surprising that when a precise notion of "small scale" has been needed, the general consensus has been to rely on a demarcation based on the number of workers employed. Staley and Morse, for example, specify 100 employees as the division between small and large. This judgment is based on the observation that, "...industries with as many as 100 employees generally require a substantial amount of specialization within management." (Staley and Morse, 1965, p. 15). The World Bank, in its sector policy paper, has opted for a smaller number of workers. Recognizing that industries employing between 50 and 200 workers are eligible for assistance under small enterprise programs in several countries, the operational distinction should isolate those firms who must need assistance. These firms, they argue, are those with less than 50 employees (IBRD, 1974, p. 2). Liedholm and Chuta similarly mark the division at 50 employees, but for different reasons. They suggest that, "...'small-scale'...include(s) those establishments employing less than 50 persons. This criteria... appear(s) to be a good dividing line between the indigenous and foreign-owned firms." (Chuta and Liedholm, 1975, p. 8).

Regardless of the rationale, acceptability, usefulness or even need for a precise definition, the general spirit of the concept will suffice for now. The overarching ideology of small industries seems to embody the notion that attention must be paid to the diverse range of productive activities which have and will continue for some time to contribute to the economic livelihood of large portions of the people in rural, small urban and urban areas of underdeveloped nations. Moreover, the promotion and development of enterprises which already exist will better serve the needs of the people involved both in an individual

and social sense. It is this philosophy which underlies the more particular problem addressed in this study.

1.1 Statement of the Problem and Objectives

This dissertation is directed at the general problem of understanding the potential role of small enterprises in the process of economic development. The problem is addressed through a detailed analysis of one collection of small firms: those involved in the production and distribution of furniture in rural Thailand. The role of these enterprises will be examined in the context of the industry in which they participate. Emphasis is placed on the importance of accounting for the heterogeneous character of these firms in analyzing their economic potential vis-a-vis the dynamic, competitive forces in the industry.

To this end there are five primary objectives of this study. These are:

- (1) To compile baseline information on the structure and organization of the furniture industry in Thailand with special emphasis on the portion of the industry serving up-country markets in the North and Northeastern regions of the country.
- (2) To analyze the market for furniture and furniture consumption in selected rural areas of Thailand.
- (3) To analyze the economic characteristics and performance of selected production-distribution firms in the industry.
- (4) To identify the key forces affecting the dynamic evolution of the rural furniture industry. This includes changes in demand, competition among the various production-distribution

firms and marketing channels, technological possibilities, innovation, organizational change and factors affecting constraints in input and factor markets.

- (5) To identify potential project, program and policy interventions which could improve the performance of firms and the industry in terms of achieving the objectives of development.

Before discussing the specific goals in greater detail it will be useful to have some background information on the economic setting of the research and the research effort itself.

1.1.1 Background: The Economic Setting

During the past two decades Thailand has achieved sustained, rapid progress in its economic development efforts. From 1960 through late 1970 growth in the gross domestic product (GDP) averaged 7.6 percent per year and was broadly based throughout the economy (World Bank, 1980, p. 128). Agricultural growth rates were sustained at about 5 percent per year, but were subject to rather large regional variation (Ibid., p. 74). Open unemployment in both rural and urban areas has consistently been low, and real wage rates have shown moderate increases (Bertrand and Squire, 1980). Overall, the World Bank estimates that during this period, "...the proportion of the country's population living in absolute poverty has declined from about half in the early 1960's to a quarter in recent years." (World Bank, 1980, p. ii). The only dark spots on the ledger relate to inequality. Regional and urban-rural disparities in income have shown noticable increases. Overall income inequality, as measured by the Gini coefficient, has worsened from .415 in 1963 to .499 in 1973 (Somluckrat, 1978, p. 275).

The generally impressive gains were grounded in the period from 1962 to 1972 which was characterized by high growth and stability in both the domestic and international economy. The years since 1972, however, have been marked by instability in the international economic arena and by the gradual emergence of a number of constraints which have led some observers to question Thailand's ability to sustain its recent economic progress (Xuto, et al., 1981). Many of the opportunities which served as the basis for economic growth in the past have been nearly exhausted. Agricultural growth has historically been based on the expansion of land area with little improvement in productivity. There is now increasing pressure on land development which may diminish agricultural growth rates, lead to increasing fragmentation of land holdings and increase landlessness (World Bank, 1980, p. 160). This will likely increase rural income disparities and put downward pressure on rural wage rates. Other resource constraints are also being felt, especially with regard to forest areas, marine resources, fresh water and energy (Xuto, et al., 1981, pp. 42-46).

Equally important is the emerging concern with the relationship between the growth of the labor force and employment generation. While substantial progress has been made in reducing the rate of population increase, these results will not be felt until late in this century. Hence, the next 20 years will be characterized by continuing high rates of entry into the labor force, estimated at 2.9 percent per year through at least 1985, then falling to 2.6 percent (World Bank, 1978, p. 70). This implies a net addition to the labor force of nearly one million persons per year between 1977 and 1990. The seriousness of this can

eventually be illustrated with the use of a simple projection model, the results of which appear in Table 1.1.

The first section of Table 1.1 contains information on the size and structure of the Thai labor force in 1960 and 1977. During this period the total labor force has grown at an average annual rate of 2.3 percent. The agricultural labor force has grown by 1.7 percent per year, the industrial labor force by 6.5 percent and the labor force classified in the service sector by 3.6 percent per year. Assuming the projected 2.9 percent annual rate of entry, the size of the labor force in 1990 will be 29.7 million persons. Under various assumptions concerning the rate of growth of employment in the agricultural and service sector, it is possible to show the implications for labor absorption in industry. Scenarios A through C assume agriculture will continue to absorb labor at a constant rate. In this case, the combined nonagricultural sector must absorb 10.1 million entrants which implies an annual growth rate of 6.1 percent. If the service sector increases at a constant rate, then industrial absorption must increase at 9.5 percent per year. This figure is reduced to 7.9 percent if the service sector is assumed to grow at 5 percent instead of the historical 3.6 percent.

Scenarios D through F assume that the agricultural land constraint will severely limit that sector's ability to absorb labor and project a zero percent increase in the agricultural labor force. In this situation the nonagricultural sector must absorb labor at an annual rate of nearly 9 percent. This implies an increase in the industrial labor force of 13.3 percent under the optimistic assumption concerning the service sector or 14.2 percent if the service sector grows at a constant rate. Thus, in either scenario the growth of employment must rise more

Table 1.1. Size and Growth of the Thai Labor Force
and Projection Scenarios, 1960-1990

Year	Total Labor Force (Millions)	Agricultural Labor Force (Millions)	Industrial Labor Force (Millions)	Service Labor Force (Millions)		
1960	14.0	11.8	.6	1.7		
1977	20.4	15.7	1.6	3.1		
Average Annual Rate of Change	2.3	1.7	6.5	3.6		

<u>Projection Scenarios in 1990</u>						
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>D</u>
Assumed Labor Force Growth Rate	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
Assumed Agricultural Labor Force Growth Rate	1.7%	1.7%	1.7%	0%	0%	0%
Assumed Service Labor Force Growth Rate	--	3.6%	5.0%	--	3.6%	5.0%
Assumed Nonagricul- tural Labor Absorption Rate	6.1%	--	--	8.8%	--	--
Required Industrial Labor Absorption Rate	--	9.5%	7.9%	--	14.2%	13.3%

Source: Computed from World Bank, 1979; and World Bank, 1980.

rapidly than the rates regarded as high during the 1960's and 1970's. The argument can be taken one step further in the case of the industrial sector by examining the output growth which would be required if the labor force were to be absorbed. From 1970 to 1977 the elasticity of employment with respect to output in the industrial sector is computed to be approximately .65. This implies that an increase in employment of 6.5 percent requires a corresponding increase in output of 10 percent. Thus, the minimum industrial sector employment growth rate of 7.9 percent corresponds to an increase in industrial output of 12.2 percent and the maximum employment growth rate of 14.2 percent implies an output growth rate of over 21 percent per year.

1.1.2 Background: The Rural Off-Farm Employment Assessment Project

The Royal Thai Government (RTG) has, for a number of years, been aware of the potential importance of small industries in their economic development. Several programs to assist such firms have been initiated, but they have been of limited coverage, less than perfectly coordinated, weakly supported and operated in an environment of limited information concerning the target population. There was, therefore, a felt need for the collection of a body of information which could be used to assist in the development and implementation of specific projects, policies and programs to further promote small industries, especially those in rural areas. USAID agreed to support such a research project, and financed such a joint research effort between USAID, Kasetsart University in Bangkok, Michigan State University and The Ohio State University. The project was entitled the Rural Off-Farm Employment Assessment Project (ROFEAP). The objective of the ROFEAP was, "to provide data

and analysis needed to identify and develop projects and policies to assist in the expansion of nonfarm employment and income opportunities in the rural areas and market towns of Thailand." (Onchan, et al., 1979, p. 3). In order to accomplish this objective the project was implemented along two courses. One part of the research was directed at village level nonagricultural enterprises and the other at town based industries. This dissertation has emerged from the town component of the study. The remainder of this section will focus only on this portion of the project.² Before doing so, however, a brief exegesis of the geography of Thailand and the project's research areas is necessary.

Thailand is divided into 72 provinces called changwats. These are grouped according to four regions, the South, North, Northeast and Central Plains. Each changwat is subdivided into districts, amphoes, one of which is called amphoe muang and contains the provincial capital city which bears the same name as the changwat. For example, Changwat Chiang Mai is the Northern region. It is subdivided into 23 amphoes. Amphoe Muang contains the changwat capital which is named Chiang Mai. Each amphoe has a primary population center which houses the district political offices. In this study these areas are referred to as amphoe towns, but they are officially known as sanitary districts. For the sake of thoroughness, it can be noted that each amphoe is further subdivided into tambons. A tambon contains a collection of villages. The

²Further information on the village study and a complete bibliography of the papers resulting from the project can be found in: Onchan, et al., 1979; and in Mead and Meyer, 1981.

amphoe town bears no natural correspondence to the tambon structure of the district.

The ROFEAP was undertaken in four changwats: Chiang Mai in the North, Khon Kaen and Roi-et in the Northeast and Suphanburi in the Central Plains. These are shown in the map in Figure 1.1. Details on the criteria used for this choice are available elsewhere (Onchan, et al., 1979), but it should be noted that the site selection was made prior to the initiation of any research activities. Table 1.2 shows the specific research sets for the town survey.

The research effort was divided into three stages: Phase I, Pre-Town Survey and Phase II. Phase I involved a complete enumeration of manufacturing firms and some commerce establishments in the survey areas. Data were collected on labor force characteristics, type of workshop and the use of machines. This information was used to provide a basis for the selection of a sample of firms for a more detailed study in Phase II.³ Following Phase I, the difficult question of deciding how to best proceed with the detailed research had to be addressed. Two problems loomed. First, which industries would be the subject of study and secondly how would the research effort be organized? In order to answer the first question, further interviews were conducted by the senior project staff with approximately 230 businessmen in order to gain a more thorough picture of the industries which were considered for inclusion in Phase II. This work is referred to as the "Pre-Town Survey" survey. On the basis of the results of these interviews, eight industries were selected for study. These were the brick industry,

³The results of the Phase I Survey are reported in Mead and Charsombut, 1980.

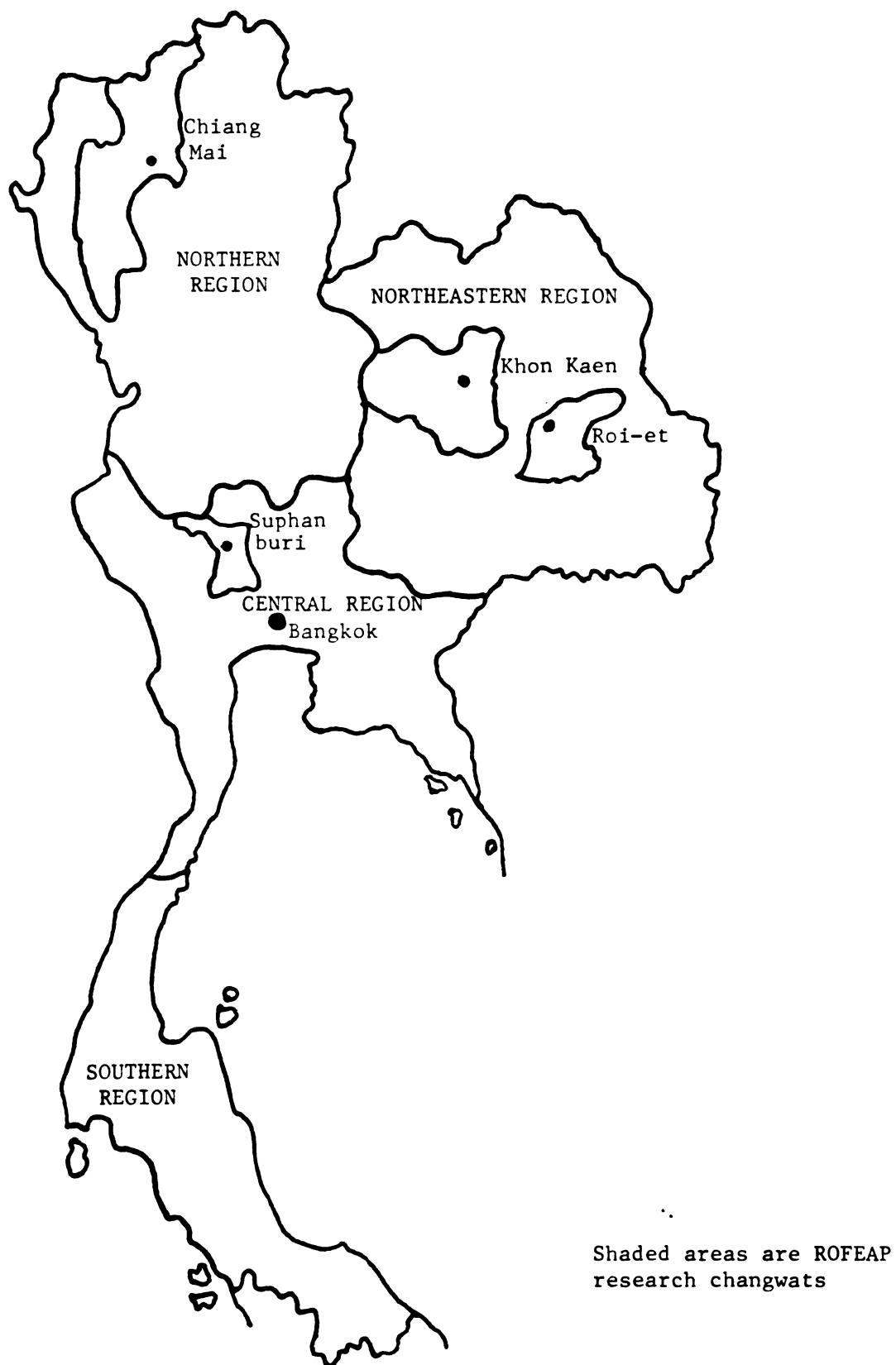


Figure 1.1. Map of Thailand and ROFEAP Research Areas

Table 1.2. ROFEAP Town Survey Research Areas

Region	Changwat	Amphoe	Research Accomplished			
			Town Survey		Furniture Industry	
			Phase I	Phase II	Pre-Town Survey	Phase II
North	Chiang Mai	Muang	X	X	X	X
		San Kamphaeng	X	X		
		San Patong	X	X	X	
Northeast	Khon Kaen	Muang	X	X		X
		Ban Phai	X	X		X
		Chonnabut	X	X		
		Nam Phong				
	Roi-et	Muang	X	X		X
		Chaturaphak phimon	X			
Central Plains	Suphanburi	Muang	X			
		Don Chedi	X			

cement products industry, fruit and vegetable processing, furniture, ready-made garments, noodles, bean curds, silk and woodcarving industries. It was further decided that one researcher from the project staff would take responsibility for supervising the data collection and the subsequent analysis of each industry. This would have the important advantages of having a staff member develop an intimate knowledge of the industry(s) under his jurisdiction and facilitating informed analyses of the information which was collected.

The Phase II survey collected information on a monthly basis for nine months from a sample of approximately 150 firms in eight industries in five towns. Each month a basic questionnaire was administered to each firm, obtaining data on production, sales and employment during the previous month. In the first month the questionnaire covered the three previous months so that data on certain key parameters would be available for an entire year: March 1980 to February 1981. In addition, a series of five special questionnaires were administered during the course of the survey. These covered several topics.

- (1) Entrepreneurship (July 1980): an exploration of the characteristics of the firm, its organizational and ownership structure and history; information concerning the entrepreneur, his education, background, experience and patterns of management and decision-making in the firm; and, problems facing the firm.
- (2) Marketing (August 1980): covered input procurement patterns, and problems associated with obtaining needed inputs; marketing patterns for output; characteristics of sales channels; and, marketing problems.

- (3) Production costs (October 1980): examined raw material, labor and machinery costs per unit for producing each of up to four products made by the firm and overhead costs for the month of September.
- (4) Labor force (November 1980): information was collected on characteristics of the labor force employed in the firm including age, education, residence, skills and wage rates; problems of obtaining workers needed by the firm; and labor force recruitment patterns and procedures.
- (5) Finance (February 1981): explored constraints to expanded production, whether financial or otherwise; assets, fixed and working capital, at the time of the survey and over the previous year; credit and loans received by the firm; barriers to entry; goals of the firm; government assistance received by the firm; and, regulations which affect the firms and the industry.

The preliminary and some final results of the ROFEAP can be found in various project publications. In addition, three conferences were held to disseminate the major findings to Thai policy makers and donor agencies.

1.1.3 The Furniture Industry Study

One of the component industry studies was focused on furniture manufacturers located in the survey areas. This dissertation both draws from and extends this study. As the ROFEAP research program proceeded a number of conceptual and empirical issues began to arise regarding the methodology and methods of studying small enterprises in

the context of an industry. Previous research on nonfarm employment had generally been content with more of a cross industry focus.⁴ There were few reliable guidelines for attempting the type of work which was being attempted. The project researchers close to the various industries began to see a number of inconsistencies between what we thought we understood about the firms and industry and what the data was showing. Furthermore, questions as to the degree to which generalization was possible from the firms in our survey area and sample were beginning to loom important. Doubts emerged as to whether it would be meaningful to say anything about the broader industry from the sample of firms being surveyed.

Part of the confusion stemmed from the increasing understanding that there were rather serious translation problems between enumerators, the Thai project staff and the Americans on the team. This had clouded the original picture of the nature of the sample firms. Furthermore, there was also an important element of inconsistency on the answers that were given to the inquiries on the questionnaires. This was compounded by the fact that the project's student enumerators were socially unable to press the respondents in order to get accurate, consistent and, in some cases, truthful answers.

Aside from these particular problems of understanding the nature of the industry which was under study, it became more and more evident that the project's sample was becoming less and less representative of the industry than originally thought. Not only was our understanding of the firms changing, but the complexity and heterogeneity of the furniture industry among others was finally beginning to reveal itself.

⁴See for example: Liedholm and Chuta (1975), Haggblade (1979), Fisseha (1979), Steel (1977) and Child (1973).

There was also a growing realization that the study of manufacturing firms was neglecting an important set of enterprises from the standpoint of understanding both the existing structure and forces of change in the industry. The numerous retail establishments were in fact linking nonlocal producers with the local market and this was, as was later understood, to play a key role in understanding the dynamic evolution of the industry. Neither the research methodology nor the specific survey instruments were capable of capturing the relevant characteristics of the distribution system.

These concerns are, for the most part, responsible for this dissertation. Starting with the base of information collected under the ROFEAP, this study attempted to augment the original data and provide a more meaningful context for its analysis. Additional information was also collected in order to shed some light on the other important components of the Thai furniture industry, especially as they bear on the potential for the "changwat level" portion of the industry.

Thus, the research for this dissertation is composed of several components.

(1) ROFEAP Furniture Industry Research

- (a) Phase I
- (b) Pre-Town Survey
- (c) Phase II

(2) Furniture Industry Case Studies

- (a) Khon Kaen furniture census: complete enumeration of all furniture producers and distributors in Changwat Khon Kaen

- (b) Chiang Mai and Roi-et partial censuses: a complete enumeration of producers and distributors in selected amphoes in Changwats Chiang Mai and Roi-et
 - (c) Lampang Muang interviews: a questionnaire administered to all producers and distributors of furniture in Changwat Lampang
 - (d) Village industry study: research on village based producers in Northern Thailand and their marketing agents in various parts of the country
 - (e) Bangkok industry study: selected interviews with Bangkok based producers and distributors
- (3) Procurement of Secondary Data: while little secondary data was available for the furniture industry, the Thai Ministry of Industry (MOI), the National Economic and Social Development Board (NESDB), the National Statistics Office (NSO) and the National Institute of Development Administration (NIDA) were willing to share most of what they knew. For the most part, the secondary data has proven to be of limited value, but will be cited as it is reported in the dissertation.

Case studies b) through e) were carried out over a three-month period after the ROFEAP research was completed. The short time frame was further constrained due to the limited logistical support available after the dismantling of the project infrastructure. In spite of these limitations, however, generous support was offered by Michigan State University and sufficient information was obtained to provide a basis for this dissertation.

1.2 Preview of the Dissertation

The remainder of this dissertation is divided into five major chapters. Chapter 2 sets the framework in the study by examining the nature of an industry and the way it may be disaggregated for analytical purposes. In addition, the characteristics of the Thai furniture industry and the changwat level production-distribution system, the primary focus of this study, are explored. Chapters 3, 4 and 5, respectively, examine the market for furniture, the distribution of furniture from manufacturers to consumers and the economics of furniture production. In Chapter 6 the forces affecting the dynamic evolution of the changwat level industry are analyzed. Finally, Chapter 7 contains the summary and conclusions of the study and recommendations for improved policy towards the furniture industry and for a revised research methodology on small-scale enterprises.

CHAPTER 2

THE FURNITURE INDUSTRY IN THAILAND

2.0 Introduction

The primary focal point of this research is the furniture industry in rural Thailand.¹ In order to accomplish the objective of the study, it is necessary to place the rural portion of the industry into its context in the industry as a whole. The goal of this chapter is to identify an appropriate analytical construct for the study of rural furniture enterprises which explicitly takes into account the structure of competitive interactions between a given portion of the rural industry and other segments of the Thai furniture industry. In the first section of this chapter the nature of an industry is explored with the objective of distilling some guidelines for the study of any particular industry or portion thereof. The second section will provide a brief overview of the Thai furniture industry. The final section will outline the characteristics, structure and organization of the rural furniture industry or what is termed the "changwat level furniture industry."

2.1 Defining an Industry and Its Components

There are two steps involved in the definition and characterization of an industry. The first is the delineation of the boundaries

¹The term "rural" is used in this context to refer to all areas outside of the Bangkok metropolitan area. Similarly, these regions will be referred to as "up-country areas."

of the industry. Which firms or establishments are to be considered participants in the industry under study? As will be seen, this process is much simpler to specify theoretically than empirically. The second step is to determine how an industry can be disaggregated into component parts which are meaningful from an analytical perspective. This section will address some of the issues concerned with the definition of an industry and the identification of its separable components.

2.1.1 The Industry

An industry represents, in its most general sense, some aggregation of economic units so as to make an analytically interesting whole. As is the case with most aggregative definitions, the appropriate boundaries of an industry depend, to a large extent, on the purposes for which the collection is to be used. For most economic analyses, the critical concern is that industries be defined so that they reflect the competitive interrelationships of economic activities.² Ideally then, an industry will contain some distinct grouping of productive enterprises which are related by the fact that they are competing for some common portion of the total expenditures in an economic system. As Professor Robinson noted, "...we should like to mean by an industry a group of firms producing the same commodity for the same market." (Robinson, 1931, p. 7).

From the standpoint of examining competitive interrelationships, it is the product, not the production or distribution enterprise, which is important. Goods are competitive if, in the perception of buyers, they

²See for example the discussions in Bain (1968), p. 6; and in Scherer (1980), pp. 60-61.

are considered close substitutes. According to Professor Bain, therefore, "Each industry should be recognizable as a group of products that are close substitutes to buyers, are available to a common group of buyers, and are relatively distant substitutes for all products not included in the industry." (Bain, 1968, p. 124). In this ideal sense, a particular firm is considered a part of an industry only to the extent that it is a supplier of a particular product for a particular market.

This ideal or theoretical industry is difficult to implement empirically. It hinges on the delineation of carefully specified markets. The market, however, is a concept which is particularly troublesome to adapt to the purpose of defining an industry. This is true for several reasons. First, the objective of manufacturers and other sellers is often to create a separate market for themselves by producing a unique product or offering a unique set of services. Furthermore, a market has geographic boundaries which are a function of transport costs and preferences. Also, preferences and other characteristics differ across consumers so that there is commonly a separate market for products of different quality. Hence, even in a static sense, the definition of industries on the basis of products and markets is subject to both empirical and conceptual problems.

In a dynamic perspective, the market must be defined in such a way as to take account of possibilities for substitution in both consumption and production. On the demand side, the question of identifying and defining close substitutes is complicated by the dependence of the concept of substitutability on changing product characteristics, prices and consumer characteristics. On the supply side, the linking of firms to products, markets and, therefore, industries is complicated by the

potential ability of firms to move into competitive product lines. This is especially true in cases where little investment is required for the manufacture of new products, such as in the wooden furniture industry where a common technology can be used to produce a wide range of products.

The thrust of this argument is that the conventional practice of defining an industry relative to a market is fraught with touchy questions. There is no clear cut way to specify the extent of the market from a geographical or preferential standpoint. Furthermore, the possibility of substitution in production creates further haziness on the industry side. Professor E. Robinson summarized the situation quite aptly in 1931 and it is instructive to quote him in full:

We had hoped that it would be possible for us to define an industry as a group of firms producing the same commodity for the same market. We must now recognize that to define it either by the commodity produced, or by the market for which it produces, is in many cases either impossible or at least unsatisfactory. In practice, all that we can do is to follow the example of those who are actually engaged in industries. Certain employers find that they have a common bond of interest with certain other employers, and come to regard themselves as composing an industry. The bond may be one of the broad type of general product, as in the motor industry, the electrical industry, the paper-box industry. It may be one of a common use of a single raw material, as in the iron and steel industry, the pottery industry, the cotton industry. It may be one of a common use of a given type of machinery, or of a given process of manufacture. Thus, we may distinguish the textile industries; we may speak of brass founders, or of steel rolling firms as having something in common which distinguishes them from other firms. Industries as such have no identity. They are simply a classification of firms which may for the moment be convenient. A change of technique and/or organization may require a new classification and a new industry. (Robinson, 1931, pp. 12-13).

Up to now the discussion has been centered on defining an industry in terms of the market for its product, but no attention has been paid to what constitutes the extent of the industry. The transformation of

raw materials into a final commodity requires that a number of distinct functions be performed. Essentially a function is a "job to be done." Examples of functions would include input procurement, processing, storage, transportation, manufacturing, buying and selling, etc. Different industries or even different components within an industry will be characterized by different sets of analytically interesting functions. Functions are grouped into establishments or firms. Firms may combine several functions or may specialize in only one function. One could characterize different combinations of functions as stages in the industry. The degree to which functions are grouped in stages is commonly referred to as the degree of vertical integration in the industry.³

The key issue from the standpoint of defining an industry is which functions are to be considered as parts of the industry. In the U.S. food industry it has been common to define the retailing industry or a commodity-specific processing industry. In studies of small enterprises the most typical approach is to define an industry as being composed of manufacturers only. There are a number of problems with this approach. First, the basic unit of study, the firm, often will be composed of different combinations of functions. The output of a firm depends on the functions it performs. A firm which produces for sale in its own store is producing a different product than a firm which manufactures unfinished goods to sell to a wholesaler. This has been recognized as a

³See for example, Marion (1976).

difficulty in some studies and probably is more prevalent than realized due to the frequent reliance on secondary data sources.⁴

Secondly, from the perspective of understanding and analyzing the competitive dynamics of an industry, it is misleading to consider only one portion or set of functions of the industry. Developments in the distribution system, for instance, can have important repercussions on the structure of competition for manufacturers. This theme will be explored in greater detail in later chapters. Suffice it to say, for now, that the vertical heterogeneity across functions and the evolution of the vertical coordinating mechanisms in an industry are critical to a complete analysis of the development of an industry.

What this argues for is a broader notion of the industry than is usually adopted. This is not a radical idea. Good industry studies normally do adopt a broad concept of the industry. Recently, the same general idea advanced here has received considerably attention in the agricultural economics literature. This broader notion of an industry is, in spirit, identical to Shaffer's notion of a "subsector." Arguing against the absence of a vertical dimension in most industry research, he suggests the term "subsector" to refer to "groupings of economic activities involving both vertical and horizontal relationships" (Shaffer, 1976, p. 5). This is not to argue for a new methodology or approach for research, but instead to suggest a new focal point for research. In other words, it forces the researcher to place his work in

⁴As White noted in his review of the factor substitution issue, "...truly valid comparisons between large and small firms are very difficult to construct. Not only must the same final product be produced by both firms, but they must be vertically integrated to the same extent.... None of the studies cited above has tried to correct for this problem." (White, 1976, p. 40).

the context of the actual vertical and horizontal character of economic activity.

An industry, then, is a hazily defined aggregation of firms involved in the production and distribution of goods or services which share the common characteristic that their final products are close substitutes in the eyes of consumers. The fact that the production of these final products requires various functions which are vertically linked necessitates that the industry be defined in such a way that it accounts for both vertical and horizontal relationships. The key benefit of such an approach lies in its closer correspondence to the actual structure of economic activity as it exists in the real world.

2.1.2 The Component Parts of an Industry

The broad notion of an industry adopted in the previous section provides the appropriate context for formulating particular research questions concerning the industry. Given the objectives of the research it is often desirable or necessary to focus on some particular portion of the industry. Rarely would a researcher need to pay equal attention to all components of a given industry. This study, for instance, is primarily concerned with the economic potential of rural, small-scale furniture enterprises. Hence, it is this segment of the industry which will serve as the basis for assembling information about the remainder of the industry.

The process of discovering an appropriate analytical unit for organizing this information requires the identification of what is termed here a separable "production-distribution" (PD) system. There is not a fixed method or criterion by which PD systems can be distinguished.

Moreover, when an industry is disaggregated there will inevitably be some overlapping between even the most separable PD systems; but these can normally be overlooked for most purposes. In any case, the first step in identifying a PD system is to obtain a thorough view of the industry as a whole.

Given a clear picture of an industry there are a number of criteria which can be used to guide the disaggregation into production-distribution systems. In this study it has proven convenient to define a province or changwat level production-distribution system. The rationale and characteristics of this system are the subject of section 2.3. This particular geographic breakdown of the industry is based on several criteria including the structure of the market for furniture, the historical pattern of development of the industry and the fact that the types of enterprises of greatest interest are located in these areas. The PD system is chosen with the same basic rules which are used to define an industry. It must take account both the vertical and horizontal relationships within the system itself and between the defined system and the rest of the industry.

Within any given PD system there will undoubtedly be a considerable amount of diversity and heterogeneity which must be both understood and explicitly accounted for. In the furniture industry, for example, the same type of product could be purchased from a number of entirely different types of producers or sellers. A chair could be made from teak, rosewood, cheap timber, plastic, metal, rattan or upholstery. Each of these products may be manufactured by a different type of firm. Moreover, the wooden chairs could have been made in a mechanized factory, a small town workshop or a village household. While the horizontal

heterogeneity in this industry may be greater than for some others, it is most likely that close scrutiny of any industry will inevitably reveal a certain amount of significant and interesting diversity.

One way of capturing this diversity is to disaggregate a production-distribution system into production-distribution channels. A production-distribution channel represents a way of classifying firms into separate and sometimes competing ways of organizing to produce and distribute products to consumers. Channels can, of course, be distinguished in a number of different ways. There are several criteria which are useful in guiding this disaggregation.

- (1) The final market for the products. Producers may specialize in the production of goods for particular, narrowly defined markets. The markets may differ by final consumer type--household, government or private institutions; geography of the market--urban, rural or foreign; quality of the product--high quality (high income) or low quality (low income); location of the markets--a particular region or area served.
- (2) The type of product. Where industries encompass a wide variety of products it may be necessary to employ a production-distribution disaggregation based on the type of product involved or classes of products, which are often associated with one another.
- (3) The location of the firm. In many cases, the firm's location will be a key factor in disaggregation. This is especially true when there is a high transport cost involved in moving

a product and where regional and national competition are important considerations.

- (4) The technology employed. Often there are important differences in the technology used within an industry. Furthermore, there may also be differences in the technique of using a particular technology. This may or may not correspond to the type of product or the market served.
- (5) The degree of vertical integration. The degree of producer control over functions related vertically in the production and distribution of the products is often a key criterium on which groups can be disaggregated into alternative channels. This includes control over input procurement, as well as sales to the final consumer. Firms that are involved at different stages or with different combinations of stages of production under their control are essentially producing different outputs and purchasing different inputs.
- (6) The organization of production. Different firms in different settings take different things into account in the running of a business. A family owned and operated business is able to share capital, such as vehicles or buildings, with the business operation, whereas, an incorporated business with a separate owner and manager presents an entirely different situation.
- (7) The rules of the game: Similar to number 6 above, different firms may face different "rules of the game" regarding what must be taken into account in the operation of the business.

This may apply to policy incentives or discouragements, sources of materials, etc.

This list does not pretend to be exhaustive, but it does hopefully capture the spirit of the types of heterogeneity which might offer a reasonable basis for disaggregation. The meaning of these criteria will become clear in the concrete application to the Thai furniture industry which follows later in this chapter.

2.1.3 The Furniture Industry Map

The previous two sections have emphasized the importance of capturing and understanding the horizontal and vertical heterogeneity of industries. A useful tool in this process is to actually draw a picture of the industry as a whole or of its component production-distribution systems. These industry or subsector maps have three key characteristics. First, they are designed to capture the vertical and horizontal relationships involved in the production and distribution of goods and services. Secondly, they evolve with the researcher's understanding of the particular industry under study. Thirdly, they are flexible. There are no set rules for constructing an industry map and the only strict principle is they reflect, at an appropriate level of abstraction, the complexity of actual industrial structures. Several examples of industry maps will be used in the description of the Thai furniture industry later in this chapter, but for now, one example of such a diagram of a production-distribution system is presented in Figure 2.1.

The hypothetical Industry Map of Figure 2.1 consists of three sections, and reads from left to right. At the far left are the boxes representing two groups of input suppliers, the beginning of the production-distribution process, and at the far right are the consumers, the end of

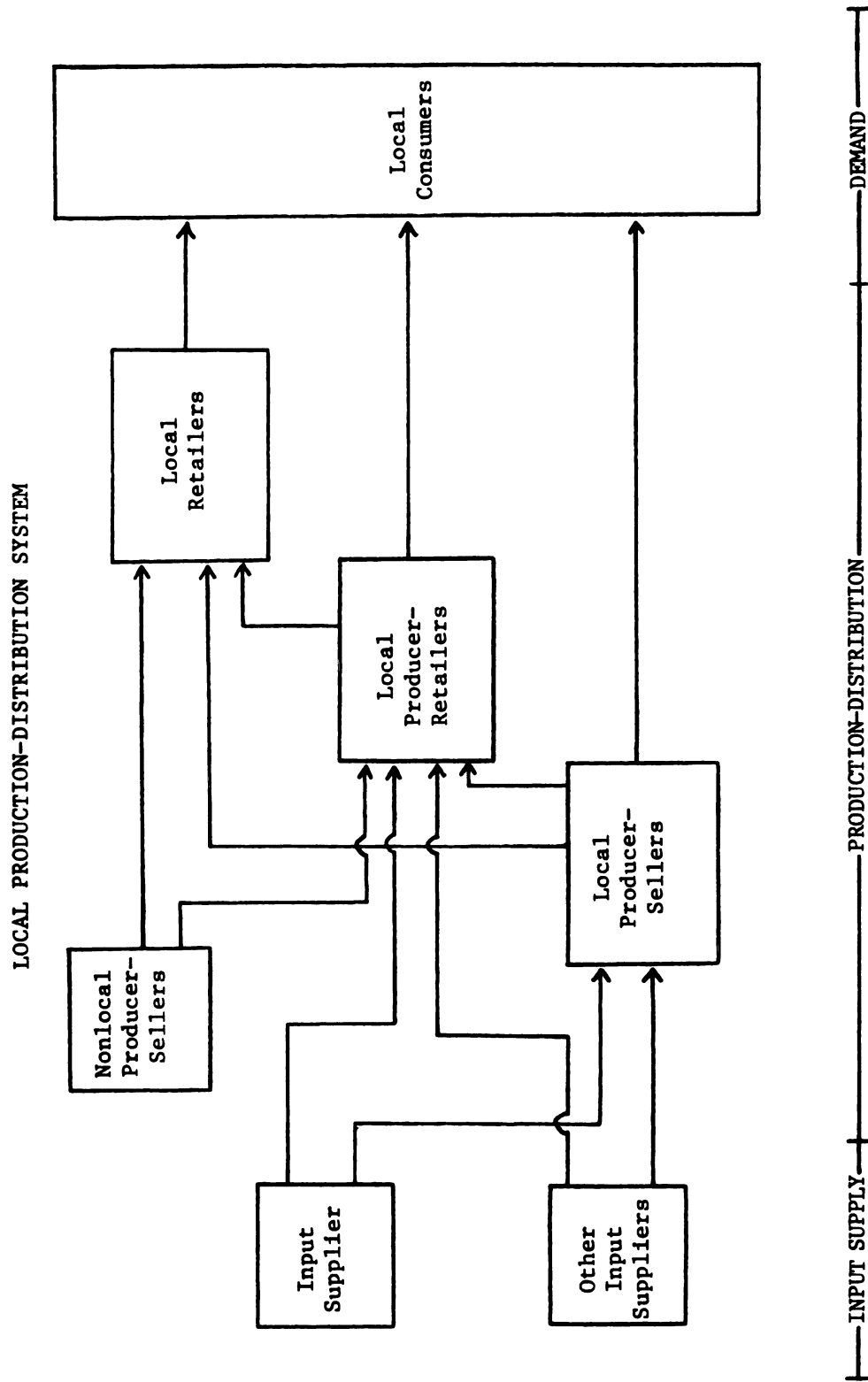


Figure 2.1. Example Industry Map

the process. In between are the various types of participants making up the alternative production-distribution channels of the system. In this example there are local producer-sellers, producer-retailers, retailers and nonlocal producer-sellers. The lines connecting the participants indicate the direction of product flows. Local retailers may purchase products from the nonlocal producer-sellers, local producer-retailers or local producer-sellers. The existence of this choice, as shown by multiple product flows to a given participant, indicates that there is some form of competition between the three classes of potential suppliers. This junction could be called a "competitive node." Similarly, consumers may purchase goods from any of the three classes of sellers who can be thought of as representing three distinct production-distribution channels. And again, these can be competitive nodes. Notice that this diagram captures both the horizontal (different types of final sellers) and vertical (producer-seller) dimensions of this component of the industry. Furthermore, in addition to inter-channel competition (competitive nodes), there is also horizontal competition among the firms which comprise each, alternative PD channel.

The same set of production-distribution firms could have been represented in different ways. Consumers could have been broken down into smaller groups by location or income classes. Greater detail could have been added to the nonlocal production-distribution system. The maps that will be used in the next sections will be drawn in different ways to capture the essential character of the firms under consideration. In any case, they all follow the same basic pattern: boxes to represent relatively homogenous classes of participants connected by

lines indicating product flows and possible nodes of competition among alternative production-distribution channels.

2.2 The Thai Furniture Industry

As would be expected in a country at the level of development achieved in Thailand there are a vast array of products, producers and distributors in the furniture industry. Part of the problem addressed by this research is to focus on the components of the industry which are most relevant to the study of the economic potential of what is termed the "changwat level" furniture industry. This will be accomplished by first taking a broad overview of the industry as a whole. Following the overview, the remainder of this section will focus on the nature and characteristics of the industry at the changwat level.

2.2.1 Overview of the Thai Furniture Industry

Furniture is manufactured in Bangkok, changwat capitals, amphoe towns and in villages. The primary markets are in urban areas, foreign countries, rural towns and villages. It will be shown later, however, that currently the majority of village dwellers use very little manufactured furniture. Production in Bangkok is largely for the greater Bangkok metropolitan area and export markets. Yet, there is beginning to be an increasingly significant flow of products from Bangkok to the rest of the kingdom. Factories in several changwats also produce for export, usually as a result of their proximity to certain materials, primarily rattan and rubber wood. The "teak advantage" once held by the Northern provinces has, in recent years, shifted to Bangkok following the establishment of the government controlled teak processing and distribution system. Most of the production in changwat capitals is directed

towards consumers in the immediate area or in certain cases to nearby changwats. Production in amphoe towns is almost exclusively for local markets, while village level production is sold throughout the kingdom.

The most important materials for furniture production are plywood, low value structural woods such as tabek and yang, and higher value structural woods such as teak and rosewoods. Plywood production is centralized in the Bangkok area. Low valued structural wood generally comes from areas relatively close to production locations. Teak is predominately from the North, but it is primarily distributed through government auctions in Bangkok or through the teak cooperatives in the North. Plastic upholstery used in several factories outside of Bangkok is imported from Bangkok. Metal and plastic hinges and other finishing materials are also produced in Bangkok or are imported from overseas. Some firms produce plastic, metal and rattan furniture, but these have not been included in the scope of the study.

There is a sizable teak woodcarving industry based in Northern Thailand which produces many products which can be classified as furniture. This group of firms has also been excluded from this study primarily because the products, the production-distribution system and the dynamic evolution of the carving industry are, for all practical purposes, independent of those characterizing the domestic furniture industry.⁵ The furniture products of the carving industry are best considered a specialty item, substitutable with those of the domestic furniture industry only in a very small number of uses. Furthermore,

⁵This exclusion is notable because carving firms are commonly lumped together with furniture enterprises for aggregate level economic analysis by the Thai Natural Statistics Office (NSO) and the National Planning Agency (NESDB). This practice obscures the distinct character of these two industries and should be avoided in future work.

the complexity of the carving industry suggests that even if the products were closer substitutes to those of the furniture industry, a separate and relatively larger-scale research effort would be required to understand the economics of the woodcarving production-distribution system.⁶ Hence, it is desirable to keep these two industries distinct in this type of research activity.

Industry level aggregate economic statistics must be treated gingerly; however, those that exist for the Thai furniture industry reveal a rather rapid recent period of growth. Tables 2.1 and 2.2 report that the total output of the furniture and fixture subsector was 1,432 million Baht⁷ in 1972 and had grown to nearly 5 billion Baht in 1978. In constant 1972 prices this represents an annual increase of 10.1 percent. Value added in constant prices during the same period grew from 560 million Baht to nearly 1 billion Baht in 1978. This represents approximately 1 percent of total manufacturing value added. The rate of growth has also been increasing. Table 2.2 shows that output in constant prices grew at an annual rate of 5.0 percent from 1972 to 1975, but increased to an average annual rate of 15.6 percent from 1975 to 1978. This information is consistent with the information obtained from the Ministry of Industry reported in Table 2.3 which shows the number of new furniture firms registering annually from 1968 through 1979.

The Ministry of Industry collects information from factories which choose to obey the law and register with them upon establishment. Very

⁶A preliminary study of the carving industry undertaken by this author lays the ground work for further research on this industry. See Boomgard (1981).

⁷All money values will be reported in Baht, the Thai currency. The conversion between Baht and dollars during the research period was 20 Baht per one U.S. dollar. After the July 1981 devaluation, one dollar is equal to approximately 23 Baht.

Table 2.1. Value of Output and Value Added for the Furniture and Fixture Industry in Thailand, 1972-78

Year	Nominal Value of Output (Million ฿)	Value of Output 1972 Prices (Million ฿)	Value Added 1972 Prices (Million ฿)
1972	1,432.0	1,432.0	558.9
1975	2,715.5	1,655.8	646.3
1978	4,815.4	2,557.3	998.1

Source: Computed from NESDB data.

Table 2.2. Average Annual Rates of Growth of Value of Output and Value Added in the Furniture and Fixture Industry in Thailand, 1972-78

Years	Average Annual Percentage Rate of Increase in:	
	Nominal Value of Output (%)	Value of Output in 1972 Prices (%)
1972-1978	22.4	10.1
1972-1975	23.8	5.0
1975-1978	21.0	15.6

Source: Computed from NESDB data.

Table 2.3. Number of New Entrants Into
the Thai Furniture Industry
by Year, 1969-79^a

Year	Number of New Entrants
1979	71
1978	68
1977	73
1976	88
1975	37
1974	48
1973	41
1972	126
1971	19
1970	28
1969	21

^aRegistration with the Ministry of
Industry.

Source: Ministry of Industry, Bangkok.

little scrutiny is exercised in the review of this information since the Ministry has chosen not to analyze the furniture industry data. These data are not regularly updated and are never checked against the actual status of the firms. Thus, the data tell the licensed level of paid-up capital and anticipated employment before the firms start producing. Once a firm is registered at that level, it generally stays there in perpetuity. In spite of these problems, it was decided that some insight on the overall structure of the furniture industry could be gleaned from an analysis of this information and the results are reported here.

Table 2.4 contains information on the size distribution of furniture manufacturers by location. Two major points can be made from the data. First, most furniture producers are quite small, extremely so by Western standards. Eighty-nine percent of the firms have less than 25 employees. Secondly, there is little difference in the size distribution of firms across regions. Firms outside of Bangkok are only slightly smaller, on average, than are the Bangkok based producers. These findings are somewhat surprising and are contrary to the original supposition that the producers in Bangkok would be larger due to the substantially larger market which they serve.

Tables 2.5 and 2.6 report on some selected characteristics of furniture manufacturers by region and employment size. The characteristics specified include the number of firms, the average age in 1981, number of employees, capital stock and the capital-labor ratio. Regionally, the most interesting findings relate to the nearly constant employment size and differential capital size. The Central Plains data is somewhat misleading due to the presence of two very large plants on the Bangkok fringe. The data clearly indicate the higher capitalization of the

Table 2.4. Size Distribution of Furniture Manufacturers in
Thailand: Number of Employees by Location

Employment Class (# Employees)	Kingdom	Other Changwats ^a							
		Bangkok		Urban		Rural		Total	
		Number of Firms (#)	Relative Frequency (%)	(#)	Relative Frequency (%)	(#)	Relative Frequency (%)		
1 - 10	411	66.0	222	64.3	146	71.6	43	189	70.0
11 - 25	141	22.6	79	22.9	36	17.6	26	62	22.3
26 - 50	41	6.6	24	7.0	15	7.4	2	17	6.1
51 - 100	13	2.1	9	2.6	3	1.5	1	4	1.4
101 - 150	4	.6	1	.3	1	.5	2	3	1.1
151+	3	.5	2	.6	1	.5	0	1	.4
Missing	10	1.6	8	2.3	2	1.0	0	2	.7
Total	623	100.0	345	100.0	204	100.0	74	278	100.0

^aUrban is defined as amphoe muangs (changwat capital) and rural includes all other amphoes.

Source: Computed from Ministry of Industry data.

Table 2.5. Selected Characteristics of Furniture Manufacturers
in Thailand by Region

Region	Number of Firms (#)	Frequency Distribution (%)	Average Age of Firms in 1981 (Years)	Average Number of Employees (#)	Average Registered Capital Stock ^a (1,000 B)	Average Registered Capital to Labor Ratio (1,000 B)
Bangkok	345	55.4	6.8	13.8	776.7	49.5
Central Plain	49	7.8	5.9	13.9	1,805.2	66.4
North	89	14.3	4.9	13.6	267.2	21.8
South	89	14.3	5.3	11.4	665.3	58.4
Northeast	28	4.5	7.3	11.3	384.6	34.4
East	23	3.7	3.8	10.5	163.3	23.2
Total Kingdom	623	100.0	6.2	13.2	723.6	46.4

^aAdjusted to 1980 prices.

Source: Computed from Ministry of Industry data.

Table 2.6. Selected Characteristics of Furniture Manufacturers
in Thailand by Employment Size

Employment Size (#)	Average Age in 1981 (Years)	Average Registered Capital Stock 1980 Baht (1,000 ฿)	Average Registered Capital to Labor Ratio (1,000 ฿)
1 - 10	6.2	283	45.8
11 - 25	6.1	661	42.3
26 - 50	6.9	1,389	39.8
51 - 100	6.6	9,580	130.0
101 - 150	4.3	9,007	73.8
150+	6.7	10,329	51.7
All Firms	6.2	725	46.4

Source: Computed from Ministry of Industry data.

Bangkok firms and the Southern firms. In the South this results from several rather large export firms which are located near the rubber wood supplies. When disaggregated by employment size as in Table 2.6, an interesting pattern emerges with the size of the capital stock and the capital-labor ratios. The size of the capital stock falls for firms in the 101-150 employment range and then rises to a peak for the largest category. At the same time, the capital-labor ratio peaks for the 51-100 employee category and falls for the larger categories. This may reflect technological differences consistent with the middle size ranges. Also of interest in Table 2.6 is the fact that the firms in the 101-150 employment size range have the lowest mean age indicating recent growth in this size category.

In summary, this section has given a broad overview of the Thai furniture industry using statistics of limited reliability, but which are the only ones available for the industry as a whole. As a closer look is taken at the components of the industry, it will become clear that the MOI data and probably the NESDB aggregate statistics substantially understate the number of firms and the output of the industry. For example, the MOI data set has information on four producers in Changwat Khon Kaen, while in the course of this study 41 producers were interviewed in the same changwat. Presumably, however, the results reported from the MOI data are suggestive of the broad patterns in a nationwide "sample" of firms. These will be augmented by what is learned from the analysis of ROFEAP data reported in the following sections.

2.2.2 Furniture Exports

Concern with the Thai furniture industry has typically emphasized the problems and prospects of the export sector. This is the case with popular discussions of the industry, the orientation and design of technical, financial and marketing assistance and virtually all previous research on the industry. In spite of this prominence given to the export sector, the vast majority of production is for the domestic Thai market. Table 2.7 illustrates this fact quite clearly. In no year through 1978 have exports exceeded 7 percent of the industry's total output. Furthermore, since rural, small-scale producers for the domestic market are undercounted in the data used for these estimates, the reported percentages most likely overstate the relative importance of the export sector.

Table 2.7. Exports of Furniture and Fixtures as a Percentage of Total Furniture Output, 1972-78

Year	Furniture and Fixtures as a Percentage of Total Industry Output
1972	2.4%
1973	6.0%
1974	6.3%
1975	5.4%
1976	6.4%
1977	4.1%
1978	6.5%

Source: Iamkamala, 1980.

Additional evidence on the significance of the domestic market comes from the analysis of the sources of growth of the industry. Professor Chalempojna has conducted such a study and his results are reported in Table 2.8. His findings indicate that from 1972 through 1978 only 8.2 percent of the growth in the industry can be directly attributed to export expansion. Over 90 percent is ascribed to domestic demand. Hence, regardless of the impressions gained in most popular discussions of the industry regarding the dominance of the export sector, by far the greatest part of the industry is producing for the domestic Thai market.

Furniture exporters are of only peripheral interest in this study and were the subject of very little primary research. Export sales are

Table 2.8. Sources of Growth of the Thai Furniture and Fixture Subsector, 1972-78

Years	Percent of Growth of the Thai Furniture and Fixture Subsector Attributable to:		
	Domestic Demand Effect	Export Expansion Effect	Import Substitution Effect
1972-75	90.1%	8.9%	1.0%
1975-78	92.8%	7.8%	.6%
1972-78	91.2%	8.2%	.6%

Source: Iamkamala, 1980.

dominated by relatively large, by Thai standards, port-proximate, Bangkok area firms. The only exceptions are speciality rattan and para-rubber using firms located close to materials supplies in Southern Thailand and other regionally dispersed firms producing high quality products which are sold to an occasional foreign visitor. For the most part, the export sector is relatively isolated from the domestic furniture industry.

The relative isolation of the export sector does not necessarily imply that trade has no effects on the domestic industry. The progressiveness of the export sector in terms of production technology, product technology (completely-knocked-down component systems, CKD) and design, can have important spillovers into the domestic market. Recently, several export producers have begun to manufacture products for sale in Bangkok and up-country. Furthermore, the development of certain materials for use by exporters has created opportunities for domestic manufacturers to adopt similar materials. The most significant example is the increasing use of processed, mature rubber trees in the South for use by nonexport

manufacturers. Some additional details on the export sector are included in Appendix A.

2.3. The Changwat Level Furniture Industry

This research is concerned with the potential role of rural, small-scale furniture enterprises in Thailand, especially in terms of the dynamics of their competitive position. Given this focus, it would be desirable to isolate this portion of the industry in order to examine its characteristics, viability and economic potential, vis-a-vis, other segments of the Thai furniture industry. The objectives of this section are to show that such a breakdown is, in fact, consistent with the overall structure and organization of the Thai furniture industry and then to describe, in some detail, the characteristics of the various changwat level PD channels.

2.3.1 The Rationale for the Changwat Level Analysis

The manufacture of furniture has historically developed in locations balancing the relative benefits of proximity to markets and to materials (Oliver, 1966). Because furniture is a "space-gaining" industry,⁸ there has been a strong tendency for producers "to be located at the point of consumption" (Smith, 1953). The physical separation of producers from consumers is predicated on the development of reliable, safe and efficient transport systems, and the concomitant emergence of a

⁸A space-gaining industry refers to the fact that the volume of space occupied by the final product is greater than that occupied by its component raw materials. The concept is due to Alfred Weber and is discussed in Friedrich (1929). Oliver has computed the volume gain associated with a "contemporary style bedroom suite, consisting of a dressing table and 4 foot and 3 foot wardrobes" to be 500 percent (Oliver, 1966, p. 144).

marketing system capable of organizing long distance buying and selling. The high transfer cost of furniture combined with the potential for damage tends to retard the growth of long distance transport (Oliver, 1966, p. 140). Hence, in its early stages the locational structure of furniture manufacturing is "market oriented to a higher degree than it is material oriented. The greatest conurbation has the greatest furniture industry." (Oliver, 1966, p. 144).

In Thailand, long distance furniture reselling is a recent phenomena. Historically, therefore, the location of production has corresponded to the location of markets. Outside of Bangkok the structure of urbanization and therefore markets is closely related to the administrative-political organization of the kingdom. Each of the 72 changwats is dominated, to a greater or lesser extent, by its capital city or amphoe muant.⁹ Hence, if changwat capitals can be regarded as the primary market centers outside of Bangkok, it is only reasonable to hypothesize that these areas also correspond to the centers of the up-country furniture industry.

Chapter 3 will examine the structure of the consumer market for furniture in some detail. The rationale for the focus on the changwat level PD system depends, in part, on certain of the results presented there. In particular, the market for furniture is, in fact, primarily centered in towns and urban areas. Only in recent years has demand begun to spread out into more rural areas. For all practical purposes then, each changwat can be regarded as a relatively distinct market area,

⁹There are 48 cities classified as municipal areas which are not changwat capitals, but in nearly every case, these are secondary when compared to the capital cities.

its center being the capital city. Demand is concentrated in the urban areas partially as a function of the higher population density, but also as a result of other factors such as income levels, housing types, the availability of furniture and consumer preferences. In a broad sense, therefore, each changwat possesses certain common characteristics as a market area even though the structure of the markets will differ according to the particular geographic and economic structure of the provinces.

Given this picture of the nature of the market for furniture and the fact that the historical development of the industry corresponds to the locational structure of demand, it does seem reasonable to define a changwat level furniture industry. As will be seen later in this section, each of the changwats studied during the course of this research contained substantially similar local furniture production-distribution channels and firms. While the basic collections of participants in the sector were the same, the primary differences related more to the level of development of the changwat and industry rather than to any substantive differences in the types of activities observed.

In recent years, the most significant change in the Thai furniture industry is that the correspondence between production and consumption location is beginning to break down. The firms within each changwat are being brought into competition with producers from other parts of the country, namely certain specialized "furniture villages" in Northern Thailand, producers from other changwats which have extended the reach of their market, and perhaps most importantly, from modern, large-scale producers from Bangkok. These competitive forces are being felt in each of the changwats studied. By framing this research in terms of a changwat level PD system, it will be possible to examine the opportunities

for continued viability of local firms in terms of the outside forces operating on the system.

2.3.2 The Products of the Changwat Level Furniture Industry

Before discussing the types of participants and the structure and organization of the changwat level industry, it will be useful to examine briefly the types of products found in the system. The term furniture refers to a wide variety of products. Webster's Dictionary defines furniture as, "equipment that is necessary, useful or desirable; esp.: movable articles (as chairs, tables or beds) for a room." A convenient way to add precision to this discussion is to classify furniture products along three dimensions. First, there is the type of product as distinguished by its function. A full range of items are produced or resold in the changwat level system; however, the most important are wardrobes, cupboards, tables, chairs, living room suites, sideboards, desks and beds.

Secondly, products can be classified by the type of materials used in their production. By far, the most commonly used material is wood. For that reason this study is focused primarily on wooden furniture manufacturers. There are four firms in the changwats studied which manufacture upholstered products. Some supplementary information was collected from three of these firms and will be mentioned when applicable. Other materials used include rattan, aluminium, steel and plastic. These products have not been included in the study primarily because there were no manufacturers using these materials in the research areas.

The final classification is by product quality. Furniture for the domestic market can be conveniently grouped into five quality groups. These are termed low (L), medium-low (ML), medium (M), medium-high (MH)

and high (H). It is difficult to consistently classify products by their quality, but the distinction is important in terms of this research. Essentially product quality hinges on the basic quality of the raw materials used, the precision and care which go into construction and the quality of the final finishing. In general, quality will be reflected in the price of the product. Table 2.9 outlines some of the characteristics of products, arranged by product quality. These should be interpreted only as rough guidelines as there are numerous exceptions which can be found.

At the low end of the quality scale it is necessary to distinguish between "cheap" furniture and "junk" furniture. In order to reach low income consumers it is necessary for some firms to produce a product which gives the consumer reasonable service at a price which he can afford to pay. This "cheap" furniture is a fair value for the money, but tends to be below socially desirable standards. "Junk" furniture, on the other hand, is a product which is not a fair value for the money paid: workmanship is skimped, poor materials are used and thoroughly shoddy furniture is produced.

Local changwat level producers primarily manufacture products in the three middle quality ranges. This is primarily because the largest portion of the urban market in the changwats is concentrated in this range. Interestingly, it will be shown that low and high quality items are generally imported into the changwat.

2.3.3 The Participants in the Changwat Level Furniture Industry

There are three basic classes of firms participating in changwat level production-distribution channels. These are producer-sellers,

Table 2.9. Descriptive Characteristics of Products in the Changwat Furniture Industry

Product Quality	Product Characteristics				Primary Markets
	Approximate Price Range (Baht)	Types of Products	Materials	Location of Production	
Low	0-300 ฿	Predominately Tables and Chairs	All Solid Wood of Varying Quality; Shellac Finish	Northern Thai Villages	All Income Levels and Areas
Medium-Low	301-800 ฿	Food Cupboards Wardrobes	Yang Plywood, Plypaper, Low Value Structural Wood	Amphoe Towns Amphoe Muang Regional Producers	Higher Income Rural; Lower Income Urban
Medium	801-2,500 ฿	Full Range of Products	Yang Plywood, Low Value Structural Wood Some Upholstery	Amphoe Towns Amphoe Muang Some Bangkok	Middle Income Urban
Medium-High	2,501-5,000 ฿	Full-Range of Products	Yang Plywood, Low Value Structural Wood Upholstery	Amphoe Muang Bangkok	High Income Amphoe Towns; Medium-High Income Amphoe Muang
High	5,000 ฿ +	Full Range of Products	Teak Plywood, Low and High Value Structural Wood	Bangkok	High Income Amphoe Muang

retailers and producer-retailers. Producer-sellers are essentially manufacturing firms that sell their products in a variety of ways, always including direct sales to final consumers. They are different from producer-retailers (P-R) in that P-R's not only sell the products produced in the firm, but also engaged in buying and selling products manufactured by other firms to final consumers. The retailer is a firm which does not produce its own product line, but sells only products produced by other firms. Frequently, the retailer may have a small group of workers who paint or repair products, but by definition they do not manufacture furniture. In order to better understand each of these classes of participants, a descriptive overview of each group will be presented. It should be noted that these discussions are, in part, based on detailed analyses which are presented later in this chapter and in chapters which follow. Documentation of the characteristics to be presented in this section therefore is reserved for those detailed presentations. The descriptive overviews are based on information collected in the research areas, primarily in Changwats Khon Kaen, Roi-et and Chiang Mai.

2.3.3.1 The Producer-Sellers

Furniture manufacturers can be differentiated in many ways. The most obvious criterion on which to distinguish producers is the type of product that is produced. It was noted earlier that the vast majority of producers located in the changwat level system manufacture wooden furniture. With few exceptions, firms tend not to specialize in a particular line of products, but instead produce a wide range of types of items. It can be said, however, that the quality of products is a

firm-specific characteristic. Normally, a producer's output will fall into one or two adjacent quality classes.

The technology of production is best classified as machine-assisted hand production. There is variation across manufacturers primarily in terms of the amount and sophistication of the machinery employed. In no case, however, is the production process fully mechanized. All firms are clearly labor intensive although there are a wide range of capital-labor ratios. There is also variation in the ratio of skilled labor to unskilled labor. Changwat level producers also differ by the size of the firm measured by the number of workers. Firms generally range in size from one to 30 workers with the largest concentration in the five-to 15-worker range.

Perhaps the most interesting difference among producer-sellers is the way in which they have organized the marketing of their output. The majority of these firms sell their output directly to final consumers. Of these firms, the most common production and selling arrangement is to produce in response to orders from consumers. This is termed "job-order" production. Normally, in this situation, products are produced individually or in very small batches.

A second group of producer-sellers are involved in the production of various sized batches of products on a contract basis. There are usually orders for desks or cupboards for government offices and schools. This is termed "batch contracting." Some firms will combine job-order and batch contract production to some degree and others will specialize entirely in batch contracts. It is usually possible to clearly classify a firm as being in one or the other category.

A third type of selling arrangement is also based on contract sales, but the contract involves the production of a small number of a wide range of products. These firms are usually involved in the interior decoration or construction subcontracting business. Their work largely involves building furniture, but it also involves the provision of a "decoration" or "design" service and a certain portion of the work is done on site. Examples of this type of contracting include building-in counters, cupboards and seats in hotels, restaurants and theaters and finishing the interiors of homes. These producer-sellers are termed "single-order contractors" or decorators.

Only a small portion of the changwat level producer-sellers sell furniture to retailers and producer-retailers for resale. One of each of the two upholstery firms located in Khon Kaen and Chiang Mai sell exclusively to town based retailers. The other types of producer-sellers in this group specialize in the manufacturing of lower quality products for the geographically dispersed lower income markets. One group is located in the changwat capitals and sells to retailers located in amphoe towns or itinerant merchants. The other group, found only in Khon Kaen, is composed of producers who come from other areas of the country, primarily from Northern Thailand, who set up temporary factories during the post-rice harvest season. Their output is largely sold through itinerant merchants in rural areas.

2.3.3.2 The Producer-Retailer

The producer-retailer is really nothing more than a single firm which combines manufacturing, selling these goods and reselling other manufacturer's goods. In both the production and retailing enterprise these firms are essentially no different from the fixed location

producer-sellers and retailers. The important difference between these firms and producer-sellers is that they offer consumers an assortment of products purchased from various outside suppliers in addition to the products they produce in their own factory. The mix of own production and resales varies substantially across firms. Most of the producer-retailers began as producer-sellers and then diversified into retailing, although some retailers have gradually expanded their finishing enterprise into a full-scale production unit.

2.3.3.3 The Retailers

Aside from the selling activities of the producer-sellers and the selling and reselling activities of producer-retailers, there are two main classes of furniture retailers operating at the changwat level. These include what are termed the fixed location retailer and the itinerant trader. The fixed location retailers are simply what is commonly thought of as a retail store. They buy furniture from various sources and sell from their store to the public. They generally will deal in a range of furniture products including wooden furniture, upholstery products and some metal products. In smaller towns, retailers will often be diversified, selling a number of different types of goods in addition to furniture. In many cases, retailers will employ a small staff of painters or carpenters to finish products which are purchased in a semi-finished form. A common practice on the part of producers who sell to retailers over a long distance is to sell the goods in a semi-finished state. Normally, the items are fully assembled and sanded, but require a final painting, staining and lacquering or varnishing.

The second type of retailer is the itinerant merchant. There are two rather distinct types of these itinerant sellers. One group

represents producers from specialized furniture production villages in the North and will be discussed below. The other group is indigenous to the changwat level system. These itinerant merchants deal exclusively in the relatively low quality, inexpensive products of certain town based manufacturers. Typically, these sellers operate on a relatively small scale, carrying their products to villages and small towns in pick-up trucks. These merchants generally are only active in the post-harvest season as a consequence of the strong relationship between the agricultural cycle and the cash incomes of their potential consumers. There may be more than 300 of these merchants operating in Changwat Khon Kaen alone.

2.3.4 Structure and Organization of the Changwat Level Industry

In order to precisely examine the structure and organization of the various changwat level production-distribution system, a complete census enumeration of all furniture enterprises, that is, producer-sellers, producer-retailers and retailers, was carried out in all amphoe towns in Changwat Khon Kaen. It was not possible to enumerate the itinerant retailers. This research was supplemented by further census enumerations in selected amphoe towns in Roi-et, Chiang Mai and Amphoe Muang, Lampang. A brief interview was conducted with the firm manager or other knowledgeable person in each firm covering sales, production, employment, sources of products resold and the age of the firm. The first step in the analysis of this section is to construct a picture of the changwat level industry based on the complete enumeration of Khon Kaen. This view will then be compared with the findings from the more limited coverage of the other changwats in order to see if the Khon Kaen results are representative of the industry in other areas.

Figure 2.3 provides a map of Khon Kaen; descriptive data on each of its 19 amphoes is presented in Table 2.10. The amphoe towns range in size from the dominant amphoe muang with 94,000 persons to four small towns with less than 5,000 persons. Unfortunately, income data by amphoe are considered unreliable and are for that reason not reported here.

A summary of the basic information obtained during the census enumeration is reported in Table 2.11. Firms are classified as described earlier and the amphoes are ordered by the size of the town population. According to the survey, there are a total of 84 establishments in the Khon Kaen furniture industry. This represents one firm per 16,000 persons in the changwat or one firm per 3.6 thousand urban residents.¹⁰ Total annual sales are approximately 31.4 million Baht. This corresponds to 24 Baht per person in the changwat and to 103 Baht per town resident. These figures include the production estimates for six itinerant producers, but do not include sales made by itinerant merchants who procure products in other changwats. Of the total sales figures, approximately 53 percent represent disposition of own products and the remaining 47 percent represent resales. Total employment in production and retailing is 504 persons, or approximately one person year per 62 thousand Baht of sales.

Producer-retailers are, on the average, larger in terms of production, resales, total sales and employment than either producer-sellers or retailers. Table 2.12 indicates that they are also the least common type of firm. The average number of firms per town in the changwat are

¹⁰Interestingly, the town figure corresponds quite closely to the U.S. Department of Commerce estimate that a population of 3,200 persons is required to support one furniture store in the U.S. Cited in Owens and Vangsness (1973), p. 14.

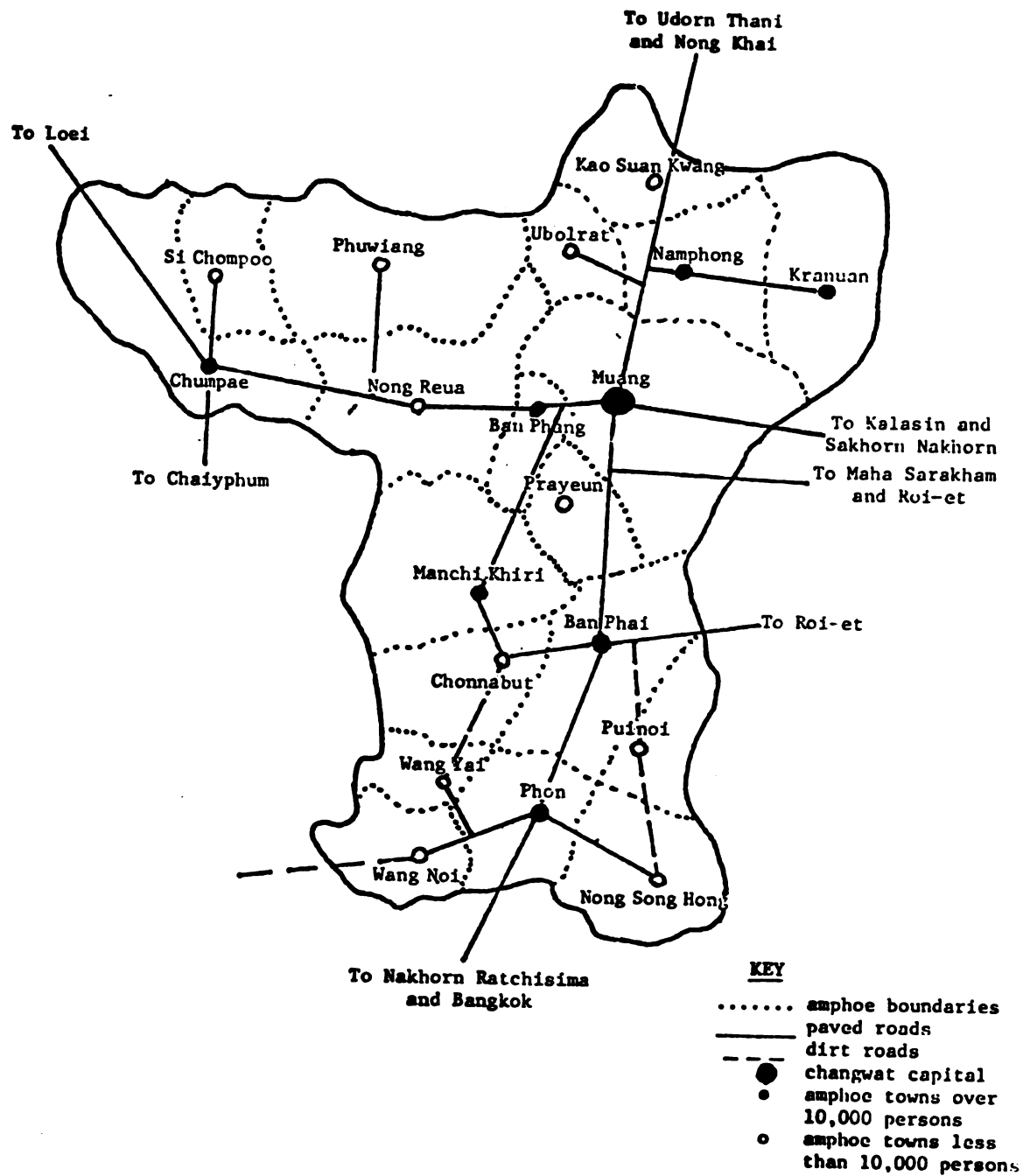


Figure 2.2. Map of Changwat Khon Kaen

Table 2.10. Selected Characteristics of Amphoes in Changwat Khon Kaen

Amphoe	Distance From Muang (km)	Amphoe Population 1980 (1,000)	Population Growth Rate ^a (%)	Amphoe Town Population 1980 (1,000)	Town Population Growth Rates (%)	Percent of Population in Town (%)	Rate of Change of Population in Towns (%)
Muang	--	252.3	-.6	94.0	6.3	37.3	6.9
Ban Phai	44	132.9	1.3	41.6	-.9	31.3	-.1
Phon	74	75.1	.9	11.8	2.5	15.8	1.6
Nong Song Hong	96	59.9	4.8	6.7	7.6	11.3	2.7
Wang Noi	96	38.0	-.1	2.6	4.2	7.0	4.3
Wang Yai	92	26.1	2.0	9.1	2.3	34.8	.3
Chonnabut	54	44.2	.6	9.3	.7	21.1	.2
Manchi Khiri	56	83.7	2.2	10.5	1.7	12.6	.5
Nong Reua	45	76.9	3.5	7.4	NA	9.7	NA
Chumpae	82	103.5	1.0	30.1	NA	29.1	NA
Si Chompoo	113	52.0	3.2	4.5	2.5	8.6	.8
Phu Wiang	67	94.2	1.0	5.0	.4	5.3	.4
Namphong	43	87.8	2.9	15.2	.6	17.3	3.7
Kranuan	66	77.2	4.9	11.2	NA	14.6	NA
Ubonrat	52	34.9	2.8	8.6	2.2	28.8	4.9
Ban Phang	22	48.9	.9	17.7	12.6	36.2	11.6
Prayean	30	29.0	NA	9.6	NA	NA	NA
Phui Noi	80	17.0	9.6	6.4	4.4	38.0	4.3
Kao Suan Kwang	.49	28.0	5.4	5.0	NA	17.8	NA
Changwat Total	---	1,316.6	1.3	306.3	---	22.5	---

^aGrowth rates are in yearly terms based on either three-or five-year series.

Sources: Project vehicle odometer; interviews at each amphoe office; interviews at changwat offices and various NESDB publications.

Table 2.11. Selected Results From the Khon Kaen Furniture Industry Census

	Producer-Sellers				Producer-Retailers				Retailers			All Firms				
	Number of Firms (f)	Annual Production Per Firm (1,000 B)	Average Employment Per Firm (f)	Number of Firms (f)	Annual Production Per Firm (1,000 B)	Annual Retail Per Firm (1,000 B)	Annual Sales Per Firm (1,000 B)	Average Employment Per Firm (f)	Number of Firms (f)	Annual Sales Per Firm (1,000 B)	Annual Employment Per Firm (f)	Number of Firms (f)	Total Product (1,000 B)	Total Retail (1,000 B)	Total Sales	Total Employment
Nang	8	544.5	9.8	7	933.8	436.5	1,370.3	12.1	10	584.4	5.1	25	10,892.6	8,899.4	19,792.1	214
Ban Phai	6	571.0	8.3	2	828.0	282.0	1,110.0	16.5	4	592.0	1.7	12	5,082.0	2,932.0	8,014.0	90
Chumpee	3	72.4	4.3	5	84.9	180.5	265.4	6.8	3	117.0	2.3	11	641.7	1,253.5	1,895.2	54
Can Phang												0	--	--	--	--
Namphong												6	--	798.0	798.0	23
Phon	1	240.0	10.0	1	182.0	18.0	180.0	5.0	3	120.0	3.7	5	402.0	372.0	780.0	26
Kranuan	1	600.0	3.0						4	102.0	1.8	5	600.0	498.0	1,098.0	10
Manchi Khiri	1	156.0	8.0	1	768.0	96.0	864.0	29.0	1	24.0	3.0	3	924.0	120.0	1,044.0	40
Prayuen												0	--	--	--	--
Chonaburi									2	30.0	2.0	2	--	60.0	60.0	5
Nang Yai												0	--	--	--	--
Ubonrat									2	300.0	2.5	2	--	600.0	600.0	5
Nong Nua												0	--	--	--	--
Kong Song Hong									3	200.0	4.3	3	--	607.0	600.0	13
Phut Noi												0	--	--	--	--
Phu Klang				1	72.0	18.0	90.0	8.0				1	72.0	18.0	90.0	8
Kao Suan Ruang									2	162.0	2.0	2	--	324.0	324.0	4
Si Choro-o	4	33.0	2.8						1	42.0	2.0	5	132.0	42.0	174.0	13
Nang Noi												0	--	--	--	--
Total Changanet	24	380.5	7.2	17	565.8	273.8	839.6	11.4	41	187.3	3.3	84	18,746.3	16,433.0	35,179.3	504

Source: Khon Kaen Furniture Census.

Table 2.12. Number of Firms Per Amphoe Town, Changwat
Khon Kaen, by Type of Enterprise

Location	Average Number of Firms Per Town:			
	Producer-Seller (#)	Producer-Retailer (#)	Retailer (#)	All Firms (#)
Amphoe Muang	8	7	10	25
Large Towns (> 10,000)	1.7	1.3	3.0	6.0
Small Towns (< 10,000)	.4	.1	.9	1.4
Average per Town for the Changwat	1.3	.9	2.2	4.4

Source: Khon Kaen Furniture Census.

1.3 producer-sellers, .9 producer-retailer and 2.2 retailer. When arranged by the size of the town, it can be seen that the relative numbers of each type of firm drops off sharply with declining town size. Based on these results from Khon Kaen, in towns with less than 10,000 persons, a producer-seller is likely to be found in two of every five towns, a producer-retailer in one of every 10 towns and a retailer in nine of every 10 towns. Larger towns, on the average, will have 1.7 producer-sellers, 1.3 producer-retailers and 3 retailers. For Amphoe Muang the figures are substantially higher.

Table 2.13 examines the percentage of resales and local production in total sales by town size. Of the 20 million Baht of sales by firms in Amphoe Muang, 55 percent is produced locally and the remaining 45

Table 2.13. Percentage of Resales and Local Production in Total Sales by Town Size: Changwat Khon Kaen

Town Size	Percentage of Total Sales Per Town Which Represent	
	Production in the Same Town	Resales
Amphoe Muang	55.0%	45.0%
Larger Towns (> 10,000)	56.5%	43.5%
Smaller Towns (< 10,000)	11.0%	89.0%

Source: Khon Kaen Furniture Census.

percent represents resales from various sources. The figures are substantially the same for larger towns, but the portion of production in total sales drops dramatically for smaller towns. Only 11 percent of the products sold in towns with less than 10,000 persons are produced in the same town.

Most of the detailed discussion of sales and product procurement by retailers and producer-retailers is reserved for Chapter 4, but some preliminary indication of the structure of retailing is presented in Table 2.14. Most of the furniture purchased for resale is produced in Bangkok, over 68 percent. Lesser amounts come from Amphoe Muang and other amphoes within Changwat Khon Kaen. A total of 9 percent is imported into Khon Kaen from nearby changwats. If data were available on the procurement sources of itinerant merchants, this figure would undoubtedly be higher. There is some variance by location of the reseller

Table 2.14. Sources of Products Purchased for Resale
in Changwat Khon Kaen

Source of Products for Resale	Percent of Total Resales (%)
Bangkok	66.8
Amphoe Muang	14.3
Other Amphoes	8.1
Other Changwats	<u>9.0</u>
	100.0

Source: Khon Kaen Furniture Census.

and by the type and size of the firm, but this analysis is deferred until Chapter 4.

Important insights into the dynamic trends at work in the changwat level furniture industry can be gained by examining the age structure of different types of firms by location. Table 2.15 reports the mean ages of firms in 1980 by firm type and town size in Khon Kaen. The producer-retailers are by far the oldest firms in all town sizes, and retailers are the most recent entrants into the industry. The anomolous case of Khon Kaen Muang can be explained by the fact that most established producer-sellers have now diversified into retailing and that the majority of the producer-sellers category is made up of firms on the outskirts of town which have been recently established to supply the itinerant merchants. It can also be noted that, for the most part, these firms are only in operation for part of the year as the producers return to their homes in the North during the wet season.

Table 2.15. Average Age of Firms by Enterprise Type and Location: Changwat Khon Kaen

Location	Average Age of Firms in 1980 by Firm Type:			
	Producer-Seller (Years)	Producer-Retailer (Years)	Retailer (Years)	All Firms (Years)
Amphoe Muang	3.5	16.9	8.1	9.1
Large Towns (> 10,000)	5.8	9.3	3.2	5.3
Small Towns (< 10,000)	3.3	5.0	1.4	2.2
Changwat	4.6	10.2	4.0	5.4

Source: Khon Kaen Furniture Census.

These temporary firms are potentially an important element in the changwat level industry. In the census work a total of seven temporary producers were discovered; one in Phon, one in Ban Phai and five in Ban Thaprae (a "suburb" of Muang). They all planned to stay in Khon Kaen only for the peak demand, post-harvest season. All of these producers were from Changwat Lamphun in the North. Once rich in raw materials for furniture production, particularly teak, Lamphun has rapidly been deforested by timber merchants, woodcarvers and furniture makers. As a consequence, a number of skilled producers have begun to migrate seasonally to areas where there appears to be both a market and materials. A large portion of their sales are through members of the "family" who act as traveling merchants or through local itinerant traders. At the end of the dry season (May) they planned to pack up and return to their villages to grow rice. None knew where they would be next season. In a

follow-up visit to Ban Thaprae in August, one of the five firms remained, but was nearly idle and ready to move on.

Additional information on the changwat level production distribution system was obtained in Changwats Chiang Mai and Roi-et. In each case the types of participants and the patterns of organization were similar. Primary attention in these areas was focused on the changwat capital city, but several of the amphoe towns in Chiang Mai and Roi-et were also visited. For comparative purposes, maps on Chiang Mai and Roi-et are presented in Figure 2.4. Table 2.16 reports certain key descriptive data for Changwats Chiang Mai, Khon Kaen and Roi-et. While each of the provinces have similar total populations, there is a clear range in income levels among the changwats. Average income per capita is almost twice as high in Chiang Mai as in Khon Kaen, while per capita income in Roi-et is only about 60 percent of that in Khon Kaen. Rates of growth in both total and per capita income are directly related to income levels with Chiang Mai significantly ahead of both Khon Kaen and Roi-et.

As shown in Table 2.17, in Chiang Mai Muang there were 23 firms with average total sales much larger than the other surveyed towns. Rapid growth in the Chiang Mai industry has made the average age of these firms the youngest of all the surveyed capital cities. Eight amphoe towns were surveyed and furniture firms were found in only two of the towns. One of these towns is quite close to Amphoe Muang and the producer-retailer there primarily served the Muang market. In the second town there were three retailers, but only one was open on the day of the survey. He had been in business for three years and sold only about 36,000 Baht of furniture annually. The absence of producers or retailers in the other

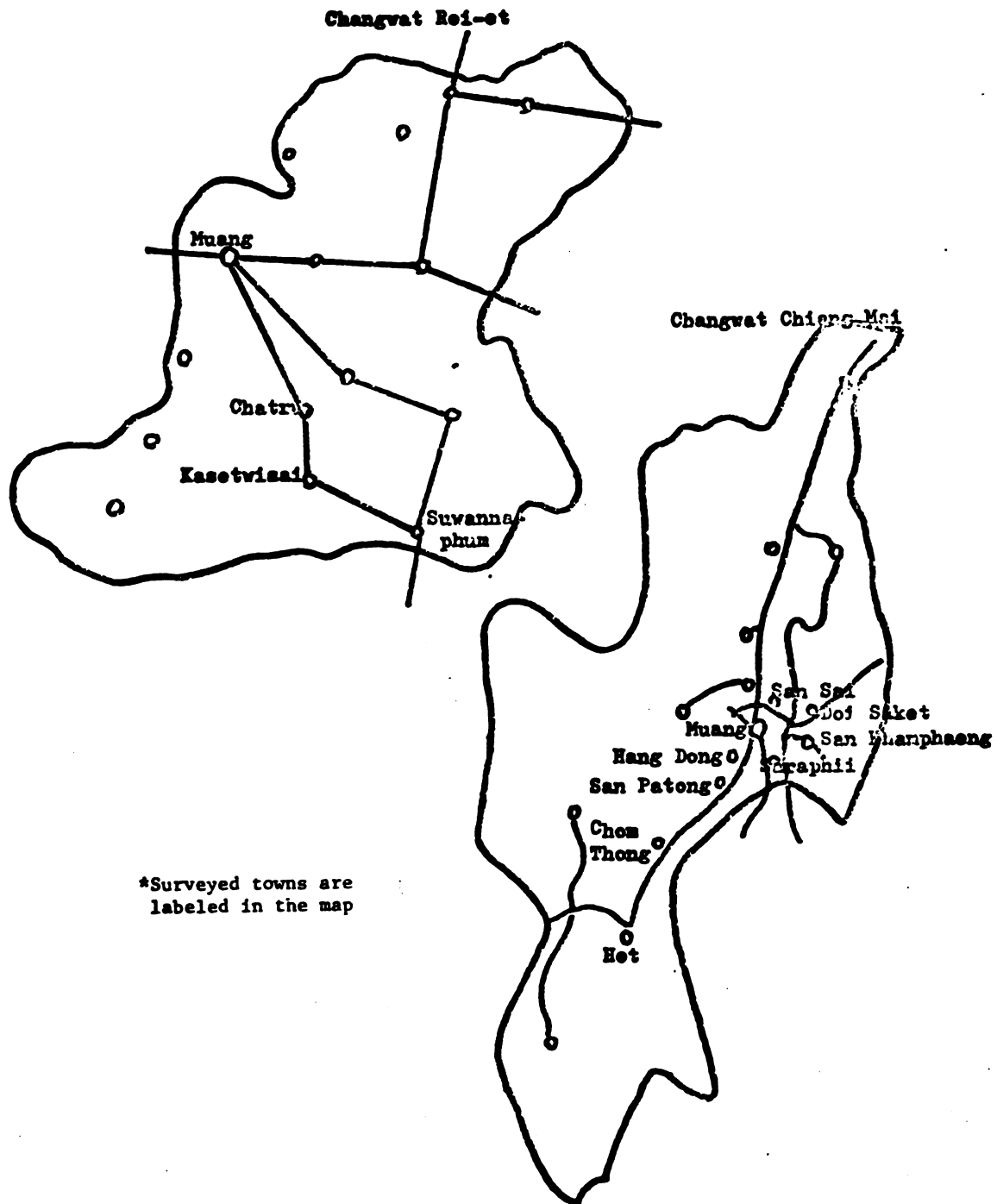


Figure 2.3. Changwats Roi-et and Chiang Mai

Table 2.16. Descriptive Characteristics of Changwats
in ROFEAP Survey Areas

	Descriptive Characteristics of:		
	Changwat Chiang Mai	Changwat Khon Kaen	Changwat Roi-et
Total Population (Thousand Persons)			
1975	1,096.2	1,263.2	988.7
1978	1,139.5	1,313.3	1,034.2
Annual Growth Rate	1.3%	1.3%	1.5%
Income - 1972 Prices (Billion Baht)			
1974	4.16	2.80	1.59
1979	6.90	4.34	2.16
Annual Growth Rate	10.8%	9.2%	6.3%
Per Capita Income (Baht)			
1974	3,841	2,217	1,605
1979	6,041	3,264	2,066
Annual Growth Rate	9.5%	8.7%	5.3%

Source: NESDB.

Table 2.17. Descriptive Characteristics of Furniture Firms in Furniture Industry
Study: Up-Country Survey Areas

Location	Number of Firms	Average Annual Sales (1,000 B)	Annual Average Production (1,000 B)	Average Annual Resales (1,000 B)	Average Age (Years)	Average Total Employment (Persons)
Chiang Mai Muang*						
Producer-Sellers	6	918.6	918.6	--	8.0	15.6
Producer-Retailers	6	3,162.7	1,709.7	1,453.0	10.0	19.7
Retailers	11	1,178.6	--	1,178.6	6.1	5.1
Chiang Mai Other Amphoes#						
Producer-Sellers	0	--	--	--	--	--
Producer-Retailers	1	2,000.0	600.0	1,400.0	20.0	30.0
Retailers	3	36.0	--	36.0	3.0	1.0
Roi-et Muang**						
Producer-Sellers	3	784.6	784.6	--	6.7	9.4
Producer-Retailers	0	--	--	--	--	--
Retailers	4	195.8	--	195.8	13.0	3.0
Roi-et Other Amphoes##						
Producer-Sellers	0	--	--	--	--	--
Producer-Retailers	0	--	--	--	--	--
Retailers	7	152.6	--	152.6	2.1	2.6
Khon Kaen Muang**						
Producer-Sellers	8	544.5	544.5	--	3.5	9.8
Producer-Retailers	7	1,370.3	933.8	436.5	16.9	12.1
Retailers	10	584.4	--	584.4	8.1	5.1
Khon Kaen Other Amphoes*						
Producer-Sellers	16	298.5	298.5	--	5.2	5.9
Producer-Retailers	10	468.1	308.2	159.9	5.5	10.9
Retailers	31	59.2	--	59.2	2.7	2.7

*Represents complete enumeration as of Spring 1981.

**Represents complete enumeration as of Summer 1981.

#Represents complete enumeration of 3 of 13 amphoes.

##Represents complete enumeration of 8 of 16 amphoes.

Source: Furniture Industry Study.

amphoes possibly reflects the relative domination of Amphoe Muang in the Chiang Mai Valley. Most of the towns visited are located within 30 kilometers of the capital city. Businessmen prefer the large market in Muang and consumers enjoy the selection available. The relatively low income markets are insufficient to support merchants in the "doughnut" of proximate amphoe towns surrounding Chiang Mai. Officials did report, however, that these areas were served by traveling merchants, similar to those found in Khon Kaen. One such merchant was interviewed who reported that producers in Lamphun supported a number of itinerant sellers in the Northern provinces.

Roi-et is a much poorer area than either Khon Kaen or Chiang Mai. A total of seven furniture firms were found in the capital city, three producer-sellers and four retailers. The average firm sizes measured by sales is larger than in Khon Kaen, due mostly to the larger producer-sellers and retailers. It should be noted that the average figures presented hide a skewed distribution of firm sizes with one or two relatively large firms, while the rest are very small. Firms are, on average, older than in Khon Kaen, but this is largely a result of a slower rate of growth from recent entry into the industry.

Three other amphoe towns were surveyed. No producers were found, but there were five small retailers in one town (150,000 ฿ average annual sales per firm; 2.4 workers) and one small retailer in each of the other two towns (300,000 ฿ annual sales and four workers in one and 18,000 ฿ annual sales and two workers in the other). The average age of the firms was 2.1 years in 1981. This appears to be consistent with the patterns of firm types and ages of firms by town size found in Khon Kaen.

Changwats Khon Kaen, Chiang Mai and Roi-et provide interesting areas for comparative analysis because they are quite different in terms of income and the general level of economic development. There are two sharp contrasts in the structure of their respective furniture industries. First, there is a much more dispersed locational structure of all types of firms in Roi-et and Khon Kaen, the poorer areas, when compared with Chiang Mai. In part, this may result from the geography of the areas. Chiang Mai is mountainous, with towns being concentrated in valleys. The largest such valley is the Chiang Mai Valley, where Amphoe Muang and several other towns are located. In this area, which is where most of the surveyed towns are located, there is a clear economic dominance of the capital city. This may be responsible for the lack of furniture production firms outside of Amphoe Muang.

Alternatively, the observed locational pattern may reflect the nature of the industry at a higher level of development. This would suggest that the pattern of evolution of the furniture industry in Khon Kaen and Roi-et may be one of a progressively greater concentration of production in the capital cities.

The second major difference relates to the importance of outside competition from various sources. Table 2.18 examines the relative importance of outside competition in each changwat by showing the percentage of the total sales¹¹ of furniture in each changwat which is produced within the changwat and outside of the changwat. Those products originating outside the changwat are specified as coming from either other

¹¹Total sales represents the total value of production and resales for all surveyed firms. This is complete census data for all Amphoe Muangs and for other amphoes in Khon Kaen and "sample" data for other amphoes in Chiang Mai and Roi-et.

Table 2.18. Structure of Outside Competition in the Chiang Mai, Khon Kaen and Roi-et Furniture Industries

Changwat	Percentage of Total Changwat Sales of Products Produced			
	Within the Changwat	Outside the Changwat		
		Other Changwats	Bangkok	Total
Chiang Mai				
Amphoe Muang	58.2%	.3%	41.5%	41.8%
Other Amphoes	100.0%	0.0%	0.0%	0.0%
Changwat Total	61.5%	.3%	39.2%	39.5%
Khon Kaen				
Amphoe Muang	61.1%	.7%	39.2%	39.9%
Other Amphoes	81.3%	6.1%	12.6%	18.7%
Changwat Total	67.5%	2.6%	29.5%	32.1%
Roi-et				
Amphoe Muang	75.1%	17.3%	7.6%	24.9%
Other Amphoes	14.0%	58.9%	27.1%	86.0%
Changwat Total	59.5%	27.9%	12.6%	40.5%

Source: Furniture Industry Study.

changwats or from Bangkok. In Chiang Mai, for example, 61.5 percent of all furniture sold in the changwat is produced in Chiang Mai and 39.5 percent is imported from outside the changwat. Only .3 percent of total sales come from other changwats, while 39.2 percent is produced in Bangkok.

The percentage of total sales origination outside of the changwat is remarkably similar for each of the three areas, ranging from 32.1 percent in Khon Kaen to 40.5 percent in Roi-et. The composition of imports, however, indicates that the higher the income of the changwat, the more important are imports from Bangkok. At the same time, other changwats are much more important sources of products in Roi-et,

especially outside of Amphoe Muang. This pattern largely reflects the fact that Bangkok products are generally in the higher quality ranges, while products from other changwats are in the lower quality ranges. Hence, the poorer the changwat, the more common are imports from other changwats.

In summary, it appears that the changwat level production-distribution system characterized earlier represents, with a sufficient degree of accuracy and generalizability, the typical changwat level furniture industry. In the three areas studied, the same basic participants, channels and imports were found although the relative significance of each of these characteristics varied in understandable ways. Further details on the changwat level industry will be explored as this study unfolds, but these will add precision rather than affecting the basic characteristics of the system presented in this section.

2.3.5 Imports Into the Changwat Level Industry

To this point, little has been said about imports into the changwat level system. Products manufactured outside of the changwat come from three main sources. These include: (1) regional medium-sized firms in nearby changwats who have sought out markets, both intermediate and final, in other areas; (2) Bangkok based firms, both large and small, whose products are resold in up-country changwats; and (3) producers in several villages in Northern Thailand which have specialized in the manufacture of low quality furniture. Each of these important sources of competition for the changwat level industry will be discussed in turn.

2.3.5.1 Regional Medium-Scale Products

Brief mention will be made about this type of firm which has emerged from the changwat level industry and has begun in some cases to generate

rather substantial market size. In the Northeast, several firms were identified which have specialized in the production of relatively low quality furniture aimed primarily at low income markets in changwat capitals and at markets in amphoe towns and in villages on a regional basis (i.e., reaching beyond their own changwat). None of these types of firms were found in the project's survey area, but these are the firms which were discovered selling to retailers in our survey area through itinerant merchants acting as wholesalers. One such factory was visited in Changwat Udorn Thani, north of Khon Kaen. This firm employed approximately 70 workers on average during the year and over 100 during the dry season. The estimated value of the capital stock is 3 million Baht. Output was estimated at close to 700,000 Baht per month or 8.4 million Baht annually. The level of technology employed is identical to the more advanced firms in the ROFEAP sample, although, the larger-scale of operation facilitated greater specialization in the production process. The products are of medium-low quality and illustrate the very thin line between "cheap" furniture and "junk" furniture. Sales are either to merchants who come to the factory and buy in small quantities (80 percent) or through the firm's retail store in the capital (20 percent). The manager did not know if the buyers coming to the factory were itinerant merchants or fixed location retailers, and did not care. He did seem to notice, however, that his products are sold in every changwat in the Northeast.

2.3.5.2 Bangkok Based Manufacturers

The largest concentration of furniture consumption, manufacturing and distribution in the country is centered in Bangkok. Limited time and resources were available for studying this part of the industry, but

enough was learned to present a broad overview of the structure of this portion of the industry. The most surprising finding was the large number of small-scale manufacturers which dominate production. There are less than a handful of large-scale relatively modern factories. For the most part, the firms bear a strong resemblance in size and technology to the firms found up-country. The primary difference between the Bangkok based and up-country firms was the consistently higher quality products available in Bangkok.

The overriding objective of the research carried out in Bangkok was to learn something about those manufacturers and distributors which are in competition to produce and sell furniture in the up-country markets. The original hope was to obtain sufficient information to make some cost comparisons among producers and products in various locations. Unfortunately, the degree of cooperation on the part of the managers interviewed was extremely limited. Answers to questions concerning production costs, value of output and distribution networks were in most cases vague, contradictory or downright misleading. As a result, the information on the Bangkok industry is limited to that obtained from a relatively small sample of producer-sellers, producer-retailers and retailers.

Three large firms were interviewed employing from 100 to 250 workers. Two of these firms are the main large-scale producers which distribute their products throughout the country. The third firm is a carbon copy of the largest firm, but is not involved in selling outside of Bangkok. One of the firms manufactures a wide range of wooden office and household furniture. This firm also has an export operation which sells exclusively in the Hong Kong market. On top of the diversity of product types, several different qualities of goods are also manufactured.

The other large national firm produces wooden framed, plastic upholstered living room and dining room sets. It is now attempting to enter export markets in deck chairs and director chairs. The upholstered products are sold in knocked-down form to buyers who provide their own transport or are shipped by train to the up-country areas.

Smaller firms also participate in national markets in one of two ways. Representatives of up-country producer-retailers and retailers frequently shop the furniture districts in Bangkok and place orders through retail outlets. Retailers may have their own small factory, but more often represent several smaller production units. The retailer assembles the order and delivery arrangements are made. The term retailer is used rather than wholesaler because the volume of products sold in this way is normally very small. There are also distributing agents (middlemen) who act as agents for one or several small producers who travel around the country and take orders for the producers they "represent." Surprisingly, both the middlemen and the retailers also often act as representatives for the products of the larger factories.

A major force in the dynamic of development in the Thai furniture industry is the emergence of the previously mentioned large-scale producers of furniture for the up-country domestic market. There is remarkable difference between these firms and the changwat level manufacturing in the scale of production, the technology employed and in the overall sophistication of the business operation. Two large firms were visited, but the interviewees were rather shy and were willing to reveal just enough to whet the researcher's appetite.

One firm manufactures partially upholstered, partially wooden, living room and dining room sets. This firm has been in business for 10

years, but expanded to the current scale three years ago in conjunction with building a new factory in an industrial estate. On average, it employs 300 workers and has fixed assets worth about 15 million Baht. The firm is relatively labor intensive, but as will be shown in Chapter 5, it is dramatically more efficient in terms of capital and labor than the changwat level manufacturers. Production is at his desired capacity utilization level and at the present time, he turns away some buyers.

The second firm manufactures a complete line of wooden furniture. The owner formerly had a small (10 employees) factory, but five years ago expanded to a unit north of Bangkok which employs 200 plus workers. This factory mills its own wood, has specialized production using pre-fabricated panels, uses modern joinery machines and assembles final products, using completely interchangeable parts. This is basically the same technique used in the production of their completely knocked-down (CKD) export product line. At the present time, all products sold in the domestic market are fully assembled, but unfinished. Although the manager would not say, it appears that the firm is geared to begin marketing CKD products in the domestic market. This firm also produces four different grades of furniture for the domestic market.

These firms represent the leading edge in the development of the Thai furniture industry. Currently, these are the only two large firms which are taking direct aim at the up-country markets. The products manufactured in these plants will set the parameters for the comparative advantage of the changwat level industry. These are not products destined for the high quality market. They are directly competitive in the middle- and medium-high markets identified earlier as primary loci of competitive interaction. Their success stems directly from the fact

that they have access to national markets rather than the limited market areas faced by the changwat level producers.

2.3.5.3 Northern Thai Village Based Producers

Thai villagers occasionally make items of furniture for use in their own households or for other households in the same area. There are a number of villages, apparently concentrated in Northern Thailand, which have specialized in the production of furniture as a primary or secondary vocation. These villages are linked into a rather extensive and complex system of distribution which effectively provides a kingdom-wide marketing radius. This marketing system is also operated by villagers, in many cases from the same or nearby villages in the North. Evidence from town based manufacturers indicates that the products produced and distributed through this system are an important source of competition affecting the economics of the changwat level furniture industry. This issue will be explored more fully in a later chapter. The present concern is to describe what is known about the village based system.

Information on the village industry was obtained through several interviews with marketing agents and a one-day visit to one of the production villages. According to informants, there are "furniture villages" located in Changwats Lampang, Lampoon and Phrae. These villages are marked by the degree to which they have specialized in furniture production. The village which was studied in Amphoe Hang Chat in Lampang consisted of approximately 400 households of which over 100 were active in the production of furniture and many others participated as hired labor. One middleman claimed that in this amphoe there were nearly 1,000 furniture producing households and more than 150 middlemen serving the area.

This village produced stools and tables, all of a similar design made from a common material. Households specialized in the production of either stools or tables, but only rarely in both. Some households produced only lathe shaped legs for the tables. Other households served as bulk buyers of wood which was sold to other producers.

The products are made from solid woods, either Maay Chom Chaa or Maay Chum Churi. The construction is rough, the finish sloppy, but the products are meant to be durable and utilitarian. Complex joining is unknown, but some pieces are fitted together with hand-made mortise and tenon joints. Finishing is initially done by the producers and consists of a rough sanding and the application of an orangish laquer. The tables are sold to merchants "knocked down" for economy in transport, but the stools are sold assembled. The only real product variation in the village was the size of the goods and whether the table legs were tooled or not.

Both types of wood used are unregulated by the Royal Forestry Department. At the present time, there are abundant supplies of these timbers available in nearby forests. Wood is supplied to the village by people who have specialized in logging and roughsawing. The wood is commonly cut into large chunks of the trunk of the tree. According to those who purchased wood from these suppliers the purchase lot is normally a pick-up truck load which is delivered by the sellers in larger six or 10 wheel trucks. There is little apparent problem with the availability of wood except by those households which are rather peripheral, part-time participants.

Some households rely exclusively on family labor and others actively hire in workers from other households. The skill level of the workforce

varies, but according to the workers, there is relatively little skill required. The most highly skilled labor is used in the lathe operations. The wage rates vary from 30 to 40 Baht per day for hired workers. Interestingly, the hired workers were primarily carpenters, while the finishing was done by family members, especially the women and girls. Several firms paid workers by the piece with earnings reported to be potentially as high as 300 Baht per day.

The production process is reasonably sophisticated for a village level industry. Some power tools were used by every household interviewed. Since the wood is purchased in large, bulk pieces, it must be sawed to the desired shape. This was done with power saws and lathing was done on simple, electrically operated machinery. Sanding and planing is done primarily by hand, but some electric planers and sanders were also evident. Much of the larger equipment is made in the village based on models in other households. It is difficult to value the investment for this reason and the impossibility of allocating land or building costs to the furniture enterprise. Two firms reported total investment of 4,000 to 5,000 Baht.

The products manufactured by this village were seen being sold in two towns in Khon Kaen and Roi-et in the Northeast, Chiang Mai in the North and in Bangkok. They are actively marketed in every corner of the country. Generally, these goods are sold at roadside stands in towns, at periodic markets in rural areas and through the relatively permanent "tent" retailers in larger towns and Bangkok. There is a widespread demand for the products which cuts across regions, urban-rural locations and all but the very highest income class. The stools and chairs are often used in rural restaurants and in other meeting

places. The prices are quite low, ranging from 100 to 200 Baht for the tables and from 20 to 35 Baht for the chairs. A set of four stools and one table are sold as a set for from 200 to 350 Baht.

The products are transported from the production village in six or 10-wheel trucks with a crew of three or four marketing agents. They may be local villagers or nearby villagers. Often they will be members of the producing households. Local people usually obtain the goods on consignment credit to be repaid when they return from their journey. Nonlocal people are required to pay cash and normally operate out of pick-up trucks on the "local," regional routes. For the long-distance routes, the trucks are commonly rented, either from truck owners experiencing their slack seasons or from commercial trucking companies. Other times truck owners will act as the middlemen. Loaded with a truckfull of stools and tables the merchants set out to a pre-selected area of the country and travel and sell until they are empty. They then return for a break and to pick up a new truckload. Some participate year-round, others only part of the year. The traveling crew often consists of a driver, a painter (to provide a second coat of laquer prior to sale) and a carpenter to assemble the products and to make minor repairs.

Production and sales are seasonal with the agricultural cycle. Seasonality comes on both the supply and demand side. Bangkok and the changwat capital markets are less linked to the agricultural cycle and often provide an outlet year-round. Some producers work year-round, while other households enter and exit subject to their primary farming enterprise constraint.

None of the producers or merchants interviewed were able to explain how and when the industry got started. The producing households sampled

had been in business for no more than three years, but there were others that had been producing "many years." Some had previously been involved in the manufacture of solid teak furniture which is now illegal. The middlemen had been in business no more than two years and the majority were in their first season of sales. The impression that was left was of an industry which has blossomed in the past two years. From whatever small beginnings this is now a major village industry involving perhaps thousands of households in selected areas of Northern Thailand.

In other villages different types of furniture are produced. There is a group of two villages in Lamphun which produce very low quality products which are sold in a relatively local area by sellers on bicycles. The most common products are flimsy tables and bookshelves. The "peddlers" were seen cycling through Chiang Mai (25 km from the producing villages) and frequently set up shop at the various universities in the town. In the town of Lampang there is a permanent "tent retailer" who sells an entire range of low quality furniture which is produced in nearby villages. In Bangkok another such retailer was interviewed who sold solid teak furniture illegally, produced in several villages in Changwat Phrae and Changwat Lamphun. Both these types of sellers are relatively common sights around Bangkok and in changwat capitals.

The most serious problems faced by these firms are for those using teak. Substantial pay-offs are required for the marketing agents if they are to set up shop. Those selling nontek products are less bothered by law enforcement agents; however, there is an increasing tendency for the roadside selling areas to be "rented" by the police to the sellers. There is no information available on the relative abundance of the nontek woods used by these village manufacturers. Presumably,

the price mechanism will function as locally available supplies become scarcer and longer distances are negotiated by the wood sellers. Clearly, however, the price of wood is not set as to insure the reafforestation of the areas logged. The wood situation is likely to become an important source of concern in the foreseeable future.

The village producers and distributors were not given the attention in this research that, in retrospect, they probably deserve. They were not discovered until very late in the study period and by then the amount of time and resources available were limited. It should be noted, however, that these firms only came to our attention as a result of the broader industry focus which guided the research. It was only through contact with merchants and curiosity about sources of supply that led to their discovery.

2.3.6 The Changwat Level Industry Map

From the above information it is possible to construct a reasonably representative industry map of the changwat level furniture production-distribution system. Such a map is pictured in Figure 2.4. Within a typical changwat system there are six key types of participants. These are input suppliers, retailers, producer-retailers, producer-sellers, temporary producers and itinerant retailers. Outside of the changwat there are significant elements of the national industry which must be taken into account. These are the Bangkok and regional manufacturers and input suppliers/producers and the Northern Thai village producers.

When the ROFEAP originally conceived its town research program, the objective was to say something about the economic potential of rural town producers. The industry map illustrates clearly that even at the

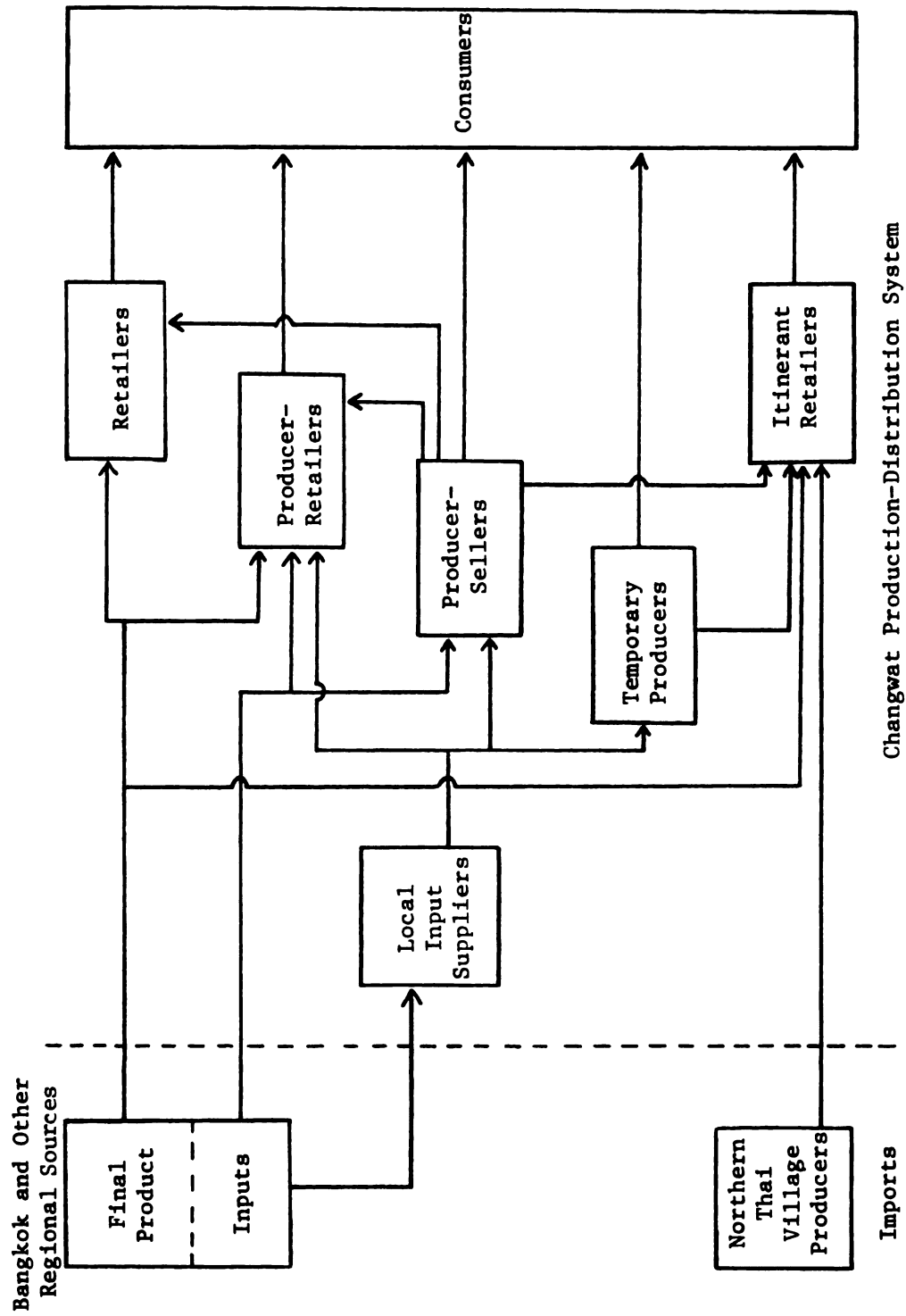


Figure 2.4. Industry Map of the Changwat Level Furniture Industry

changwat level, among small rural furniture firms, there are several different types of producers and distributors, each with different vertical and horizontal linkages and displaying a considerable amount of heterogeneity. Furthermore, this picture of the industry illustrates that the role of the retailing and distribution system can hardly be ignored in assessing questions regarding the evolution of the system. The important nodes of the competition in the industry, in part, determines the choices open to buyers and sellers and set the context for the further development of the industry. The retailers, merchants and consumers all exert considerable influence on the relative competitive positions of the various participants in the industry.

2.4 Summary and Conclusions

A substantial amount of ground has been covered in this chapter. The overall objective was to provide an appropriate context for studying the economic potential of rural, small-scale furniture enterprises. The chapter began by examining the nature of an industry and exploring ways of identifying manageable units for analytical purposes. It was found that it was reasonable to focus on a relatively separable production-distribution system which took explicit consideration of vertical and horizontal relationships within the system and between the system and the rest of the industry. The various production-distribution channels which make up a production-distribution system can conveniently be understood in the context of the industry map.

Given this framework and the broad characterization of the Thai furniture industry, attention was focused on the changwat level production-distribution system. This system represents the key characteristics

of the furniture industry which could be found in each of Thailand's non-Bangkok changwats. The details of the system will differ according to the size, population, geography, income and general level of development of each individual changwat, but the model was found to be an adequate representation of the industry in the three changwats studied.

Several interesting findings emerged from the description of the changwat level production-distribution system. These are:

- (1) The changwat level production-distribution system is composed of a variety of heterogeneous types of participants. Firms specialize in various functions and have differing organization. Most importantly there are producer-sellers, producer-retailers and retailers.
- (2) Each of these firm types differs with respect to their average size, age and geographic distribution. Producer-retailers tend to be larger in both their production and retailing enterprise than either producer-sellers or retailers. Retailers, including itinerant merchants, are the youngest firms indicating the increasing separation of production and consumption and opening up opportunities for increased competition from products manufactured outside of the changwat. Geographically, producer-sellers and producer-retailers are more likely to be found in changwat capitals, with retailers dominating sales in smaller towns. Itinerant merchants appear to serve even smaller towns and dispersed rural consumers. In Chiang Mai, the most developed changwat in the study area, the industry is much more concentrated in the capital city

than in Khon Kaen or Roi-et where a more dispersed pattern is found.

- (3) Competition from outside the changwat comes primarily from regional medium-scale producers and Northern Thai village producers at the lower end of the product quality range, and from the Bangkok producers in the higher quality ranges. The importance of these different sources of imports into the changwat differs in each of the study areas, apparently as a consequence of the income levels of the changwats and the resultant size of the market for different qualities of products.

In the chapters which follow the changwat level production-distribution system will be explored in greater detail. Chapter 3 examines the nature of the market for furniture; Chapter 4, the distribution of products to consumers; and Chapter 5, the production of furniture. The information presented in these chapters will be brought together in Chapter 6 in order to assess the factors affecting the development of the industry.

CHAPTER 3

THE MARKET FOR FURNITURE AND FURNITURE CONSUMPTION

3.0 Introduction

One of the most important factors affecting the rate and structure of growth in the Thai furniture industry is the pattern and growth of furniture consumption. Given the relatively high transport costs for furniture, the geographic distribution of consumption expenditures can exert a strong influence on the geographic distribution of production and the evolution of the distribution system. Additionally, to the extent that expenditures are a function of income and if poorer people tend to make purchases from smaller-scale, labor-intensive producers, then improvements in the economic position of low income groups could encourage the development of the small-scale, geographically distributed enterprises.¹ Finally, the overall rate of growth in consumption expenditures for furniture can be viewed as a key indicator of the upper bound of the growth potential for the industry as a whole.

The objective of this section is to cast some light on the above contentions. A detailed analysis of the complete consumption picture is

¹This has been well documented by House (1980) in his study of the Kenyan furniture industry and by King and Byerlee (1977) for a wide variety of small industry products in Sierra Leone.

impossible due to data and resource limitations,² however, it is possible to examine the implications of some previous consumption studies and to explore data generated in the ROFEAP village survey. The FAO in conjunction with the Thai National Statistics Office (NSO) conducted an extensive wood products consumption survey in 1971. ROFEAP village data were collected on furniture ownership and purchases in approximately 420 households in four provinces. Finally, the sample furniture firms were queried on their subjective opinions about the future course of demand. Each of these sources of information has important insights to offer for the study of furniture consumption.

3.1 The Market for Furniture

The market is the concept which serves as the basis for defining an industry. In practice, however, industries generally serve a variety of different markets. The wide variety of products which are incorporated under the heading of furniture creates a particularly difficult problem of defining markets in terms which facilitate the analysis of competitive interaction. It is possible, however, to disaggregate the market for furniture products into rather broad categories which can assist in clarifying the demand side of the competition picture.

The four most interesting dimensions along which to disaggregate the furniture market are: (1) institutional or private demand; (2) the location of demand; (3) the income level of the consumer; (4) the quality of the product. Figure 3.1 presents one possible view of the market

²A more thorough consumption study was originally planned using the 1976 Thai National Socio-Economic Survey data; however, the data tape which was supplied by NSO contained a number of problems which could not be resolved satisfactorily.

for furniture broken down along these dimensions. The four primary columns specify geographic location, Bangkok, changwat capitals, amphoe towns and villages. The composition of demand in each area differs as a consequence of a variety of factors including income, tastes, the relative importance of institutional demand and the types of products which are available. The secondary column disaggregation is based on income. It should be noted that the width of the columns is not meant to be indicative of the relative importance of each category nor as an indicator of actual income distribution patterns. Each column is then separated into several sections which indicate the relative importance of various product qualities. As in Chapter 2, five quality levels have been employed. These are high quality (H), medium-high quality (MH), medium quality (M), medium-low quality (ML) and low quality (L). In practice it is very difficult to consistently classify products into these groupings. However, for the most part, the product line manufactured by a given firm can be roughly classified into one or two of the quality levels.

A consumer finds himself in one of the columns by virtue of his residence and income level. The position of the column, that is, the quality level, is a function of tastes and the outcome of the consumer's budgetary allocation decisions. For instance, a low income amphoe town consumer may have a preference for high quality furniture, but immediately his income level prevents him from making such a purchase. The most feasible options open to him are to purchase medium-low or low quality furniture. The choice between the two will depend on his preferences subject to his budgetary allocation decisions.

The picture presented in Figure 3.1 contains little which is surprising, particularly clever or controversial. The point to be emphasized, however, is that the market is a complex, diverse entity. Any given firm or group of producers and distributors will be able to aim towards only a certain portion of the market. Firms which are manufacturing products for the same or overlapping markets are competitive rivals. The products of these firms will be meeting head on in the marketplace, and for a given market size, the competition for market shares in a zero sum game.

Before examining the structure of consumption in greater detail, it is necessary to briefly explore the distinction made earlier between institutional and private consumption. Institutional consumers include government purchases for schools, the army and government offices. and other institutions such as hotels, theaters and hospitals. Unfortunately, it is impossible to quantify the relative importance of each class of institutional consumer with any degree of accuracy.

The only estimates available on the relative importance of institutional and private consumption is from the data collected in the 1975 Input-Output Table for Thailand.³ According to this information, government consumption expenditures accounted for 3.8 percent of the domestic sales of the wooden furniture and fixture industry. Private consumption, therefore, accounts for 96.2 percent of the domestic sales (NESDB, 1975). These figures appear to underestimate the extent of

³The original input-output survey of the furniture industry was not used in the compilation of the final Input-Output Table. According to the chief of the NESDB Statistics Bureau, the furniture industry data was not acceptable due to a lack of cooperation on the part of the producers. Hence, the coefficients were computed from loan applications of the Bangkok Office of the Small Industry Finance Organization.

government demand and, of course, do not distinguish private institutional demand from aggregate private consumption. In the ROFEAP town survey approximately 20 percent of all production was on government contracts. The difference between the two estimates perhaps reflects the greater significance of government contracting for the changwat level industry as compared with the national industry.

3.2 Patterns of Furniture Ownership and Consumption

This section will consider some of the quantitative information available on the patterns of furniture ownership and consumption. Before presenting these data, however, it is necessary to consider certain special characteristics of furniture which bear on the analysis of the empirical work.

3.2.1 Special Characteristics of Furniture

The analysis of furniture consumption requires consideration of certain characteristics peculiar to durable consumer goods in general and furniture in particular. First, the fact that furniture is durable implies a separation of expenditure from consumption. Expenditures occur at the time of purchase, but consumption continues throughout the lifetime of the product. Hence, the purchase of a durable good might usefully be regarded as an investment which produces a discountable stream of returns. More importantly, however, from the standpoint of this study, this implies that purchases are periodic. In any given year only a small percentage of consumers will actually make a purchase. This raises some rather serious questions concerning the appropriateness of estimating income or expenditure elasticities from cross-section data which cover only a single year. In addition, certain adjustments

must be made in the estimation procedures to account for the high proportion of nonpurchasers in any given period.

A second major consideration is that furniture is a relatively new product for the majority of Thai consumers. Historically, Thai's have not used furniture, per se. In rural areas floors have been and are traditionally used for sleeping, eating and sitting. Village housing was designed without consideration of the idea of purchased furnishings. In major urban centers and among higher income groups the use of furniture has increased rapidly in the past 25 years, and more recently, consumption has begun to spread throughout the population. It is likely, given this pattern, that preferences for furniture are changing in ways that will have important implications in the growth and development of the furniture industry.

Lastly, some of the difficulties inherent in the concept of furniture should be noted. Furniture includes a wide variety of products which provide a flow of particular services. As has been previously noted, these products vary in size, shape, materials, durability and along other dimensions of quality. For this reason, it is difficult to carry out any kind of rigorous price or formal demand analysis. This is not to imply that price is not important. It is important, however, for much narrower categories of products that can be examined here. In addition, one of the key issues affecting the industry is the rising price of certain raw materials and the fact that some producers have access to a primary material, wood, which is priced substantially below that price which would assure sustainable yields of timber for future consumption needs (see Chapter 6). Rising real prices of furniture are potentially very important for the growth of demand. In this study,

however, technical and data limitations prescribe that the focus be placed on consumption and expenditure patterns rather than on demand and price analysis.

Related to the breadth of the term furniture is the strong probability that, as measured in empirical studies, all goods providing "furniture type" services are not adequately enumerated. The clearest example is in home improvement and construction. In these cases, furniture may be "built in," perhaps by a decoration contractor and, therefore, not counted when furniture expenditures are reported. It is not clear how significant this phenomena is; however, it is possibly very important, especially for higher income groups.

3.2.2 Patterns of Furniture Ownership and Consumption

There are three sets of data which will serve as the basis for the discussion of this section and the analysis which follows. First, the Food and Agricultural Organization of the UN in conjunction with the Thai National Statistics Office (NSO) conducted an extensive wood products consumption survey in 1971. The survey collected information on 1970 stocks of furniture and purchases during the survey year from a stratified random sample of 5,000 households throughout Thailand. Included were 3,500 rural households from villages and amphoe towns and approximately 1,500 urban households in municipal areas and Bangkok. The inclusion of amphoe towns with villages in the rural category was based on the standard procedures of NSO at that time. Currently, however, the amphoe towns are considered a separate community type. This affects the comparability of the FAO data with the rural village data which is discussed below.

The second set of information was collected as part of the ROFEAP in 1980. These data were gathered from a sample of about 420 households in 25 villages located in four provinces. The households are randomly drawn within villages, but the villages were purposively selected. This introduces some bias in the village data, but it is unknown how severe the problem is for the analysis of furniture ownership and consumption.⁴ In any case, this data set contains sufficient information to allow some statistical and econometric analysis of ownership and purchase patterns.

Finally, some published data exist from the 1975-76 NSO socio-economic survey on consumer expenditures. As was noted earlier, a copy of the original data tape was obtained for analysis. Published statistics from the survey could not be replicated from the tape suggesting inconsistencies resulting from the copying of the tape. This does not necessarily imply problems with the tape used in the computation of the published results. Some results from this survey will be used in this section.

The observed pattern of furniture ownership in Thailand in 1970 is reported in Table 3.1 on a per household basis by location and type of product. In all product categories, urban consumers clearly dominate rural consumers. The average urban household owned 22.4 pieces of furniture in 1970, while the average rural household owned 7.4 pieces. The national average was 9.4 pieces. Comparable data for villages in 1981 are reported in Table 3.2. In all of the sample households the average number of pieces of furniture owned is .56, one-thirteenth of the figure for villages and amphoe towns in the FAO survey. Even

⁴See Mead (1981) for a discussion of the nature of the bias in the village sample selection procedure.

Table 3.1. Furniture Stock Per Household, in Thailand,
by Type of Furniture and Location, 1970

Location	Average Number of Pieces Per Household of:						Total
	Chairs	Tables	Kitchen Furniture	Living Room Furniture	Beds	Wardrobes	Miscellaneous
Rural	1.3	.4	2.0	.8	.6	1.1	1.1
Urban	7.9	2.3	3.2	1.7	2.2	3.0	2.1

Country	2.1	.6	2.2	.9	1.0	1.4	1.2

95

Source: FAO, 1972.

accounting for definitional and reporting problems, this serves to underline the remarkably low level of per household furniture ownership in villages in Thailand.

The FAO information is further disaggregated by income class in Table 3.3. It should be noted that the FAO researchers used a rather peculiar definition of income quintiles which normally would assign equal portions of the population to each class. These are not, therefore, comparable quantities to those presented later for the ROFEAP villages. The FAO data, however, reveals the apparently strong relationship between income levels and furniture owned in the cross-section. For Thailand, as a whole, the poorest 33 percent of the population own only 15 percent of the furniture, while the richest 6 percent own 11 percent of the furniture stock. This pattern holds for both urban and rural areas.

Data from the NSO Socio-Economic Survey on furniture expenditures are reported in Table 3.4 for three regions of Thailand. The information for each region is broken down by municipal areas, sanitary districts (or amphoe towns) and villages. Included in the table are data on the population in each region, income per capita, average annual expenditure on furniture per capita, expenditures on furniture as a percentage of income and total expenditures for the region by each type of community. Within each region per capita expenditures are highest in municipal areas and lowest in villages. This corresponds to per capita income levels as well as community types. In the North and Northeast expenditures on furniture as a percentage of income are highest in the sanitary districts. This can be explained by the fact that sanitary districts are more like municipal areas in terms of types of houses and

Table 3.3. Furniture Stock by Location and Income Class, 1970

Income Class	Rural Areas		Urban Areas		Country	
	Percent of Population	Percent of Furniture Stock	Percent of Population	Percent of Furniture Stock	Percent of Population	Percent of Furniture Stock
Lowest "Quintile"	38%	17%	4%	3%	33%	15%
Second "Quintile"	30%	27%	8%	6%	27%	24%
Third "Quintile"	24%	34%	23%	20%	24%	32%
Fourth "Quintile"	6%	15%	33%	33%	10%	18%
Highest "Quintile"	2%	7%	32%	38%	6%	11%

Country	86%	64%	14%	36%	100%	100%

Source: FAO, 1972; quotation marks added.

Table 3.4. Expenditures on Furniture by Region and Community Type

Location/Community Type	Total Population (1,000 Persons)	Average Income Per Capita (1,000 B)	Average Annual Expenditure on Furniture Per Capita (Baht)	Expenditures on Furniture as a Percentage of Income (%)	Total Annual Furniture Expenditures (Million Baht)
Northern Region					
Municipal Areas	637.0	8.7	12.2	.14%	7.8
Sanitary Districts	1,048.0	4.5	9.5	.21%	10.0
Villages	7,515.0	3.1	3.5	.11%	26.3
Total	9,200.0	3.7	4.8	.13%	44.2
Northeastern Region					
Municipal Areas	739.0	6.7	16.6	.25%	12.3
Sanitary Districts	1,446.0	4.8	13.3	.28%	19.2
Villages	13,015.0	2.6	2.4	.09%	31.2
Total	15,200.0	3.0	4.2	.14%	63.8
Central Region					
Municipal Areas	640.0	8.3	30.2	.36%	19.3
Sanitary Districts	1,330.0	6.1	14.2	.23%	18.9
Villages	6,030.0	4.6	9.8	.21%	59.1
Total	8,000.0	5.2	12.2	.23%	97.6

Source: Computed from NSO, 1978 (a), (b) and (c).

access to furniture than they are like villages. The sanitary district resident's preference and need for and access to furniture is similar to the resident of the municipal area, yet, his income is much lower on average than the municipal area resident. As a result, a larger portion of his income is spent on furniture. This situation is not found in the central region, most likely because the income levels in sanitary districts and municipal areas are not as different as in the other areas.

What stands out most in Table 3.4, however, is the structure of total furniture expenditures by community type. In spite of the low levels of per capita furniture expenditures in villages, the sheer numbers of rural residents results in total expenditures for this group considerably larger than would have been anticipated. For all three regions combined nearly 57 percent of total expenditures on furniture are made by villagers, compared to 19 percent for residents of municipal areas and 23 percent for sanitary districts.

Further insight into the nature of furniture consumption and ownership in villages can be obtained by examining the ROFEAP village data in more detail. In these villages the relationship between furniture ownership, purchases and income class is also apparent. Table 3.5 reports the results of the analysis of ownership and purchases by village income quintiles. The quintiles are formed on the basis of total household income, creating five groups of approximately equal numbers of households. As incomes rise, the sample mean value of furniture owned per household follows monotonically from 107 Baht for the lowest income households to 846 Baht for the highest income households. Thus, while mean income increases by 1,233 percent, mean furniture ownership

Table 3.5. Descriptive Characteristics of ROFEAP Village Sample
and Furniture Ownership and Consumption

Income Class	Number of Households	Mean Household Income (Baht/Year)	Mean Value of Furniture Owned Per Household (Baht)	Mean Value of Furniture Purchased 1980 (Baht)	Mean Household Size (Persons)
Lowest Quintile	80	6,728	107	28	4.7
Second Quintile	90	13,701	115	37	5.5
Third Quintile	84	20,335	307	95	6.0
Fourth Quintile	82	30,987	410	89	6.3
Highest Quintile	82	86,004	846	371	7.0

All Households	418	31,215	353	122	5.9

Source: ROFEAP Village Survey.

increases by 691 percent. For furniture purchases made in 1980 the figures indicate a similar pattern of association with income class, although there is a slight drop from the third to the fourth quintile. For purchases, the 1,223 percent increase in incomes is associated with a 1,225 percent increase in mean value of purchases of furniture. This suggests a relatively strong income elasticity; however, more rigorous analysis of this issue will follow.

Tables 3.6 and 3.7 are constructed using only those households which either own or purchased furniture and report some basic descriptive data on the characteristics of the products. Table 3.6 deals with furniture owning households and Table 3.7 deals with households which purchased furniture in 1980. In general, the percentage of households owning furniture increases with income. For the sample, as a whole, 27.8 percent of the households reported owning furniture, while only 20 percent of the poorest and nearly 40 percent of the richest households reported ownership. Higher income is also associated with larger amounts of the total value owned, the average number of pieces owned and interestingly, the average value per piece. Higher income households purchase more expensive furniture and more of it than lower income households.

Table 3.7 presents the same data for purchases for those households which purchased furniture in 1980. Similar patterns are revealed except that the income association appears stronger in this case. This is not surprising given that income is measured for the purchase year and that past purchases which comprise the ownership variable are more a function of income in years past than current income. Also, some of the furniture

Table 3.6. Descriptive Characteristics of Furniture Owned in ROFEAP
Sample Furniture Owning Households by Income Class

Income Class	Percentage of Households Owning Furniture (%)	Average Value of All Furniture Owned (Owning Households Only) (₪)	Average Number of Pieces Owned (Owning Households Only)	Average Value Per Piece of Furniture Owned (Owning Households Only) (₪)
Lowest Quintile	20.0%	543	1.6	334
Second Quintile	18.9%	609	1.4	441
Third Quintile	26.2%	1,171	2.4	493
Fourth Quintile	35.4%	1,159	1.8	659
Highest Quintile	39.0%	2,167	2.2	989
All Households	27.8%	1,274	2.0	642

Source: ROFEAP Village Survey.

Table 3.7. Descriptive Characteristics of Furniture Purchased in 1980
in ROFEAP Sample Purchasing Households by Income Class

Income Class	Percentage of Households Purchasing Furniture in 1980	Average Value of Total Purchases in 1980 (Purchasing Households Only) (₦)	Average Number of Pieces Purchased in 1980 (Purchasing Households Only) (₦)	Average Price Per Piece (₦)
Lowest Quintile	7.5%	372	1.6	226
Second Quintile	6.7%	548	1.8	310
Third Quintile	6.0%	1,598	2.3	708
Fourth Quintile	9.8%	908	2.0	465
Highest Quintile	15.9%	2,338	2.2	1,051
All Households	9.1%	1,347	2.1	635

Source: ROFEAP Village Survey.

stock owned was not purchased, but handed down through the family and this would diminish the strength of the association with income.

The information presented here suggests that there is a relationship between mean levels of furniture ownership and purchases, community type and income levels. Study of the association of means, however, can often be misleading in the absence of the analysis of the variance around the means. If the variances are large enough, there may not be a statistically significant difference between means that, on first examination, appear to be different. Hence, more rigorous statistical and econometric analyses of this information is necessary before any firm conclusions can be reached. This is the subject of the following section.

3.3 Econometric Analysis of Furniture Ownership and Consumption Patterns

In developed countries the demand for furniture is generally thought to arise from the following sources:

- (a) Newlyweds making their initial purchases of furniture for setting up home;
- (b) Extensions to equipment of new households to complete initial equipment;
- (c) Extensions to equipment of new households as family requirements increase; and,
- (d) Extensions of and changes in equipment arising from increases in the prosperity of the family. (Working Party Report, 1946).

This suggests that the key factors affecting consumption would therefore be general business conditions, new house construction and the number of marriages. In time series analysis of expenditures in Great Britain, each of these factors has been found to bear a significant relationship with consumption patterns. (Working Party Reports, 1946).

In Thailand, and perhaps in other underdeveloped areas, these factors are likely to be of equal importance. This would be especially true for higher income consumers in urban areas. In this study, however, emphasis is placed on those factors which would be associated with more general economic development in Thailand. The two factors of the greatest interest here are location and income. The structural transformation of an economy is associated with an increase in the proportion of the population living in urban areas. If the above data are accepted, then the gradual structural transformation of Thailand will provide a strong stimulus to the development of the domestic furniture industry.

It is possible to examine the existence and strength of the relationship between income and consumption using the ROFEAP village data. Obviously, it would be preferable to explore this relationship for the country as a whole. In the absence of this analysis, however, the results derived from the sample villages can offer some important insights into the overall consumption story. First, if there is a strong relationship between income and consumption within rural areas, added credence is given to the existence of an equally if not stronger relationship when looking at wider income differentials in the context of different community types. One would be hard pressed to argue that the finding of an association between income and consumption in one cell of the location-income-consumption matrix is not indicative of a stronger relationship across the cells in the matrix.

Secondly, the fact that there is at present such a low level of per capita and per household furniture ownership and consumption in villages implies that villages represent an important source of potential demand for furniture. The rapid proliferation of the itinerant

furniture merchants discussed briefly in Chapter 2 indicates that this fact is already becoming known in the industry. In Chapter 6 it will be argued that one of the factors which can support the growth of the changwat level furniture industry is its degree to which it can succeed in capturing the growing markets in rural areas. There are so many people in rural Thailand that even a small increase in effective demand across the population can have important aggregate consumption effects.

Justification aside, there are a number of approaches which can be taken to estimate the relationship between income and furniture consumption. The parameter of interest is the income elasticity of furniture expenditures. In general terms, the approach is to estimate some function with consumption as the dependent variable and income as one of the independent variables. The specific method adopted here is to estimate a series of relationships using both the value of furniture owned and the value of furniture expenditures in 1980. The first specification will examine the effect of income on the dependent variables across the entire sample. This will provide the basic elasticity estimates. Secondly, however, furniture ownership and expenditures will be examined in the context of a two-step decision process. The first decision is a qualitative choice between owning and not owning or purchasing and not purchasing. The second decision, made only by those who have decided to own or purchase, is the quantity owned or the level expenditures. The decision whether to purchase furniture or not may be governed by factors such as contact with furniture sellers, peer groups acting on preferences, housing type, etc. Income may be only one of a variety of considerations here. However, once the decision to purchase

has been made, it would be expected that income would play a much more important role in determining the level of expenditure.

Before specifying the exact relationships which will be estimated, it is necessary to say a few words about the choice of the appropriate functional form. Considerable work has been done on the derivation of functional forms for expenditure studies, but the main concern of much of this effort is the appropriateness of the function as a component of a complete expenditure system. In single product studies the choice of a functional form is somewhat less important. The greatest concern is the flexibility of the function with respect to the behavior of the marginal propensity to consume (MPC) and the income elasticity (E_y) parameters among the various functions typically used in this type of work.⁵ The ratio semi-log inverse (RSLI) function has been chosen for this study. This choice was made on the basis of the flexibility of the computed MPC and E_y across income levels. The RSLI function can be written in its general form as:

$$(E/Y)_i = b_0 + b_1 \ln Y_i + b_2 1/Y_i, \quad (4.1)$$

where E is defined as consumption expenditures on furniture, Y is total household income, i is the index for households and the b_i s are parameters to be estimated.

For computational simplicity, both sides of 4.1 are multiplied by Y_i to get:

$$E_i = b_0 Y + b_1 Y \ln Y_i + b_2 \quad (4.2)$$

From this formulation it can easily be seen that the marginal propensity

⁵See King and Byerlee (1977, p. 31) for an excellent summary of the properties of these commonly used functional forms.

to consume is equal to:

$$MPC = \frac{\partial E}{\partial Y} = b_0 + b_1 + b_1 \ln Y, \quad (4.3)$$

and the income elasticity of expenditures is:

$$E_y = \frac{\partial E}{\partial Y} \cdot \frac{Y}{E} = (b_0 + b_1 + b_1 \ln Y) \frac{Y}{E} \quad (4.4)$$

Three modifications are made to this basic formulation of the RSLI function for estimation. First, in order to account for variation in ownership and purchases due to factors such as access to furniture sellers, externalities in preferences, average village wealth, etc., binary dummy variables (V_1 to V_{24}) are added for 24 of the 25 sample villages. Secondly, household size (H_i) is also added as an independent variable to account for variation due to the number of people supported on any given household's income. Lastly, of course, an error term (μ_i) is added to each estimating equation. This gives the general estimating form of the equation:

$$E_i = b_2 + \sum_{j=1}^{24} V_j + b_0 Y_i + b_1 Y_i \ln Y_i + b_3 H_i + \mu_i \quad (4.5)$$

This general estimating form is used with six different dependent variables. These equations are:

(1) Furniture ownership

- (a) Value of furniture owned for all sample households (VF0);
- (b) Binary variable which equals 1 if the household owns furniture and zero otherwise (F0);
- (c) Value of furniture owned for households owning furniture (VF00).

(2) Furniture expenditures in 1980

- (a) Value of furniture expenditures in 1980 for all sample households (VFP);
- (b) Binary variable which equals 1 if the household purchased furniture in 1980 and zero otherwise (FP).
- (c) Value of furniture purchased in 1980 for purchasing households (VFPP).

Before presenting the results of the analysis, there are two econometric issues which need to be noted. In equations 1(a) and 2(a) above, data on the dependent variable are truncated; that is, they are subject to a bound at zero. In this case, it can be shown that the OLS assumptions that $E(\mu) = 0$ and that μ be independent of the explanatory variables are violated over the truncated sample. This implies that least squares estimates will be biased and inconsistent.⁶ The direction and extent of the bias is unknown.

Secondly, a similar problem arises in the equations specifying binary dependent variables. Once again, the expected value of the error term is not zero and depends on the value of the independent variables, indicating that least square estimates are biased and inconsistent. Furthermore, the binary dependent variable makes the function identical to a conditional probability statement. A desirable property of such functions is that the estimate of the dependent variable be bounded by 0 and 1. Unfortunately, no such assurance is built into the estimating procedure.

⁶See Schmidt (1980) on the truncated dependent variable problem. This is a generalization of what is normally referred to as the limited dependent variable case.

These two problems have given rise to various estimating techniques which use maximum likelihood estimates of logit, probit and tobit functions.⁷ For our purposes, however, it was decided that direct least squares estimates in the truncated variable case and the case of the linear probability function would provide sufficiently accurate answers to the questions addressed.⁸

The estimated coefficients from the six RSLI equations are presented in Table 3.8. The performance of the equations is uneven with respect to the statistical significance of the individual coefficients, but the adjusted R^2 's, $\bar{R}^2$, are acceptable for this type of cross-section analysis. The income variables will be analyzed shortly once the elasticity estimates are presented. Analysis of the R^2 , however, can reveal the extent to which the total explained variation in the dependent variable can be attributed to the various explanatory variables.⁹

⁷See Cragg (1971) for a discussion of models used in the case of limited dependent variables.

⁸A comparison of different methods of estimating quantitative dependent variable model was undertaken by Steve Haggblade and the author. Estimates obtained using the linear probability function and a maximum likelihood logistic specification were for all practical purposes similar. In this case, there appeared to be little justification for using the more sophisticated and econometrically appropriate technique.

⁹There is some question as to the legitimacy, from a statistical point of view, of decomposing R^2 . The R^2 attributable to a subset of dependent variables, say $\hat{x}_j$, is termed the partial determination coefficient, R^2_{yxj} . In the typical case where the regressor matrix is not perfectly orthogonal, the sum of all partial determination coefficients for all mutually exclusive and exhaustive subsets of dependent variables is not, in general, equal to the R^2 of the original equation. The partial determination coefficients depend on the order in which variables are entered into the equation.

This problem can be avoided by comparing the R^2 of the original equation with the R^2_{yxj} derived from a separately estimated equation which does not include the subset of variables of interest. This is the procedure followed here. For further discussion of this topic, see Goldberger, 1964, pp. 197-201.

Table 3.8. Coefficient Estimates of RSLI Ownership and Expenditure Equations, ROFEAP Village Data

Equation	OLS Parameter Estimates				
	Y_i	$Y_i \ln Y_i$	H_i	$\bar{R}^2$	$\% R^2(a)$ $\% R^2_y$
(1) (a) VF0	.0155 (.0119)	-.00088 (.00092)	24.62 (17.87)	.27	75.6% 12.9%
(b) F0	.0000062 (.0000057)	-.00000042 (.00000044)	.01731 ** (.00848)	.30	93.1% 2.2%
(c) VF00	.1209 (.0483)**	-.00857 (.00373)**	-34.573 (45.718)	.36	72.4% 24.1%
(2) (a) VFP	.0144 (.0068)**	-.00104 (.00053)**	7.221 (10.253)	.27	86.7% 4.5%
(b) FP	.0000016 (.0000037)	-.00000008 (.00000028)	.0109 (.0055)**	.29	90.9% .3%
(c) VFPP	.3322 (.1569)**	-.0257 (.0128)*	-99.46 (64.52)	.20	43.0% 56.3%

Standard errors in parentheses.

*Indicates parameters statistically different from zero at 90 percent level.

**Indicates parameters statistically different from zero at 95 percent level.

(a) $\% R_i^2$ is the percent of the R^2 for the equation which can be attributed to villages (V) or income (Y).

The figures presented in the final three columns of the table indicate the percentage of the R^2 which can roughly be attributed to the village dummy variables ($\% R_V^2$) and the income variables ($\% R_Y^2$).

Of the variation explained by the equations, a large percentage can be attributed to the village variables. Equations 1(b) and 2(b) which estimate the probability of ownership and purchase gain most of their overall explanatory power, 93.1 percent in the first case and 90.9 percent in the second case, from the village dummy variables. This reflects the varied consumption patterns across villages. A number of factors could account for this phenomena including access to furniture sellers, preferences, other village characteristics and possibly inconsistent enumeration. Once the decision to own or purchase has been made, however, the importance of village decreases and the importance of income increases, especially for purchases in 1980 (2c). In this case, only 43 percent of the explained variation is associated with the village dummy, while over 56 percent can be attributed to income. In none of the equations is the household size effect particularly important.

The computed ownership and consumption income elasticity estimates are presented in Tables 3.9 and 3.10 for the sample mean values of income and ownership and purchases and by income quintiles. For the total value of furniture owned (VFO) the mean income elasticity is .52. This means that in the cross-section sample a 10 percent rise in income is associated with a 5.2 percent increase in furniture ownership. Hence, furniture is a "normal" good. Broken down by quintiles the elasticities point to the largest increase within the second quintile. The probability elasticity (FO) at the sample mean is .18. In other words, a 10 percent rise in income is associated with a 24.2 percent increase in

Table 3.9. Income Elasticity of Furniture Ownership
in ROFEAP Sample Villages

Income Class	Value of the Income Elasticity of Ownership for Equation		
	1(a) VF0	1(b) FO ^a	1(c) VF00
Sample Mean	.52	.18	2.42*
Lowest Quintile	.44	.07	2.43*
Second Quintile	.74	.13	3.66*
Third Quintile	.39	.13	1.81*
Fourth Quintile	.42	.13	1.79*
Highest Quintile	.49	.24	1.70*

* = Computed from statistically significant parameters.

^aThis elasticity should be interpreted as the percentage change in the probability of owning furniture for a percentage change in income.

Table 3.10. Income Elasticity of Furniture Consumption
in ROFEAP Sample Villages

Income Class	Value of the Income Elasticity of Consumption for Equation		
	2(a) VFP	2(b) FP ^a	2(c) VFPP
Sample Mean	.74*	.11	12.45*
Lowest Quintile	1.64*	.04	31.65*
Second Quintile	.74*	.07	13.19*
Third Quintile	1.07*	.11	17.91*
Fourth Quintile	.61*	.09	9.43*
Highest Quintile	.45*	.12	5.04*

* = Computed from statistically significant parameters.

^aThis elasticity should be interpreted as the percentage change in the probability of purchasing furniture for a percentage change in income.

the value of furniture owned. This follows a rather peculiar pattern by quintiles, reaching a peak in the second quintile. This perhaps reflects a threshold class of income with respect to furniture ownership.

Table 3.10 presents the same information for purchases in 1980. The mean income elasticity for the sample is .74, somewhat larger than for ownership. No attempt will be made to explain the pattern by quintiles. The probability elasticity is .11 at the sample mean and shows an increasing trend through the income classes, except for a slight drop in the fourth quintile. For furniture consumers, the income elasticities are extremely high and declining through income classes. The values were double-checked for arithmetic errors and are all statistically significant. At the sample mean a 10 percent rise in income is associated with a 124.5 percent increase in the value of furniture purchased in 1980. This indicates the importance of income in determining the level of purchases once a decision has been made to buy furniture.

In summary, several points can be made.

- (1) The picture told by the tables showing mean values of ownership and consumption by income class are somewhat misleading in that they hide a substantial amount of variation within each income quintile. This is reflected in the relatively low percentage of total variation explained by income.
- (2) Village is the most important identified variable associated with furniture ownership and is replaced by income as the primary factor only among furniture purchasers.
- (3) Income elasticities are strong, but in several cases, are based on statistically insignificant parameters. The

highest elasticities are found among owners and purchasers of furniture. This suggests that income is more important in determining the amount purchased and the value owned than in determining the question of whether to purchase or not.

- (4) The finding of positive income elasticities in the sample equations, 1(a) and 2(a), however, means that there is some association between levels of income and furniture demand. This suggests that if it were possible to study the consumption patterns by income between villages and towns or within towns the results would likely show equally strong income elasticities.

3.4 Sources of Village Furniture

The ROFEAP village data can also provide some insight into the acquisition channels used by village furniture owners and purchasers. Information was collected on the source of the products owned by each household. These data are broken down by village location, product price and product age in order to explore the differences due to these factors. The possible responses to this question have been grouped as from family or neighbor, from a local, village, merchant, from other presumably itinerant merchants and from town merchants. It is not known whether these merchants are also producers. Table 3.11 reports the percentage of items acquired in each way by changwat. "Hand-me-downs" from family and neighbor are very significant in three of four changwats, with the Roi-et results standing in sharp contrast. In Chiang Mai local (village) merchants are most important. The itinerant sellers show up as the most important source of village furniture and by far the most significant

Table 3.11. Source of Furniture Owned by Location
in ROFEAP Sample Villages

Village Locations	Percentage of Items Owned or Acquired Through			
	Family or Neighbor	Local Merchant	Itinerant Merchant	Town Merchant
Khon Kaen	41%	9%	44%	7%
Roi-et	0%	4%	96%	0%
Chiang Mai	38%	43%	18%	1%
Suphanburi	68%	0%	32%	0%

Sample	38%	19%	39%	3%

Source: ROFEAP Village Survey.

Table 3.12. Source of Furniture Owned by Purchase
Price in ROFEAP Sample Villages

Purchase Price (Baht)	Percentage of Products Received or Purchased From			
	Family or Neighbor	Local Merchant	Itinerant Merchant	Town Merchant
0-500	41.8%	24.7%	33.5%	0%
501-1,000	34.1%	13.6%	38.6%	13.6%
1,000+	28.6%	2.9%	62.9%	5.7%
Total	38.4%	19.4%	38.8%	3.4%

Source: ROFEAP Village Survey.

source of purchased products. Town merchants are only significant in Khon Kaen.

When arranged by product price, as in Table 3.12, it is clear that family or neighbor and local merchants are most prominent in the lower price category. The most expensive products are acquired through the itinerant merchant. Interestingly, village purchases in towns fall mostly in the 501 to 1,000 Baht range. The age grouping of Table 3.13 reveals that the importance of family and neighbor has diminished over time as has the local merchant. The itinerant merchant shows a strong rising trend and town merchants have only been used in the past two years. These data suggest a pattern of change which is quite plausible.

3.5 Prospects for Furniture Consumption and Demand

The demand for furniture depends, in a general sense, on population, or perhaps more precisely the number of households, its geographic distribution and income levels and preferences. The evidence reported above suggests at least two things regarding these factors. First, as incomes rise, so does the demand for furniture. Secondly, shifts from rural to urban locations changes the type of housing accommodation and, thus, the demand for furniture rises. In addition, it is taken as a given that a larger population is associated with a larger demand for furniture. Hence, on all three accounts it can be expected that the demand for furniture will undergo substantial increases in the future.

Table 3.14 presents the results of our attempt to forecast expenditures on furniture in 1990 by community type for the Northern and Northeastern regions. The projections account for population growth, migration and income changes. The income elasticity of expenditures is not

Table 3.13. Sources of Furniture Owned by Age of Furniture
in ROFEAP Sample Villages

Age of Furniture (Years)	Percentage of Furniture Owned by Source			
	Family or Neighbor	Local Merchant	Itinerant Merchant	Merchant
0-2	30.4%	18.2%	45.5%	6.1%
3-5	38.5%	23.1%	38.5%	0%
6-10	40.5%	24.2%	53.3%	0%
10+	58.8%	17.6%	23.5%	0%

Source: ROFEAP Village Survey.

available at the levels of aggregation used in the analysis. As a result, the figures will underestimate expenditure changes which would have resulted from positive income elasticities.

The findings confirm the overall importance of consumption in sanitary districts and villages. Of the total increase in annual expenditures on furniture in the two regions, 76 percent is accounted for outside of municipal areas. The magnitude of the increase in all areas, however, is quite substantial. In the Northeast, expenditures will more than double by 1990 with only a slightly less dramatic increase for the North.

If the above forecasts are even close to being accurate, the implication is potentially very favorable for producers located in areas other than Bangkok. In the absence of rapid penetration of outlying areas by Bangkok based manufacturers, the greatest portion of demand

Table 3.14. Projections of Total Expenditures on Furniture by Community Type
for the Northern and Northeastern Region, 1990

Region/Community Type	1975/76 Furniture Expenditures (Million Baht)	1990 Projected Furniture Expenditures (Million Baht)	Absolute Change in Expenditures 1975/76-1990 (Million Baht)	Percentage Increase 1975/76-1990 (%)
Northeastern Region				
Municipal Areas	12.3	30.3	+18.0	146.7%
Sanitary Districts	19.2	56.7	+37.5	195.1%
Villages	31.2	53.0	+26.7	101.4%
Total Region	63.8	140.0	+82.2	128.8%
Northern Region				
Municipal Areas	7.8	17.1	+9.3	119.5%
Sanitary Districts	10.0	19.5	+9.5	95.4%
Villages	26.3	39.3	+13.0	49.5%
Total Region	44.2	75.9	+31.8	71.9%

Source: Computed from data in NSO, 1978 (a), (b) and (c), World Bank, 1979 and Xuto, et al., 1981.

increases will be for the products produced in Amphoe Muang and other amphoe towns throughout the Kingdom. This is likely to have favorable employment and income impacts throughout the "urban," rural areas. The desirable effects will be correspondingly greater as income growth is concentrated among rural people. In a recent study by the ILO in Kenya this issue was addressed in the context of the employment implications of income redistribution (House, 1980). The results of that study are consistent with the hypothesis that the growth in the rural demand for furniture has strong employment effects with little or no cost in aggregate income and output.

Some further evidence on the likely course of demand is available from interviews with the producers in the town sample. Their perceptions are reported in Table 4.15. When asked their opinions about the demand for the products produced in their firms over the next five years, the managers had mixed feelings. Only tables and desks and "other products" came out with positive forecasts. The source of the managers' pessimism is not clear, but is perhaps due to their "insecurity" about the products they produce. The response may have been different if the question had a more general referent. It is quite likely that in the broader sense the managers' predictions are likely to be incorrect.

3.6 Summary and Conclusions

This chapter has explored, in some detail, the nature of the market for furniture, the patterns of ownership and consumption, the factors affecting expenditures in villages and the likely future course of consumption changes. The evidence indicates that the market for furniture is likely to grow, thereby creating a favorable environment for growth and development in the furniture industry.

Table 3.15. Five-Year Demand Projections by Changwat Level
Furniture Producers by Product Type

Product Type	Percent of Producers Who Think That:		
	Demand Will Increase	Demand Will Decrease	Demand Will Stay the Same
Cupboards	46%	4%	0%
Tables and Desks	100%	0%	0%
Beds	50%	50%	11%
Other Products	44%	11%	44%

The composition of the growth in expenditures is critical in the analysis of the economic potential and opportunities available to the various participants in the changwat level furniture production-distribution system. The data presented in Section 3.5 suggest that many of the opportunities for growth will be found outside of changwat capitals. Before drawing further implications from this finding, however, it will be useful to explore the nature of product distribution and manufacturing in further detail. These are the respective tasks of Chapters 4 and 5.

CHAPTER 4

THE MARKETING AND DISTRIBUTION OF FURNITURE

4.0 Introduction

The previous chapter has examined the characteristics of the market for furniture in areas of Thailand other than Bangkok. The next step in our analysis of the changwat level furniture industry is to investigate the ways in which products are distributed from manufacturers to consumers. Product distribution has generally been neglected in studies of small-scale industries. When marketing agents are analyzed, it is usually as an aggregated unit including all distribution trades or all retailers. The industry focus of this study, however, views product distribution as just one more central component of the overall industry structure and organization (see Chapter 2).

From an economic point of view the distribution system plays a number of important roles in the process of economic development in general and also in the growth and development of particular industries. The emphasis of this chapter is on the analysis of some aspects of the structure, conduct and performance of the distribution systems operating in the Thai furniture industry. In this context, there are at least five key functions that are performed by the distribution system.

First, the essence of any product distribution system is its role in extending the reach of the market. Marketing systems move products from producers to consumers. The degree of physical separation of

products from consumers is a measure of the reach of the marketing system. Secondly, by widening the reach of manufacturers, the product distribution system determines the structure of the competitive interaction of various producers. In any given segment of the market, the competing constellation of goods is a direct function of which products are being brought together through the marketing system. Along with the establishment of the structure of competition, the distribution system plays an important role in setting the terms of competition. This concept will be developed in a later section.

Fourthly, the marketing system can be an important source of entrepreneurship and innovation with respect to the system itself, but also for the industry as a whole. Innovative marketing practices can open up substantial new opportunities for producers. The strong interrelationship between production and marketing makes this point especially interesting. Lastly, the distribution system needs to be considered in an evaluation of the overall economic performance of the industry. The capital-labor ratio embodied in a piece of furniture reflects the labor intensity of the distribution system, as well as the production process. Similarly, overall efficiency in the industry depends on the combined efficiency of the production and distribution systems.

In Chapter 2, three main classes of furniture sellers were identified as participants in the changwat level production-distribution system. These were producer-sellers, producer-retailers and retailers. Within the group of retailers were found fixed-location retail stores and itinerant merchants. This chapter will focus on the channels by which products move from producers to consumers for each of these enterprise types. The discussion will center on those firms which are found

in the changwat level system, and the analysis will take these firms as the point of departure. For example, the movement of products for re-sale from Bangkok to up-country changwats will be examined from the point of view of the procurement practices and channels of changwat retailers rather than as sales practices of Bangkok producer-sellers.

The analysis of this chapter is based on brief, single visit interviews with all retailers in Chiang Mai Muang, Changwat Khon Kaen, Roi-et Muang and a number of merchants and producers in Bangkok. In addition, reference is made to the village producers and middlemen interviewed during the course of the research. Altogether, over 100 merchants of one sort or another were interviewed. A small amount of information was obtained from most, but a few were willing to reveal considerable details on their operations.

The discussion begins in Section 4.1 by looking at the procurement practices and channels of changwat level firms involved in reselling. This includes all types of retailing firms, except itinerant merchants, as well as the producer-retailers. Section 4.2 will then examine the other end of the distribution process: sales practices of furniture sellers. This discussion will cover all of the resellers mentioned in Section 4.1, as well as producer-sellers. Section 4.3 will focus on the procurement and sales practices of itinerant merchants. Section 4.4 examines certain aspects of the economic performance of the system. Finally, Section 4.5 will focus on developments, trends and opportunities in marketing and distribution.

4.1 Product Procurement by Furniture Retailers

Up-country resellers can procure their supplies of products for re-sale in a number of ways from a variety of sources. The objective of

this section is to examine product procurement channels from the perspective of the resellers and, to a lesser extent, from the sellers' and manufacturers' point of view. Before examining these channels, it will be useful to analyze the relative importance of various sources of supply. This is followed by a discussion of other dimensions of procurement such as credit, transportation, types of suppliers and the factors affecting the use of alternative sources of supply. For now, this discussion will focus only on fixed-location resellers, including both retailers and the reselling enterprise of producer-retailers as they are essentially similar. The itinerant merchants are treated separately in a later portion of this chapter.

4.1.1 Sources of Supply by Geographic Origin

Information on the geographic origin of products purchased by resellers is presented in Table 4.1. These data are broken down by the location of the resellers and whether the firm is a producer-retailer or a retailer. The geographic origins specified are from the same amphoe, the same changwat, other changwats and Bangkok. The most interesting results in the table are the relative importance of Bangkok produced furniture in up-country resales and, at the same time, the variation in source of supply by location and firm type.

First, considering only the "All Firms" rows, it can be seen that in Chiang Mai Muang and Khon Kaen Muang the vast majority of products sold by resellers are manufactured in Bangkok. In Roi-et Muang the figures are somewhat lower. This may, in part, be due to the lower per capita income in this area, and also because transportation from Bangkok to Roi-et is somewhat less convenient than to Chiang Mai and Khon Kaen. In the more rural areas

Table 4.1. Sources of Products Purchased for Resale by Retailers and Producer-Retailers

Location and Type of Firm	Percentage of Products Purchased for Resale From: ^a			
	Same Amphoe	Same Changwat	Other Changwat	Bangkok
Chiang Mai Muang				
Retailer	32.3%	--	.1%	59.2%
Producer/Retailer	10.0%	--	--	90.0%
All Firms	27.9%	--	.5%	71.6%
Khon Kaen Muang				
Retailer	9.6%	2.1%	3.0%	85.4%
Producer/Retailer	4.1%	--	--	95.9%
All Firms	7.7%	1.2%	2.0%	88.9%
Khon Kaen Other Amphoes				
Retailer	10.7%	42.5%	21.3%	25.4%
Producer/Retailer	--	--	--	100.0%
All Firms	8.0%	31.8%	16.0%	44.1%
Roi-et Muang				
Retailer	--	.3%	69.2%	30.5%
Producer/Retailer	--	--	--	--
All Firms	--	.3%	69.2%	30.5%
Roi-et Other Amphoes				
Retailer	--	14.1%	58.9%	27.1%
Producer/Retailer	--	--	--	--
All Firms	--	14.1%	58.9%	27.1%

^aPercentages are computed on the basis of the value of the products at purchase cost.

Source: Furniture Industry Study.

represented by the other amphoes in Khon Kaen and Roi-et there is a much stronger relationship with firms in the changwat, primarily amphoe muang. Also, in Roi-et sources from other changwats are very important.

The pattern revealed by the data suggests that the size of the local market, the income of the area and, therefore, quality preferences each play an important role in determining the supplies used. While no hard evidence is available, observation indicated that the highest quality and most expensive products normally originate in Bangkok. Therefore, these products are more likely to find a ready market in the larger, higher income towns such as Khon Kaen Muang and Chiang Mai Muang. On the other hand, the products produced in the same and other changwats which are sold to resellers are generally of lower quality and price thereby being represented to a greater extent in the relatively poorer towns.

The variation in source of supply by firm type also merits attention. Producer-retailers are found to have a clear preference for purchasing goods produced in Bangkok. The small percentage of goods procured from manufacturers in the same amphoe almost exclusively represents upholstered products. This pattern perhaps reflects the desire of producer-retailers to upgrade their product line with their resale enterprise. There were no cases where producer-retailers bought lower quality products for reselling than were produced in their firm.

Further insight into the sources of supply can be obtained by taking a closer look at the data from Khon Kaen. Table 4.2 breaks down procurement sources by the specific area and by each amphoe in the changwat. No distinction is made in this table between retailers and producer-retailers. Reference can be made to the map of Khon Kaen in

Table 4.2. Sources of Khon Kaen Resales by Amphoe, 1980-81

Amphoe	Yearly Volume of Resales (1,000 B)	Percentage of Resales in Changwat Khon Kaen Procured From:									
		Other Amphoes in Khon Kaen					Other Changwats				
		Same Amphoe	Amphoe Muang	Ban Phai	Manchi Khiri	Phon	Si Chompoo	Udon Thani	Sakon Nakorn	Nakorn Rat	Bangkok
Muang	8,419	10.1%	--	1.1%	.1%			1.5%			87.2%
Ban Phai	1,620	27.9%		--	7.4%				2.0%		62.7%
Chumpae	956		18.8%				2.8%	2.8%			75.5%
Nampong	798		40.6%					55.6%			3.8%
Pohn	378					--					100.0%
Kranuan	408		9.8%					80.4%			9.8%
Manchi Khiri	120		6.7%					6.7%			86.7%
Chonnabut	30		100.0%								
Ubon Rat	420		71.4%							28.6%	
Nong Song Hong	600		17.5%	27.5%	17.5%	27.5%					10.0%
Phuwiang	18		50.0%								50.0%
Kao Suan Kwang	324		55.6%							44.4%	
Si Chompoo	42						--	100.0%			
Total Except Muang	5,741	7.9%	20.6%	2.9%	3.9%	2.9%	.5%	14.8%	.6%	4.6%	41.3%
Grand Total	14,133	9.2%	7.6%	1.8%	1.7%	1.2%	.2%	6.9%	.2%	1.9%	68.6%

Source: Furniture Industry Study.

Chapter 2. It can immediately be seen that the sources of supply vary substantially by amphoe. This suggests that resellers have a wide range of options available when making procurement decisions. Amphoe Muang is the origin of over 20 percent of the products resold in other amphoes, while only about 10 percent of the products resold in Amphoe Muang originate there. Somewhat surprising is the large volume of Bangkok products which find their way into some of the amphoes. In Phon, Manchi-Khiri, Chumpae, Ban Phai and Phuwiang over 50 percent of the products originate in Bangkok. The importance of other changwat suppliers appears to follow a pattern of either being important or not at all important. In no case is more than one "other changwat" represented in any given amphoe.

In order to better assess the "rationality" of procurement patterns Khon Kaen has been divided into five regions. Each region has a dominant amphoe as the market center. If it is supposed that the convenience of procurement in terms of proximity of supply source is a major factor in supply decisions, then it is possible to group supply sources into those which appear to make sense from a locational convenience perspective and those which require some explanation. Table 4.3 presents such a breakdown of the data. Procurement from Amphoe Muang, Bangkok, other amphoes in the same region of the changwat and from other changwats which are directly linked or are contiguous with the region is termed "apparently rational procurement." The use of sources in amphoes outside the region or in nondirectly linked or noncontiguous other changwats is termed "apparently irrational procurement." The use of the terms rational and irrational imply nothing about the actual

Table 4.3. Apparently Rational and Irrational Sources of Procurement
by Region in Changwat Khon Kaen

Region in Khon Kaen	Apparently Rational Procurement			Apparently Irrational Procurement		
	Amphoe Muang and Bangkok	Amphoes Within Region	Direct Linked Changwats	Total	Amphoes Outside Region	Nondirect Linked Changwats
Muang Region	97.3%	--	--	97.3%	1.2%	1.5%
Ban Phai Region	65.4%	32.3%	1.8%	99.5%	--	.5%
Namphong Region	46.9%	--	39.6%	86.5%	--	13.5%
Phon Region	50.2%	18.9%	--	69.1%	30.9%	--
Chumpae Region	90.5%	2.6%	6.8%	100.0%	--	--

Changwat Total	67.5%	10.3%	11.8%	89.6%	5.0%	5.4%
Region Centers	76.1%	10.8%	9.0%	95.9%	1.8%	2.3%
Other Amphoes	42.0%	8.9%	19.9%	70.9%	14.5%	14.6%

Source: Furniture Industry Study.

procurement decisions, but instead refer to the ability to explain the patterns in terms of locational convenience.

The data in the table indicate that the majority of procurement decisions appear rational. For the changwat, as a whole, almost 90 percent of the supply comes from proximate sources or from Amphoe Muang and Bangkok. For the regional centers the figure is 96 percent and other amphoes is 70.9 percent. The two apparently anomolous cases are in the Namphong area and the Phon area. In both cases, it was possible to trace the source of the incongruity back to specific firms. The Namphong anomaly occurs in Amphoe Kao Suan Kwang and Amphoe Ubolrat where one retailer in each area makes purchases from an itinerant merchant representing the same producer in Changwat Nakorn Ratchisima which is south of Khon Kaen. It is not at all clear why the only penetration of Khon Kaen from this changwat and this seller is this far north. This is especially curious since similar merchants operate out of Changwat Udorn Thani which is contiguous to the Namphong area. The Phon case is due to two sellers in Nong Song Hong who buy from the large producer in Manchi Khiri and from Ban Phai. A new road connects Nong Song Hong with Ban Phai which may explain the Ban Phai purchases. No information is available on the reasons behind the Manchi Khiri procurement.

4.1.2 Types of Suppliers and Supply Channels

Some allusion was made in the preceding section to the types of suppliers used by resellers by the location of the suppliers. Also, in Chapter 2 the basic structure of the channels used to import Bangkok produced products was outlined. This section will bring together these previous discussions and attempt to briefly outline the various supplier

types and supply channels in a more systematic manner. It will focus on typical supply relationships among both Bangkok and changwat level suppliers and local reselling establishments, whether they are producer-retailers or retailers.

The key elements of the supply channel from the perspective of this study are first, the type of supplier with which the reseller transacts business and secondly, the location of the transaction. The reseller may make purchases from a merchant/wholesaler/middleman or directly from the manufacturer. The transaction may occur at the retail store, at a fixed location wholesale firm or at the factory location.

For products manufactured in Bangkok there appear to be three channels of supply to up-country firms. First, there are retailer/wholesalers who represent a variety of producers, both large- and small-scale. These firms are often fixed location Bangkok retailers who do some wholesaling on the side. There are also some wholesalers who act only as middlemen and have no retail outlets. Several up-country firms claimed to do business through this type of agent, although none were identified in the Bangkok research. Transactions with wholesalers may occur in Bangkok by phone or letter from the up-country retailer or with traveling representatives of the merchant. There is often a catalog of products which is generally a collection of snapshots with price information on the back. A number of up-country buyers have long-standing relationships with one wholesaler who becomes their sole supplier. This serves to economize on transactions costs because orders can be easily placed by phone or mail.

A second type of supply channel involves retailers in Bangkok who represent only one or two small factories. These stores are concentrated

in several furniture areas in Bangkok. Transactions involving these suppliers usually involve trips to Bangkok by the up-country buyer who then shops around and arranges orders from several of these stores. This offers an advantage to the buyer in terms of the variety of products available, but is an expensive and cumbersome transaction method. This is often the procedure followed by relatively new buyers who are trying to get a feel for the Bangkok market. It is also used by some producer-retailers who are not only procuring products for resale, but are buying products to copy as well, thus becoming an alternative way for certain producer-retailers to get new ideas for product design.

The final supply channel which is frequently used is placing direct orders with the two major large-scale producers in Bangkok. This can usually be done by mail or by phone. Both firms have catalogs and attempt to facilitate this type of ordering. Also, both manufacturers have small staffs of salesmen working in other changwats. While both large firms produce a variety of products, it is unlikely that either one alone has sufficient breadth in their lines to adequately stock a retail outlet. Hence, resellers tend to prefer to pay a small premium to the wholesalers mentioned above in order to get a good selection with a maximum convenience.

Resellers purchasing products from sellers outside of Bangkok normally use either of two supply channels. Generally, for purchases from local areas or areas in the same changwat the retailers must make a visit to the producer to place an order and to pick up the products. Most of the smaller changwat level producer-sellers do not cater to other retailers. A few of the larger-scale changwat level manufacturers do aim for the reselling market and have representatives (merchants) travel

around to take orders and deliver products. In each of the cases where Khon Kaen firms made purchases from producers in other changwats, this is the pattern that was followed. The products sold by these factories are of relatively low quality and are relatively inexpensive. Often plypaper is used in place of plywood and the finishes are rather gaudy. The market they service is among lower income consumers and more in rural than urban areas.

4.1.3 The Use of Credit in Product Procurement

According to one experienced Thai business analyst, the chief factor in manufacturer-reseller marketing arrangements is credit.¹ The reseller will base his decision on whom to purchase from based almost entirely on whether the seller is willing to offer trade credit and, if so, at what terms. In Bangkok, a number of furniture sellers were interviewed in an effort to identify those firms who sold products to up-country merchants. Of the 15 firms contacted, only five sold products at wholesale to up-country buyers, and in each case, these sales represented no more than 5 to 10 percent of their total volume of sales. Without exception the managers of the Bangkok firms commented that their sales to the up-country buyers are limited due to their reluctance to provide trade credit. Two of the firms had experimented with giving credit, but had been forced to stop because of lack of payment. Among Bangkok merchants, up-country resellers have a reputation of demanding credit and then defaulting.

¹From conversations with Dr. Gerald Sentell, JFK Professor of Marketing and Business, National Institute of Development Administration, Bangkok.

Sellers are more willing to talk about credit than buyers. Only a handful of up-country resellers were openly willing to discuss the use of credit provided by their suppliers. What was learned, however, is that among the Bangkok suppliers, credit was available to virtually any buyer who purchases from one of the large-scale producers. One firm gave 30-day credit with a 2 percent discount for cash payment and the other gave 60-day credit with a 3 percent discount for cash. Neither of the large firms complained that bad debts were any higher than they should expect, 2-3 percent. Both firms required that postdated checks be left as payment and both suggested they had ways of making sure people paid.

Among the Bangkok based wholesalers, credit was common if there was a long-standing relationship between the buyer and seller. Cash would be used in the first few orders until the buyer became well-known to the seller and then 30-to 60-day terms were common. For those purchases made by up-country buyers from retailers and small factories in Bangkok, credit use did not appear common. Several retailers had tried giving credit to up-country buyers once, but now wish they had not.

The general pattern observed in the furniture industry appears to hold across the various retail trades. In Professor Preecha's study of retailers in Changwat Pitsanolk, she found that,

It is necessary to distinguish between two categories of buyers: the regular buyers and occasional buyers.... Regular buyers who have traded with a particular trader for some time obtain goods on credit.... General buyers buy for cash and do not establish any specific relation with the sellers.... Initially a customer must buy for cash, but when they are sufficiently acquainted with one another, the trader may begin to extend credit. If credit is promptly repaid, further services and credit are offered. They then become kha pracham to each other and trust and concession becomes the norm. As traders put it: "we have traded with each other for a long time and we trust each other." (Kuwinpant, 1980, pp. 139-140).

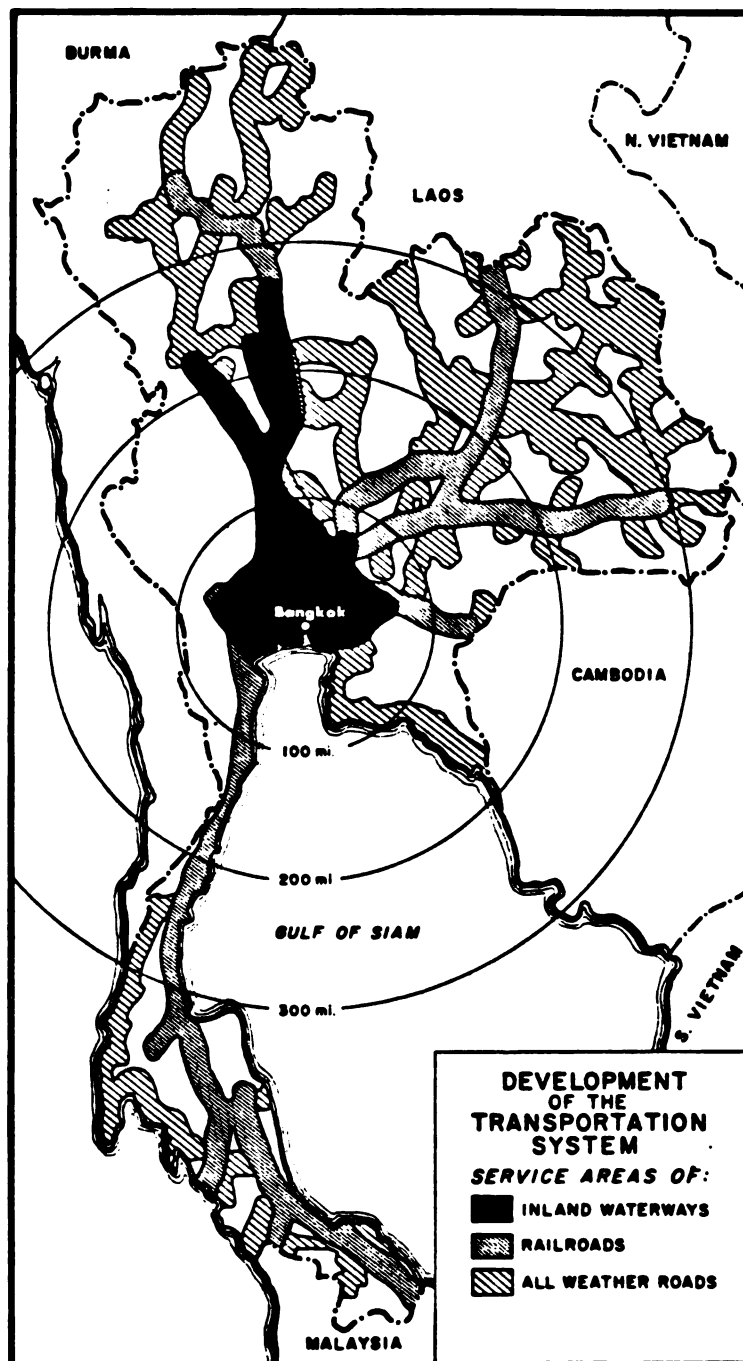
Trade credit is less readily available from changwat level producers. As will be shown in a later section, very little credit is offered to middlemen and retailers, and that credit which is advanced is based on the same type of long-term relationship as discussed above. None of those buying from itinerant representatives of the up-country firms reported the use of credit. It is not known to what extent credit is used in these transactions.

4.1.4 Transportation

A precondition for the development of long distance product distribution is the existence of an efficient, relatively inexpensive and convenient transportation system. Thailand has a well-developed network of railways and highways linking Bangkok with provincial capitals, provincial capitals with district towns and proximate provincial capitals with each other. Government owned, as well as private trucking companies, serve all areas of the country. The government-run railway system has trunk lines linking Bangkok with each of the major geographic regions. The relative ease of transporting goods has provided a major stimulus to the development of long distance product distribution in Thailand.²

It must be noted, however, that the "primate" city geography of Thailand is apparent in the transport system. The primary transport linkages are between Bangkok and other parts of the country. This is illustrated quite clearly in Figure 4.1. There has been some improvement in the road system linking certain portions of the country, for

²For a discussion of the development of the transportation system in Thailand, see Anderson, 1970, pp. 111-129.



Source: Anderson (1970), p. 113.

Figure 4.1. The Structure of the Transportation System in Thailand

example Khon Kaen with Chiang Mai, but the routing is still rather indirect and the roads are not on par with those radiating from Bangkok.

Two basic modes of transportation are used between Bangkok and up-country areas, truck and train. Table 4.4 provides some comparative information on the relative cost associated with transporting furniture from Bangkok to four of the studied research areas. The information on which the figures in the table are based was obtained from the government trucking organization and the state railway company. Costs are presented for six-wheel trucks, 10-wheel trucks and trains. For each category the prices differ according to whether the load is sufficient to fill an entire truck or train car or is only a partial load. All prices are reported on a per kilogram basis.

The most important things to note about the rate schedules are that there are differences in transport costs between the different modes and secondly that there are substantial economies associated with load size. Figure 4.2 illustrates the cost structure by the weight of the load. The vertical axis represents the Baht per kilogram rate associated with the total load weight along the horizontal axis. The cost schedules indicate that train transport is always less expensive than truck transport, except for a narrow range of weights from 5,000 to about 7,000 kg where 10-wheel truck transport dominates. Six-wheel truck transport is never the most economical mode; however, it is cheaper than the 10-wheel truck for loads between 2,500 and 4,999 kilograms and between 8,250 kg to 9,999 kilograms.

Both truck and train transport are used by furniture resellers between Bangkok and Chiang Mai and Khon Kaen. Each reseller seems to have a strong opinion about his preference for one mode or the other,

Table 4.4. Transportation Charges by Transport Mode From Bangkok to Various Up-Country Locations

Price of Transporting Furniture in Summer 1981 From Bangkok to Up-Country Locations by:									
Destination	Distance in Kilometers	Six-Wheel Truck			10-Wheel Truck			Train	
		Baht Per ^a Kilogram Partial Load	Baht Per ^b Kilogram Full Truck Load	Baht Per ^a Kilogram Partial Load	Baht Per ^c Kilogram Full Truck Load	Baht Per ^a Kilogram Partial Load	Baht Per ^d Kilogram Full Car- load		
Chiang Mai Muang	702	4.32	2.04	4.32	1.22	1.89	.33		
Khon Kaen Muang	444	3.30	1.42	3.30	.85	1.21	.23		
Khon Kaen Ban Phai	400	3.18	1.32	3.18	.79	1.10	.21		
Roi-et Muang	510	3.54	1.58	3.54	.95	--	--		

^aPrice includes the base rate set per kilogram and a charge for loading and unloading. Insurance is not included in these figures, although it is generally available.

^bA six-wheel truck has a maximum capacity of 5 metric tons. The maximum load of furniture permitted by the Express Transport Organization is 2.5 metric tons.

^cA 10-wheel truck has a maximum capacity of 10 metric tons. The maximum load of furniture permitted by the Express Transport Organization is 5 metric tons.

^dA full train carload of furniture is estimated by railway officials to be 10,000 kg, or 10 metric tons.

Source: Computed from information provided by the Express Transport Organization (State Enterprise) and the Railway Organization of Thailand (State Enterprise).

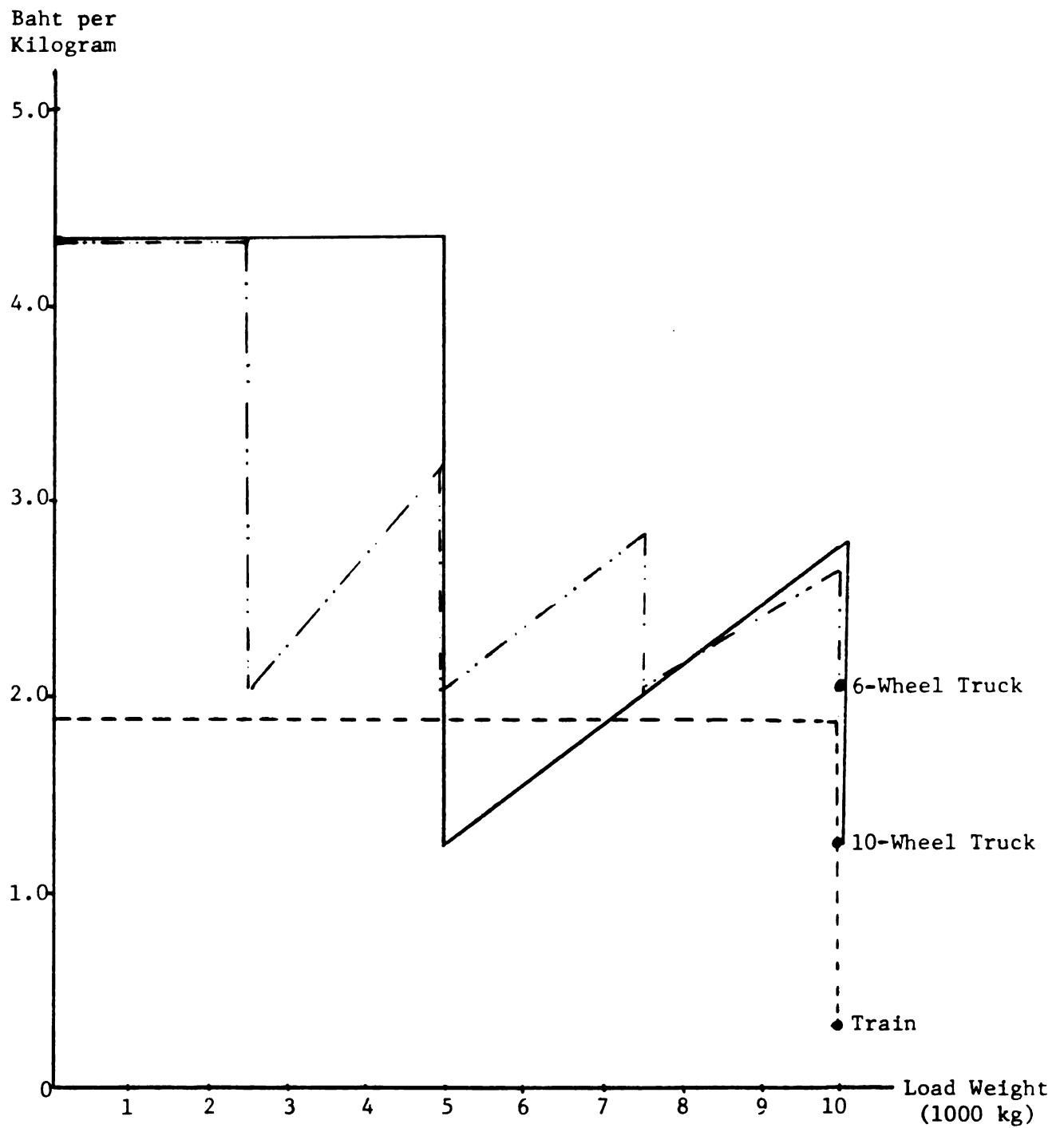


Figure 4.2. Transportation Cost Structure by Weight of Load and Mode of Transport

but there is little agreement on the choice or reasons for the choice. The reasons usually given are related to the individual merchant's experience with problems of product damage. Most merchants who purchase from Bangkok suppliers experience some product damage in transit. The railroad system will not be responsible for any problems, but some trucking companies are. Of course, premium price is paid for the service of these companies.

The system has made several responses to the problem of transportation damage. The most significant solution is the sale of unfinished products in Bangkok with finishing done by the up-country reseller. This has the subsidiary advantage of allowing products to be finished in accordance with local tastes, but local retailers view damage prevention as the primary rationale. Also, there are certain conventions which exist between buyers and sellers. Resellers often will not accept delivery of damaged goods or will bill the producer or transporter, frequently unsuccessfully, for the cost of repair. Retailers with finishers in their employment and producer-retailers are less concerned about damage because they can easily make repairs.

It is difficult to address the question of transport costs per unit of furniture or as a portion of the final sales price. There is little, if any, correspondence between load weight and load value. Some merchants were asked their perception of the percentage of the final sales price of their products which represented transport costs. The most common answers were approximately 10 percent in Chiang Mai and 5 percent in Khon Kaen. In any case, it is clear that the importance of transport charges is lower the higher the value (quality) of the product.

This would tend to bias the system towards the long distance transport of higher quality furniture.

The large Bangkok factories and diversified middlemen generally make transportation arrangements for goods which are ordered. The up-country reseller who visits Bangkok and buys from several sources usually makes his own arrangements based on the recommendations of local businessmen. Generally, product transportation presents a few problems other than its expense and the potential for damage.

For furniture exporters the transportation system has provided the incentive for an important innovation which makes long distance movement of furniture more economical. In recent years, Thai exporters have begun to specialize in what is known as completely knocked-down furniture, or simply CKD furniture. Essentially this involves the production of furniture components which are transported unassembled. This solves the bulkiness problem which had plagued the industry. One of the large Bangkok firms has recently begun to experiment with the use of CKD designs for the domestic market, although only in a small number of product lines. This type of design does place considerable demands on the production process and is most amenable in fully mechanized operations where there are standardized products and precisely interchangeable components.

4.1.5 Summary of Factors Affecting Sources of Supply

A number of factors have been suggested which affect the changwat level reseller's decision about where and from whom to buy his products. Among the explanations are the locational convenience of the supplier, the type of market served, the availability of credit and the desire to have a unique or competitive product. The most frequent explanation

given by the retailers for Bangkok procurement is that the quality of the products and the variety of items available is greater in Bangkok. Those who purchase from local sources say that the price of products in Bangkok is too high even before transportation charges are added.

This suggests that the markets served by different retailers are dissimilar. The higher income, higher quality market is less sensitive to the price differential involved with the imported products. Styling and workmanship is the principle concern. This implies a relatively low price elasticity of demand. Those retailers serving lower income markets must be more concerned with price. Quality and workmanship is secondary to utility and low cost. The market faced by their sellers is more price elastic. Hence, for those retailers serving the higher income markets with higher priced products, the high transport and transactions costs of Bangkok purchases matter less than for the lower quality retailers.

4.2 Sales Practices of Changwat Level Furniture Firms

The previous section examined the procurement practices of changwat level resellers, emphasizing purchases from sellers outside of the changwat level system. This section focuses on the sales practices of furniture sellers in the changwat level industry. All types of sellers will be covered including retailers, producer-retailers and producer sellers. Again, however, the discussion of itinerant merchants is reserved for a later section.

The data used in this section come primarily from two sources. Information on output sales channels and practices was obtained from 18 ROFEAP sample firms in Chiang Mai, Khon Kaen and Roi-et. This sample included only producer-sellers and producer-retailers. Many of the

specific questions asked of the producer-retailers were in reference to their own production rather than to their resales. This is the rather unfortunate consequence of not recognizing the importance of firm organization until late in the survey year. For the most part, however, there appears to be little reason to presume that the answers given would not apply equally well to their resold products. The data on retailers were obtained in the single visit retailers survey mentioned in the previous section.

4.2.1 Furniture From a Marketing Perspective

When a consumer makes a furniture purchase, the transaction involves more than the visible exchange of goods for money. In addition to obtaining ownership rights to a physical entity, the consumer has purchased a whole range of attributes which essentially define the product. Some of these attributes are associated with the production of the product; shape, quality of construction, materials, and so on. Others, however, are associated with the distribution system. These can include the final finish of the product, the terms of purchase and so on. Furthermore, the way the consumer perceives the final product can be associated with the type of sales outlet. This influence can range from the image of the seller, the attractiveness of the store and display, the variety of products and the information provided by the seller.

Following Porter (1974) the influence of the seller on purchase decisions can be broken down into those factors in which:

- (1) Retailers control or are a proxy for some of the attributes which the consumer may desire in the product. These include: (a) the physical amenity of the store; (b) the attendant services provided by the retailer (credit,

billing, delivery, warranty, repair, etc.); and (c) the quality of the attendant services.

- (2) Provision of information, that is, the selling presentation, personal recommendations and the conveyance of product information.

The importance of seller influence will vary by the type of product and the costliness of information to consumers.

Furniture falls into a class of goods which marketing specialists refer to as nonconvenience goods or shopping goods. The key characteristic of this type of product are defined by consumer buying habits. Shopping goods are goods, "where the consumer compares prices, quality and style, compares several stores, the purchase can be delayed, the purchase is relatively infrequent and probably gains from making price and quality comparisons are large relative to the consumers' appraisal of search costs" (Porter, 1974, p. 424). In other words, the consumer considers the purchase important enough to expend effort in shopping and comparing products. Characteristically then, nonconvenience good outlets will be selectively located (concentrated) rather than evenly distributed and normally sales assistance will be provided. Also, manufacturers of shopping goods then must focus their promotion efforts on retailers rather than on consumers.

A number of the characteristics of the furniture distribution system in Thailand are consistent with this conception of furniture. The importance of local finishing of products gives the reseller relatively more control over the attributes of the product in a physical sense. Larger sellers frequently only finish one or two pieces in a product line and allow the consumer to specify the type of finish preferred.

Secondly, the fact that sellers like to deal in a wide variety of product lines is consistent with enhancing the attractiveness of the outlet, especially when compared with the typical changwat level producer.

There is also a movement among the larger retailers towards modernization of the appearances of the store and improving the way products are displayed.

There are two especially interesting characteristics, however, which stand out in the Thai furniture industry. First, in larger municipal areas, furniture retailers are beginning to be found in concentrated locations. In Bangkok there are four or five areas known as furniture districts. These areas may contain more than 50 furniture retailers all selling similar products on similar terms. This tends to economize on search cost for consumers who go to one of these areas. In Chiang Mai Muang a similar pattern is beginning to emerge. New stores tend to locate nearby old stores with the hope of gaining an advantage due to location. This also has the effect of encouraging a great deal of competition in these areas and, while it makes good sense from the point of view of the new entrant into the area, the effect on all sellers is probably negative. This is especially true for the producer-sellers who sell from their factory. The seller located outside of the "furniture areas" are finding themselves in a progressively disadvantageous situation.

A second interesting characteristic of the industry is that no manufacturer brand names are used in the retail business. Nor do retailers usually make any claims for products based on the manufacturer's reputation. In part, this reflects the retailer's hidden fear that if the consumer knew where the product originated, he would be bypassed.

Up-country retailers were sometimes even reluctant to reveal their sources of supply to researchers. It is very much the retailer's name rather than the manufacturer's name which is important. The more progressive retailers recognize this as a key element of their mandate to the consumer. Producer-retailers and retailers with finishing enterprises are usually prepared to make assurances with respect to the repair of products they sell. Producer-sellers are, of course, fully accountable for the products they manufacture and sell.

This view of the industry is also consistent with research done on consumer buying practices. In order to gain a better understanding of the average Thai consumer, the Indiana University International Consumer Information Survey (ICIS) Project carried out an extensive study of consumer ecology in Thailand in 1975 (Thorelli and Sentell, 1979). The survey covered approximately 1,000 households in Bangkok and the four major regions of the country and is considered to be broadly representative of the overall population. Some of the findings of this project offer some interesting insights for our study of the furniture industry.

The overarching hypothesis of the ICIS research is that the consumer buying process in LDCs and especially in Thailand is "often fraught with high risk" (Ibid., p. 325). This is due, in part, to the lack of quality control in manufacturing and the predatory practices of sellers. In Thailand, "chicanery is not unethical--it is a game" (Ibid., p. 325). This evokes the rational response among consumers of engaging in "surprisingly intensive search efforts." This applies to routine, everyday goods, as well as in the purchase of major durable goods. Prices are rarely posted, there are no "brand names" in furniture and bargaining over prices and other terms of sale is a way of life.

The ICIS survey did not focus on furniture, but did collect data on the purchase of consumer durables in general. It was discovered that approximately 83 percent of the respondents purchased their most recently acquired durable goods from a store. Only in villages were other sources significant. For the most recent durable purchase among villagers, 13.7 percent were from traveling salesmen and 3.7 percent were from mobile markets.

Table 4.5 reports some of the findings of the survey regarding shopping habits for durables. The first question deals with the number of stores visited while shopping for the durable. The distribution of responses is bimodal. Approximately equal proportions of the population either visited only one store or visited several stores. Question two asks about the consideration of other models than the one purchased. Sixty percent reported that they did compare different types of products while shopping. The final question concerns the information collected by shoppers on various brands of products. More than half of the respondents almost always consider some sort of information before making purchases.

It is unclear how these responses would vary if the question concerned furniture rather than all consumer durable goods, most probably the general order of magnitudes would be preserved. It is also worth wondering how the responses to a survey question compare with actual buying and shopping habits. One would expect that there are reasons which would lead the respondents to report that they are better shoppers than they really are.

Table 4.5. Consumer Characteristics: Purchases of Durable Goods in Thailand

Question/Response	Percent Response by Sample Area			Total	
	Bangkok	Municipal Areas	Villages	N	Percent
(1) If you bought your product (most recently purchased durable good) from a store, how many stores did you visit while you were shopping for it?					
(a) Only the store where bought	39.0%	33.1%	37.1%	(251)	37.1%
(b) One other	6.3%	11.3%	8.9%	(57)	8.4%
(c) Two others	12.6%	16.9%	14.5%	(97)	14.3%
(d) Several others	42.0%	38.8%	39.1%	(272)	40.7%
	N = (269)	(160)	(248)	(667)	
(2) Did you consider any model other than the one you bought for your most recently purchased durable good?					
(a) Yes	58.6%	58.3%	62.3%	(475)	60.1%
(b) No	41.5%	41.7%	37.7%	(316)	39.9%
	N = (299)	(168)	(324)	(791)	
(3) When you are buying a new product for the first time, do you study its characteristics and collect information about various brands before you make your purchase?					
(a) Almost always or often	53.9%	54.5%	57.6%	(550)	55.5%
(b) Occasionally	16.3%	24.2%	18.8%	(187)	18.9%
(c) Seldom or never	29.8%	21.2%	23.6%	(254)	25.6%
	N = (399)	(71)	(394)	(991)	

Source: Thorelli and Sentell, 1979.

4.2.2 Product Sales in the ROFEAP Sample Firms

Information on output sales channels was obtained from the sample firms in the special marketing questionnaire, administered in August 1980. Some of the highlights of this survey will be presented in this section. The marketing questionnaire was designed in such a way that it could be analyzed independently of the longitudinal data on production. The decision was made, however, not to ask volume of output questions as the interviewees were quickly becoming tired of reporting their production. As a consequence, it is not possible to provide estimates of product distribution in very precise flow terms. Hence, the information is reported largely in terms of frequency distribution. This may make some of the tables appear awkward with percentages adding to more than 100 percent, but if it is understood that firms may participate in multiple distribution channels and may sell products on different terms to various buyers, there should be little problem interpreting the results.

Table 4.6 reports data on the types of purchases of the products manufactured in the sample firms. The managers were asked which of several types of buyers made up the market for their products. The data represent the percentage of firms reporting some sales to these buyers and not the volume of product flow. Several interesting points emerge from these data. First, it is clear that the most important buyer type is the higher income town consumer. Only three of the 18 firms in the sample named lower income consumers as purchasers of their products. Forty-four percent of the firms sold products to the government on occasion, although only two firms did so in large quantities.

Broken down by firm type it can be seen that there is only a slight difference in the income classes served by the producer-retailers

Table 4.6. Purchasers of the Output Produced in the Sample Furniture Firms, by Firm Type

Firm Type	N	Percentage of Firms Reporting Some Sales to:				
		Low Income Town Consumers	High Income Town Consumers	Bangkok Consumers	Govern- ment	Middle- men/ Re- tailers
Producer-Retailers	5	20%	100%	--	60%	40%
Producer-Sellers						
Job Order Firms	8	25%	88%	13%	38%	--
Decorators	3	--	100%	--	--	--
Batch Contractors	2	--	--	--	100%	--
All Sample Firms	18	17%	83%	6%	44%	11%

and job order producer-sellers. That difference which does exist places the producer-retailers more on the higher income end. Interestingly, producer-retailers are the only type of firm which sells products to middlemen or other retailers. Other field work suggests that this probably is not generalizable outside of the particular research areas from which this sample is drawn. As would be expected, decorators serve exclusively a higher income market and batch contractors, the government.

One important dimension of product sales practices is the use of credit. The use of cash, credit and advances was investigated. Cash sales are defined as cash payment at the time of purchase. Advance payment occurs when buyers are required to place a deposit on the good they order which is normally used to assist in financing working capital requirements. Credit sales cover any sales on which payment is deferred.

Table 4.7 reports the percentage of various groupings of firms which always, sometimes or never use the various types of terms of sale for sales to various buyer types.

Advances are commonly required by several firms, but only in sales to consumers or to wholesaler/middlemen. Credit is used to some extent with all buyer types except to retailers. If the previous section's analysis of the potential importance of credit in product procurement by retailers is correct, then this may, in part, explain the small amount of local production sold to others for resale.

The final aspect of the disposition of output of interest here is the size of the geographic area served by the producers. An indication of the market radius can be seen in two ways: first, by finding out where the buyers come from or secondly, asking producers about the final destination of their products. Both questions were asked and the results are almost identical. Table 4.8 reports on the interviewees' understanding of the final destination of their products. Firms were placed into only one category; that which represents the most distant markets served. Seventy-four percent of the sample producers serve markets within the same changwat. The 37 percent reported as being in the same changwat is probably dominated by buyers from neighboring amphoes and so the market area is really quite small. Northern firms had occasional links with Bangkok, but none with other changwats in the North. Northeastern producers have a wider regional distribution, but only a weak link to Bangkok consumers.

In summary then, the sample town firms generally serve higher income town consumers, especially those located in a nearby geographic radius. There is little linkage between the sample firms and retailers

Table 4.7. Terms of Sales: Use of Cash, Advance and Credit by Sample Furniture Producers by Purchase Type

Type of Purchaser	Percentage of Firms Reporting Use of:							
	Cash			Advances			Credit	
	Always	Sometimes	Never	Always	Sometimes	Never	Always	Sometimes
Final Consumer	47%	24%	29%	24%	6%	70%	12%	18%
Retailers	100%	0%	0%	0%	0%	100%	0%	0%
Wholesalers/Middlemen	40%	20%	40%	20%	0%	80%	20%	20%
Government	50%	25%	25%	0%	0%	100%	25%	25%

Source: Furniture Industry Study.

Table 4.8. Origins of the Consumer and Nonconsumer Buyers of the Sample Furniture Firms

Location of Firm	Percentage of Firms Reporting Their Product Sold in:			
	Same Amphoe	Same Changwat	Same Region	Bangkok
Northern Firms	50%	25%	0%	25%
Northeastern Firms	33%	40%	20%	7%
All Firms	37%	37%	16%	11%

or wholesalers. Cash payment is the primary medium of exchange, although some firms require advance payments and others provide credit to certain types of buyers.

4.2.3 Product Sales Practices of Retailers

Different kinds of information on sales practices were obtained from the retailer interviews. Some data were obtained on pricing practices and the use of consumer credit by retailers. Price bargaining is perhaps the most typical attribute of traditional consumer-seller relationships in Thailand. Several retailers attributed their large sales volumes to the fact that they set their prices high and then made the consumer feel like he was getting a good deal by bargaining down to the final sales price. Bargaining is very much a part of the Thai consumers' mentality. Sentell and Thorelli, in their study referred to earlier, investigated the significance of bargaining or what Sentell has referred to as the "national pastime." The answers to two questions in their survey on

bargaining are reported in Table 4.9. The figures in the table verify both that bargaining is common and secondly, that people generally enjoy this exercise.

Given the prevalence of bargaining over prices it is very difficult to get very accurate information on the pricing and markup practices of retailers. Furthermore, most retailers were reluctant to reveal the actual margins that were involved in their business. A relatively small sample of merchants did give what seemed to be reasonably accurate data on prices and markups and these are presented in Table 4.10. The data here apply only to products which were purchased in finished form and the sales price represents the lowest cash sales price which they would be willing to agree upon. Hence, this probably underestimates the actual markups to some unknown extent.

The data reveal rather low percentage markups across the board. The markups are lowest in the poorest areas, Lampang Muang and the other amphoes in Khon Kaen. The total average figure should be treated with caution because the sample is not representative, but it does provide a general indication of the low level of markups. One generally thinks of retail markups of 50 to 100 percent in the U.S. as being quite common. The low level found in Thailand perhaps reflects the high degree of competition in the changwat furniture market.

Consumer credit is another issue that retailers do not like to discuss. There are some retailers who exist primarily as lending institutions. In Khon Kaen there were a number of stores, usually diversified retailers, which sell virtually their entire sales on credit. Other stores seemed to have reputations of being easy credit stores or cash sales only. On more than a couple of

Table 4.9. Consumers' Use of and Attitudes Toward Bargaining in Thailand

	Percent Responses by Sample			Total	
	Bangkok	Municipal	Village	N	Percentage
(1) How often do you bargain on prices?					
(a) Never	4.3%	5.6%	3.8%	(43)	4.3%
(b) Sometimes	27.3%	24.2%	17.5%	(227)	22.8%
(c) Often	28.8%	32.3%	24.8%	(278)	27.9%
(d) Nearly Always	39.8%	37.9%	53.9%	(449)	45.0%
					158
(2) Do you like or dislike bargaining?					
(a) Very much dislike	4.9%	5.1%	4.2%	(46)	4.7%
(b) Somewhat dislike	18.4%	11.2%	9.2%	(131)	13.2%
(c) It depends	28.4%	18.3%	12.5%	(197)	19.9%
(d) Somewhat like	30.2%	40.6%	42.6%	(369)	37.3%
(e) Very much like	18.2%	24.9%	31.4%	(246)	24.9%
	N = (397)	(197)	(395)	(989)	

Source: Thorelli and Sentell, 1979, p. 332.

Table 4.10. Average Price Markup for Retailers by Sample Areas

	Chiang Mai Muang	Lampang Muang	Khon Kaen Muang	Khon Kaen Other Amphoes	Roi-et Other Amphoes	Total
Sample Size	10	3	6	13	4	36
Mean Purchase Price ^a (฿)	2,420	2,400	3,637	2,126	1,538	2,417
Mean Cash Sales Price (฿)	2,965	2,800	4,400	2,265	1,950	2,804
Percentage Markup ^b (%)	22.5%	16.7%	21.0%	6.5%	26.8%	16.0%

^a Includes transportation charges.

^b Calculated as $\frac{\text{Cash Sales Price} - \text{Purchase Price}}{\text{Purchase Price}}$.

Source: Furniture Industry Study.

occasions, the manager would tell us that credit was never used, while the manager of a nearby store would inform us that the original store drew all the customers because he would give credit to anyone.

The most common case mirrors the situation described earlier in terms of the credit relationship between suppliers and retailers. Credit will commonly be given to people known to the store manager. As a consequence, in smaller towns in more rural areas credit is quite common. This also may represent an attempt to retailers to offset the more severe problems of demand side seasonality in these areas. No estimate of the total volume of credit versus cash sales was made, although it was certainly not an uncommon phenomena. It can be said that credit sales are much more prevalent by retailers than by producers.

When possible, information was collected on the cost of consumer credit. The sample of examples is a subset of the data used in the construction of Table 4.10. Table 4.11 contains the figures on the cost of consumer credit. Credit is normally given for a three- or six-month period. The usual procedure is to fix the credit price somewhat higher than the cash price. Retailers were asked the credit price for six months repayment with a minimum down payment. These are reported in the table as the percentage markup over the cash price, the total markup and the annual interest rate implied by the credit cost. The data indicate quite substantial variation in the credit markup and the annual interest rate by region. This is, in part, explained by the small and undoubtedly biased sample of firms and products. However, in Chiang Mai and in the rural Northeast the interest rate is significantly higher than in either Lampang or Khon Kaen Muang. On average, the rate is sufficient to allow retailers to profit on the credit they give, even assuming a reasonable amount of defaulting.

Table 4.11. Cost of Consumer Credit Advanced by Retailers by Sample Area

	N	Chiang Mai Muang	Lampang Muang	Khon Kaen Muang	Khon Kaen Other Amphoes	Roi-et Other Amphoes	Total
Mean Purchase Price	10	2,420	2,200	4,513	2,033	1,550	24
Mean Cash Sales Price		2,965	2,800	5,450	2,142	2,017	2,555
Percentage Markup		23.0%	27.0%	20.0%	5.0%	30.1%	3,048
Mean Credit Price ^a		3,706	3,080	5,975	2,650	2,433	19.3%
Markup Over Cash Price		27.0%	20.0%	20.0%	24.0%	20.6%	3,635
Total Credit Markup ^b		53.2%	40.0%	32.0%	30.0%	57.0%	19.3%
Annual Interest Rate ^c		56.2%	21.0%	20.2%	53.1%	45.5%	43.2%
							42.2%

^aSix months credit with minimum down payment.^bCredit markup is defined as $\frac{\text{Mean Credit Price} - \text{Mean Purchase Price}}{\text{Mean Purchase Price}}$.^cAnnual interest rate is computed as follows:

1. Loan value = mean cash sales price.
2. Total repayment = mean credit price.
3. Interest payment = repayment - loan value.
4. Six month interest rate = $\frac{\text{Interest Payment}}{\text{Loan Value}}$; rate is then annualized.

Source: Furniture Industry Study.

4.3 Procurement and Sales Practices of Itinerant Merchants

It is more difficult to characterize the two types of itinerant merchants because fewer were actually interviewed and because there is little continuity over time in the structure of their operations. The discussion here will, therefore, describe those merchants who were interviewed as individual case studies.

Case 1

A five-man team from Lampang in the North was discovered in a small town on the outskirts of Khon Kaen Muang. They had rented a 10-wheel truck and had also brought along a pick-up truck. They had been doing this as a team for two years, but only during the dry season. During 1981 they had made 10 trips to different parts of the country. They are friends of a producer in Amphoe Hang Chat and he advances the products to them for a slight premium on the price. When they sell-out, they return to Lampang to pay the producer and pick up a new load. The furniture they buy has one coat of lacquer, but must be finished again before it is sold. They only sell small tables and stools. The tables are loaded unassembled and sold in finished form. Their standard operating procedure was to find an open area to park the 10-wheeler, set up a display and also to canvass other nearby towns and villages with the pick-up truck. They estimated that there may be more than 1,000 households in Amphoe Hang Chat producing furniture and well over 100 merchants who sell their products in this way.

On one trip they start with 500 chairs, 100 small tables and 100 large tables. The large tables cost 120 Baht each and are sold for approximately 200 Baht; the small tables cost 70 Baht and sell for 100 Baht and the chairs cost 16 Baht and sell for 30 Baht. On this basis, the total cost of

their load is 28,000 Baht, the total revenue is 45,000 Baht leaving a gross profit of 17,000 Baht. The truck is rented from a friend and the total cost, including fuel for both trucks, was estimated to be approximately 11,000 Baht. The trip would probably last 10 days to two weeks. Thus, given this information, each person grosses approximately 1,200 Baht for two weeks of work.

Case 2

In Amphoe Ban Phai, Khon Kaen a family of five people from Lampang was encountered. They had set up a tent display on an empty corner lot in the middle of town. They sold tables and chairs which were produced in the same areas as those sold by the Case 1 merchants. The leader of the group owned a six-wheel truck which they used in their traveling. They had only been in the business for three months and had made two trips of approximately 10 days each month. In one trip they carry 80 large tables, 200 small stools and 200 large stools. The tables cost 150 Baht and are sold for 230 Baht; the small stools cost 18 Baht and sell for 26 Baht; the large stools cost 20 Baht and sell for 35 Baht. A set of four stools of either size and one table is sold for 300 Baht. The total load cost is therefore 19,600 Baht and revenue is somewhere between 28,160 to 30,600 Baht. No cost estimates were made.

Case 3

In Amphoe Muang, Lampang there is an "itinerant" merchant who has set up a "permanent" tent on the outskirts of town. Prior to 1976, the family spent four years traveling around the country selling furniture, but decided they would try a fixed location. To do so it was necessary to sell more than the tables and stools of Amphoe Hang Chat and so they expanded the geographic area of procurement to include villages in

Changwats Phrae and Lamphun, as well as Lampang. Various members of the family travel to the supply areas and make cash purchases. The products are stored in the village where they live until they are ready to be moved to the tent. At the sales tent there are six family workers; two of which live there permanently. They have approximately 300,000 Baht of products in inventory. A big smile was the only answer received when asked about sources of finance.

On average, they sell approximately 10,000 Baht per month of products (a conservative estimate), making about 6 percent over cost on sales. In the past (two years ago) their usual markup was about 30 percent on cost, but the past two years have been bad due to the economy in Lampang and an increasing number of itinerant salesmen in the area. They pay land rent of 1,000 Baht per month and have spent about 10,000 Baht on the tent and its additions. They used to sell to townspeople and villages, but lately fewer and fewer villagers are coming to town to buy furniture.

Case 4

A villager in Amphoe Mae Thae, Lampang needed some extra income after his rice harvest and got the idea from a merchant visiting the village to try selling furniture. He buys his products from the villages in Amphoe Hang Chat and sells in Changwats Sukothai and Lampang. This is his first year of business. Using his own pick-up truck he buys 30 sets of a table and four chairs. The tables are 115 Baht each and the chairs are 13 Baht each. He must pay in cash, but is waiting to get to know the supplier better so that he can buy on credit. The merchant then travels to technical schools, universities and villages to sell the products. The average price per set is 265 Baht. This is a gross

profit of 2,940 Baht on each load. It takes about three days to sell out. He makes one trip per week. In his tambon there are at least 30 other people who do the same thing.

This particular merchant was proud of his quick success and gave most of the credit for his sales record to his sales pitch. He told us that most villages consider furniture an unnecessary item and are almost embarrassed to own it. However, Northern Thai's are extremely hospitable to visitors and will go out of their way to make guests comfortable. Usually this means bringing out the special, ceremonial grass mats for sitting. Capitalizing on this characteristic of the local people he explains that every household should own at least one set of a table and chairs for visitors. Townspeople expect to find furniture and if you do not have some, at least for the visitors comfort, it will give your family and the whole village a bad image.

Case 5

There is a road on the outskirts of Bangkok which is becoming known as a market for all kinds of itinerant merchants from "up-country." In this market we encountered a seller of the tables and stools from Amphoe Hang Chat in Lampang. There were three people on this team all from the same village in Lampang. These merchants make purchases on credit and carry a load worth about 20,000 Baht. The cost of credit is approximately 10 percent on the price of the products. One trip takes about 20 days and after all costs are met, they can net 2,000 Baht per person. The 10-wheel truck used is rented from a private trucking company for 3,000 Baht per trip. There is no formal rental fee, but the police charge 300 Baht per month for their services.

Case 6

In Chiang Mai Muang it is common to see merchants pedaling wares on bicycles. There are a number of such sellers carrying small cupboards, chairs and bookshelves. The sellers and products come from villages in Lamphan, approximately 25 kilometers from Chiang Mai Muang. Their selling strategy is to park in busy areas and wait for people to approach them. In one trip, one bicycle merchant would carry nine bookshelves which cost 35 Baht each and sell for 70 Baht. He makes three or four trips per week and does this all year long. His gross profit, given this information, is about 4,500 Baht per month. This is substantial, but is probably an overestimate.

Case 7

The other type of itinerant merchant purchases products from town producers and carry small loads to villages and small towns in the area. One of these merchants was interviewed at a "rest stop" along the road between Chonnabut and Wang Yai in Khon Kaen (see map of Khon Kaen in Chapter 2). During the dry season the merchant and his partner would buy five or six cupboards from a seasonal producer just outside of Amphoe Muang. They would get credit because they had been reliable sellers of the manufacturers' products. The money would be paid back at the end of each day's trip. The cupboards cost an average of 1,100 Baht each and would sell for about 1,300 Baht. On the day of the interview they had sold five of six cupboards, spent 200 Baht on gasoline and food and made a net profit of 400 Baht each. They estimated that there were at least 250 such sellers operating out of Changwat Khon Kaen.

The case studies of the various itinerant merchants reveal a number of things about this type of activity and the furniture industry as a

whole. First, is the large numbers of this type of seller of furniture and the wide geographical reach they provide for the producers they represent. It is impossible to quantify either of these observations other than to let the estimates made by the sellers to stand by themselves. Once alerted to their existence, such itinerant furniture merchants were a common sight along roads and in towns. There are also references to these merchants in other studies. One author writing about a market town in Central Thailand noted that,

Occasionally teams of carpenters come from the North with cupboards, chairs, tables and other similar items. Demand here is high, especially after the maize harvest in October. Each team comprises an elderly carpenter with two or three young assistants. The artifacts are made at their homes in the North. In Wang Thong they rent a house as a base for finishing and painting their wares before selling them in villages or market centers. Normally, they stay for one or two months to sell their goods and receive new orders for the next time around. Because their products, though lower in quality, are cheaper than those made in Wang Thong they find a ready market especially among farmers who cannot afford to buy from the only furniture shop in Wang Thong. (Kuwinpant, 1980, p. 183).

The basic story is the same, only the details differ.

Secondly, Dr. Kuwinpant is correct in her assessment of the nature of the market for the itinerant merchant. The large market for their products is a direct result of the low price of the furniture they sell. The consumers they serve are not so much interested in appearances as they are in functional utility and price. It is clear that there is a much larger market for relatively inexpensive, utilitarian furniture among the poorer segments of the Thai population. The itinerant merchants are able to tap this vast market. It is not clear how much of the market served through the itinerants by the low cost producers displaces the market for products produced by town merchants. This will be a topic of further discussion in the chapter which follows.

Thirdly, in every case there is evidence that rather substantial amounts of money can be made in this line of work. This results from the high markups in combination with the large volumes of furniture which are sold. In comparison with daily village farm and nonfarm wages of 20 to 30 Baht per day or town wages for skilled furniture production workers of approximately 90 Baht per day, the returns to labor in itinerant selling are rather remarkable. This offers good evidence that there is still room for additional sellers in the market.

4.4 Performance of the Distribution System

The economic performance of the distribution system can be assessed along a variety of dimensions. Two are chosen for analysis in this study. These are, first, an assessment of the overall efficiency of the distribution system and, secondly, the employment generation involved in production distribution.

4.4.1 The Efficiency of Product Distribution

A rigorous analysis of efficiency in the distribution system is not possible, given the limited empirical data available; however, there are certain indicators which can suggest whether or not conditions are present which would permit gross inefficiencies to persist. Marketing efficiency is generally assessed in terms of price-cost differentials and marketing margins. High markups and wide marketing margins are not good indicators of inefficiency by themselves. Too frequently marketing agents are lambasted in the media and among consumers because markups are thought to be exploitive. The idea that marketing agents incur costs and perform useful functions is somehow easily forgotten.

Unless significant barriers to entry exist at each of the stages of a distribution channel, it can generally be presumed that excess profits, exploitation and major inefficiencies will not persist for long. The rapid growth of furniture retailing in recent years suggests that market mechanisms are functioning in a way that tends to discourage inefficient business practices at this level. The transportation system contains monopolistic elements in the railroad system, but there is significant intermodal competition between trucking and the railroads and intramodal competition in the trucking business to discourage inefficiency or exploitation. For suppliers there also appears to be relatively easy entry and a variety of options open to buyers. Furthermore, competition at the changwat level between local production and retailing acts to reduce the risk of uneconomic behavior.

Thus, while little concrete evidence is available on price-cost margins, the structural factors at work in the furniture industry are not conducive to the existence of persistent economic inefficiency or exploitative behavior in the marketing channels. There is, of course, a risk that any particular transaction may not be on fair or equitable terms, but if so, there is no need for the next transaction to be that way. As will be discussed in Chapter 6, perhaps a more substantial concern is with the effects of too much competition and its effect on dynamic efficiency.

4.4.2 Employment Generation in Product Distribution

Employment generation is most commonly examined in the context of manufacturing and production. Product distribution, however, can also be an important source of employment generation. Factor intensity is

perhaps most appropriately viewed as a characteristic of a particular final product rather than of a production process. A good example is in the noodle-making industry in Northern Thailand. There are two primary technologies available for noodle-making; a traditional, labor-intensive technology and a modern, capital-intensive alternative. In terms of employment generation, the more traditional alternative is clearly superior. However, a large portion of the output of the industry is sold through small, employment-intensive noodle soup vendors. One noodle factory might support 200 or 300 noodle vendors. Hence, a change in the employment intensity of the production process would hardly make a dent in the overall employment capacity of the entire industry inclusive of the distribution system.

The situation in the furniture industry is less extreme than in the noodle industry, but the fact remains that employment and incomes are generated in the distribution of furniture. Table 4.12 presents data gathered from furniture retailers and producer-retailers on employment per firm. Virtually all the resellers interviewed were family-owned and operated businesses. Most hired some additional workers for finishing work, sales or transportation. There are approximately two family workers in each firm. Hired sales workers are common in Chiang Mai, Lampang and Roi-et, but are not generally found in Khon Kaen. The wages paid for salesworkers vary from 700 Baht per month in Roi-et to nearly 3,000 Baht per month in Chiang Mai. In Chiang Mai it is more common for salespeople to be paid commissions than in other areas. Also, some production or finishing workers are employed by retailers as mentioned earlier. Surprisingly, wages to those workers involved with repairs and finishing are in several cases lower than wages paid to the

Table 4.12. Employment in Furniture Retailing by Location and Type of Worker

	Employment Per Firm of:					
	Family Workers (#)	Sales		Hired Workers		Total Employment Per Firm
		#	Average Monthly Wage (฿)	#	Average Monthly Wage (฿)	
Chiang Mai Muang Producer-Retailers	1.8 1.4	3.7 2.5	2,984 1,880	14.2 1.2	1,701 1,458	19.7 5.1
Khon Kaen Muang Producer-Retailers	2.1 2.3	0.0 0.0	-- --	10.0 2.8	1,731 1,300	12.1 5.1
Lampang Muang Producer-Retailers	-- 2.0	-- 2.0	-- 1,000	-- 0.0	-- --	-- 4.0
Khon Kaen Other Amphoes Producer-Retailers	2.0 2.4	.4 .1	1,150 967	8.5 .3	1,797 787	10.9 2.7
Roi-et Muang Producer-Retailers	-- 2.3	-- .8	-- 700	-- 0.0	-- --	-- 3.0
Roi-et Other Amphoes Producer-Retailers	-- 2.8	-- --	-- --	-- --	-- --	-- 2.8

sales force. This reflects the low skill requirements of product finishing. This also suggests why wages in the producer-retailers firms are higher than in the retail only firms.

It is possible to make a rough assessment of the effect of the distribution system on employment generation in the furniture industry. Suppose, for the purposes of this exercise, that an identical bundle of furniture is manufactured in Bangkok, Chiang Mai and Khon Kaen. The only difference among the three collections of furniture is that, for whatever reasons, the Bangkok produced products are cheaper than the up-country products by an amount exactly equal to the cost of distribution to the up-country locations. This means, for example, that in Chiang Mai both the locally produced furniture and the "imported" furniture would sell for, say, one million Baht. The same holds true for the case of Khon Kaen. Given this situation, the question is, what are the relative amounts of resources used in local production when compared with Bangkok production and distribution to the up-country locations?

Several other assumptions must be made in order to answer this question. It is assumed that the Bangkok products pass from the manufacturer to a wholesaler, are transported and then are sold through a retailer. The wholesale markup is assumed to be 5 percent. The transport cost is 5 percent of the ex-wholesaler price to Khon Kaen and 10 percent to Chiang Mai. The retail markups are presumed to be 22.5 percent in Chiang Mai and 21.0 percent in Khon Kaen. This means that the total markup on the ex-Bangkok producer price is 41.5 percent for Chiang Mai and 33.4 percent for Khon Kaen. The up-country products are assumed to be sold from the manufacturer directly to the consumer.

The data for this comparison are drawn from several sources. The assumptions of the preceding paragraph are the best estimates of actual markups from interviews with retailers, wholesalers, producers and transport agents. The economic information on the representative up-country firms is taken directly from the analysis which will be discussed in Chapter 5. The Bangkok producer is represented by one of the largest producers and the only Bangkok firm which provided enough information to estimate the needed coefficients. This firm employs over 300 workers and produces large batches of products which are primarily sold to up-country merchants. Data on the economic characteristics of the distribution channel are based on information contained in the 1975 Input-Output Table for Thailand. The capital service variable is based on estimates of the replacement value of the capital stock made from depreciation costs assuming a 10-year straight line depreciation for the fixed assets of retailers and wholesalers, 15 years for truck transport and 20 years for train transport. The discount rate was assumed to be 12 percent to make the capital service variables comparable to those in Chapter 5. Aggregate transport data are computed as an average of the truck and train transport categories.

Table 4.13 reports the values of the data used in this exercise. These include the labor coefficient, capital coefficient and the capital labor ratio for each participant in the system. Table 4.14 shows the distribution of returns in the system by the final destination and also reports the aggregated economic coefficients for the production and distribution system as a whole. The structure of the returns differs between the Chiang Mai and Khon Kaen bound bundles due to the lower transport costs to Khon Kaen and the different retail markups used in

Table 4.13. Basic Economic Data for Analysis of the Economics of
Bangkok Up-Country Furniture Distribution System

	<u>Local Manufacture and Sale</u>		<u>Bangkok Up-Country Distribution System</u>		
	Chiang Mai	Khon Kaen	Large-Scale Production	Wholesaler	Transportation Retailing
Labor/Output	.317	.276	.030	.221	.280 .291
Capital/Output	.126	.145	.025	.111	.351 .144
Capital/Labor	.400	.524	.842	.503	1.254 .494

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Distribution Channel Markups from Bangkok to:

	<u>Chiang Mai</u>	<u>Khon Kaen</u>
Wholesale Markup	5%	5%
Transport Markup	10%	5%
Retail Markup	<u>22.5%</u>	<u>21%</u>
Total Markup	41.5%	33.4%

Sources: See text.

Table 4.14. Distribution of Returns and Economic Ratios
by Final Product Destination

	Chiang Mai		Khon Kaen	
	Local	Bangkok Import	Local	Bangkok Import
Final Sales Price	100.0	100.0	100.0	100.0
Retailer Share	--	18.4	--	17.4
Transport Share	--	7.4	--	3.9
Wholesaler Share	--	3.5	--	3.7
Producer Share	100.0	70.7	100.0	75.0
Labor/Output				
Production	.317	.030	.276	.030
Distribution	--	.280	--	.279
Total	.317	.103	.276	.092
Capital/Output				
Production	.126	.018	.145	.018
Distribution	--	.192	--	.171
Total	.126	.074	.145	.062
Capital/Labor				
Production	.400	.833	.524	.857
Distribution	--	.686	--	.613
Total	.400	.718	.524	.674

the calculation. Analysis of the key economic ratios reveals that the inclusion of the distribution system increases both the capital and labor content of the final product. The labor/output ratio is 243 percent higher for goods delivered to Chiang Mai than at the Bangkok factory and 20 percent higher for Khon Kaen. The capital/output ratio increases by 311 percent for the Chiang Mai destination by 244 percent for Khon Kaen. Overall, the capital/labor ratio for goods manufactured in Bangkok decreased by 13 percent as the goods are distributed to Chiang Mai and by 21 percent to Khon Kaen.

In terms of employment and income generated from wages, the general conclusion is that while the distribution of goods to the up-country locations increases employment, it is still less than the amount of employment generated by the up-country producers taken by themselves. Table 4.15 summarizes the employment effects of the alternative production-distribution systems. The Bangkok up-country distribution systems, as specified in this exercise, will generate between 1,100 and 1,400 man-days of employment for every million Baht of product sold in the up-country locations which originated in Bangkok. This represents over 75 percent of the total employment generated in production and distribution combined. Thus, for Chiang Mai Muang alone, which imported approximately 15.5 million Baht of furniture from Bangkok in 1980-81, the employment generated by the distribution system is over 21,000 man-days or 68 man-years of employment at 60 Baht per day. For the whole of Changwat Khon Kaen, 9.1 million Baht of furniture was imported generating over 10,000 man-days or 35 man-years of employment.

Table 4.15. Summary of Employment Effects of Local Versus Bangkok Produced and Distributed Products

	Wages and Employment Generated Per 1 Million Baht of Sales			
	Chiang Mai		Khon Kaen	
	Local Products	Bangkok Imports	Local Products	Bangkok Imports
Total Production Wages (1,000 ฿)	317	21.2	276	22.5
Man-days Generated @ 60 Baht/Day	5,283	354	4,600	375
Total Distribution Wages (1,000 ฿)	0	82.0	0	69.8
Man-days Generated @ 60 Baht/Day	0	1,367	0	1,163
Total Wages Generated (1,000 ฿)	317	103.2	276	92.3
Total Man-days Generated	5,283	1,721	4,600	1,538
Percent Production Man-days	100%	26.6%	100%	24.4%
Percent Distribution Man-days	0%	79.4%	0%	75.6%

4.5 Developments, Trends and Opportunities in the Product Distribution System

This section will discuss several topics related to the development of the product distribution system. In particular, attention will be focused on the development of modern retail establishments, additional analysis of the producer-retailers and some further analysis of the relationship of the market and the distribution system.

4.5.1 Modern Retailing

By and large the retail furniture stores in provincial Thailand are little different from any other store. Showroom space is limited, furniture is arranged in no particular way, usually stacked in so there is barely room to move. The attendant services are also limited. In Chiang Mai and Khon Kaen, however, a subtle change is beginning to occur that is changing the nature of furniture retailing. An example will serve to illustrate the point.

In Amphoe Muang, Khon Kaen a former producer-retailer of furniture has moved into the retail business in a big way. After visiting the United States and seeing the way furniture was retailed there, he decided to invest all of his money in setting up a modern retail establishment. He rented an entire, newly constructed three-story building in the heart of town and set up showroom-type displays throughout the store. All the products are imported from Bangkok and are medium-high to high quality. He retained several of his former production staff for finishing and repairs. The store employs two full-time people to deliver products to consumers and has a staff of trained (informed) salespeople. Potential consumers are greeted at the door with a glass of chilled fruit juice and are encouraged to browse through the store. This firm also is

generous with consumer credit. Approximately 90 percent of total sales are made on credit. The manager would not discuss the source of his funds.

Several factors motivated this rather bold step. First, the manager foresees rapid growth in the demand for relatively high quality furniture. Secondly, he feels that there is no way that local manufacturers can compete with Bangkok producers in the high quality product lines. Furthermore, he foresees more difficult times ahead for most local producers, especially in terms of wood supplies. Thirdly, he believes that most innovation will begin in Bangkok and by developing strong ties with producers there he can be on the leading edge as a distributor in the Northeast. His business is becoming well known among Bangkok firms and, as a result, is continually being contacted by producers who want their products represented in this store. Finally, he is convinced that consumers will prefer his store because of its appearance and the service he gives. He claims that the volume of sales provides all the proof he needs.

A similar, but somewhat less extreme version of the modern retail store has recently appeared in Chiang Mai. These sellers seem to understand the nature of furniture as a nonconvenience marketing good as discussed earlier. This development may have important implications for the ease of entry into retailing and for the smaller-scale, lower key, traditional retail outlets. This is especially relevant to the larger provincial capital cities where there is sufficient demand for medium-high and high quality products.

4.5.2 The Producer-Retailer

Even though the idea of combining production and retailing enterprises is hardly new, a number of firms have determined that this form of business organization is more appropriate than the single enterprise format. The combination of production and retailing results in a number of important advantages for both portions of the business. First, it permits some specialization in production consistent with the comparative advantage of the local producers. The shopping involved in procurement lets the producer know which products can more cheaply be purchased and which he is better off producing. Secondly, the combination spreads out the capital costs of the building and land. Often the producer needs a showroom anyway and by purchasing products for resale more efficient use can be made of that space. Of course, this may be offset by increased working capital requirements. Thirdly, the procurement process can provide important information on product designs. Retailers who have moved into production often have done so because they discovered that they could produce copies of Bangkok products more cheaply than they could purchase them. Several Bangkok wholesalers complained that up-country businessmen will commonly buy one of each of their most popular products and then copy the designs in the production enterprise. Fourthly, by purchasing products for resale the producer can substantially diversify the range of items offered for sale in his showroom. This can make the outlet much more attractive from the consumer's perspective. The combination of production and retailing can also aid in compensating for any supply side seasonality in the production process.

Combined production and retailing is an extremely flexible type of enterprise organization. It facilitates producing in accordance with

comparative advantage as discovered in the process of procuring products for resale. Product assortment in manufacturing can be limited, making gains from specialization and batch production possible without limiting the variability of products available to consumers. By having an experienced group of carpenters or upholsterers it is a relatively simple matter to provide high quality finishing of resold goods and to offer assurances of repair services down the road. In addition, the firm has the capacity to cater to the special orders made by consumers. These advantages of this type of firm organization will be explored further in Chapter 5.

4.5.3 The Market and Product Distribution

In Chapter 3 the market for furniture was explored in some detail. For analytical purposes the market was disaggregated by community type income level, and product quality (see Figure 2.1). The more rural the market, the greater the proportion of lower income consumers and therefore the greater the demand for lower quality, lower priced products. It was demonstrated that in terms of absolute levels of expenditures on furniture, the greatest growth could be expected in these more rural amphoe towns and villages.

There are two major characteristics of the rural furniture market other than the fact that it demands a lower priced product. The first is that the market is geographically dispersed. Only when the market reaches a certain degree of locational concentration is it economical for the establishment of a fixed-location production or sales enterprise. Secondly, it is reasonable to presume that the rural market is much more seasonal than the market in large towns. This is circumstantially

supported by the existence of temporary producers and seasonal itinerant merchants.

These characteristics of rural markets pose an interesting challenge for those attempting to capture this demand. This will be explored later, but for now it can be observed that the town producer-sellers and producer-retailers in the ROFEAP sample have demonstrated very little interest in servicing these market areas. One important reason for this may be that they are not aware of its potential. Obviously, some manufacturers and distributors have capitalized on the opportunities in rural markets, both in terms of sales of lower quality products to retailers and in organizing or catering to itinerant merchants. As will be discussed in Chapter 6, one of the key opportunities available to manufacturers in the changwat level system is to be found outside of the changwat capital.

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CHAPTER 5

THE ECONOMICS OF FURNITURE PRODUCTION

5.0 Introduction and Overview

The study of the economics of production in changwat level furniture firms is one important component of the analysis of the development of the Thai furniture industry. From the study of production a number of key issues relating to the competitive position of this portion of the furniture industry can be addressed. There are, therefore, two main objectives which will be treated in this chapter. The first is to provide an analytical description of the most important characteristics of the furniture manufacturers. This includes the material and factor inputs used by the firms, the nature of output and the technology of furniture production. Second, a series of detailed empirical production analyses will be presented. These include production function estimates, representative firm budget studies, the estimate of a frontier production to examine technical efficiency and the analysis of product profitability.

The analysis of this chapter is based primarily on the data obtained in the ROFEAP survey described in Chapter 1. The conclusions reached, therefore, only directly apply to Amphoe Muang, Chiang Mai, Amphoes Muang and Ban Phai, Khon Kaen and Amphoe Muang, Roi-et. A number of the findings can be considered indicative of the nature of furniture production in other changwats. There is no way of knowing with any degree of

certainly how representative the results are and it is therefore advisable to exercise caution in generalizing beyond the sample ampoes.

5.1 Descriptive Analysis of Inputs, Outputs and Technology

This section will explore a number of characteristics of the inputs, outputs and technology of the changwat level furniture industry. The inputs considered are raw material inputs, labor inputs and capital inputs and investment. These discussions are followed by consideration of the assortment, quality and seasonality of the output of the industry. Lastly, the technology of furniture manufacturing will be examined.

5.1.1 Raw Material Inputs

The primary material input for furniture manufacturing in Thailand is wood. Historically, the country has possessed abundant supplies of high quality timber, but uncontrolled deforestation resulting from widespread dependence on forest resources has rapidly led to the depletion of a number of important species. The effect of this reduced supply in the face of continually growing demand and the consequent tightening of forest control efforts has been felt in the furniture industry, and is likely to be a major factor in the future evolution of the industry.

A variety of wood species are used in furniture production. The most important are listed in Figure 5.1. It is convenient to group wood inputs by their function and value. Accordingly, there are three classes of wood inputs: plywood, low value structural wood and high valued structural wood. Virtually all producers use plywood and low value structural wood. Many firms also occasionally use some high value woods such as teak and rosewood for finishing, and some firms, primarily those

Thai Name	Scientific Name
Maay Sak (Teak)	<i>Tectona grandes</i>
Maay Tabek	<i>Lagerstroemis calyculata</i>
Maay Yang	<i>Dipterocarpus alatus</i>
Maay Macamong	<i>Afzellia xylocarpa</i>
Maay Ching Chang (Ket Daeng)	<i>Dalbergia Oliverii</i>
Maay Payung	<i>Dalbergia cochinchinensis</i>
Maay Takien Hin	<i>Hopea ferrea</i>
Maay Pradu	<i>Pterocarpus macrocarpus</i>
Maay Saya	

Source: Furniture Industry Study.

Figure 5.1. Woods Commonly Used in Furniture Production

in Northern Thailand, depend almost exclusively on higher value structural woods.

Plywood

Practically every type of wooden furniture found in Thailand contains some plywood which is commonly available throughout the country. There are three types available including: yang plywood, teak plywood and composite panels made from paper. Plywood production is centralized in Bangkok and the factory-gate prices are common across manufacturers. Price differences reflect size, thickness, quality and the base material. According to plywood merchants, prices have been increasing at approximately 10 percent per year since 1974, reflecting energy price increases, material price rises and general inflation.

Changwat level furniture producers may purchase plywood locally from wood merchants, or place orders and receive deliveries from Bangkok based merchants. According to the ROFEAP survey, approximately 70 percent of purchases are directly from Bangkok, while the remaining 30 percent is locally procured. All but one of the larger sized sample firms uses Bangkok suppliers, while only a quarter of the smaller firms do the same. Smaller firms usually buy from local merchants and in relative small quantities and, as a result, pay a slightly higher price for plywood. More detailed price analysis is precluded due to the variety of mixes of sizes, qualities and types of plywood used by the producers. The only other difference in plywood procurement of significance is that the larger purchasers generally are provided with seller delivery and the smaller firms must usually arrange their own transportation.

Overall, plywood currently presents few problems for the changwat level furniture industry. It is widely available, there is sufficient

competition in supply channels to keep prices reasonable and there is a clear system of grading and quality control which assures that the buyer gets what it anticipated. The only complaint heard is that prices are continually and consistently increasing. There is no evidence, however, that these increases are unjustified, nor is there evidence of a significant differential in the impact of the price inflation.

Structural Woods

In contrast to the centralized production and distribution of plywood, structurally woods are produced, processed and distributed regionally. In recent years, rapid deforestation has had important supply and price effects for most of the types of woods commonly used in furniture production. There are two classes of structural wood, high value and low value. The most important high value wood is teak, but the category also includes rosewoods. A variety of lower value woods are used, but the dominant type is tabek. Others include takien, yang and saya.

Structural wood is purchased from sawmills, wood wholesalers, retailers, the government and, in rare cases, from the logging companies. Of these suppliers, local sawmills are by far the most commonly used, accounting for approximately 70 percent of the volume of wood purchased by the sample firms. Bangkok based merchants are second at 28 percent, sawmills in other changwats account for 4 percent and .1 percent comes from local wood merchants. The Bangkok component is primarily made up of teak purchases by Northeastern firms and campus wood imported from Malaysia and Indonesia. Some teak is procured illegally, but this is impossible to reliably quantify.

Rough aggregate price data has been assembled in Table 5.1. The analysis of prices is made difficult by quality variations in the wood

Table 5.1. Prices of Structural Wood as Reported by Sample Firms

Type of Wood	Price Per Cubic Foot	
	Northeast (Baht)	North (Baht)
High Valued Structural Wood		
Teak	387	275
Macamong	320	--
Payung	500	--
Low Valued Structural Wood		
Tabek	148	--
Takien	150	--
Campus	110	--
Hardwood	--	191

Source: ROFEAP Survey.

purchased. The teak available in the North is primarily procured through the government sales outlets or from illegal sources and is, therefore, of inconsistent quality. Most of the teak which enters the Bangkok market is of somewhat better quality, but these factors cannot be accounted for in the price data.

Forecasts of the supply and demand for timber were made in 1970 by a team of specialists from the FAO (FAO, 1972). The results of their analyses make up the highly regarded Timber Trends Study. According to their projections, serious roundwood shortages will begin to emerge on a national basis by the mid 1980s. The shortfall will increase steadily through the end of the century. In the year 2000, the anticipated shortfall is predicted to be 11 million cubic meters, one-third of the

total demand at that time. Since the time of this study, however, satellite surveys of Thailand's forest reserves have revealed the problems of deforestation to be much worse than originally thought (Thailand Business, 1981). Hence, even the FAO projections can now be regarded as optimistic.

Aggregate timber shortages not only will have a direct effect on the furniture producers by increasing the price and difficulty of acquiring needed supplies of structural wood, but will also change the now rather rosy picture in the plywood market. A recent interview with the President of the Thai Plywood Association concerning the supply of timber revealed that, "Plywood...is now presenting serious production problems for even the domestic market, making the future for this essential component for construction and furniture a bleak one indeed." (Thailand Business, 1981, p. 26).

Even at the present time the market for structural wood faced by changwat level producers is far from orderly. The lots of wood available for purchase are generally low in quality, resulting in a large portion of wood waste. In Chiang Mai, where the historical dependence on teak is great and regulation is the most stringent (and corrupt), three-quarters of the sample firms complained of problems in getting the quantity of wood needed, getting it at the right time, very high rising and unpredictable prices and government regulation. The problems are less severe in the Northeast, but all indications point to increasing problems in the procurement of desired wood supplies. Fully 90 percent of the managers interviewed anticipated serious problems in the wood markets in the next five years.

One bright spot in terms of the supply of structural woods is the development of technology in recent years which permits the commercial use of the wood from spent rubber trees. Pararubber wood is a term which applies to the wood which comes from the chemically treated trunks of "retired" rubber trees. There is a vast supply of these overage trees in Southern Thailand. Trees that were once cut and left to rot or burned can now be chemically treated and used in a variety of purposes including the production of furniture. The Thai government is currently involved in a program of replanting to upgrade the stock of latex producing trees. This will result in the clearing of 300,000 rai of old trees each year. Pararubber wood is currently used primarily by three export oriented furniture factories in the South. At the time this study was completed some of this wood was starting to be used by a new Chiang Mai furniture firm.

Other Material Inputs

A wide assortment of other inputs are used in the production of furniture. Among these the most important are putty, glue, nails, screws, hinges, handles, mirrors, screens, formica, fiberglass, plastic upholstery materials, metal, lacquer, shellac, thinner, alcohol and paints. Normally, there is no problem in the procurement of these accessories. These products are produced in Bangkok, for the most part, and are widely available in sufficient quantities. Furthermore, these inputs represent a small portion of total costs of production. As a result, little attention was focused on these inputs during the course of the research.

5.1.2 Labor Inputs

Labor is the most important factor of production used in the manufacturing of furniture. This section will explore the characteristics of the labor force in the changwat level furniture industry. The discussion will focus on the composition of the labor force by functional category and by employment arrangement. Data will be presented on structure of the labor force by employment arrangement, functional category and wages.

All but one of the sample firms is owned and operated as a family business. This is a characteristic pattern of business organization in Thailand. A portion of the labor in the firms is thus provided by the family. Other workers are hired on a permanent or a temporary basis and, in addition, there is a small amount of work done on a subcontract basis. Table 5.2 contains information on the structure of the labor force by employment arrangement. As a percentage of total man-hours worked in the sample firms, family labor is a relatively constant 15.4 percent on average during the survey year. Permanent workers make up about 72 percent of the work force and temporary workers 12 percent of total man-hours. As would be expected, the percentage of temporary workers is subject to the greatest relative variability over the course of the year as indicated by large coefficient of variation. Family labor shows the least variability.

An array of skills are required in furniture production. The required skill composition of the labor force varies from firm to firm, depending on the type of product, the market served and the degree of mechanization of the workplace. The type of skills also vary by function; skilled woodworking, machine operation, finishing, etc. The relative

Table 5.2. Composition of the Labor Force in the ROFEAP Sample Furniture Firms by Employment Arrangement

Month	Family Labor	Percentage of Total Manhours of:							
		Permanent Hired Workers				Temporary Hired Workers			
		Administrative, Sales	Skilled Production	Unskilled Production	Apprentice	Skilled Production	Unskilled Production	Sub-contract	
March	14.9	2.5	46.6	21.5	6.8	7.4	.2	--	
April	15.1	2.6	46.1	21.8	5.9	8.2	.2	--	
May	15.7	2.7	47.3	19.1	6.5	8.4	.3	--	
June	15.0	2.1	36.9	27.2	7.3	2.7	8.8	--	
July	16.4	1.3	47.9	16.8	4.0	1.3	7.3	--	
August	16.9	1.4	49.4	19.3	4.0	2.8	6.3	--	
September	15.5	1.4	42.7	17.7	4.7	14.0	1.6	2.3	
October	15.2	3.4	37.6	19.8	3.9	16.2	.9	3.1	
November	16.9	4.0	52.4	11.5	4.6	7.8	--	2.8	
December	12.8	3.2	46.5	17.7	3.7	10.1	2.0	3.9	
January	14.5	1.3	49.9	19.6	4.0	8.5	2.2	--	
February	15.4	1.4	43.5	18.1	4.4	10.4	5.0	1.3	
Average	15.4	2.3	45.6	19.2	5.0	8.2	2.9	1.1	
Coefficient of Variation ($\sigma/\bar{x}$)	(.072)	(.391)	(.103)	(.190)	(.257)	(.541)	(.1075)	(1.341)	

Source: ROFEAP Survey.

scarcity of skilled labor is a potentially important constraint for the changwat level furniture industry. Skills are developed in the industry primarily through within-firm training systems. In the sample firms labor was thought of as skilled or unskilled, while apprentices were generally considered unskilled workers. From the pool of unskilled workers some will emerge who are more "responsible" or "learn quickly" and will gradually work themselves up to skilled status. There is a rapid turnover of unskilled workers and, therefore, often just working in a firm for a sustained period is the only requirement for achieving the needed skills. In several firms, one or two workers were pointed to as the "masters" of the next generation. This suggests that it might have been better to disaggregate the skilled labor category into those with the basic skills which are accessible to all who stay in the industry for a long enough period and those with special design or craft talents who form the backbone of the firms' production efforts.

The perception of the part of managers as to the amount of time and training required to achieve "skilled" status varied markedly across firms. Figures were reported that started at six months and went as long as 10 years. This reflects not only the difficulty of strictly defining skilled and unskilled, but the variation by firm in the levels of skills. In the analysis which follows production workers are considered skilled or unskilled based on the viewpoint of each of the firms' managers. Where there were questions of interpretation the wage rate was used for demarcation.

The functional breakdown of the labor force in the sample firms by manhours is as follows:

Administrative and Sales	10.5%
Skilled Production	58.6%
Unskilled Production	30.8%

On the basis of these data, the ratio of skilled to unskilled workers is approximately two to one. It should be noted that these data include family labor.

Wage rates vary by skill, by location, by the type of employment arrangement and by firm type. There is also some variation in the manner by which workers are compensated. Most of the factories in the sample pay by daily wages. Others, however, especially in the Northeast, will pay a percentage of the product price to labor. Usually work in these firms is organized on a work team basis with a foreman (skilled producer) in charge of establishing the distribution of the labor payments. In these cases, it was difficult to get a precise, comparable estimate of wage rates, but an attempt was made to convert to hourly equivalents.

Table 5.3 reports the average wages by worker type in the sample firms. The computed wages are above average for the industries surveyed in the ROFEAP project, and these wage figures are exclusive of any fringe benefits paid to workers. Most firms offer meals and, in some cases, lodging to workers, but precise imputation of these figures has proven difficult.

For comparative purposes, the average daily wages in cement product firms in the same areas are 48 Baht per day for skilled workers and 35 Baht per day for unskilled workers. In the ready-made garment industry, the figures are 25 to 55 Baht per day for skilled workers and 16 Baht per day for unskilled workers (Aungsumalin, 1982). The 1981 government

Table 5.3. Average Wages in ROFEAP Sample of Furniture Producers

Type of Worker	Sample Average Wages	
	Baht/Hour	Baht/Day
Permanent Workers:		
Administrative, Sales	10.7	85.6
Skilled Production	11.1	88.8
Unskilled Production	6.6	52.8
Apprentices	3.8	30.4
Temporary Workers:		
Skilled Production	10.8	86.4
Unskilled Production	4.7	37.6
Subcontract	8.6	68.8
Grand Average	9.1	72.9

Source: ROFEAP Survey.

established minimum wages in Thailand were 54 Baht per day for Bangkok, 47 Baht per day for the Central and Southern regions and 44 Baht per day in the North and Northeast.

5.1.3 Capital Inputs and Investment

Fixed capital used in the production of furniture consists of directly productive machinery and equipment, buildings and land. In addition, working capital is required for accounts receivable, and inventories of raw materials, semi-finished and finished products. Obtaining reliable data on the capital stock of the sample firms proved to be quite problematic. Attempts were made to collect information on the capital stock in several questionnaires and each subsequent iteration

tended more to reveal greater inconsistency in the answers rather than resulting in an acceptable convergence of responses. Part of the problem results from the inherent difficulty of assigning capital costs when, for example, the home and factory are part of the same building, the pick-up truck is shared by the family and the business, certain tools and equipment are owned by employees or the showroom is used to display goods purchased for resale in addition to the produced items. Attempts to quantify working capital were also hampered by the lack of willingness of firm managers to estimate accounts receivable, the prevalence of input supplier credit and advance payments by consumers. Efforts have been made to construct a reasonable picture of the assets on a firm-by-firm basis, but these estimates need to be treated with some degree of caution.

Table 5.4 reports the results of a query very early in the survey year about the amount, uses and sources of investment in fixed assets. The average initial investment valued at the original cost is approximately 204 thousand Baht (\$10,000). Twenty-seven percent is for purchased or leased buildings and land, while 73 percent is for purchased machinery and equipment.

In current (1980) Baht, this represents 453 thousand Baht which is 2.2 times the original cost. This compares favorably with the estimated 380 thousand Baht average investment computed from the Ministry of Industry data for firms in the 1 to 25 employment size category.

As to the source of capital, the funds for initial investments came from savings and loans with 47 percent from personal or family savings and 53 percent from loans. Reliance on loans was about the same for smaller and larger sample firms in the North, but in the Northeast, most

Table 5.4. Amount, Source and Application of Initial and Expansion Investment in Fixed Assets: ROFEAP Sample Firms

	Initial Investment	Expansion Investment
Original Cost (1,000 ฿)	203.6	369.9
Current Replacement Cost ^a (1,000 ฿)	452.5	n.c. ^b
Replacement Cost/Initial Cost	2.22	n.c. ^b
Disbursement of Investment		
Building	27%	62%
Machinery and Equipment	73%	38%
Source of Funds		
Savings/Profits	47%	51%
Loans	53%	48%

^aCalculated by adjusting prices according to the general wholesale price index for land, the machinery and equipment index for machinery and equipment and the construction index for buildings. Indices obtained from various Bangkok Bank Monthly Bulletins.

^bIt was not possible to estimate the replacement cost of expansion investment because the date of the investment is now known.

Source: ROFEAP Survey.

of the loan finance was used by the larger firms (Boomgard, 1981, p. 73). More than half, 53 percent, of the sample firms have expanded their stock of fixed assets since establishment. The average expansion investment was 370 thousand Baht, of which 62 percent went to buildings and land and 38 percent to machinery and equipment. About half of the expansion funds came from savings or firm profits and the other half from loans.

Further questionnaires collected data on the value of the stock of assets currently held by the firms. These data are presented in the tables accompanying the profitability budget analysis later in this chapter. The sample average stock of capital in 1980 Baht is approximately 755 thousand Baht. Of this total, approximately 20 percent is in machinery and equipment and 80 percent is in building and land. This is difficult to reconcile with the data above on initial and expansion investment.

In most of the analyses which follow the capital stock has been converted into a flow of capital services. This measures the annualized, imputed cost of capital to the firm, taking into account depreciation and the opportunity cost of funds. The annual capital service flow (KSV) is approximated by:

$$KSV = \frac{rV}{1 - (1+r)^{-n}} \quad (5.1)$$

where r is the opportunity cost of funds, V is the replacement cost of the asset and n is the life expectancy of the asset. The value of r was assumed to be 12 percent. Life expectancy varied by the type of asset and the firm. The capital service variable was computed separately for each type of asset and for each firm and asset specific lifetime. On

average, the annual KSV is approximately 16.1 percent of the value of the capital stock. The KSV is used in both the production function and budget analyses and the actual values obtained are reported in those sections.

The estimation of working capital requirements has proven exceedingly troublesome. It is a common practice for firms to require some advance payment on ordered products which is used to partially finance working capital needs. Input supplier credit is also prevalent and relied upon by nearly half of the sample firms. Furthermore, inventories of materials and finished goods vary considerably over the course of the year. Perhaps most critical, however, is the fact that firms were never asked to estimate their average working capital needs. Hence, for the analysis of production working capital has been excluded from consideration. More will be said about the possibility of working capital shortages as a constraint on the industry in Chapter 6.

5.1.4 Output of the Changwat Level Furniture Industry

There are two dimensions of the output of the changwat level furniture industry which will be considered in this section. First is this issue of product assortment. While all of the firms in the ROFEAP sample produce wooden furniture, there is very little intra-firm specialization in particular product lines. Variation in both the type of product and the quality of the products will be examined. The second portion of this section focuses on the seasonality of production patterns. The volume of furniture production was recorded on a monthly basis for the sample firms and it will be useful to explore the seasonal pattern of production. At the same time, it is convenient to examine the relationship between seasonality in employment, labor productivity and output.

5.1.4.1 Product Assortment and Product Quality

The basic technology of furniture manufacturing at the level employed in Thailand is consistent with the production of a wide array of product types. The same is true for more modern manufacturers employing relatively sophisticated processes. A crucial difference, however, is that the modern firms specialize to the extent of producing several relatively large batches of identical products, while the typical, traditional firms produce very few pieces which could be considered identical. The variability in products has important implications for the economics of the furniture manufacturing, so much so that one expert has noted that, "the greatest production problem in most furniture factories is the great assortment of items" (Paavoli, in UNIDO, 1974, p. 83).

Products differ along a number of dimensions. There is the primary distinction between wardrobes, beds, chairs, desks, etc., which here is termed as differences in product class. At the secondary level there are an assortment of product qualities, materials and sizes which distinguish different items. Presumably, within a given product class, the secondary variables will be manifest as a difference in the selling price of the product. While this is an imperfect indicator of variety, it does provide a reasonable (and the only available) basis on which to analyze variability. The remainder of this section will explore the nature of the product assortment in the Phase II sample firms based on monthly survey data. After an explanation of the data available, the analysis will focus on quality differences between firms and product variability within and between firms.

Survey data were collected from each of 18 firms on a monthly basis on the type of products produced during each month, the quantity and the

value of production. The information was entered on the survey form in up to 11 different product class categories.¹ Thus, for each firm, in each month, the following information is available:

$$\begin{aligned} \text{Number of products produced,} & \quad x_{kij}, \\ \text{Value of production,} & \quad v_{kij}, \text{ and} \\ \text{Average product price,} & \quad p_{kij} = \frac{v_{kij}}{x_{kij}}, \end{aligned}$$

where, $k = 1, \dots, 11$ indexes product class, $i = 1, \dots, 18$ indexes firms and $j = 1, \dots, 12$ indexes months. Associated with the average price, p_{kij} , is an unknown variance, $\sigma_{p_{kij}}^2$. It is assumed that for any given firm, product class and month, this variance is relatively small. Its effect is to bias all higher level aggregation variances in a conservative direction.

For the purpose of this analysis, the survey data have been aggregated to an annual total for each product class and firm. Hence, for each firm there is a vector of product classes which contains the total production of each type of product, $x_{ki} = \sum_{j=1}^{12} x_{kij}$, the total value of production of each product class, $v_{ki} = \sum_{j=1}^{12} v_{kij}$, the average product price, $p_{ki} = \frac{x_{ki}}{v_{ki}}$ and its associated variance with respect to the monthly average prices, $\sigma_{p_{ki}}^2$.

The data are first aggregated to the firm level. For each of the sample firms, Table 5.5 reports the number of product types produced by the firm during the survey year, the total number of products produced and the average product price. As can be seen, the firms in the sample

¹The product classes were revised during the survey to better correspond to the observed product mix. The final categories used are wardrobes, tables, dressing tables, living room set, sideboard, cupboards, chairs, desks, beds, decoration work and other.

Table 5.5. Variation in Output Price Between and Within Product Classes, by Firms

Firm ID	Number of Product Classes ^a	Total Number of Products Produced	Average Price (Baht)	Coefficient of Variation ($\sigma_{\bar{p}} / \bar{p}$)			Significance Test F Statistic ^b
				Total	Within Classes	Between Classes	
1	4	20	883	.84	.50	1.77	** ^c
2	7	95	1,467	1.38	1.25	2.65	**
3	8	448	2,042	1.41	.78	9.38	**
4	6	319	2,009	1.00	.74	5.44	**
6	7	208	2,154	.49	.31	2.23	**
7	6	54	1,411	.31	.19	.83	**
8	6	492	1,507	.72	.67	2.77	**
9	7	53	4,830	.75	.39	2.69	**
10	7	499	2,180	1.88	1.81	5.00	**
11	7	171	1,685	1.16	.60	5.32	**
12	7	1,196	1,717	1.36	.51	17.77	**
13	6	936	1,295	1.02	.69	10.32	**
14	5	318	948	.44	.24	3.27	**
15	5	17	11,500	.37	.15	.70	**
16	7	674	1,127	.30	.25	1.68	**
17	7	36	7,789	.50	.36	.91	**
18	5	149	834	.28	.25	.79	**
19	2	3,330	397	.12	.10	3.99	**
Average	5.9	501	1,217	.80	.54	4.31	

^aExcludes "Decoration" product class.

^bTest of the null hypothesis that the variance of the price of furniture is greater within classes than between classes.

^c** = significant at 1% level.

Source: ROFEAP Survey.

produce between two and eight of the 11 possible product types. This disguises the fact, however, that there is some degree of variability within each of the product types. The amount and significance of variation can be examined with the use of standard analysis of variance (ANOVA) techniques. The variation around each firms' mean output price is disaggregated into the variation within each product class and the variation between product classes. This information is presented in the table as the coefficient of variation which allows direct comparisons between firms. The total variation is quite large, ranging from .12 to 1.88 with an unweighted average of .80. This means that the average standard deviation of price from the firms' mean is 80 percent of the mean price. The coefficient of variation within classes averages .54, which indicates that even in the same firm there are significant differences in the products grouped within a given class. The price variation between classes is much larger, however, with an average coefficient of variation of 4.31. For each of the firms the between class variation was significantly larger than the within class variation at the 1 percent level of significance. This implies that the particular product aggregation scheme followed is reasonable.

A similar analysis was carried out by product class aggregated over the sample firms and is reported in Table 5.6. These results substantiate the perhaps obvious proposition that there is a wide variation even within the same class of product across different producers. As the analysis of variance results indicate, in all but two cases, wardrobes and sideboards, the variance between firms dominates the variance within firms for the same product type.

Table 5.6. Variability in Prices of Product Groups Produced in the ROFEAP Sample of Furniture Firms

Product Class	Number of Firms Reporting ^a Production	Total Number Produced	Sample Average Price (Baht) ($\bar{p}$)	Coefficient of Variation of Price ($\hat{\sigma}_p / \bar{p}$)			Significance Test Statistic ^b
				Total	Average With- in Firms	Average Be- tween Firms	
Wardrobes	14	502	2,120	1.47	.69	8.10	** ^c
Tables	12	615	1,359	1.02	.93	3.24	
Dressing Tables	3	32	2,706	.78	.65	1.79	
Living Room Sets	5	48	3,442	.50	.39	1.15	
Sideboards	9	104	4,781	1.34	.27	4.71	**
Cupboards	15	807	2,938	.84	.58	4.60	
Chairs	9	489	606	.51	.31	3.22	
Desks	12	5,186	751	1.08	.64	19.72	
Beds	15	371	1,914	1.14	.36	3.32	
Decoration	10	109	19,853	2.85	2.01	7.30	
Miscellaneous	11	787	1,175	23.49	23.59	12.59	

^aOut of a sample of 18 firms.

^bTest of the hypothesis that the variance around the firm mean is significantly larger than the variation around the sample mean.

^c* = significant at 5% level.

Source: ROFEAP Survey.

The implication of the preceding analyses is that firms and their products are different. Each firm produces a variety of different product types within a given class of goods. Furthermore, across firms there are important differences in the products which are grouped together. Hence, any effort to create an aggregate output index disaggregated by products is subject to serious definitional problems. In the context of this study it has therefore been decided to abandon attempts to analyze output in terms of product classes. Production will be measured in aggregate value terms.

Another issue of interest is the relative degree of specialization in the production process achieved by different types of firms. This is examined in two ways. First, Table 5.7 presents information on the composition of output measured in value terms by product type in the sample firms. Firms are grouped as producer-retailers and producer-sellers. As before, producer-sellers are disaggregated by the type of marketing arrangement.

The most interesting comparison is between producer-retailers and job-order producer-sellers. The decorator data is not very useful in this analysis because of the large amount of work reported simply as decoration work. The batch contractors are clearly highly specialized in the production of desks. There appears to be little difference, however, in the degree of specialization between the producer-retailers and the job-order firms. If any conclusion is possible, it would be slightly in favor of the job-order firms because of the relatively larger importance of their three most important products in the total value of output. Both types of firms, however, on the average, manufacture a wide range of products.

Table 5.7. Composition of Manufactured Output in ROFEAP
Sample Firms by Firm Type

Product Type	Percentage of Total Value of Production of Each Product Type for:			
	Producer/Retailer	Job Order	Decorator	Batch Contractor
Wardrobes	9.3%	18.2%	5.2%	3.4%
Table	9.4%	8.1%	7.1%	.6%
Dining Room Table	1.1%	.3%	1.2%	--
Living Room Set	3.6%	.3%	.3%	--
Sideboard	5.4%	.6%	4.9%	3.4%
Cupboards	26.3%	31.8%	11.3%	3.7%
Chairs	2.0%	1.9%	1.3%	3.6%
Desks	16.3%	20.3%	3.4%	73.2%
Beds	6.8%	9.3%	6.7%	--
Cabinets, Decoration	7.1%	2.5%	57.4%	4.7%
Miscellaneous	12.7%	6.7%	1.1%	7.3%

Source: ROFEAP Survey.

This result is somewhat surprising because it was argued in the previous chapter that the producer-retailers are in a better position to reap the benefits of specialization due to the fact that they need not produce as wide a range of products given that they also are involved in reselling. Furthermore, the information presented in the previous chapter on output sales suggests that the producer-retailers are the only type of firm selling to middlemen or retailers, and that they also engage in some government contract work.

A more careful examination of these data revealed that, in fact, the producer-retailers do specialize, but not in particular product lines. Instead, they tend to produce more products in each particular product line and this is really where gains from specialization come from. Table 5.8 illustrates this finding quite clearly. The typical producer-retailer produces a much larger batch of products for every product class he chooses to manufacture except in the case of wardrobes. There is a substantial difference in the average number of each product type produced between producer-retailers and job-order producer-sellers. The high degree of specialization by batch contractors can also be seen in the table.

The final dimension of output to be investigated is product quality. While product quality varies within as well as between firms, the most important variability occurs between firms. Quality is, therefore, primarily a characteristic of a firm and reflects differences in prices between firms. The average price of a firm's aggregate output reflects both differential quality and the particular product mix of the firm. In order to get at the variation due only to quality, it is necessary to adjust the average price for the composition of output. This has been

Table 5.8. Average Number of Products of Each Type Manufactured Per Firm
in ROFEAP Sample Firms by Firm Type

Product Type	Average Number of Each Type of Product Manufactured ^a			
	Producer-Retailer	Job-Order	Decorator	Batch Contractor
Wardrobes	34	53	11	6
Tables	91	24	51	23
Dining Room Tables	23	2	7	0
Living Room Sets	23	1	1	0
Sideboard	20	8	4	4
Cupboard	111	31	30	54
Chairs	60	19	75	160
Desks	149	91	29	2,860
Bed	36	20	17	0
Average Per Product Type	60.8	22.7	25.0	390.0

^a Averages are per firm producing the product type only.
Source: ROFEAP Survey.

done by computing a price index for each firm's output based on a weighted average of an index of product and firm specific prices with weights according to the composition of each firm's output.²

Table 5.9 reports the results of this calculation grouped by firm type and by location. When examined by firm type it can be seen that decorators generally produce a higher quality product. In part, this is because a service is sold along with the furniture. The producer-retailer produces the lowest quality product. This may be due to the fact that these firms purchase higher quality products for resale and choose to compete with their production enterprise in a somewhat lower quality product line.

When examined by location, it is clear that in the least developed survey areas, Ban Phai and Roi-et, product quality is lowest. When decorators are excluded, the difference even becomes more marked. This lends strong support to contention that lower income markets require lower quality products.

5.1.4.2 The Seasonality of Production

Fluctuations in production over the course of the year exert considerable influence on the economics of many industries. The ability of managers to adapt to seasonality is a major challenge bearing on the viability of the business. If seasonal fluctuations in production could be matched with the appropriate flexibility in factor usage and payments, the variations would pose little problems. However, capital stocks are

²More precisely, the average price of each product class for each firm was computed. These were then converted into an index relative to the average for each product class across all firms. A weighted average of these price indices was computed for each firm where the weights are the value of each product class in the output of that firm.

Table 5.9. Relative Quality of the Products Manufactured in the Sample Firms: Composition Adjusted Price Index

Firm Type/Location	Price Index
I. <u>Firm Type</u>	
Producer-Retailer	1.24
Producer-Seller	
- Job Order	1.75
- Decorator	3.17
- Batch Contractor	1.74
II. <u>Firm Location</u>	<u>All Firms</u> <u>Excluding Decorators</u>
Chiang Mai Muang	1.64 (1.75)
Khon Kaen Muang	1.93 (1.93)
Khon Kaen Ban Phai	1.41 (.57)
Roi-et Muang	1.48 (.52)

Source: ROFEAP Survey.

fixed in the short-run and the labor force is less than perfectly flexible on a month-by-month basis. With less than perfect flexibility in the adjustment of employed factors of production, utilization rates must absorb the slack. This imposes direct constraints on the efficiency of factor utilization over the course of the year.

The monthly fluctuation in output, number of workers, manhours worked and output per manhour is reported in Table 5.10 on a firm-by-firm basis. The reported figures in the first column are the coefficient of variation around each firm's average monthly output. These coefficients vary from .37 to 1.29 with a mean of .76. This means that, on

Table 5.10. Monthly Variability in Output, Number of Workers,
Man-hours and Output Per Man-hour in the ROFEAP
Sample of Furniture Producers

Firm	Degree of Monthly Variability in Output, Number of Workers, Man-hours and Output Per Man-hour as Measured by the Coefficient of Variation, $\sigma/\bar{X}$			
	Output $\sigma/\bar{X}$	Employment $\sigma/\bar{X}$	Man-hours $\sigma/\bar{X}$	Output/Man-hour $\sigma/\bar{X}$
1	1.02	.98	.95	1.15
2	.59	.12	.16	.62
3	.45	.15	.13	.43
4	.96	.36	.33	1.03
6	.49	.21	.20	.60
7	.69	.23	.21	.54
8	.53	.16	.17	.47
9	.73	.45	.43	.80
10	1.04	.19	.23	.89
11	.37	.29	.35	1.05
12	.96	.64	.70	.57
13	.42	.20	.20	.49
14	.68	.55	.59	.67
15	1.29	.76	.74	1.48
16	1.09	.61	.63	.96
17	.52	.30	.30	.50
18	.61	.32	.28	.63
19	1.26	1.08	1.08	1.30
Average	.76	.42	.43	.79

Source: ROFEAP Survey.

average, the standard deviation of monthly output is 76 percent of the mean. The number of employees and man-hours also is subject to seasonal variability and, as expected, both vary substantially less than does output.

The correspondence of production declines with cutbacks in labor employment can be measured by examining the variation in output per man-hour. The mean coefficient of variation in output per manhour is .79. This is greater than the variability in output, suggesting that managers are not doing very well at adjusting employment to output changes. One possible reason for this result may be that managers are not accurately able to anticipate seasonal output variations. This suggests that there may be other factors than a pure seasonal trend affecting output fluctuations. The possibility of measurement error must also not be overlooked.

Further insight into the seasonality issue can be gained by plotting the annual pattern of production on a monthly basis to see if the pattern can be explained by seasonal factors. This is done in Figure 5.2. The vertical axis represents the average of the ratio of actual to mean monthly values of output, employment and labor productivity on a firm-by-firm basis for all sample firms. The output trend line shows a steady decline through the year until the mid-rice harvest and then shows a sharp increase until month 11 when a slight decline occurs. Labor productivity first declines, rises with the mid-rainy season output and then levels off at a much lower level than where it started off.

Figure 5.3 presents the output and employment trends by the two survey regions, the North and Northeast. It can be seen in these graphs that the mid-rainy season output surge is unique to the North, and is

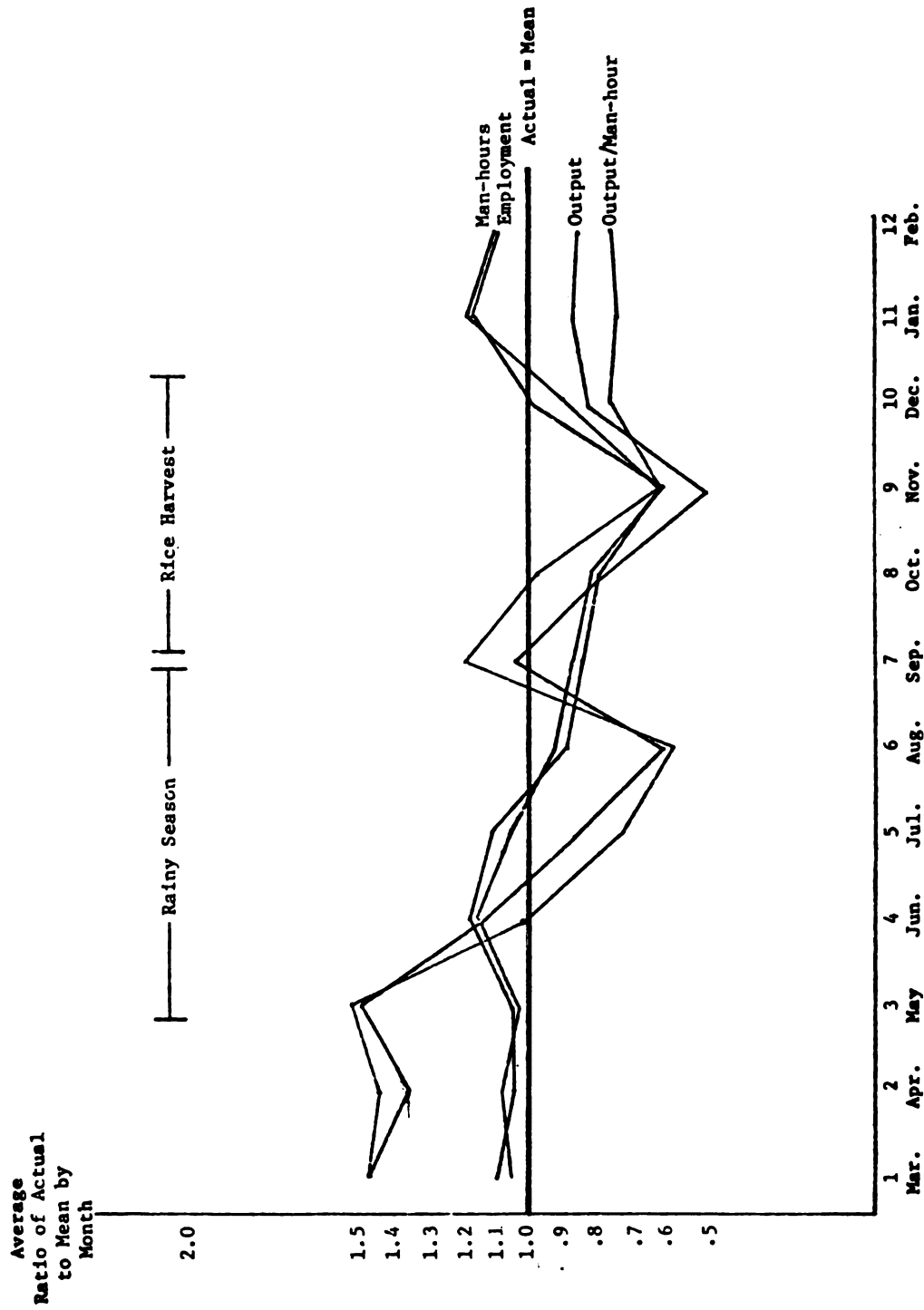
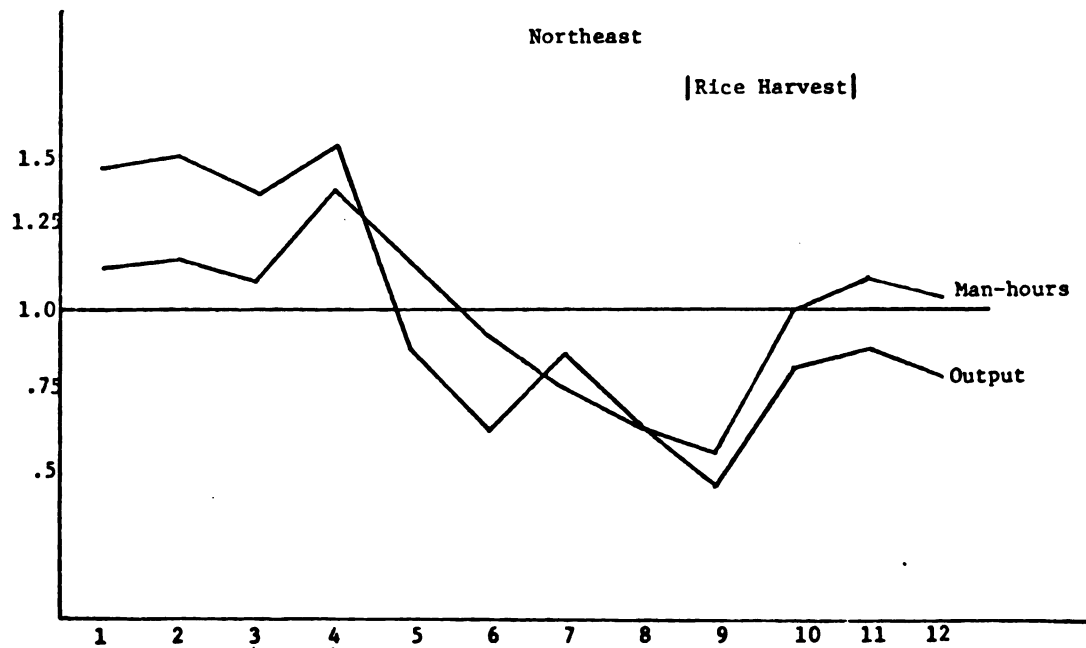
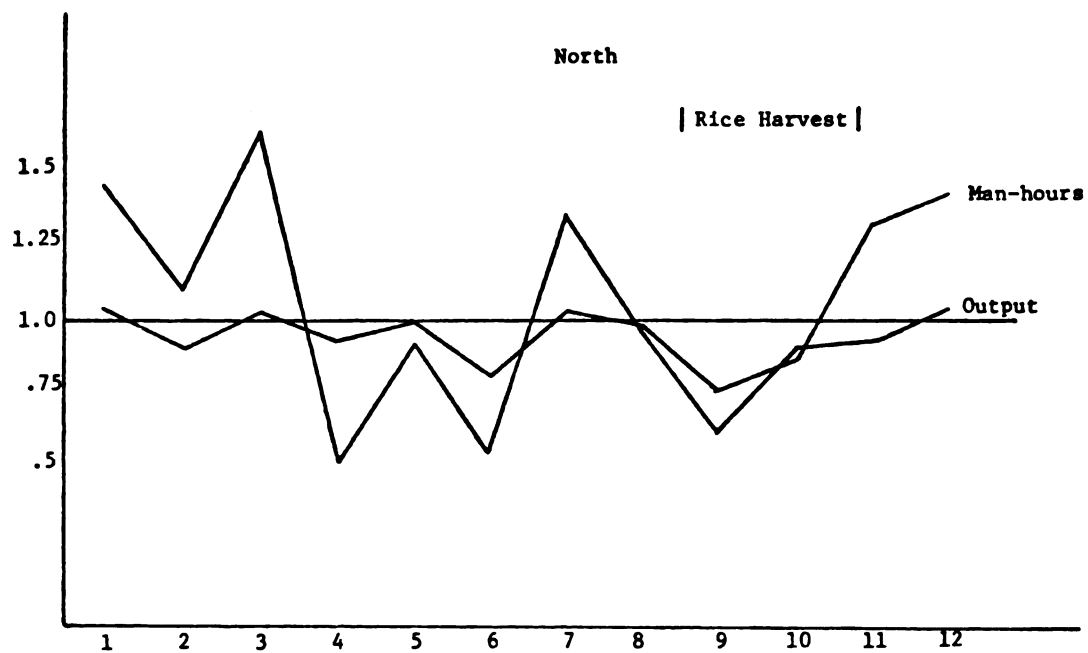


Figure 5.2. Annual Pattern of Products, Man-hours Employed and Labor Productivity



Source: ROFEAP Survey.

Figure 5.3. Annual Pattern of Products and Man-hours of Labor: Variation by Location

just one part of an extremely erratic trend line. The Northeast diagram illustrates a much more seasonal pattern, probably along a downward trend line. In both cases, however, the ratio of monthly to mean annual output drops below the ratio for man-hours, suggesting the possibility of an unanticipated decline in production at the end of the survey year.

Systematic monthly output variation can be the result of factors operating on both the supply and demand side. In the furniture industry the most probable demand side factors relate to the annual timing of consumer income receipts. Given the importance of agricultural income in Thailand, this type of seasonality would be closely linked to the wet season rice harvest which occurs in October, November and December (months 8, 9 and 10). One would expect this linkage to be greater in the Northeast than in the North, given the general level of development of the economy in the two areas. In both areas there is some increase in output following the harvest with the highest output lagging behind the previous year's harvest by several months. This would be about the length of time required for the rice income to work itself through the economy. The trough periods may also reflect the low level of money prior to the harvest period. Therefore, given this rough analysis, it appears that there is some seasonal fluctuation resulting from the cycle of agricultural production.

On the supply side, it is possible that the seasonal labor demands in agriculture could pinch urban labor markets during the periods of peak agricultural labor demands. During the period of slack labor demand in agriculture, on the other hand, there is likely an excess supply of workers in urban areas, especially unskilled labor. This type of seasonality can best be measured by monthly wage sums. The

monthly data on wages, however, was not considered reliable enough to warrant such analysis. Hence, the best that can be done is to suggest that the observed decline in man-hours of employment during the rainy season and the harvest season may, in part, be attributable to this effect.

Firm managers were asked about seasonality and its causes. Seventy-five percent of the interviewees indicated that the primary cause of their seasonal fluctuations was due to demand factors. The remaining 25 percent were split evenly between skilled or unskilled labor shortages as the cause. These firms were all located in the Northeast where there seems to be a much closer interaction between the urban and rural economies than in the North.

5.1.5 The Technology of Furniture Production

The issue of technology and especially the choice of technology has become a topic of great interest to development economists in recent years. Indeed, much of the concern with small-scale enterprises has arisen as a result of the "appropriateness" of the technology employed by these firms. In general terms, the interest in technology by economists stems from the view that the mix of capital and labor used in production can have important welfare and developmental implications. It is argued that development strategies which have historically attempted to promote capital-intensive, import substituting industrialization have resulted in overemployment of scarce capital resources and underutilization of relatively abundant labor resources. A more desirable strategy would attempt to align policy incentives with the market prices or scarcity values of capital and labor in order to generate a

more employment intensive industrial structure. This argument depends on there being a choice of technology characterized by differing capital-labor requirements and also on the potential economic trade-offs between the alternative technologies.

The production of furniture for the domestic Thai market is considered, by international standards, quite labor-intensive. As noted in a recent assessment of the Thai furniture industry:

...most firms operate on a job-order, custom-built basis with the furniture being largely hand-crafted. Machines, where they do exist, are used as an extension of hand production and not as a primary means of producing machine-made products. Thus, the industry may be regarded as largely a craft-based one with relatively little mechanization. (Cody, 1980, p. 5).

This is in sharp contrast to the methods now employed in most developed nations where, "an industrial revolution has taken place in the furniture industry, and furniture of the very finest quality can now be made entirely by machine" (Sheridan, 1955, p. 25). Yet, in Thailand in even the relatively sophisticated export sector, the basic production methods have been described as "highly labor-intensive...(sharing) little of the technology which characterizes (the industry) in other parts of the world. Even in enterprises employing numbers in excess of 100, with few exceptions, the level of mechanization is little above that of an extension of the use of traditional hand tools" (Cody, p. 7).

The technology of furniture production can best be understood as a series of successive operations or processes carried out on materials resulting in a final product. These processes generally include sawing, planing, shaping, joining and jointing, sanding, assembly and finishing. At each stage of the operation there are possibilities for factor substitution. This substitution takes the form of power saws for hand saws, electric drills for hand drills, drill presses for electric hand

drills, electric planers for hand planers, surfacing and thickening machines for electric planers, compressors for hand painting, etc.

Evidence of the variation in technology that occurs in the changwat level furniture industry, which is basically a labor-intensive segment of a labor-intensive industry, can be documented by examining the relative factor intensity of the sample firms. There are a number of theoretical and empirical problems encountered in defining factor intensity,³ but instead of attempting to resolve a complex debate it will be more productive to precisely identify the approach followed here. The index of factor intensity is defined as the ratio of the costs of the factor of interest to the sum of total factor costs, all valued at the appropriate shadow prices (Morowitz, 1974, pp. 497-498). Hence, the intensity of production with respect to factor i is defined as,

$$I_i = \frac{W_i X_i}{\sum_{i=1}^n W_i X_i}, \quad i = 1, \dots, n, \quad (5.2)$$

where X_i is the quantity of factor i employed and W_i is the shadow wage rate for input i .

In this study a four input model is employed with inputs defined as raw materials, skilled labor, unskilled labor and capital. Factor intensities are computed for each of the four basic intensities in each firm. The total labor intensity and the capital-labor ratios are also calculated. Materials costs represent the total cost of raw materials to the firms over the course of the survey year. Labor is measured in annual

³See, for example, the discussion in Bhalla (1975) and Morawetz (1974).

man-hours of skilled and unskilled labor. The actual wage rates are used as the best estimate of shadow wages.⁴ Capital is represented by the annual flow of capital services of machinery and equipment valued at a 12 percent rate of discount.

Table 5.11 contains the average factor intensities by firm type, technology, location and firm size. Some interesting and rather substantial variations are evident even in this relatively homogenous sample of firms. For example, job-order firms are much more skilled labor-intensive than any of the other firm types, including the producer-retailers. Capital intensity is constant across producer-retailers and job-order firms, but is much lower for decorators and much higher for batch contractors. The capital-labor ratio shows a similar pattern except that the job-order firms have a lower ratio than producer-retailers.

When examined along the other dimensions, it can be seen that firms in the smallest survey town, Khon Kaen Ban Phai, are the least capital intensive, most intensive in the use of unskilled labor and have the lowest capital-labor ratio. In Roi-et the degree of capital intensity is the greatest, largely due to the dominance of one firm which is a large, relatively capital-intensive government contractor. Firm size disaggregation shows that the larger the firm, the relatively greater is the material intensity and the capital-labor ratio. The smaller firms are characterized by the highest skilled labor intensity and overall labor intensity. The breakdown by capital-labor ratio shows the

⁴"(In the Thai economy)...the use of shadow prices significantly different from market prices...cannot be supported by the best available evidence." (Bertrand and Squire, 1980, p. 508).

Table 5.11. Average Factor Intensities by Firm Type, Location, Size of Firm and Technology

Firm Type, Location	Average Factor Intensity for:				
	Materials	Skilled Labor	Unskilled Labor	Total Labor	Machinery and Equipment
<u>I. Firm Type</u>					
Producer-Retailer	.637	.225	.108	.333	.030
Producer-Seller					
- Job Order	.483	.409	.076	.485	.030
- Decorator	.642	.267	.084	.351	.007
- Batch Contractor	.759	.163	.025	.188	.053
					.101
					.006
					.021
					.280
<u>II. Production Technology</u>					
Labor Intensive	.534	.363	.091	.454	.012
Capital Intensive	.639	.243	.066	.309	.049
					.027
					.179
<u>III. Firm Location</u>					
North:					
Chiang Mai Muang	.529	.362	.072	.434	.033
					.086
Northeast:					
Khon Kaen Muang	.626	.298	.054	.352	.022
Khon Kaen Ban Phai	.577	.231	.186	.417	.005
Roi-et Muang	.630	.283	.041	.324	.346
Northeast Total	.614	.276	.086	.362	.106
					.095
<u>IV. Firm Size</u>					
Smaller Firms	.434	.450	.097	.547	.019
Medium Firms	.615	.274	.096	.370	.015
Larger Firms	.670	.226	.052	.278	.046
					.035
					.045
					.178

Source: Furniture Industry Study.

relatively capital-intensive to be more material-intensive. The firms with the lowest K/L ratios, on the other hand, are more intensive in all the labor categories.

Additional insight into the factor intensity data can be achieved by examining the relationship among the firm intensity rankings. Table 5.12 contains the rank correlation measures between intensities for each pair of dimensions. A high coefficient indicates a strong correlation among rankings of firms. The strongest correlation is between the capital intensity measure and the capital-labor ratio, which suggests that one is a good predictor of the other. Rankings according to labor intensity, however, are not a good indication of the degree of capital intensity or the capital-labor ratio. One other point of interest is that there is a strong, negative correlation between skilled labor intensity, overall labor intensity and material intensity. This indicates that the greater the labor intensity, the lower the share of materials in total cost and may reflect a more efficient use of raw materials.

The analysis of this section has supported the hypothesis that a range of technologies do exist even in the changwat level furniture industry. These techniques are consistent with the production of a wide variety of products for roughly similar markets. Further evidence on substitutibility and the efficiency of the various production techniques is presented later in this chapter.

5.2 Neoclassical Production Function Analysis

The econometric analysis of production functions can yield a number of insights into the economics of furniture manufacturing. Specifically, assuming that formulations of the production function can be found which

Table 5.12. Spearman's rho^a Correlations Among the Various Factor Intensities

	I _M	I _{SL}	I _{UL}	I _L	I _K	I _{K/L}
I _M	1.0	-.92*	-.13*	-.98*	.13*	.36*
I _{SL}	--	1.0	-.18*	.89*	.01	-.21*
I _{UL}	--	--	1.0	.18*	-.37*	-.35*
I _L	--	--	--	1.0	-.21*	-.44*
I _K	--	--	--	--	1.0	.94*
I _{K/L}	--	--	--	--	--	1.0

^a $\rho = 1 - \frac{6 \sum d_i^2}{N^3 - N}$, where d_i is the difference in the rankings for each of the i firms and N is the sample size. The test statistic is $\rho \left(\frac{N-2}{1-\rho^2} \right) \sim t_{N-2} \text{ df.}$

*Indicates that the coefficient is statistically different from zero at the 5% level of significance ($t \geq 2.11$).

Source: Furniture Industry Study.

are adequately consistent with the data for the industry, it is possible to examine such issues as returns to scale, resource productivity, allocative efficiency and the elasticity of input substitution. Three forms of the production function are examined in this section: the Cobb-Douglas (C-D), constant elasticity of substitution (CES) function and the transcendental logarithmic (Translog) function. The Cobb-Douglas formulation is used in the analysis of returns to scale, resource productivity and efficiency. The CES and Translog forms are estimated in order to check the validity of the more restrictive CD function and also to examine the input substitution issue.

The Cobb-Douglas production function has historically been the most commonly used functional form due to the relative ease with which it can be estimated and interpreted. The general form of the CD function can be written as:

$$Y = A \prod_{i=1}^n x_i^{\alpha_i} \quad i = 1, \dots, n \quad (5.3)$$

where, Y = output or value added; A = constant term; x_i = quantity of input i employed; and α_i = output elasticity of input i .

In its general form the CD function is homogeneous degree $\sum_{i=1}^n \alpha_i$; that is, it is subject to increasing, constant or decreasing returns to scale as $\sum_{i=1}^n \alpha_i$ is greater than, equal to or less than one. The elasticity of input substitution, $\frac{d \ln(x_1/x_2)}{d \ln(\partial Y / \partial x_2 / \partial Y / \partial x_1)}$, is restricted to exactly equal one by the nature of the functional form. Thus, the CD is not an appropriate tool for examining input substitutibility. The CD function does have the desirable property, however, that the estimated coefficients (α_i) for each input represent the output elasticity, $\frac{\partial \ln Y}{\partial \ln x_i}$,

for each input. This facilitates the computation of the marginal productivity, $\frac{\partial Y}{\partial x_i} = \alpha_i \frac{Y}{x_i}$, of each input which can be used to examine the allocative efficiency of the industry.

Several alternative specifications of the CD functions were estimated. The most realistic formulation is a three input model. The inputs are annual man-hours of skilled labor, annual man-hours of unskilled labor and the annual flow of capital services from machinery and equipment. The dependent variable is value added, measured as total production minus materials and overhead costs. The final estimating form is:

$$\ln Y = \ln A + \alpha_1 \ln SL + \alpha_2 \ln UL + \alpha_3 \ln KM + \mu \quad (5.4)$$

where, SL = skilled labor hours; UL = unskilled labor hours; KM = annual cost of machinery and equipment; and μ is the error term with the usual properties.

Equation 5.4 was estimated using Ordinary Least Squares (OLS). The results of the estimation are reported in Table 5.13. Overall, the CD function performs adequately, given the cross-section, adjusted R^2 of .54. The model is a better estimation of $\ln Y$ than the sample mean as indicated by the statistically significant F statistic. The coefficients for unskilled labor and capital are both statistically significant at the 90 percent level, while the skilled labor coefficient cannot be said to be different from zero. The sum of the output elasticities is .805, indicating slightly decreasing returns to scale; however, the hypothesis that the sum is equal to one cannot be statistically rejected.

The computed marginal productivities show the rather surprising result that unskilled labor has a much larger marginal product than skilled labor, although the coefficient in skilled labor is not

Table 5.13. Parameter Estimates of the Three Input Cobb-Douglas Production Function

Estimated Parameter	Coefficient Value	Standard Error	T-Statistic _a
lnA - Constant	4.763	2.697	1.766**
α_1 - Skilled Labor	.271	.409	.633
α_2 - Unskilled Labor	.283	.114	2.491**
α_3 - Machinery and Equipment	.251	.211	1.191
$\bar{R}^2 = .54$ F(3,15) = 8.177**			

Returns to Scale			
$\sum_{i=1}^3 \alpha_i =$	.805	(.363)	.538 ^b

Marginal Productivity (MP)	Average Factor Costs (AFC)		MP _i /AFC
$\frac{\partial Y}{\partial SL} = 3.35 \text{ ¢}$	10.98 ¢		.31
$\frac{\partial Y}{\partial UL} = 9.93 \text{ ¢}$	6.00 ¢		1.66
$\frac{\partial Y}{\partial KM} = 1.90 \text{ ¢}$	1.00 ¢		1.90

^aTest of the null hypothesis that $\alpha_i = 0$.

^bTest of the null hypothesis that $\sum_{i=1}^3 \alpha_i = 1$.

*Indicates statistical significance at 90% level.

**Indicates statistical significance at 95% level.

Source: Furniture Industry Study.

statistically significant.⁵ This may be due to the possibility that inputs are not perfectly substitutable as implied by the Cobb-Douglas specification. If not, there may be an optimal proportionality between, say, skilled and unskilled labor or with capital which would tend to bias the productivity estimates.

Comparison of the marginal products with factor costs can provide an indication of the average allocative efficiency of furniture manufacturing. These figures are presented in the lower portion of Table 5.13. The data indicate that, on average, firms are not choosing least cost factor combinations. In fact, skilled labor appears to be overutilized, unskilled labor underutilized and capital underutilized. This result was checked in a two input CD function using total labor hours and capital.⁶ The ratios of marginal products to factor costs for labor are 1.10 for total labor hours and 1.17 in capital, although the capital coefficient is not statistically significant. These figures indicate a high degree of allocative efficiency. The differences between the two and three input functions suggest that the original hypothesis concerning the inappropriateness of the unitary elasticity of substitution in the CD function may be valid, especially in the three input case. There is also always the problem of the definition of skilled and unskilled labor which may lend credence to the two input specification for the purpose of examining marginal productivity.

⁵In spite of this lack of statistical significance, the estimated coefficient still represents the best estimate of this parameter, given this specification of the production function.

⁶The estimated coefficients and standard errors in the two input model are: constant, -.496 (2.877); labor, 1.111 (.386); capital, .155 (.201).

The adjusted R^2 , $\bar{R}^2 = .55$. The coefficients in capital and the constant term are not statistically different from zero.

The issue of factor substitutability can be addressed by specifying production functions which permit nonunitary elasticities of substitutions. The CES function has the property that the elasticity of substitution (σ) can be different from one, but it is constant for all input combinations. The translog function is still more general, allowing the elasticity to vary across different pairs of inputs. For computational reasons, the CES is estimated for the case of two inputs, labor and capital and the translog for three inputs, unskilled labor, skilled labor and capital.

The CES production function originally proposed in Arrow, Chenery, Minhas and Solow (1961) is of the form:

$$Y = \gamma [\delta K^\rho + (1-\delta)L^\rho]^{V/\rho} \quad (5.5)$$

where, γ = efficiency parameter; V = scale parameter; ρ = substitution parameter; and all other variables are as previously defined. The elasticity of substitution, σ , is equal to $\frac{1}{1-\rho}$. A variety of techniques are available for estimating the parameters of (5.5). The most straightforward is to estimate a linear approximation of the nonlinear CES function by Ordinary Least Squares. The linear estimating form proposed by Kmenta (1967) is,

$$\ln Y = \ln \gamma + w\delta \ln(K/L) + V \ln L + \beta [\ln(K/L)]^2 + \mu \quad (5.6)$$

where, $\beta = -\rho V \delta (1-\delta)/2$ and μ is a disturbance term with the usual properties. This equation has been fitted to the ROFEAP firm sample data with labor measured in total unweighted manhours and capital measured as the annual capital service flow of machinery and equipment. The parameter estimates are reported in Table 5.14.

The coefficient β , from which the elasticity of substitution is estimated, is not statistically significant. This is partially the

Table 5.14. Estimates of Linearized CES Production Function

Parameter	Estimated Value	Standard Error	T-Statistic
γ	-.5465	2.880	.190
$V\delta$	.3573	.229	1.238
V	1.2623	.281	4.486**
β	.1442	.147	.980
δ	.2831	--	--
ρ	-1.1257	.842 ^a	1.337*
σ	.470	--	--
$\bar{R}^2$	.55		
F(3,15)	8.41**		

^aStandard error is estimated from the Taylor series approximations for the variance of $\hat{\beta}$:

$$\begin{aligned}
 V(\hat{\beta}) = & \left(\frac{\partial \hat{\rho}}{\partial \hat{\beta}}\right)^2 V(\hat{\beta}) + \left(\frac{\partial \hat{\rho}}{\partial (\gamma \hat{\delta})}\right)^2 V(\gamma \hat{\delta}) \\
 & + \left(\frac{\partial \hat{\rho}}{\partial \hat{\gamma}}\right)^2 V(\hat{\gamma}) + 2 \left(\frac{\partial \hat{\rho}}{\partial \hat{\beta}}\right) \left(\frac{\partial \hat{\rho}}{\partial (\gamma \hat{\delta})}\right) \text{cov}(\hat{\beta}, \gamma \hat{\delta}) \\
 & + 2 \left(\frac{\partial \hat{\rho}}{\partial \hat{\beta}}\right) \left(\frac{\partial \hat{\rho}}{\partial \hat{\gamma}}\right) \text{cov}(\hat{\beta}, \hat{\gamma}) \\
 & + 2 \left(\frac{\partial \hat{\rho}}{\partial (\gamma \hat{\delta})}\right) \left(\frac{\partial \hat{\rho}}{\partial \hat{\gamma}}\right) \text{cov}(\gamma \hat{\delta}, \hat{\gamma})
 \end{aligned}$$

*Indicates statistically significant at the 90% level.

**Indicates statistically significant at the 95% level.

Source: Furniture Industry Study.

result of the inflation of the standard errors attributable to the presence of multicollinearity between $\ln(K/L)$ and $[\ln(K/L)]^2$ (Tsang and Persky, 1975). Fortunately, however, the derived coefficient, $\hat{\rho}$, is significant and this is the best indication of the reliability of the calculated elasticity of substitution. The elasticity is equal to .470 indicating weak substitutability between capital and labor.

The returns to scale parameter, V , is statistically significant and can be compared with the C-D case. The hypothesis of constant returns to scale, $V=1$, cannot be rejected as the t-statistic for this two-tailed test is .933. Thus, the CES function adds additional support to the supposition of constant returns to scale in the changwat level furniture industry.

In the case of more than two inputs, there are multiple input substitution possibilities. The translog production function can be used to estimate the partial elasticities of substitution (σ_{ij}) between the various pairs of inputs. With three inputs there are three substitution parameters to estimate since by definition $\sigma_{ij} = \sigma_{ji}$. The translog function is a flexible functional form which represents a local second-order approximation to any arbitrary production function (Christinson et al., 1973). In its general form the function is written as:

$$\ln Y = \ln \alpha_0 + \sum_{i=1}^n \alpha_i \ln X_i + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij} \ln X_i \ln X_j \quad (5.7)$$

where the α_i and γ_{ij} are technology coefficients; Y is output; and the X_i are inputs. Parameter estimates are most conveniently made on linearized input share equations derived from (5.7). For the three input

case, analogous to the three input C-D estimate, the share equations are written as:

$$\begin{aligned} S_S &= \alpha_S + \gamma_{SS}S + \gamma_{SU}U + \gamma_{SK}K + \mu_S \\ S_U &= \alpha_U + \gamma_{US}S + \gamma_{UU}U + \gamma_{UK}K + \mu_U \\ S_K &= \alpha_K + \gamma_{KS}S + \gamma_{KU}U + \gamma_{KK}K + \mu_K \end{aligned} \quad (5.8)$$

where, S_i is the share of input i in value added and the subscripts S , U , K indicate skilled labor, unskilled labor and capital. Estimates of production coefficients based on share equations assumes competitive input markets. Furthermore, the assumption of symmetry, $\gamma_{ij} = \gamma_{ji}$, and homogeneity, $\sum_{i=1}^n \alpha_i = 1$, $\sum_{i=1}^n \gamma_{ij} = \sum_{j=1}^n \gamma_{ij} = \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij} = 0$ are imposed for estimation. OLS estimates of the set of equations, (5.8), will be inefficient because it does not account for the fact that there is a systematic relationship among the various disturbance terms for the same firm. Hence, a two-stage generalized least squared estimation technique is appropriate. The parameter estimates for the translog production function are reported in Table 5.15.

The partial elasticities of substitution can be easily derived according to the formula:

$$\sigma_{ij} = \frac{S_i S_j}{\gamma_{ij} + S_i S_j}.$$

These are reported at the bottom of Table 5.15. All of the estimated coefficients used in the calculation of the σ_{ij} 's are statistically significant at the 95 percent level. The partial elasticities show that $\sigma_{SK} > \sigma_{SU} > \sigma_{UK}$. Skilled labor and capital are strong substitutes as are skilled labor and unskilled labor. The negative partial elasticity

Table 5.15. Parameter Estimates for Three Input Translog Production Function

Parameter	Coefficient Estimate	Standard Error	T-Statistic
α_S	.2772	.1600	1.73
α_U	.5572	.1417	3.93
α_K	.2156	.1706	1.29
γ_{SS}	.1402	.0196	7.16
γ_{SU}	-.0570	.0102	5.60
γ_{SK}	-.0443	.0147	3.00
γ_{US}	-.0570	.0102	5.60
γ_{UU}	.0617	.0115	5.38
γ_{UK}	-.0367	.0154	2.38
γ_{KS}	-.0443	.0196	3.00
γ_{KU}	-.0367	.0154	2.38
γ_{KK}	.0810	.0209	3.87

$S_S: R^2 = .72$			
$S_U: R^2 = .62$			

$\sigma_{SU} = 1.648$	$\sigma_{SK} = 5.397$	$\sigma_{KU} = -.691$	

Source: Furniture Industry Study.

between unskilled labor and capital indicates that these inputs are complementary.⁷ Specifically, this means that an increase in the relative price (marginal productivity) of unskilled labor to capital is associated with an increase in the quantity of unskilled labor employed relative to capital, ceteris paribus. It is often more difficult to intuitively "explain" partial elasticities of substitution.

The complementarity between unskilled labor and capital suggests that larger capital stocks are consistent with greater employment of unskilled labor and smaller capital stocks are generally associated with greater employment of skilled labor.

The analysis of neoclassical production functions has revealed several interesting features of the furniture production process. First, within the sample firms there appears to be a high degree of allocative efficiency with capital and labor, but when labor is broken down by skill levels, the analysis reveals rather substantial allocative inefficiency. Secondly, there are most likely constant returns to scale among the sample firms. This, however, does not suggest that this would hold if the sample also included modern, large-scale firms. Finally, the elasticity of substitution between capital and labor is low in the two-input case, but more careful analysis reveals that skilled and unskilled labor and skilled labor and capital are strong substitutes, while unskilled labor and capital are complements.

5.3 Firm Budget Analysis

The production function analysis of the previous section has provided an interesting picture of the changwat level furniture industry in

⁷See Furgeson (1971), pp. 107-111, for a discussion of complementarity in the context of the partial elasticity of substitution.

the ROFEAP sample areas. In this portion of the study, the objective is to delve deeper into the sample information in order to examine the economic characteristics and performance of certain groups of firms within the sample. As opposed to the estimation of industry level parameters in the production function analysis, enterprise budgets will be constructed for several representative firm types facilitating comparisons between subgroups of the industry sample. There are several dimensions among which representative firm types have been constructed. These are: (1) production technology; (2) firm size; (3) location; and (4) firm organization. This section will focus on the breakdown by firm organization, although the results of the other breakdowns will be briefly discussed. Comparatative information will be presented on a series of descriptive economic characteristics relating to firm size, the labor force, wages and capital and resource productivity. This will be sufficient to define a unit isoquant for the analysis of relative efficiency. Lastly, evidence will be presented on enterprise profitability for each of the firm types. Before proceeding to the analysis of representative firms, however, it will be useful to conduct the analysis for the average sample firm.

5.3.1 The Average Firm

Table 5.16 summarizes the most important economic characteristics of the average (mean) of the 19 sample furniture manufacturers. The average value of production over the course of the survey year was approximately 882 thousand Baht or slightly more than \$44 thousand dollars. This was, on average, 83.9 percent of the firms' total sales after accounting for the presence of firms which purchase products for resale

Table 5.16. Economic Characteristics of Changwat Level Furniture Industry: The Average Firm

Characteristics	Average Firm (N=19)
Total Production (1,000 ฿)	882.27
Own Production in Total Sales	83.9%
Annual Value Added (1,000 ฿)	292.15
% Value Added in Total Output	33.1%
Number of Employees	13.4
Annual Man-hours of Labor (% of Total)	
- Administrative and Sales	3,265 (10.5%)
- Skilled Production	18,161 (58.6%)
- Unskilled Production	9,553 (30.8%)
- Total Production	27,714 (89.5%)
- Skilled/Unskilled	1.90
Average Wage Rates (฿ Per Hour)	
- Skilled Production	11.10
- Unskilled Production	5.89
- Average Production	9.31
Average Annual Flow of Capital Services (1,000 ฿)	
- Machinery and Equipment	23.26
- Total Fixed Assets	121.50
- % Machinery and Equipment	19.1%
Value Added/Production Labor Cost (฿) (Labor Cost/Value Added)	1.132 (.883)
Value Added/Machinery and Equipment (฿) (Machinery and Equipment/Value Added)	12.560 (.080)

Source: Furniture Industry Study.

in addition to marketing their own production. Value added, total production minus materials and overhead costs, represents 33.1 percent of the total value of production. The average firm has 13.4 total workers. Total man-hours of labor is composed of 10.5 percent administrative and sales, 58.6 percent skilled production hours, 30.8 percent unskilled production hours with the ratio of skilled labor hours to unskilled hours of 1.90. Mean wage rates per hour are 11.10 ¢ for skilled workers, 5.89 ¢ for unskilled production workers giving a weighted average production wage of 9.31 ¢ per hour. This can be multiplied by eight hours to give the average daily wage of 74.5 ¢ per day and again by 26 to give the average monthly wage of 1,937 ¢. Capital is measured as the annual flow of capital services with an assumed discount rate of 12 percent. The annual implicit cost of directly productive machinery and equipment is 23,261 ¢ and 121,497 ¢ for total fixed assets.⁸

Resource productivity can be assessed in broad terms through examination of the ratios of value added to capital and labor and the reciprocal of these ratios, the labor and capital coefficients. Little can be said, however, about the sample mean values without a basis for comparison. Given the representative firm types discussed later, it will be useful to compare the value of these ratios with the sample mean values.

The value added (VA)-labor ratio is expressed in terms of a unit (Baht), of labor cost in order to account for the differing skilled-unskilled labor force composition. The ratio of value added to labor cost for the sample is 1.13 and its reciprocal is .883. This means that 88.3

⁸It should be noted that the data for machinery and equipment are considered much more reliable than the data on total fixed assets for the reasons discussed in the section on capital (pp. 5-13 - 5-17).

percent of value added is paid to labor. This is computed by valuing the family labor hours used in production work at the firm average wage for skilled labor or unskilled labor, depending on the type of work performed. Value added per Baht of machinery and equipment used is 12.56 and the capital coefficient, therefore, is .080. Hence, at the assumed rate of return of 12 percent per annum, 8 percent of value added represents the return to machinery and equipment.

Table 5.17 presents the economic budget for the average sample firm. The object of this budget is to assess the economic performance of the furniture firms. The top half of the table contains data on production and costs. The lower half presents several different measures of performance derived from the analysis of costs and returns. Returns to capital and family labor is a gross measure of production minus materials, overhead and labor costs. Since capital is normally owned by the family, this figure represents the income to the family which then must be allocated to capital and family labor. The second measure is obtained by deducting the imputed costs of machinery and equipment from the returns to total capital and family labor. Since most of the capital valuation problems occur as a result of the fact that factory and residence are almost always on the same premise, this measure considers building, land and vehicle costs as part of the return to family labor. Returns to family labor and building, land and vehicles is reported as a gross quantity and per hour of family labor. The third measure, returns to family labor, takes the analysis one step further by deducting all capital costs from the gross returns. Finally, economic profit is calculated by valuing family labor hours at the firm average wage for the appropriate type of family labor and then subtracting this

Table 5.17. Economic Budget for the Changwat Level Furniture
Industry: The Average Firm

Account Item	Sample Average (1,000 ฿)
Total Production	882.27
Materials Cost	512.43
Overhead Costs	77.68
Hired Labor Costs	
- Administrative	7.09
- Production	230.76
- Worker Benefits	11.05
- Total Labor Costs	248.90
Capital Costs	
- Machinery and Equipment	23.26
- Building, Land and Vehicles	98.24
- Total Capital Costs	121.50
Capital Stock	755.53
Total Returns to Capital and Family Labor	43.26
Returns to Family Labor and Building, Land and Vehicles	
- Gross	20.00
- Per Hour of Family Labor	.005
Returns to Family Labor	
- Gross	-78.24
- Per Hour of Family Labor	-.018
Economic Profits	
- Gross	-129.77
- Rate of Profit	-17.2%

Source: Furniture Industry Study.

figure from the returns to family labor. The rate of profit represents gross economic profit divided by the replacement cost of the total capital stock. It is important to keep in mind that this is an economic and not a financial analysis. The use of capital service costs computed with a 12 percent discount rate means that a zero rate of economic profit represents a 12 percent return to capital after deducting implicit costs of family labor.

The bottom line for the changwat level furniture industry is not a pretty picture. Returns turn negative as soon as the imputed return to buildings, land and vehicles is deducted and the rate of economic profit is -17.2 percent. The immediate question arises regarding the degree of confidence with which these results can be held. After all, businessmen do not undertake production with the aim of losing money. Why then do we find negative returns to family labor after deducting capital costs? There are several factors which can be noted to help explain the results. Several of the points anticipate arguments of later sections and chapters, but it will be useful to briefly summarize the main considerations here.

First, there is the intractable problem of measurement error. This applies to some extent to all of the data which were collected, but is probably most serious for the total production figures. There is a great deal of reluctance on the part of firm owners/managers to reveal the value of production. Most, if not all, of the sample firms find it convenient to underestimate their sales for taxation purposes. Tax avoidance is a common characteristic of small firms and, in the absence of strict accounting controls by the revenue service, this represents perfectly rational behavior. Unfortunately, there is no way to know the

significance of the underestimation in any reliable way. Several of the sample firms, however, did report to us that their reports to tax officials were from 20 percent to 60 percent of their total revenues.

Secondly, furniture manufacturers often engage in some buying and selling of products to complement their production line. It proved impossible to allocate building and land costs and administrative labor costs to the retailing enterprise. Hence, if the total picture of the firm was available, a somewhat higher return would likely be revealed.

Thirdly, and a major topic of the chapter which follows, there is a major dynamic structural evolution underway in the Thai furniture industry. In recent years there has been a remarkable increase in the volume of products sold through retail stores. This has resulted in an extremely competitive market for furniture. This would tend to force major adjustments in the economies of local producers which would be initially reflected in low returns and negative rates of economic profits. It is not at all clear how these various factors can be systematically accounted for and, therefore, to assess the validity of the economic budgets. It is perhaps more important to focus attention on the relative performance of the various representative firm types keeping the absolute values of the variables in the background. This is the basic approach taken in the comparative analyses which follows.

5.3.2 Variation By Firm Organization

Firm organization in this study has been defined in terms of two criteria: (1) whether a firm is a producer-seller or a producer-retailer; and (2) the type of marketing arrangement among the producer-seller firms. These include job-order production, decorator contracting

and batch contracting. A producer-retailer could choose to organize the marketing of his own production in the same ways as a producer-seller; however, in the sample, all of the producer-retailers are job-order firms. Hence, differences between the job-order producer-sellers and the producer-retailers are ascribed to the combination of manufacturing and resales by the producer-retailers.

The descriptive economic characteristics of each of these four firm types are presented in Table 5.18. In the sample, batch contractors are by far the largest firms in terms of the value of annual production followed by decorators, producer-retailers and job-order firms. However, in terms of the number of employees and annual man-hours, the firms are roughly similar. This immediately implies substantial variations in labor productivity.

Interestingly, the structure of the labor force in man-hours is fairly similar for all producer-sellers, but there are two important differences between these firms and the producer-retailers. First, the producer-retailers are characterized by substantially larger numbers of administrative and sales man-hours, reflecting the existence of reselling in addition to production. Secondly, the skill composition of the total production labor hours is much different in the producer-retailers. They rely to a much greater extent than any of the producer-sellers on unskilled labor. This could be due to the greater need for painters who are generally classified as unskilled workers as a consequence of the need to finish products purchased for resale. Furthermore, this may be a reflection of the type of product manufactured by the producer-retailers which are lower in quality than those of other firms as shown in Section 5.4.1. Wage rates are similar among the firm types except

Table 5.18. Descriptive Characteristics of the Changwat Level
Furniture Industry: Variations by Firm Organization

Characteristic	Producer - Retailer	Producer-Seller		
		Job Order	Decorator	Batch Contract
Annual Production (1,000 ฿)	820.95	666.34	1,039.49	1,771.55
Own Production in Total Sales	.591	1.00	1.00	1.00
Annual Value Added (1,000 ฿)				
% Value Added on Total Output	35.5%	26.6%	37.1%	38.0%
Number of Employees	13.2	13.9	14.1	13.8
Annual Man-hours (% of Total)				
- Administrative and Sales	6,246 (19.3%)	2,511 (7.7%)	872 (3.1%)	2,804 (9.2%)
- Skilled Production	12,462 (38.6%)	20,935 (64.2%)	17,915 (63.6%)	20,293 (66.5%)
- Unskilled Production	13,597 (42.1%)	9,180 (28.1%)	9,367 (33.3%)	7,424 (24.3%)
- Total Production	26,059 (80.7%)	30,115 (92.3%)	27,282 (96.9%)	27,717 (90.8%)
- Skilled/Unskilled	.92	2.28	1.91	2.73
Average Wage Rates (฿ Per Hour)				
- Skilled	11.89	10.43	13.12	10.36
- Unskilled	5.48	4.64	8.63	4.79
- Average Production	8.54	8.67	11.58	8.87
Average Annual Flow of Capital Services (1,000 ฿)				
- Machinery and Equipment	22.96	24.06	6.45	45.63
- Total Fixed Assets	177.91	107.92	53.46	143.60
- % Machinery and Equipment	12.9%	22.3%	12.1%	31.8%
Value Added/Production				
Labor Cost (฿)	1.308	.448	1.219	2.739
(Labor Cost/Value Added)	.765	2.230	.820	.365
Value Added/Machinery and Equipment (฿)	12.676	4.865	59.716	14.757
(Machinery and Equipment/Value Added)	.079	.206	.017	.068

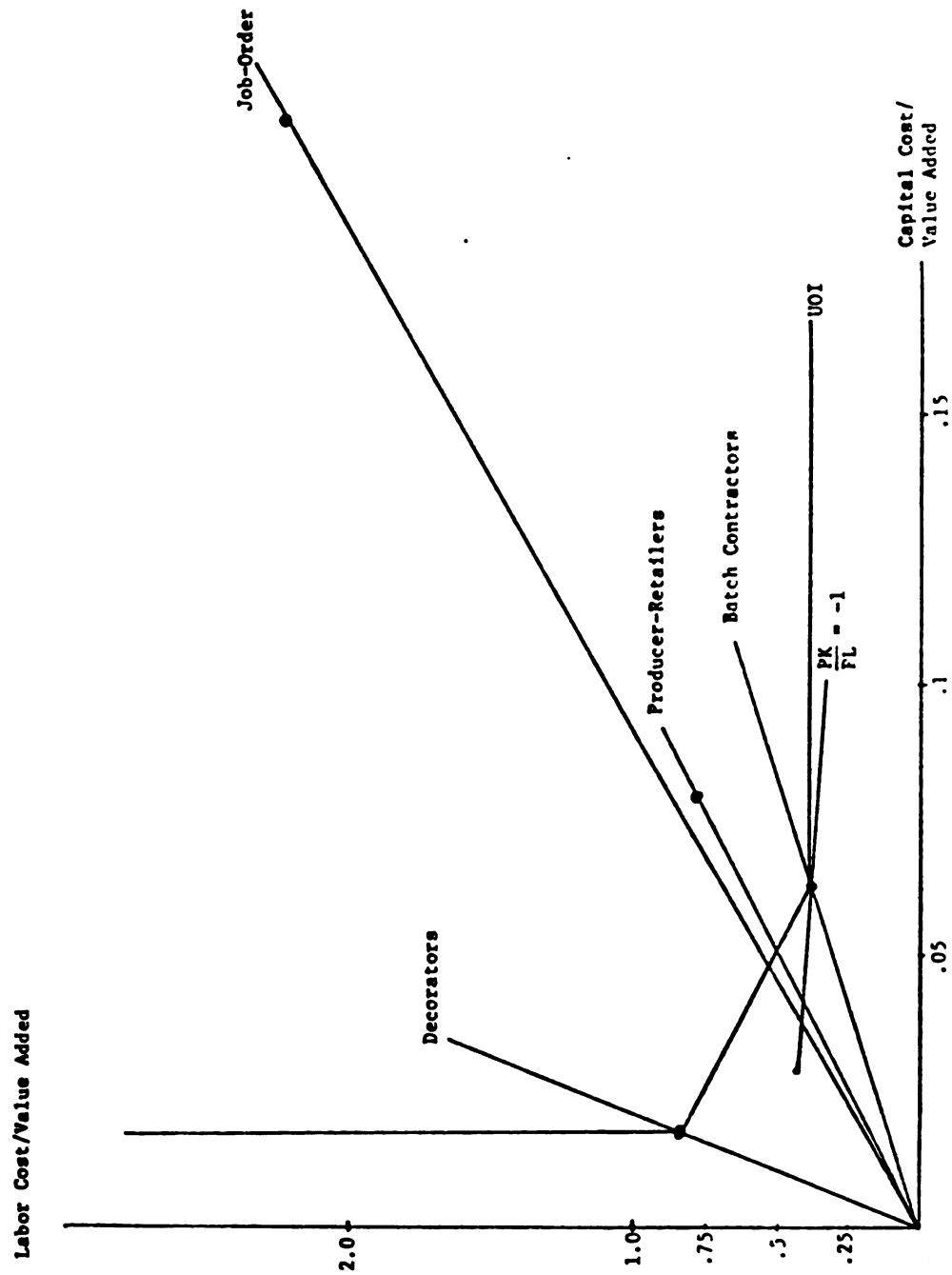
Source: Furniture Industry Study.

for the decorators indicating a relatively greater skill requirement for this type of work.

The cost of capital services for machinery and equipment is greatest in the batch contractors, suggesting that larger capitalization is associated with larger size and specialization in production. The decorators use a relatively small amount of machinery and equipment since they perform much of their work on site and must keep their production tools as portable as possible. Interestingly, the percentage of machinery and equipment in total assets is lowest in the producer-retailers and decorators. This is due to the fact that the building figures for the producer-retailers include that portion of the showroom and factory which are used to furnish and display the items purchased for resale. The low percentage for decorators is a result of the very small value of machinery and equipment.

The efficiency ratios can best be examined in the context of the unit-output isoquant of Figure 5.4. The isoquant (UOI) is constructed as an envelope of the most efficient observations and, therefore, represents a frontier rather than an average isoquant. Relative technical efficiency is measured by the distance of each observation from the isoquant. Batch contract and decorator firms define the isoquant and are, therefore, technically efficient. Both producer-retailers and job-order firms are inefficient, but as can be seen, the producer-retailers perform much better than the job-order firms.

The diagram is drawn in value terms and so by definition the relative price of capital and labor is equal to negative one. The price line meets the isoquant at the coordinate of the batch contractors



Source: Furniture Industry Study.

Figure 5.4. Unit Output Isoquant: Variation by Firm Organization

indicating that these firms are the most economically efficient among the representative firm types.

In part, the differential efficiency may be a product of the measurement error discussed earlier. Contractors engage in fewer transactions which are each quite large. This may improve the ability to recall actual output levels. Job-order producers and producer-retailers, however, are less able to keep track of the total value of all of their many small transactions. It is plausible that this would tend to result in underestimation of output. This would explain some of the efficiency differential. Furthermore, the government contractors have nothing to fear from tax officials since the government knows the volume of business which they perform. Hence, these firms would likely be less inclined to underreport output for tax reasons.

Table 5.19 contains the profitability budget for these firms. Returns to capital and family labor are negative for the job-order firms, but positive for all other firm types. The negative returns for the job-order firms is primarily due to the fact that the hired labor bill is larger than total value added. Returns to family labor and building, land and vehicles follow the same sign pattern. Returns to family labor are negative for both producer-retailers and job-order producer-sellers, but are positive for both types of contractors. Economic profits are quite high for the batch contractors, positive for decorators and negative for the other two firm types.

The superior performance of the government batch contractors could be due to a number of factors including their larger size, higher degree of capitalization, gains from specialization or possibly from generous contract terms. The decorators do well perhaps because they are dealing

Table 5.19. Profitability Budget for Changwat Level Furniture Industry:
Variation by Firm Organization

Account Item	Producer-Seller			
	Producer-Retailer	Job-Order	Decorator Single Order Contract	Government Batch Contract
Total Output (1,000 ฿)	820.95 (100)	666.34 (100)	1,039.41 (100)	1,771.55 (100)
Materials Cost (1,000 ฿)	470.43 (57.5)	405.76 (60.9)	569.48 (54.8)	1,011.90 (57.1)
Overhead Cost (1,000 ฿)	59.48 (7.2)	83.52 (12.5)	84.76 (8.2)	86.28 (4.9)
Hired Labor Costs (1,000 ฿)				
- Administrative	3.58	11.48	0	6.75
- Production	203.60	236.96	271.1	209.66
- Worker Benefits	24.48	6.93	0	12.60
- Total Labor Cost	231.66 (28.2)	255.37 (38.3)	271.1 (26.1)	229.01 (12.9)
Capital Costs (1,000 ฿)				
- Machinery and Equipment	22.96	24.06	6.45	45.63
- Building, Land and Vehicles	154.95	83.86	47.01	97.98
- Total Capital Costs	177.91 (21.7)	107.92 (16.2)	53.46 (5.1)	143.60 (8.1)
Capital Stock (1,000 ฿)	1,073.25	600.11	277.53	970.72

Total Returns to Capital and Family Labor (1,000 ฿)	59.38	-78.31	113.76	444.37
Returns to Family Labor and Building, Land and Vehicles (1,000 ฿)				
- Gross	36.42	-102.37	107.32	398.74
- Per Hour of Family Labor	.004	-.029	.025	.209
Returns to Family Labor				
- Gross (1,000 ฿)	-118.53	-186.56	60.31	300.76
- Per Hour of Family Labor	-.017	-.052	.014	.158
Economic Profits				
- Gross (1,000 ฿)	-196.12	-223.49	2.94	281.03
- Rate of Profit	-18.27%	-37.24%	1.1%	29.0%

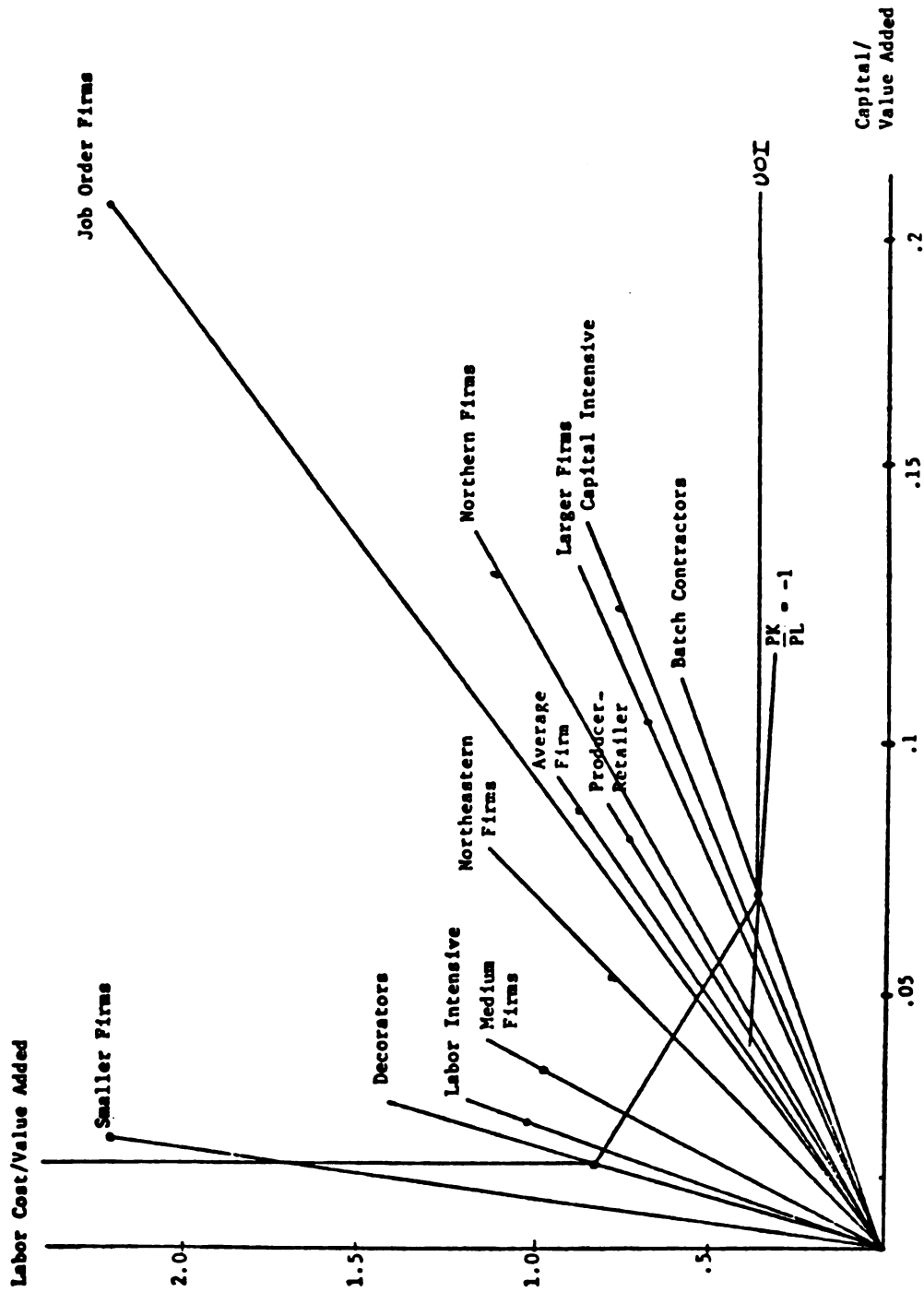
Source: Furniture Industry Study.

in a relatively high income market and the fact that they sell a service along with the furniture items. Producer-retailers fare better than job-order firms possibly because they are better able to choose the advantageous mix of products to manufacture or because of the relatively larger batches of products which they produce.

5.3.3 Summary of Additional Budget Analyses

Budgets were constructed and analyzed for representative firms based on relative firm size, technology of production and firm location. Firms were broken down into three size categories, large, medium and small based on an index of size rankings by output, capital service flow and man-hours of production labor. For the technology budget firms were grouped into relatively labor intensive firms and relatively capital intensive firms based on the capital labor ratio. The location groupings were for the North and Northeast. The summary results of these analyses are reported in Figure 5.5 and Table 5.20. The complete budgets are contained in Appendix B.

Figure 5.5 summarizes the efficiency analysis in the unit-output isoquant diagram. The isoquant is defined by the decorators and batch contractors and the most distant outlier is represented by the job-order firms. This suggests that the most important variation is due to firm organization with size, location and technology secondary considerations. It would be useful to attempt to disentangle the relative importance of technology, size, location and marketing; however, given the small sample size the cells would be exceedingly small for a reliable multivariate analysis of variance. The diagram illustrates that the larger sample firms are more efficient than medium and smaller firms; the relatively capital intensive firms perform better than the relatively labor



Source: Furniture Industry Study.

Figure 5.5. Summary of Budget Efficiency Analysis by Representative Firm Type

Table 5.20. Summary of Economic Profit Rates by
Representative Firm Types

Type of Firm	Economic Profit Rate
Batch Contractor	29.0%
Single Order Contractor	1.1%
Larger Firms	-10.0%
Capital Intensive Firms	-10.0%
Northeastern Firms	-11.8%
Job-Order/Small Batch	-16.8%
Average Firm	-17.2%
Labor Intensive Firms	-23.3%
Medium Firms	-23.9%
Northern Firms	-26.2%
Job-Order Firms	-32.9%
Smaller Firms	-50.5%

Source: Furniture Industry Study.

intensive firms; and the Northeastern firms are as a group, more efficient than Northern firms.

Table 5.20 ranks the representative firm types by the economic profit rate. These results are completely consistent with the efficiency analysis. The only firms with positive economic profit rates are the contract firms. After imputing returns to family labor, those firms showing profit rates of more than -12 percent are earning some financial profit. For the average firm and those below it on the list, both economic and "imputed" financial profits are negative. The data indicate that the most successful producers in the changwat level furniture industry are larger, capital intensive firms. Performance is also improved through the development of contract marketing arrangements as opposed to exclusive job-order producers.

5.4 The Technical Efficiency of Furniture Production

In the previous section it was possible to make certain statements concerning the relative technical efficiency of the various representative firm types. The statements were based on comparisons of the productivity of capital and labor for the firms. If a representative firm used less capital and labor per unit of output than another, it was said to be more technically efficient. When one firm was more efficient in the use of one factor, but less efficient in the use of the other, it was, however, not possible to say anything about relative technical efficiency. In the analytical framework of the previous section, both firms were presumed to be technically efficient and relative efficiency comparisons were made in terms of allocative efficiency.

Neoclassical production theory is predicated on the assumption that the production function represents the "maximum output obtainable from

every possible input combination" (Henderson and Quandt, p. 54). This presupposes technical efficiency which according to a popular text is, "...a technical, not an economic problem" (Henderson and Quandt, p. 54). Recent interest in intra-firm allocative decision making and the view that growth and technological change is somehow related to the difference between "best" and "average" practices in the economy has begun to persuade economists that the study of technical efficiency is an important and worthwhile endeavor. With Farrell's 1957 work on technical efficiency as a foundation, a rather substantial volume of literature on the subject has emerged since the early 1970s.⁹

The general objectives and approach of technical efficiency analysis can be illustrated with the standard unit-output isoquant of Figure 5.6. Assume that all firms in an industry employ two factors of production, capital and labor, have equal access to the same technology characterized by constant returns to scale and face the same economic environment. Data collected on each firm's production decisions reveal the scatter of observations in the diagram. Given the above assumption the immediate implication is that firms vary in the degree to which they combine factors (allocative efficiency) and in the level of output they obtain from the combination of factors employed (technical efficiency). Conventional production estimates would define an average isoquant similar to I_p . Variation around the isoquant is due to measurement or specification error. The issue of technical efficiency is ignored.

⁹An excellent review of the history and summary of the state of the art on technical efficiency can be found in Forsund, Lovell and Schmidt (1980).

The objective of technical efficiency analysis is to generate an isoquant which represents "best practice" techniques in the industry. This implies that all observations must lie on or above the isoquant. This is an envelope or boundry function derived from what is termed the frontier production function. Such an isoquant is represented by I_F in the diagram. The degree of technical efficiency of each observation can then be measured as its relative distance from the frontier isoquant along a ray from the origin.

There are several approaches to the specification and estimation of frontier production functions. The techniques are differentiated according to whether the frontier is specified as a parametric function or not, whether an explicit statistical model of the frontier and observed output is made and whether the frontier is deterministic or random (Forsund et al., 1980). The approach followed here is parametric, in that a functional form is specified, and deterministic in that parameters are estimated by linear programming techniques. This is similar to the general approach taken by Timmer (1970, 1971) among others. A Cobb-Douglas and a translog functional form were estimated with essentially similar results. The Cobb-Douglas case is reported here.

Formally and in general terms the model to be estimated is based on the production frontier:

$$y_i = f(x_{ij}) \leq \hat{y}_i \quad i = 1, \dots, n \quad (5.9)$$

where y_i is actual output; $\hat{y}_i$ is estimated output; and the other variables are defined as in the production function analysis. Notice that the inequality imposes the constraint that all observations be in the interior of the production surface. Therefore, all estimated outputs, $\hat{y}_i$ will always be greater than or equal to actual output, y_i . All

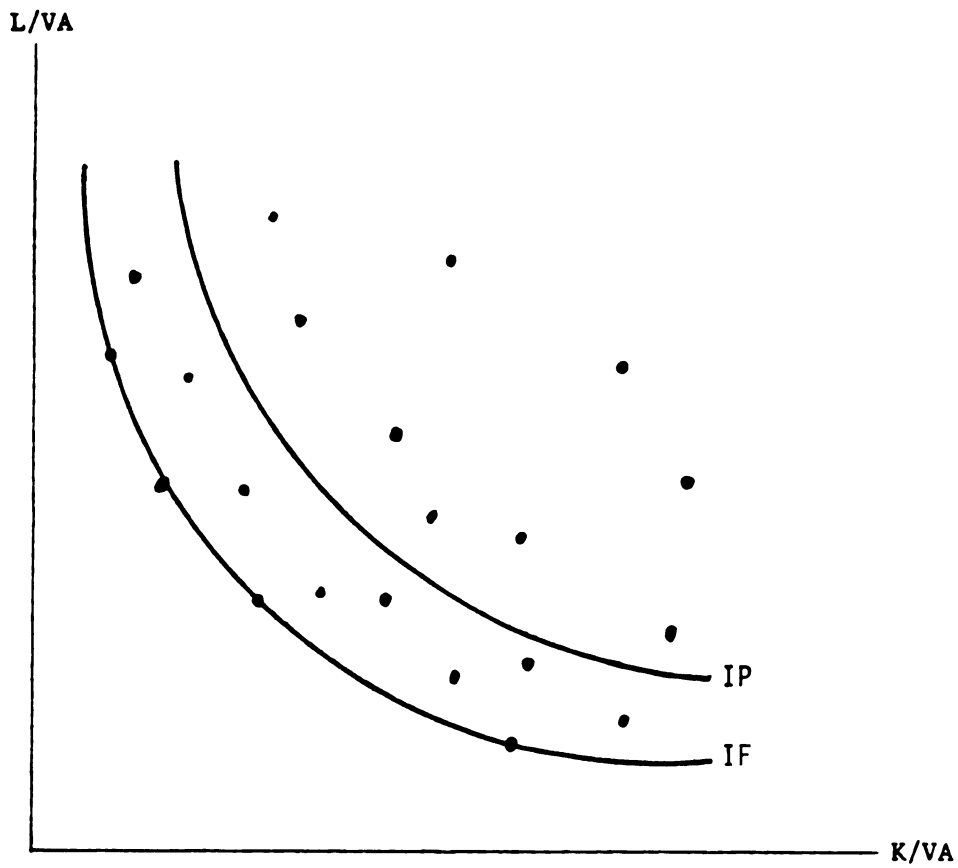


Figure 5.6. Average and Frontier Unit Output Isoquants

technically efficient observations will lie on the frontier and, therefore, satisfy the equality $y_i = \hat{y}_i$. Inefficient producers lie inside the surface and, thus, $\hat{y}_i > y_i$. One index of relative technical efficiency is, therefore, $T = y_i/\hat{y}_i$ and $0 \leq T < 1$.

Before describing the exact estimating equations and formulations, a word should be said about the data used in the analysis. The emphasis of the ROFEAP was placed on obtaining information on product profitability and efficiency rather than on the firm level data used in the production function and budget analysis. The rationale for the product approach is argued elsewhere (Mead and Artkongharn, 1980). It was decided to apply the technical efficiency analyses to the product data. This focuses attention on the efficiency of the product-by-product process rather than on the characteristics of the firm and reduces the problem of measurement error in the aggregate output figures.

For 15 of the 19 sample furniture producers data were collected on the costs incurred in the production of between two and four products. These products are assumed to be representative of each firm's total output. There are a total of 43 observations. Output is measured by the sales price of the product. Three inputs are specified: raw materials, labor and capital. Materials are measured by the cost of raw material used in the production of the product, labor is measured in man-hours and capital, imputed from firm level capital labor ratios, is measured in Baht of machinery and equipment used.

The estimating form of the Cobb-Douglas production function is:

$$\ln y_i = \ln \alpha_0 + \beta_1 \ln M_i + \beta_2 \ln L_i + \beta_3 \ln K_i + \mu_i \quad (5.10)$$

Parameters are estimated by minimizing the sum of the deviations of $\ln y_i$ from $\ln \hat{y}_i$ subject to the constraints that all deviations be less than or

equal to zero and that all coefficients be nonnegative. The linear programming problem can be written as:

$$\text{Minimize: } \sum_{i=1}^n u_i = \sum_{i=1}^n (\ln \hat{\alpha}_0 + \hat{\beta}_1 \ln M_i + \hat{\beta}_2 \ln L_i + \hat{\beta}_3 \ln K_i - y_i) \quad (5.11)$$

Subject to:

$$\ln \alpha_0 + \hat{\beta}_1 \ln M_i + \hat{\beta}_2 \ln L_i + \hat{\beta}_3 \ln K_i \geq y_i, \quad i = 1, \dots, n, \text{ and}$$

$$\beta_1, \beta_2, \beta_3 \geq 0.$$

This problem can easily be solved by any linear programming computer package.

A rather serious difficulty associated with the use of a deterministic frontier is that the location of the surface is particularly sensitive to extreme observations. By definition the frontier is determined by outliers. This makes estimates extremely sensitive to measurement error. Two ways of minimizing the seriousness of this problem are available. The first is to specify the objective function in terms of the sum of error terms rather than the sum of squared error terms. Secondly, following Timmer (1970, 1971), the frontier can be reestimated after dropping a portion of the extreme observations. The observations are selected on the basis of the highest shadow prices among the frontier firms. This procedure makes the frontier "probabilistic" according to Timmer's terminology.

The Cobb-Douglas frontier estimates are presented in Table 5.21. An average CD function has also been estimated by OLS for comparative purposes. The programming coefficients (LP) are reported for runs with all observations (LP-0) and then twice removing two frontier observations each time (LP-2, LP-4). As can be seen, specifying the production

Table 5.21. Estimates of Cobb-Douglas Production Frontier and Average Production Function

Coefficient	Estimating Equation			
	OLS ^a	LP-0	LP-2	LP-4
Constant	1.108 (.198)	1.639	1.531	1.497
Materials	.916 (.043)	.850	.809	.807
Labor	.001 (.058)	.077	.168	.174
Capital	.005 (.027)	.000	.004	.010
$\bar{R}^2$	.96	--	--	--
Mean Level of Technical Efficiency	1.0	.736	--	--

^aStandard errors in parentheses.

Source: Furniture Industry Study.

function in terms of products and three inputs including materials creates a rather puzzling picture of production. The only statistically significant output elasticity is for raw materials. While the coefficients for labor and capital are positive, they cannot be said to be statistically different from zero with any degree of confidence. The OLS average function does possess excellent goodness of fit, $\bar{R}^2 = .96$ and the predictive power of the model is, therefore, high. These statistical results can, at best, be considered approximate indicators of the statistical properties of the LP estimates.

The stability of the LP estimates after discarding observations is satisfactory. The limited number of observations and their rather large variance around mean values almost guarantees that the frontier will move when observations are removed. The constant term tends to converge to the average values, while the output elasticities all diverge. Hence, the frontier is not a neutral transformation of the average function and, therefore, estimates of technical efficiency derived from the analysis of the residuals of the average function are inappropriate. Spearman's rank correlation of observation specific efficiency rankings is only slightly sensitive to the removal of observations. The analysis which follows, therefore, is based on technical efficiency estimates computed from the LP-0 coefficients.

Observation specific indices of technical efficiency have been computed. The sample mean level of technical efficiency is .736. More interesting than the level of efficiency is the variation in efficiency. The standard deviation around the mean is .134 and the coefficient of variation, $\sigma/\bar{X}$ is 18.2 percent. This does not indicate wide variability, but it does document that a range of degrees of technical efficiency exist. In other words, products are manufactured with different levels of efficiency.

Given the observation specific indices, the next step is to aggregate this information in order to derive a firm specific efficiency indicator. It is plausible, however, that the variation in efficiency may reflect differences in the products enumerated rather than differences in firm efficiency. An analysis of variance was performed on the data grouped by products. The F statistic is .01 which discounts the significance of any relationship between product type and technical

efficiency. Analysis of variance was also used to test the existence of a relationship between the firm and the observational efficiency index. Again, no such relationship was found as the associated F statistic is .65. This implies that even within the same firm there is significant variation in the technical efficiency of production.

Firm specific technical efficiency indices are presented in Table 5.22. The most efficient firm has an index of .89. This firm is one of the largest and the most capital intensive producers. It is also one of the government contract firms. The least efficient firm is the smallest firm in the sample, basically a one man operation, which produces exclusively on a job-order basis. At least in the extremes, then the measures of efficiency used here are quite plausible. It is a simple matter to generate efficiency indices for each of the representative firm types analyzed earlier. These are drawn from a subset of the sample used in the budget analysis and so there may be some bias in the estimates which, of course, is unknown. In any case, these figures are reported in Table 5.23.

Capital intensive firms are slightly more technically efficient than the labor intensive firms. The difference is probably small as a result of the small weights attached to capital and labor in the production frontier. Differentiated by firm size, a clear pattern emerges of higher levels of technical efficiency associated with larger size. There is quite a substantial difference between the smallest firms and the largest firms. Locational analysis also reveals a clear difference with Northern firms, much less technically efficient than Northeastern firms. The breakdown by firm organization shows that the batch contractors are

Table 5.22. Firm Specific Indices of Technical Efficiency

Firm ID	N	Technical Efficiency Index
1	2	.570
2	2	.645
3	2	.763
4	2	.754
6	2	.635
7	2	.637
8	3	.695
10	3	.784
11	4	.762
12	4	.778
13	4	.719
14	3	.843
16	4	.761
18	4	.705
19	2	.889

Source: Furniture Industry Study.

Table 5.23. Technical Efficiency by Representative Firm Type

Type of Firm	N	Technical Efficiency Index
Average Firm	15	.729
Labor Intensive Firm	9	.717
Capital Intensive Firm	6	.747
Smaller Firm	6	.693
Medium Firm	3	.716
Larger Firm	6	.771
Northern Firm	7	.671
Northeastern Firm	8	.780
Producer-Retailer	5	.732
Producer-Sellers		
- Job-Order Firm	7	.694
- Single-Order Contractor	1	.754
- Batch Contractor	2	.833

Source: Furniture Industry Study.

most efficient, followed by the decorator, the producer-retailers and the job-order firms.

The results of this section add additional weight to the findings of the budget analysis. In every case, the technical efficiency of product level manufacturing corresponds to the relative efficiency of the various types of firms. The firms that are performing badly, in general, are also less technically efficient. This implies that technical assistance in production can be an important component of any overall assistance package.

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5.5 A Brief Analysis of Product Profitability

Given the product level data used in the previous section, it is possible to estimate the profitability of furniture production on a product-by-product basis. This can provide an independent check of the firm profitability data reported in the budget analysis and also can provide some insight into the types of products which generate the highest return.

The measure of profit used in this section is simply the difference between sales price and total cost. This can be expressed in money terms, as a percentage of sales price or as a percentage of total cost. Total cost includes the costs of materials, labor, capital and overhead expenses. Materials and labor used in the manufacturing of each product are taken directly from the product profitability questionnaire. Capital cost is computed on a firm basis using the firm's capital-labor ratio and the actual amount of labor used. Overhead costs are imputed from the percentage of overhead costs in the total value of each firm's production over the course of the survey year. Data were available for 43 products from 15 of the sample firms.

Table 5.24 reports the average percentage profit in final sales price by product type. There is a surprisingly narrow range in the percentage of profit, varying from 24.5 percent to 35.9 percent. Table 5.25 examines the profit data by firm organization. The differences here are also small with values ranging from 27.1 percent for job-order firms to 35.0 percent for the decorators. Producer-retailers have a higher product profit rate than job-order firms.

Table 5.26 groups products by their final sales price. The very interesting result emerges that in all but one of the price ranges, the

Table 5.24. Percentage Profit in Sales Price by
Product Type: Product Data

Product Type	Sample Size	Average Percentage Profit in Sales Price
Wardrobes	11	27.8%
Tables	6	27.5%
Sideboards	3	24.5%
Cupboards	5	33.7%
Chairs	2	35.9%
Desks	12	31.1%
Beds	4	32.3%

Source: ROFEAP Study.

Table 5.25. Percentage Profit in Product Sales Price by
Firm Type: Product Data

Firm Type	Sample Size	Average Percentage Profit in Sales Price
Producer-Retailer	17	31.7%
Producer-Seller		
- Job-Order	18	27.1%
- Decorator	2	35.0%
- Batch Contractor	6	31.8%

Source: ROFEAP Study.

Table 5.26. Net Returns and Profit Rate on Products in ROFEAP Town Sample by Sales Price

Sales Price Range (฿)	Sample Size	Average Net Returns (Baht) ^a	Average Percentage Profit in Sales Price
0-499	4	96	30.1%
500-999	9	240	31.5%
1,000-1,499	8	374	32.2%
1,500-1,999	6	527	31.9%
2,000-2,499	6	649	31.7%
2,500-4,999	6	600	19.8%
5,000 +	4	3,499	31.0%

^aNet Returns = Product Price - Materials Cost - Labor Cost - Imputed Capital Cost - Imputed Overhead Cost.

Source: ROFEAP Study.

profit rate is between 30.1 percent and 32.2 percent. However, in products in the 2,500-4,999 Baht range, the profit rate drops to 19.8 percent. One possible explanation for this pattern is related to competition with resold products. A large portion of the products which are imported into the changwat level system from Bangkok would fall into the 2,500 to 4,999 Baht price range. One could hypothesize that in this medium-high quality range, profits are lower due to competition from products imported into the area, especially from Bangkok.

It is necessary to comment on the obvious disparity between the positive profit rates associated with individual products and the low or negative returns reported in the firm budget analysis. The primary

source of the incongruity lies in the differences in labor costs used in the two approaches. In the firm budget study labor cost is computed on the basis of the total man-hours of labor employed over the course of the survey year. For the product analysis, however, labor cost was determined by asking managers the quantity and value of labor time involved in the manufacturing of each specified product. It turns out that there is a rather substantial difference between the labor required to produce the total output of a firm and the quantity of labor actually employed by the business.

This disparity can arise from either or both of two sources. First, there is the possibility that there is a significant amount of idle labor time in the firms. This would be empirically reflected as a difference between necessary and actual labor use. Alternatively, managers may have underreported their output volume which would result in the same situation. Unfortunately, there is no reliable way to discriminate between these two hypotheses. It is suspected that both explanations are valid to some extent. Some idle labor time was observed during the interviews, but probably not enough to cause the degree of incongruity found in the profit figures. Hence, both factors are likely to be involved.

5.6 A Brief Note on the Production of Furniture Outside the Sample Firms

The production analyses of this chapter have been based on a sample of 19 wooden furniture manufacturers from the ROFEAP research areas. It is important to briefly consider the economics of production in several other types of manufacturers found in the Thai furniture industry. Of primary concern were changwat level upholstery firms, regional medium-scale producer-sellers and Bangkok based small- and large-scale firms.

The analyses of this section will attempt to highlight the unique characteristics and advantages and disadvantages of these production types.

5.6.1 Changwat Level Upholstery Manufacturing

Within the last three years, four new firms were established in the research areas which manufacture and distribute upholstered furniture. This type of product has been produced in Bangkok for some time and was typically one of the products retailed up-country. The successful establishment of these up-country upholstery producers may alter the relative competitive advantage once held in Bangkok.

Three of the four firms were interviewed during the course of the research. There are two firms in Amphoe Muang, Khon Kaen which have been in operation for one year and two years, respectively. Both were established by people who had formerly been employed as skilled workers in Bangkok firms. One was contacted about the possibility of decorating the interior of a new hotel in Khon Kaen through a friend and used this opportunity to set up the business in Khon Kaen. The other wanted to start his own business and decided that this would be a good location. The key reasons for locating in Khon Kaen given by both managers is that labor is much cheaper there¹⁰ and that it is cheaper to transport materials than finished products from Bangkok. The two firms are not direct competitors as one sells primarily to retail stores and the other does decoration and special order work. As a result, both firms are

¹⁰The differential labor cost is substantial. According to one of the managers, wages are 200 percent higher in Bangkok for skilled labor and about 40 percent higher for unskilled labor. This represents a total production cost savings of approximately 12 percent for the Khon Kaen location. This compares with a 5-7 percent cost for transporting finished goods from Bangkok to Khon Kaen.

doing well. They are producing at capacity and profits are high. Both plan to expand in the near future.

The other two firms are in Amphoe Muang, Chiang Mai. One was interviewed, and the story here is slightly different. This firm was an established wooden furniture manufacturer. Observing the increasing popularity of Bangkok produced upholstery furniture in Chiang Mai, he hired a skilled worker from Bangkok to set up a production unit at his factory. Currently, there are only two skilled upholsterers in the firm, but the manager has hired new trainees in order to expand the enterprise. He is also considering abandoning wooden furniture due to the high demand and profits in the upholstery enterprise.

5.6.2 Regional Medium-Scale Producer-Sellers

The regional medium-scale manufacturers were discussed briefly in Chapter 2, Section 2.3.5. Essentially, these are changwat level firms which have grown and now export their products to other changwats. They are characterized by the fact that they manufacture medium-low quality products and, therefore, serve a more rural, geographically dispersed market than the sample firms. The advantage of this type of firm comes from their larger size and associated larger batch size production. They produce for inventory rather than to individual consumer orders.

5.6.3 Bangkok Manufacturers

Information on Bangkok based producer-sellers was presented in Chapter 2, Section 2.3.5 and in Chapter 4, Section 4.2.2. What needs to be highlighted in the context of this chapter is that the large-scale, modern Bangkok firms are in a different league than the sample changwat level producers with respect to production efficiency. As shown in

Table 4.15, the one manufacturer that provided reliable information is substantially more efficient with respect to the use of both labor and capital than the changwat level firms. This suggests that this type of producer is likely to be able to compete effectively from a production cost point of view in any market area chosen. As will be discussed in the following chapter, the actions of these firms will set the parameters of the opportunities open to the changwat level manufacturers.

The smaller Bangkok firms are much like the changwat level firms in many respects, including production technology and size. The larger market size in Bangkok, however, permits a degree of specialization not open to the changwat level manufacturer at this time. Labor is somewhat more expensive in Bangkok, but the product quality is also consistently higher, reflecting a higher skill content of the Bangkok labor force. These smaller Bangkok manufacturers are likely to remain an important source of competition in the higher product quality lines in up-country markets.

5.7 Summary and Conclusions

This chapter has reported a good deal of descriptive and analytical information regarding the production of furniture in Thailand, not all of which is amenable to a brief summary. Instead of trying to review the details of the preceding analysis, this summary will attempt to identify the key findings which bear most importantly on the economic potential of the changwat level furniture industry.

From the standpoint of the objective of this study the most interesting and significant finding of this chapter relates to the consistent relationship found between economic performance and firm organization.

The most profitable firms, as seen in the budget analysis, are those firms which have chosen to market their output through contractual relations, whether with batch government contracts or single order decoration contracts. The key to understanding the relative performance of these firm types may only partially be in the fact that a contract is used. For the government contractors the advantage most likely arises from the degree of specialization achieved in production. The decorators do well primarily because they have combined furniture manufacturing with the sale of a complementary service. In both cases, the firms have managed to secure a market niche in which they can profitably compete.

In the comparison of the producer-retailers and job-order producer-sellers the issue of firm organization is also highlighted. These two classes of firms are essentially similar in the marketing of their own production, but differ as a consequence of the fact that one class of firm combines production with reselling. In the sample of firms studied this difference in firm organization seems to impart certain advantages to the producer-retailer which are evident in comparative analysis of their respective manufacturing enterprises. In the budget analysis, for example, the producer-retailers perform significantly better than the job-order producer-sellers. This may be the result of greater specialization evidenced by the larger batch size of the producer-retailers or simply that these firms make better informed decisions about the types of products to produce.

It should be noted that the results of the budget breakdowns by firm size, technology and location show less variation than by firm organization, suggesting the dominant importance of organization. Furthermore, the finding of constant returns to scale in production function

analysis suggests that advantages are not the result of firm size. The primary determinants of performance are, therefore, attributed to batch size and the ability to organize production for the appropriate market niche.

The technical efficiency analysis confirms these findings about firm organization. With the exception of the decorators, whose final price includes a service fee which biases the results in their favor, the technical efficiency of production is closely related to the degree of specialization. Since these data are, in large part, independent of the firm level data, the strength of this confirmation is reassuring.

The product profitability data reveal that individual products are consistently priced to earn a reasonably high return on the direct costs of production. If the absolute level of profits reported in the firm budgets are, in fact, true (there is some doubt about this, however), then the incongruity between the product level and firm level analysis has an important implication. It suggests that the problem of low profits is less due to purely technical factors of the production process¹¹ than to the ability to organize the firm in such a way that factors of production are fully utilized. This may imply general management deficiencies or a more fundamental problem of not manufacturing the right products for the right market.

¹¹ The technical efficiency analysis found, however, that there is also variation in performance along this dimension.

CHAPTER 6

FORCES AFFECTING THE DEVELOPMENT OF THE FURNITURE INDUSTRY IN THAILAND

6.0 Introduction

The preceding chapters have described and analyzed some of the salient characteristics of the Thai furniture industry. The objective of this chapter is to attempt to take the analysis a step further and examine those forces which are most likely to shape the dynamic evolution of the industry. The primary focus of the analysis is on the development of the changwat level furniture industry. However, as has been argued earlier, the evolution of the changwat level production-distribution system cannot be understood independently of the overall growth and development of other components of the industry. There is, therefore, a need to assess the competitive interrelationships which will effect the structural evolution of the changwat level system, as well as the forces which will determine the position of this sytem in the industry's overall composition.

6.1 Problem Areas and Constraints Facing the Furniture Industry

Businesses face problems and constraints every day in the normal course of their operations. Success in handling problems and in adjusting to constraints are the signs of effective management. Some problems facing an industry, however, are particularly persistent, troublesome and widely felt by a substantial number of firms. These more serious

issues can exert a powerful influence on the development of the industry. This section examines several of the problem areas which are likely to exert significant influence on the growth and development of the Thai furniture industry. The first step is to identify those issues which are worthy of more detailed discussion.

6.1.1 Overview of the Problem Areas Facing the Furniture Industry

The most straightforward way of learning about problems and constraints is to systematically ask businessmen what issues concern them most. The subjective assessment of problems facing furniture manufacturers was sought from the 19 sample producers. Managers were read a list of 15 potential problem areas and asked to indicate those which applied to their businesses. They were also requested to identify the three areas which were considered most serious. The results of these interviews are reported in Table 6.1. For now, the only column of interest is the "total" category. Reference is made to the breakdowns in the discussion of the particular problem areas. The most frequently cited concerns and the percentage of sample firms reporting each area were:

(1) Rising prices of inputs (wood)	74 percent
(2) Lack of cash or working capital	58 percent
(3) Shortage of inputs (wood)	53 percent
(4) Seasonal shortage of unskilled labor	47 percent
(5) Shortage of skilled workers	42 percent
(6) Problems with official (wood) regulations	42 percent
(7) Too much competition between producers	42 percent

Each of these were also considered among the most serious problems by most of the firms reporting the problems.

Table 6.1. Firm Manager's Subjective Assessment of Problems Facing the Changwat Level Furniture Industry by Representative Firm Type

Percentage of Firms Reporting Each Problem as Significant (and the Proportion of Those Who Considered it Among Their Three Most Serious Problems); Variation by Firm Type																	
	Total Sample	Location		Firm Size			Technology			Firm Organization			Product Quality				
		North	Northeast	Small	Medium	Large	K	L	P/R	J0	D	BC	Low	Medium	High		
N	19	8	11	6	6	7	8	11	5	9	3	2	6	8	5		
1. Demand Decreasing or Little Demand	16% (33%)	25 (-)	9 (100)	17 (-)	17 (100)	14 (-)	13 (-)	18 (50)	20 (100)	22 (-)	- (-)	- (-)	33 (50)	13 (-)	- (-)		
2. Don't Know Types of Products Demanded	16% (33%)	25 (-)	9 (100)	17 (-)	17 (100)	14 (-)	13 (-)	18 (50)	20 (100)	22 (-)	- (-)	- (-)	17 (100)	25 (-)	- (-)		
3. Monopsony or Oligopsony	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)		
4. Too Much Competition Between Producers	42% (38%)	50 (25)	36 (50)	33 (-)	50 (67)	43 (33)	50 (50)	36 (25)	40 (-)	22 (50)	33 (100)	50 (100)	50 (33)	38 (33)	40 (50)		
5. Substitute Products Compete for Market Share	21% (-)	38 (-)	9 (-)	17 (-)	17 (-)	29 (-)	25 (-)	18 (-)	20 (-)	33 (-)	- (-)	- (-)	17 (25)	25 (-)	20 (-)		
6. Rising Prices of Inputs	74% (64%)	88 (43)	64 (86)	83 (60)	83 (80)	57 (37)	75 (67)	73 (63)	60 (67)	89 (50)	66 (60)	50 (100)	100 (67)	75 (67)	40 (50)		
7. Lack of Cash or Working Capital	58% (82%)	63 (80)	55 (83)	50 (100)	50 (67)	71 (80)	63 (83)	55 (83)	60 (67)	78 (86)	33 (100)	- (-)	67 (75)	50 (75)	60 (100)		
8. Lack of Technical Advice	11% (-)	25 (-)	- (-)	17 (-)	- (-)	14 (-)	13 (-)	9 (-)	- (-)	22 (-)	- (-)	- (-)	17 (13)	13 (-)	- (-)		
9. Shortage of Skilled Workers	42% (75%)	50 (50)	36 (50)	50 (67)	33 (50)	43 (67)	25 (50)	55 (67)	- (-)	44 (75)	66 (50)	100 (50)	33 (100)	38 (100)	60 (67)		
10. Seasonal Shortage of Unskilled Workers	47% (78%)	38 (100)	55 (83)	33 (100)	50 (67)	57 (100)	38 (100)	55 (67)	60 (100)	33 (100)	66 (50)	50 (100)	17 (100)	50 (100)	80 (75)		
11. Shortage of Wood Inputs	53% (80%)	100 (100)	18 (50)	50 (100)	50 (67)	57 (100)	63 (100)	45 (80)	20 (100)	67 (100)	66 (50)	50 (100)	17 (100)	75 (100)	40 (50)		
12. Shortage of Equipment or Spare Parts	21% (25%)	38 (-)	9 (100)	50 (33)	- (-)	14 (-)	13 (-)	27 (33)	- (-)	44 (25)	- (-)	- (-)	50 (67)	13 (-)	20 (-)		
13. Machinery, Equipment Out of Date	5% (-)	13 (-)	- (-)	17 (-)	- (-)	- (-)	- (-)	9 (-)	- (-)	11 (-)	- (-)	- (-)	13 (-)	- (-)	- (-)		
14. Problems from Wood Regulations	42% (75%)	63 (80)	27 (67)	67 (75)	33 (50)	29 (100)	13 (100)	64 (71)	20 (100)	44 (75)	66 (55)	50 (100)	13 (100)	50 (75)	60 (67)		
15. Laws Regarding Firms' Operations	5% (-)	13 (-)	- (-)	- (-)	- (-)	14 (-)	13 (-)	- (-)	- (-)	11 (-)	- (-)	- (-)	- (-)	13 (-)	- (-)		
16. Other																	
a. No Retail Outlet	5% (100%)	- (-)	9 (100)	- (-)	17 (100)	- (-)	- (-)	9 (100)	- (-)	11 (100)	- (-)	- (-)	- (-)	13 (100)	- (-)		
b. Workers Not Responsible	11% (50%)	13 (-)	9 (100)	- (-)	17 (100)	14 (-)	13 (-)	9 (100)	20 (-)	- (-)	33 (100)	- (-)	- (-)	13 (-)	20 (100)		

Source: ROFEAP Survey.

These subjective assessments are consistent with the assessment of the potentially most interesting problem areas facing the industry based on interviews with various participants in the industry. They also are consistent with the less systematic, informal interviews with nonsample businessmen in other changwats, Bangkok and in villages. The only issue which is not contained in the list and was not asked of the interviewees concerns the quality of firm management. However, this will be included in the discussion which follows. These eight major concerns can be grouped under four headings: wood supply and regulation, labor, finance, problems of competition and management. Each is discussed in turn below.

Firms were also asked late in the survey year about the problems they would encounter if they were to increase their overall level of production by 25 percent. The results of this inquiry is reported in Table 6.2. Interestingly, 67 percent of the sample firms felt that they would have little trouble selling this additional amount of output. The other results of this question will be presented in the individual problem area discussions that follow.

6.1.2 Problem Area: Wood and Wood Regulations

The wood situation was previously discussed in Chapter 5. There it was noted that for both plywood and structural woods the future outlook is not bright. Producers complained about rising prices and shortages at the present time and, as reported in Chapter 5, anticipate more problems five years from now. The problem is very real and may pose a most difficult adjustment for the Thai furniture industry. The Thai government began to realize the seriousness of its forest depletion in the early 1960s. The first timber species to come under strict

Table 6.2. Perceptions of Constraints to Expanded Production in the
Changwat Level Furniture Industry

	Percentage of Firms Answering Positively																
	Total	Location		Firm Size			Technology			Firm Organization				Product Quality			
		North	Northeast	Small	Medium	Large	K	L	P/R	J/O	D	BC	Low	Medium	High		
N	15	5	10	5	4	6	7	8	5	6	2	2	6	4	5		
1. Problem Selling Additional Output	33%	80%	10%	40%	25%	33%	43%	25%	40%	33%	0%	50%	33%	50%	20%		
2. Need to Hire Additional Workers																	
a. Skilled	87%	100%	80%	80%	100%	83%	100%	75%	100%	83%	100%	50%	83%	100%	80%		
b. Unskilled	80%	80%	90%	100%	75%	67%	57%	100%	86%	60%	100%	50%	83%	50%	80%		
3. Problems Finding Additional Workers																	
a. Skilled	53%	60%	50%	60%	75%	33%	29%	75%	60%	50%	50%	50%	33%	100%	40%		
b. Unskilled	33%	60%	30%	20%	50%	33%	43%	25%	80%	17%	0%	0%	17%	50%	20%		
4. Problems Securing Additional Materials																	
a. Structural Wood	20%	40%	10%	20%	0%	33%	14%	25%	0%	33%	0%	50%	17%	25%	20%		
b. Plywood	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
5. Need to Purchase Additional Fixed Assets	47%	40%	50%	40%	50%	50%	67%	38%	80%	33%	50%	0%	33%	50%	50%		
6. Problems Financing Addition to																	
a. Fixed Assets	53%	40%	60%	60%	75%	33%	67%	50%	60%	50%	100%	0%	33%	75%	50%		
b. Working Capital	13%	0%	20%	20%	25%	0%	0%	25%	0%	17%	50%	0%	17%	0%	20%		
7. Would Additional Finance (Credit) Solve These Problems?	47%	20%	50%	60%	50%	33%	29%	63%	20%	50%	100%	50%	33%	50%	60%		

Source: ROFEAP Survey.

government control was teak. Since then, other species have been included under the control of the Royal Forestry Department (RFD).¹

Nonsubstitutable raw material price increases which reflect basic supply conditions or rising production costs are a problem for the material users only under certain conditions. These are: (1) when the price increases are not constant across buyers; (2) when competing users produce products with different intensity of the material; or (3) when conditions in output markets prevent sales prices from absorbing the higher material costs. In the case of plywood, it appears that there is little differential in the price increase across producers. Furthermore, price increases for structural woods have apparently been greater than for plywoods and, hence, plywood intensive producers have probably gained from the price trends. In the sample firms, rising input prices were less commonly reported in the Northeast (64 percent) than in the North (88 percent), but were considered more serious by firms who reported the problem in the Northeast (43 percent compared to 86 percent). This is most likely due to the fact that wood markets in the North have been in disarray for nearly 10 years due to government teak regulations and the producers there are by now quite used to rising and unstable prices. Rising wood prices are slightly more frequently reported by job-order firms, but are considered more serious by contractors and producer-retailers. Fixed price contracts can be quite risky in the face of unanticipated materials price inflation. Furthermore, producers of lower quality products complain more about price increases than higher quality

¹For further details on forestry in Thailand, see Mungkorndin and Eadkeo, 1978.

manufacturers. This may be due to the relatively smaller absolute margins accruing to firms on lower quality, lower priced items.

Wood shortages occur primarily for structural woods. It is rare when a producer cannot buy wood. The real problems seem to be added search costs, forced substitution to less desirable wood species or having to buy relatively lower quality wood of the preferred species. This can, of course, create problems for those manufacturing to certain materials specification. Among the sample firms input shortage problems are substantially, but not surprisingly different between the North and the Northeast. Fully 100 percent of the firms in the North reported this problem as one of their most severe. Much of this reflects the preferred use of teak which is subject to severe supply limitations. In the Northeast only 18 percent of the manufacturers reported this as a problem and only half of those thought it among the three most serious faced by their businesses.

When firms were asked whether material scarcities would prevent them from expanding their output over peak levels by 25 percent, only 20 percent of the 15 firms interviewed answered positively. This represents two of five Northern firms and one of 10 Northeastern firms. Hence, at the present time, materials are a problem, but not an insurmountable one. In the future, however, the problem can only be expected to become more serious.

Wood regulation problems arise from two sources. First, the strict, but frequently corrupt, and inconsistent regulation of the use of teak creates significant problems for those firms which insist on continuing to use teak in quantities beyond which they can legally purchase. There are a variety of ways, illegal or at least of extremely borderline legality,

to procure teak. If firms are not caught with the illegal wood, this usually is a result of having bribed the appropriate officials. This also is considered a problem of government regulation.

A second source of problems with regulation derives from the Royal Forestry Department's "Wood Using Industry Quota System." A prospective wood using factory is required by law to be licensed by the Royal Forestry Department. Allocation of these licenses is tied to a quota which limits the number and types of firms by amphoe. The quota is set at three jurisdictional levels. There is a national quota which is the responsibility of the Director of the Royal Forestry Department. The national limits are then apportioned by the various regional directorates. Finally, each changwat within a region is assigned a respective share which is allocated among the amphoes.

Several sample and nonsample firms reported that they could not get RFD licenses because the amphoe forestry official claimed that the local quota was filled. In each case, however, the official agreed that he could allow the factory to operate if he was outfitted with the appropriate pieces of furniture on demand. Most firms seem to cooperate, but two that were found that had refused had been repeatedly closed, fined and in one case had all tools and equipment confiscated. There are separate quotas for hand and machine powered factories and a similar situation has also arisen in cases where a firm wished to have its license upgraded.

According to officials at the RFD in Bangkok, the quota system has never been regarded as a very effective or useful way to regulate wood use and ultimately forest depletion. Since the quota is on the number of factories rather than specifically on wood consumption, this

conclusion is hardly surprising. Interestingly, however, officials in Bangkok, at the Northeastern Regional Offices in Khon Kaen and Chiang Mai, and at the Chiang Mai, Khon Kaen and Roi-et changwat forestry offices unanimously and unequivocally reported that the quotas are not a barrier to licensing. If a quota category is full, the limit can easily be increased through reallocation at the changwat level. Furthermore, in order specifically to avoid such difficulties, quota limits are formally reviewed every three or four years. In all the interviews with high ranking national, regional and changwat RFD officials only one case could be recalled where a quota prevented licensing. In this case, the quota was changed. This should hardly be necessary, however, because after reviewing the RFD data on quotas and licenses for the entire Northeastern region it was found that no quota for either hand or machine powered furniture manufacturers was more than half full for any amphoe.²

The point of this discussion of the quota system is that there is very uneven enforcement of even very basic forestry regulations. Analysis of teak regulation in the North also revealed extensive corruption on the part of local officials. This is perhaps at the root of the problem associated with the wood issue. It affects loggers, sawmills and wood suppliers in addition to wood using industries. The RFD, interested Thai scholars and participants in the industry are very much aware of the problems and it is on the agenda of important issues to be addressed.

The incidence of wood regulation problems among the sample firms is more frequent in the North, among smaller firms and for firms producing

²In Changwat Khon Kaen, for example, a total of 28 furniture factories were licensed while the quota was for 99 firms. Our census work there revealed 44 furniture factories.

higher quality products. These differentials reflect the importance of teak regulation in the North. Furthermore, the greater economic and political power associated with larger firm size may have a bearing on the size differential. Finally, the higher quality firms may suffer more due to the somewhat greater reliance on restricted woods by these firms.

For other producer groups the wood issue is somewhat different. Bangkok producers had no complaints about wood availability or regulations. They did, however, unanimously concur with the problem of rising prices. In addition, producers in one area of Bangkok, which is a major sawmill area called Bang Po, consistently reported that the bundles of structural wood sold there were of lower and lower quality. They were not only paying more, but were getting less usable wood for their money. This was not a major complaint among changwat level firms. Observation suggests that this may be due to several factors. First, buyers up-country are less frequently required to purchase wood in large lots which are prepackaged by the sellers. Secondly, up-country firms may be used to lower quality processing of wood and, therefore, lower quality lots. Also, this is perhaps due to more rigorous demands for wood quality to produce the somewhat higher quality Bangkok products.

Village producers rely primarily on a type of wood which is currently unregulated by the government, Maay Chom Chaa. There is a relatively well developed supply system which serves the villages visited in Lampang. Producers reported that prices were rising, but that this presented no real problem. Occasionally, production must be interrupted due to shortages, but as one producer put it, "We know the seller will come soon." The real problem for the village producers is the fact that

the supply of Maay Chom Chaa is ultimately limited. It is still an unregulated wood perhaps because the RFD does not realize the extent of its utilization in this industry. If the government were simply to make an administrative decision to regulate this wood, allocations would have been made through the licensed sawmill system. If the allocated cuts were consistent with supply conditions, the price of wood would likely rise substantially and the existing supply channels would either disappear or become illegal.

This places the village producers of furniture in a very precarious position, and one which none of the village interviewees had much appreciation for. Villages typically carry little political weight and one town producer in the Northeast who was disgusted at the fact of having to compete with the itinerant merchants was prepared to do whatever was necessary to force the village producers to "obey the law."³ It is very difficult to speculate on the future of the materials situation for the villages.

The one group of producers yet to be mentioned in this context are those who produce upholstered furniture. Several points can be made about this group of firms. First, these manufacturers use some wood as the structural framing material, but wood quality is not as important for this usage as for external finishing. Wood costs are only approximately 18 percent of total, fully allocated costs, compared with about 50 percent for wooden furniture makers. Secondly, these firms are quite new and have occasional difficulties getting the needed wood. They have not yet mastered the art of securing adequate supplies in a complex

³This manager was unaware that the wood used by the village was currently unregulated.

market. Thirdly, the price of the plastic upholstery supplies (covering and filler foam) have been increasing rapidly with oil price increases. Hence, at the present time, there does not appear to be much of a relative materials cost advantage for these producers. In the future, however, as wood becomes scarcer and more expensive, and if plastics suffer less, materials costs could move sharply in favor of upholstery makers. It should also be noted that Bangkok manufacturers are slowly introducing cloth coverings which are less sensitive to the behavior of oil prices.

A good deal has been written about problems with wood, not only because three of the seven most important problems fall into this category, but because of the potential significance of this area in the dynamic evolution of the industry. The trends and these potential implications can be summarized as follows:

- (1) continued rising prices of both plywoods and structural woods for all manufacturers;
- (2) progressively more serious supply interruptions in up-country markets, but less so for Bangkok because of the dominance of this market area;
- (3) gradual, but noticeable shifts to increasing the plywood intensity of furniture manufacturing in all areas; and
- (4) progressively increasing cost advantages to nonwooden furniture manufacturers.

There is a potential for certain policy programs or innovations to intervene in the wood situation. In the longer term a dramatic improvement in resource management practices or the development of sustainable yields of timber could bring about much more stable structural wood supplies.

Furthermore, active development of more wood efficient materials such as veneers and particle boards could aid in conserving wood supplies. In the short term, the development of pararubber wood in the South of Thailand may ease the structural wood problem to some extent; however, the potential impact of this development is not known.

6.1.3 Problem Area: Labor

Labor and employment were considered in some detail in Chapter 5. The labor problems of particular interest are the seasonal shortages of unskilled labor and the absolute shortages of skilled labor. The widespread concern with seasonal shortages of unskilled labor is rather surprising. More in-depth questioning of firms reporting this problem revealed that the real concern was more with the unreliability of unskilled workers rather than their absolute availability. According to some managers "workers begin projects without finishing them," "fail to report to work without notice" and are "generally lazy." Sixteen percent of the sample firms reported "worker irresponsibility" as a problem even though it was not specifically on the original list read to the interviewees. It is suspected that much of the real problem with unskilled workers relates to this issue rather than to seasonal labor market dynamics.

It is important to note, however, that the majority of firms report little or no problem with unskilled workers. Several managers of these firms were able to list the producers in the area with labor problems. They suggested that the problem was not inherent to labor markets, but instead a result of poor worker-manager relations. Some managers are better personnel managers than others. Also, some firms pay better wages

and benefits and these firms characteristically have fewer problems with both unskilled and skilled workers. In a number of cases, workers leave one firm and come to another on the basis of the conditions for the workers. Rumors spread and workers are aware of who are the preferred employers.

To the extent, however, that there is some seasonal labor market pressure, it is likely to diminish as urbanization and rural development move forward. The economic problem for unskilled workers is expanding the number of jobs available for the increasing supply of such workers, especially in urban areas.

From an economic point of view, the problem of shortages of skilled workers requires greater attention. Among the sample firms 42 percent reported shortages of skilled workers as a problem area and 75 percent of those thought it to be among the most serious. There is little differential in the frequency by firm location or firm size. However, it is more common among labor intensive firms, contractors and high quality producers. Both labor intensive firms and high quality manufacturers depend to a relatively greater extent on skilled workers. Hence, it is not surprising that they would consider shortages a problem. It is more difficult to explain why the batch contractors report skilled labor shortages more frequently than other firms. One possible explanation is that they must operate on a set timetable and, therefore, any input disruption creates a major difficulty.

When asked about constraints to increasing output, 53 percent of the firms reported that they would experience difficulties in hiring the needed skilled workers. The most significant differential is that the labor intensive firms would expect to have greater difficulties than the

capital intensive ones. Hence, across all the sample firms, skilled labor shortages present a problem at existing levels of output and for increases in output.

There are two additional questions which arise with respect to skilled labor shortages. The first is what factors affect the supply situation for skilled labor? Two major trends at work are skilled labor migration to Bangkok or other changwats, and the temporary migration of skilled labor to work overseas, especially to the Middle East. The overall extent of migration as it affects the furniture industry is not known, but several interviewees reported that it was a significant cause of their problem. In selected areas there is also a noticeable decline in skilled labor availabilities due to temporary migration to the Middle East. In Lampang Muang, for example, every producer interviewed mentioned this problem. A much smaller proportion of firms in our survey areas were concerned with this type of migration.

The second, and perhaps more pertinent question, is why producers are failing to train the needed quantities of skilled workers. Ultimately, the responsibility rests with employers to assure that the necessary mix of workers is available. The answer may be related to the combined effect of a relatively high turnover rate for unskilled workers, the relatively low wages for apprentices and the fact that many highly skilled workers prefer to start their own businesses. The higher the turnover rate, the more difficult it is to invest in worker training by an individual firm. The greater the investment in training, the greater the cost of worker attrition. Also, there is little incentive for anyone to become an apprentice due to the low wages offered. This has contributed to the demise of a rigid apprenticeship system in the town-based

furniture industry. It can hardly be expected that people would be willing to forego employment at higher wages as an unskilled worker in the furniture or other industry to become an apprentice. This is especially true if, as was reported in Chapter 5, unskilled workers can work their way up to being skilled workers. Finally, several firms reported that there is a tendency for skilled workers to leave to start their own businesses. Hence, investments in worker training may imply training potential competitors.

The implications of this argument is that, in general, the structure of incentives encourages underinvestment in skill development. If this is, in fact, the problem, then some form of subsidy to reduce the cost of training might be justified. This issue will be further considered in the policy section.

The impact of skilled labor shortages, according to sample firms, has been to necessitate higher wages for this type of worker. Some firms have been more reluctant than others to raise wages and normally these are the firms experiencing the most problems. Other firms have initiated payment schemes based on a percentage of the value of production. Observation also suggests that these firms are less apt to have skilled labor problems. It is not clear, however, how important skilled labor shortages should be considered. In the production function analysis, it was found that skilled workers are over-utilized. Unfortunately, this cannot account for the heterogenous labor needs of different types of firms and is therefore not sufficient evidence to completely discount the manager's perceptions.

In Bangkok, the producers interviewed expressed no concern with the unavailability of skilled workers, but did commonly complain of the high

wages which must be paid. It is difficult to compare wage rates for skilled workers because of the differences in skill levels, skill types and the real cost of living, but on average wages for skilled workers in Bangkok were reported to be double what they are up-country. The implication of this fact is unclear. It is suspected that this reflects higher skill levels. There is a range of skilled wages from 80 Baht per day to 400 Baht per day, but this is drawn from a relatively small sample and so there is no way to meaningfully examine the distribution of wage rates.

Village produced products require relatively low skill levels, and no worker-related problems were reported by the producers interviewed. Wage rates for skilled workers are between 35 and 60 Baht per day, but again it is difficult to make meaningful comparisons between them.

In summary, the following conclusions can be made with respect to labor force problems.

- (1) Seasonal shortages of skilled labor are not generally a significant problem for town-based firms and in those areas where it may be important, they will likely diminish over time and may respond to improvements in labor-management relations.
- (2) Shortages of unskilled workers does present a problem for changwat level manufacturers, vis-a-vis, Bangkok and village producers, although the significance of the problem is unclear.
- (3) Rising wage rates for skilled workers will probably result from the labor shortages and may be relatively more serious for up-country firms compared to Bangkok firms.

- (4) There may be some legitimate justification for subsidizing skill development in up-country areas.

6.1.4 Problem Area: Finance

The availability of finance for fixed assets and working capital needs is perhaps the most commonly mentioned problem facing small industries. Perfectly functioning financial markets would insure that credit for "good" projects or ideas would be forthcoming at reasonable interest rates. The general problem for small industries is that lending institutions often have little experience in making loans to small businesses and the costs of making an informed judgment is often high relative to the loan value. In addition, overhead and administrative costs are almost by definition higher for the smaller sized loans demanded by small businesses.⁴

Among the sample furniture producers in Thailand, credit needs for fixed assets and working capital are drawn from a variety of sources. These include bank loans, overdraft accounts, loans from friends or relatives, credit from input suppliers, rotating credit associations, Small Industry Finance Organization (SIFO) loans, advance payments from buyers, firm profits and personal savings. Most firms use several of these sources of finance.

Working capital shortages were reported by 58 percent of the sample firms, with 82 percent of these firms considering the problem among them most serious. Larger firms, producer-retailers and job-order firms complain about working capital shortages more than the other groups of

⁴More detailed discussion of the credit issue from a theoretical perspective can be found in Anderson, 1981.

firms. Only 13 percent of the sample reported, however, that working capital would pose a problem for a 25 percent increase in production. It is difficult, therefore, to judge the relative singificance of this problem area.

Working capital is defined as money invested in stocks of raw materials, semi-finished products, finished goods and accounts receivable. The amount of money needed for working capital depends on desired levels of inventories, goods in process, finished goods, as well as the amount extended on credit to buyers. A shortage of working capital implies that actual levels of these variables are less than desired levels or that a firm is in a problematic situation as a result of actual levels being too high. In other words, working capital issues are essentially management issues. One responsibility of management is to control the cash flow of the enterprise. In most cases, the existence of a working capital problem suggests a high level of uncertainty in output markets or input markets, or problems in the management of cash flow. The solution to these problems is not necessarily to increase fund availability, but to improve other aspects of a firm's operation or find better ways to manage uncertainty.

This is not meant to suggest that working capital shortages are not a real problem for producers. What it implies, however, is that these shortages are often symptomatic of other more fundamental problems faced by the firm. Therefore, providing more funds to meet cash needs may solve nothing and may contribute to making the other problems of the firm more severe. One good example of this is the manager who felt that if he had more working capital, he could produce more products to display in his showroom. What wasn't realized, however, was that the

products were not selling, not because there were not enough items on display, but because they were of particularly poor design. They were also made of good quality materials and were therefore very expensive. If this manager had additional working capital, he most likely would be digging himself into a deeper hole than he was already in. It should be noted that halfway through the survey year this factory closed and was, therefore, dropped from the sample.

Finance for fixed assets is an equally complex issue. Over 50 percent of the sample firms reported that they would have problems financing the additional fixed assets required to increase their peak production by 25 percent. This tells us very little, however, because it is not known if it is a particularly good idea for these firms to expand their production. The real question is, if it is a good idea, then are there structural or behavioral problems which would prevent the good idea from being financed?

Firms were asked about their actual expansion plans very early during the course of the survey year. Out of the 19 firms surveyed, 42 percent had planned expansion activities; 16 percent were considering expanding, but were still uncertain; 42 percent do not wish to expand; 5 percent want to exit; and, importantly, no firm reported that they wanted to expand their operations, but could not. Some of the reasons given by the 42 percent which didn't want to invest include, "don't want to spend money now;" "wood too expensive;" "cannot get enough teak;" "not enough labor;" and "too much capacity already." Hence, problems appear to discourage the desire to grow rather than to frustrate the implementation of expansion plans. Not one firm even suggested in this set of questions that finance would be a problem.

The availability of finance does not appear to be a major problem which will have much effect on the development of the changwat level furniture industry. What may be important, however, is the differential availability of credit for larger-scale producers in Bangkok. The financial sector in Thailand has suffered from a net transfer of loanable funds from the provinces to Bangkok, but an attempt has been made to reduce this flow by requiring branch banks to lend 60 percent of their portfolio locally (Onchan, 1981).

Much is left to be learned about finance questions. Little is known about the availability of capital to retailers or manufacturers interested in diversifying into reselling. This applies both to working capital needs and fixed asset finance. Also, a more careful assessment is needed of the gaps in the commercial banking system in terms of the ability to finance small projects. Further study of these issues is recommended in the following chapter.

6.1.5 Problem Area: Management and Entrepreneurship

The issue of management deficiencies is difficult to pin down. Businesses can be run in a variety of ways with equally satisfactory outcomes. Evaluating management skills in Thailand against Western business school models is not necessarily appropriate. In spite of these caveats, at least a couple of points can be made. First, there are at least three indicators of potential management problems which have already been noted. These are the rather remarkable difference between product and firm profitability, the existence of technical inefficiency and finally the prevalence of working capital problems.

There are also instances of specifically questionable practices among the sample firms. The clearest example involves the keeping of records regarding the firms' operations. Table 6.3 illustrates the patterns of record keeping in the sample firms. Only slightly more than half the firms keep any records at all and only 37 percent draw up any kind of periodic profit-loss statements. Larger firms typically keep records more frequently than smaller firms and there is some differential by firm organization as well. There is a greater tendency for batch contract firms to keep records, but surprisingly decorators are the most lax in this area. It is not clear whether the fact of keeping records is a cause or effect of good performance, but it is certainly a necessity for accurate pricing. The firms who did not draw up formal profit-loss statements characteristically reported that they set their prices in order to make a profit on every transaction. It is difficult, however, to insure that accurate account is taken of capital and overhead expenses without keeping track of these variables.

6.1.6 Problem Area: Competition

Theoretically, competition is generally regarded as a healthy, desirable economic state. This largely ignores the fact, however, that competition can also have undesirable consequences for producers and consumers. There are at least three actual and/or potential deleterious effects which a highly competitive environment can produce. These are excessively low returns to firms, the consequences of limited market size per firm and problems related to the quality of the products produced by the industry.

Table 6.3. Record Keeping Practices in the Sample of Furniture Manufacturers

Firm Type	Number of Firms	Percentage of Sample Firms:	
		Keeping Some Records	Keeping Profit-Loss Statements
North	8	50%	50%
Northeast	11	55%	27%
Small	6	33%	33%
Medium	6	33%	17%
Large	7	86%	57%
Labor Intensive	11	45%	36%
Capital Intensive	8	63%	38%
Producer-Retailer	5	60%	40%
Producer-Seller			
- Job-Order	9	44%	33%
- Decorator-Contractor	3	33%	0%
- Batch Contractor	2	100%	100%
Sample Total	19	53%	37%

Source: ROFEAP Survey.

Evidence suggesting the possibility of low returns to producers was examined in Chapter 5. Returns to family labor are very small for most representative firm types and negative for many others. It was suggested previously that one factor contributing to this finding is the possibility of serious problems with the underreporting of output by the sample firms. This certainly explains a part of the results, but probably cannot account for the consistency of the findings.

Such low firm earnings can be explained in terms of economic theory. Presumably, competition has the desirable attribute of penalizing inefficiency and giving an advantage to firms with the lowest average long-run cost of production. This, however, is a static, long-run equilibrium result. In a short-run, dynamic, disequilibrium context the rule of advantage is different. This difference was well phrased by Professor E.A.G. Robinson in 1931. He noted that:

...competition only indirectly gives an advantage to the firm with the lowest average long period cost of production. Short period competition tends as a rule to select the firm whose short period cost of production is lowest. And since capital equipment is long-lived, and available in the short period whether or not it is sufficiently rewarded, economies of capital cost play little part in short period competition. (Robinson, 1931, p. 16).

Hence, in a situation where the economic environment is rapidly changing with the continual entry of new competitors, firms can be forced to lower prices below those at which long term average unit costs would be recovered.

Further evidence is lent to this hypothesis by the fact that nearly all the firms in the industry are family owned and operated enterprises. Many of the fixed assets such as building, land and vehicles are jointly used for the family welfare, as well as for the family business. This also carries over to working capital which is a part of the families

overall cash flow. This means that the family can easily overlook, in the short-run, the need to earn an economic return on these assets apart from their contribution to family well-being. Only in the case where families have borrowed heavily and must meet monthly payments is this argument somewhat mitigated. Interestingly, the two sample firms which received large loans from the Small Industry Finance Organization for fixed assets finance told researchers that their chief problem was in making the loan repayments. They felt this added cost placed them at a disadvantage, vis-a-vis, their competitors who owned their assets outright.

This is not the first study of the Thai furniture industry to identify this potentially counterproductive economic environment. Desmond Cody in his recent report on the industry from the perspective of Bangkok producers noted that:

Much of the industry's indifferent performance can be traced to cut-throat competition from small units operating all over the country. There is no doubt that the removal of this kind of competition would immeasurably benefit the industry as a whole. (Cody, 1980, p. 17).

While his conclusion is not shared with this study, the point he makes about competition is accurate.

The implications of the degree of competition in the industry are great. Aside from those already discussed, the low returns create an extremely hostile environment for progressive innovation and development.

Cody goes on to emphasize:

...there is a chronic shortage of working capital for development and expansion. This is due to: (1) the ease of entry to the industry, which encourages employers and others with little capital to set up on their own; and (2) the intensive competition in the industry (itself partly caused by the ease of entry) which reduces profits below a level which would provide funds for reinvestment. (Cody, p. 8).

The reinvestment and expansion which does take place usually involves the purchase of new buildings (combination home, factory and showroom) and the purchase of new equipment which may only be slightly better than old equipment. Very little technical innovation has occurred among changwat level producers. Furthermore, "expansion investment" may often mean replacing a worn out machine rather than actual growth of the stock of fixed assets. Replacement of fixed assets becomes a major investment activity under these conditions.

The second major consequence of the short period competitive market structure is that the potential market share of any one firm is extremely limited. Even if returns are not as low as the above argument would suggest, the scale of operation is limited by the large number of competitors. This problem is particularly significant for changwat producers of medium or higher quality furniture. Only the low quality producers operating through itinerant merchants and to some extent the government contractors have been able to substantially extend their market share. Bangkok producers, on the other hand, are in a much better position, given the nature of the established transportation and distribution system, to expand the geographic scope of their market area.

This has at least two implications for the changwat level producers. First, it limits the possibility of gains from specialization in production. As was noted in Chapter 5, such specialization is perhaps one reason for the superior economic performance of the batch contract producers and producer-retailers relative to job-order producer-sellers. Secondly, however, the limited potential market share operates to provide an incentive for diversified production. In order to attract consumers

and to sustain economic sales volumes the producer must manufacture a wide range of products. Given limited sales potential, this means that the absolute quantity of any one type of product line which can be produced is quite small. Hence, the producer is locked into a pattern of a highly diversified output mix.

The final major consequence of the highly competitive environment in the changwat level furniture industry is that it opens the door for undesirable effects on product quality. The overall quality of furniture in Thailand is not particularly high. The quality of basic materials is uneven, design is mediocre and construction and finishing leave much to be desired. Joining is typified by butt joints, often poorly fitted. Only a small number of higher quality factories use stronger and more attractive fitted joining.

Much poor quality furniture is manufactured by producers who are unaware of the characteristics of good furniture and purchased by consumers who are equally uninformed. Normally, it would be expected that such producers would be quickly driven out of business. However, the market fails to work as expected because of the lack of knowledge on the part of consumers. It has been noted that:

After many years of protection of the (Thai) domestic market, the bulk of consumers are quite unfamiliar with well designed furniture. Not only have most of them never seen it, but in this country purchases of furniture are made so infrequently by the average household that there is no opportunity to acquire a background of expertise and appreciation in these matters. (Cody, p. 10).

In this type of situation the incentive exists to skimp on quality in order to reduce production costs. Furniture is a type of product particularly prone to this problem because surface appearance can hide a large number of potential defects.

It is interesting that the team assigned to study how best to revive Great Britain's furniture industry after World War II noted a similar situation. The Board of Trade Committee noted in 1946 that:

Competition both among manufacturers and among retailers was keen. (Among other things)...competition also lead to low prices and thence to a depreciation in quality. There was a marked tendency to meet a certain price and to do so by sacrificing features essential to the utility of the article, whilst giving the appearance of value by showy exteriors. The public generally buy furniture so seldom that their ability to assess quality and suitability is limited. Too often they go entirely by external appearance only, to find later in some cases that the wardrobe they have bought is too shallow to take a coat-hanger conveniently, the dressing chest drawers are too small to take a shirt and the easy chair too poorly sprung to stand up to reasonable wear and tear. Even responsible manufacturers tried hard to maintain a decent standard, but were driven to produce articles which were in some respects inadequate for the purpose for which they were intended. (Working Party Reports, 1946, p. 11).

The incentive to skimp on quality in production is to some extent counter-balanced by the fact that many up-country manufacturers sell directly from their own factory. Thus, even though producer brand names are virtually unknown in Thailand, the consumer buying directly can at least identify the firm which may have cheated him. In addition, for products sold through retailers, the retailer must eventually account for cases of selling junk products. However, many of the retailers interviewed during the course of this study admitted to having little particular expertise or training as furniture buyers, and they also are participants in the highly competitive markets with an equally strong incentive to buy cheap and sell dear.

Therefore, a major problem facing producers of all types of manufacturers and retailers, as well, is the highly competitive nature of the furniture market. The effect of this environment may seem beneficial to consumers in the short-run, but the potential consequences in terms

of dynamic instability, choking off innovation and providing incentives for cheapening products certainly outweigh any short-run benefits.

To this point in the discussion the term competition has been used in a broad sense. As was argued in Chapter 2, however, competitive interaction is defined in terms of a particular market. Given the diverse character of the Thai furniture market, it would be expected that some firms could limit the effects of direct competition by directing their activities towards a particular segment of the market. Such a segment is referred to as a market niche.

In particular, batch contractors and decorators have made the most progress at securing such a market niche. Certainly there is some competition among firms for these markets, but these firms have organized their activities in order to be uniquely qualified to serve these specific markets. This is in direct contrast to the producer-retailers and job-order producer-sellers which are competing in a much wider market where competition from within the changwat and from outside is most intense. The performance of these firms is most directly consistent with the discussion of the effects of short period competition.

The producer-retailers have responded to this environment in a way that has given them one advantage over the job-order producer-sellers. They have not secured a market niche in the same way as the contractors, but have demonstrated they are better able to take advantage of the gains from specialization by offering a greater variety of products for sale than they produce.

6.2 Government Policy and the Development of the Furniture Industry

Little has been said in this report concerning government regulations and policy as they affect the furniture industry other than the

discussions of Forestry Department regulations in Chapter 5. Generally, direct government intervention has little effect on changwat level furniture producers. Fifteen sample firms were asked about their contact with various agencies and institutions and about the effect of a number of government laws and regulations on the operation of their business. The results are reported in Tables 6.4 and 6.5.

The list of agencies and institutions in Table 6.4 includes both government and private organizations. A surprisingly low percentage of firms are familiar with these institutions and very few received any assistance from these groups. One of the firms responding to this survey received a SIFO loan to expand their business; two managers received management training from the Department of Industrial Promotion Management Development Center; one firm hired a worker who graduated from the Skill Development Institute; another received some assistance from the Community Development Office; and one firm received an order from a university to produce desks.

Table 6.5 contains the percentage of sample firms which reported that their operations were affected by the laws and regulations listed. Three firms said that they were affected by minimum wage regulation. When asked how they were affected, one firm said that it increased production costs, another said that it forced them to violate the law by paying low wages to apprentices and, similarly, a third pointed out that if he obeyed the law, skilled and unskilled labor would get the same wage. Factory laws, municipal laws and licenses all refer to steps in the licensing process for firms. The firms which complained about these regulations all said that their basic effect is to waste time. One unlicensed firm reported having to make payoffs to certain officials

Table 6.4. The Importance of Various Institutions and Agencies
in Assisting the Furniture Industry

Agency, Institution	Percentage of Sample Firms Which:	
	Are Familiar With Agency or Institution	Have Received As- sistance From Agen- cy or Institution
Small Industry Association	33%	0%
Industrial Association of Thailand	47%	0%
Other Industrial Association	47%	0%
Small Industry Finance Organization* (SIFO)	7%	7%
Industrial Finance Corpora- tion of Thailand* (IFCI)	27%	0%
Department of Industrial Promotion* (DIP)	7%	0%
DIP Industrial Services Institute*	47%	0%
DIP Management Development Center*	33%	13%
Institute for Skill Development*	33%	7%
Department of Community Development*	60%	7%
College or University*	80%	7%
Office of Accelerated Rural Development*	60%	0%

*Government affiliated.

Source: ROFEAP Survey.

Table 6.5. Laws and Regulations Affecting the Operation
of the Furniture Industry

Law or Regulation	Percentage of Firms Reporting That Law or Regulation Affects Their Firm N=15
Minimum Wage Laws	20%
Other Labor Law	0%
Factory Laws (Registration)	7%
Municipal or Sanitary Office Laws	7%
Forestry Laws	47%
Licenses	13%
Sales Taxes, Other Taxes	7%
Compensation Funds	0%
Export Policy	0%
Import Policy	0%
Promotion Policy	0%
Gasoline Policy	20%
Electric Price Policy	27%
Water Policy	27%
Others	0%

Source: ROFEAP Study.

in order to stay in business. The most frequently mentioned regulations are those of the Forestry Department. Two of the seven firms reporting this category said they couldn't get enough teak and the other five reported having to bribe officials in order to stay in business. Gasoline policy, electricity price policy and water policy are mentioned exclusively because of the "high prices" charged in these inputs. The one firm reporting problems with taxes complained that revenue officials harass the business.

As can be seen, from the perspective of the sample firms, the biggest problems with the government related to time consuming licensing procedures, the price or supply effects on inputs and corruption. It will be useful to consider certain selected aspects of government policies in more detail.

6.2.1 Industrial Licensing Procedures

Compared with some countries, the licensing procedures in Thailand for a small firm are relatively simple. There are basically four steps which must be followed in order to open a wood using factory. The first step involves registering with the changwat level representative of the Ministry of Industry. This must be done if more than two horsepower of equipment will be employed. The businessman presents a brief summary of the amount of planned investment, the size of the firm and a site plan. A nominal fee of 50 Baht per horsepower is charged for a license which is good for three years. From there, the prospective wood user must get permission to operate from the Royal Forestry Department. This involves submitting an application which verifies that the applicant is Thai, that he is not bankrupt and that he is not a criminal. If these

criteria are met, the businessmen may obtain a license. The only other factor which can cause a RFD license to be denied is if the quotas, discussed earlier, are full. The license costs 50 Baht per horsepower and 1 Baht per worker if more than two horsepower are employed or 10 Baht per worker for a hand powered factory. The final license is granted in one or two months, but a provisional license can be granted at the discretion of the local forestry official. The final step involves registering with the local tax officials.

The chief problem with the licensing process is that it can be time consuming. As with dealings with most bureaucracies in Thailand, the process can be substantially speeded up if payments are made to the appropriate officials. Several of the sample firms privately complained that the cost of getting licenses efficiently has risen substantially in the past few years.

The topic of corruption is extremely difficult to address in this context. What is viewed as corruption to an outsider is often seen as "just the way the game is played" to those who are part of the system. Certainly, it is outside the scope of this study to suggest solutions to this rather endemic problem with Thai bureaucracy. However, one factor which appears to contribute to the problem is that many businessmen are simply unaware of the regulations which affect them and are, therefore, unaware of their rights and the prescribed limitations on official behavior. Rules and regulations are often written in the "formal" Thai language which is difficult for many to understand. This is not unlike the "legalese" which prevades government regulations in the United States.

A small contribution to the solution of these problems would be to clearly publicize the rules and regulations which apply to various

businesses. The Bangkok offices of many of the local agencies and institutes seem to be aware that corruption is a problem and if their expressed concern is genuine, they could help ease the problem by taking the responsibility to inform the public of their rights in relation to the government's operations.

6.2.2 Financial Assistance Programs

Outside of the commercial banking sector there are primarily two government institutions which provide financial services to industry in Thailand. The Industrial Finance Corporation of Thailand (IFCT), established in 1959, is designed to complement the activities of the commercial banking system by providing medium- and long-term funds for fixed asset financing. The IFCT is oriented towards large-scale industrial development with an average loan size in 1980 of 23.9 million Baht (IFCT, 1981). Recently, the Japanese government made a large loan to IFCT at 3 percent interest to support small-scale industries, but no other information is available on the program (Amyot, 1980, p. 4).

The second institution is the Small Industry Finance Office (SIFO) which was established in 1964 to provide loans of less than 500,000 Baht to small industries for fixed asset finance at a subsidized rate of interest. The operation of SIFO is limited because of chronic shortages of funds and administrative problems with its partner the Krung Thai Bank. Details on the lending patterns are unavailable, although the administrative characteristics of SIFO are discussed in Amyot (1980).

Two firms were interviewed that were recipients of SIFO loans. Both firms had obtained 1 million Baht loans for business expansion. It was difficult to assess the effect of the loans because no data are available on firm performance prior to the expansion. One firm, however, is

now the most technically inefficient firm in Chiang Mai and both firms report serious problems with loan repayment. Observation suggests that one firm is very over capitalized and operating far below capacity. The other firm is the one referred to earlier which is about to abandon its wooden furniture enterprise and concentrate on upholstered products. The SIFO money was not used in the establishment of its upholstery enterprise.

6.2.3 Technical Assistance Programs

Two institutes, the Institute for Skill Development and the Industrial Services Institute, offer direct and indirect technical assistance to the furniture industry. The Institute for Skill Development (ISD) is set up under the Department of Labor and is primarily designed to be a labor training center. The Industrial Services Institute (ISI) is under the Ministry of Industry's Department of Industrial Promotion (DIP) and serves primarily as a technical information, extension and advisory service. Both institutes have a section specifically oriented to the furniture industry. The main office of these agencies is in Bangkok, but ISD has regional branches in Lampang in the North and Khon Kaen in the Northeast, as well as a branch in the South. ISI has one regional office in Chiang Mai and is in the process of establishing an office in Khon Kaen.

As was noted earlier there is little direct contact between these institutes and the changwat level furniture industry. ISI has no aggressive outreach program and relies totally on user initiated contact. The absence of contact is not surprising given the technological orientation of ISI. It is equipped to provide assistance at a level of

sophistication not seen in the local furniture industry. This problem is recognized, but many of the product and equipment exhibitions originate in Bangkok and are not at all sensitive to the needs of local furniture makers. ISI is not equipped to provide technical assistance to upholsterers.

The Khon Kaen Skill Development Institute offers a six-month training course in furniture making. According to a review of the IDS by Professor Amyot, "The training provided is strictly job oriented and geared to the immediate needs of both the labor force and industry," (Amyot, 1980, p. 2). However, a cursory look at the course curriculum and the equipment for which training is provided was all that was needed to confirm the feeling of several local businessmen that the skills developed at the IDS are almost completely irrelevant to the needs of the local furniture industry. The firm that had hired one graduate of IDS complained that he was told that he would be getting a skilled furniture maker, but that the employee had to be completely retrained. The worker knew how to operate sophisticated joining machines, but could not make a joint by hand.

The source of the problem for both institutes is that decisions concerning curriculum and training equipment have been made by people unfamiliar with the needs of the local industry. In some cases, the technical advice has come from foreign donors, the Japanese government in the case of the Khon Kaen IDS and UNDP in the ISI case. That which has not come from overseas has been developed in Bangkok where both institutes are oriented to serving the furniture export sector. There is considerable potential for both institutions, but this can only be

realized if rather substantive changes are made in the basic approach to technical assistance.

6.2.4 Limitations of Government Policy

It does not appear that government policy has geared itself well to the needs of the changwat level furniture industry. There is no technical support consistent with the needs of small-scale, rural producers and product distributors. Furthermore, there would seem to be much more that the government could do to supplement the fixed and working capital financial needs of small firms, producers and distributors alike. In the final chapter several policy suggestions along these lines will be made.

6.3 A Note on Innovation and Change in the Furniture Industry

Innovation and change are key elements in the development of the Thai furniture industry. Those businessmen who are willing and able to seize the opportunity to improve are most likely to be those who prove successful in the industry. Innovation, as the term is used here, applies to a wide spectrum of potential changes. Among the possible types of innovation are:

- (1) the application of new techniques to the manufacturing of furniture;
- (2) the development of new product lines;
- (3) changes in the organization of enterprises;
- (4) changes in the distribution of products to sellers and consumers;
- (5) changes in business practices which permit more productive use to be made of existing technologies, products, distribution channels and enterprise organization.

In the ROFEAP sample of furniture manufacturers there are few examples of major innovations. Firms were asked about the types of changes that had been made in their basic production process, the types of products produced and in the organization of their business. Of the 19 firms in the sample, none reported any basic change in production technology, two firms reported that they had started to resell furniture in addition to producing it, one firm had begun to produce after beginning as a retailer, five indicated that they have produced new products in response to orders from consumers, one firm tried to start producing aluminium cabinets, but was forced to abandon the idea, one firm stopped using teakwood and another firm reported reducing the quality of products manufactured in response to rising materials prices.

Even though these examples do not seem impressive, several things must be kept in mind about innovation. First, the process of change is generally slow. The term innovation, however, implies some sort of quantum jump from one point to another. The ultimate effect of innovation may be a big step, but the process is not necessarily immediate. As a result, it can be very difficult to identify innovative behavior as it is occurring. This is especially true for the types of firms dealt with in this study. They are relatively small to begin with and with their generally limited resources the process is by necessity slow, even though its effects are cumulative.

Secondly, innovation frequently is embodied in new firms. Many important innovations are associated with new enterprises. This implies that the diversity in firm types, even among the sample which was at one time considered a relatively homogenous group, whether by technology, product quality, marketing arrangement, size, and so on, may, in fact,

reflect innovation at the time the firms were established. The fact that one businessman decided to become a decorator-contractor could undoubtedly be termed innovative behavior.

Thirdly, certain of the seemingly minor innovations and changes undertaken by the sample firms are, in fact, reasonably important steps from the standpoint of the development of the industry. Whether it involves the use of a new type of wood, or adding a retailing or production enterprise or perhaps even trying to make a new product in response to a consumer's order, each may, in retrospect, be judged as a critical decision.

Lastly, innovation occurs in response to incentives. Until recently, the changwat level furniture industry was in a fairly stable and predictable environment. Materials were easily available, prices were steady, competition from Bangkok or from villages was limited and demand was growing with the overall level of economic activity. In the past five years their situation has deteriorated substantially. Hence, it is probable that the rate of change will increase in the near future in response to the need to improve their competitive position. In the final chapter several important potential areas of innovation and change will be considered.

CHAPTER 7

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

7.0 Introduction

This dissertation is concerned with the economic viability and potential of the changwat level furniture industry. In order to address this issue, it was necessary and desirable to adopt an industry or sub-sector focus which emphasized both the vertical and horizontal dimensions of economic activities. This chapter will summarize the findings of this study and draw several conclusions addressing both policy considerations and issues of research methodology. No attempt will be made to summarize the large volume of descriptive information contained in this study except as it bears on particular issues developed here. A part of the contribution of this paper is its value as a reference point for further work on the Thai furniture industry, studies of similar industries in other countries and development studies in general. As Professor Hagen noted in 1958,

One basic service which industry studies can perform is to provide an increasingly solid foundation for scientific analysis of an economy and how it develops. (Hagen, 1958).

Hence, it is felt that no apology is necessary for leaving certain loose ends and presenting certain data or analysis which have not directly contributed to the conclusions of the study. Instead, the immediate task is to focus on the major trends and opportunities affecting the industry and questions of policy and research methodology which can be derived from the study.

7.1 Trends, Opportunities and the Development of the Changwat Level Furniture Industry

This section will examine the major trends operating in the Thai furniture industry and the opportunities for the development of the changwat level industry. Before forging ahead, however, it will be useful to step back and reassemble what is known about the structure and organization of the system. At any given point in time there is a particular constellation of firms organized to satisfy the market for furniture as it is constituted. The underlying epistemology of this study is that an understanding of the existing configuration of the industry contains important information bearing on the nature of its potential future configuration. Furthermore, if it is possible to discover the primary forces at work effecting change in the industry, and the likely impact which these forces will have, then not only can the range of potential future configurations be reduced, but it is possible to see how the course can be altered by interventions into the industry.

7.1.1 The Changwat Level Furniture Industry Revisited

The industry map of the changwat level furniture industry presented in Figure 2.4 in Chapter 2 represents our best understanding of the structure and organization of the industry. For the purpose of examining the development of the industry, however, it is necessary to reformulate the diagram on the basis of what has been learned about the structure of competitive interaction in particular markets.

As was illustrated in Chapter 3 the market for furniture can be disaggregated by the source of demand (institutional or private), the location of demand, the income level of the consumer and the quality of the product. Unfortunately this detailed breakdown is not amenable to

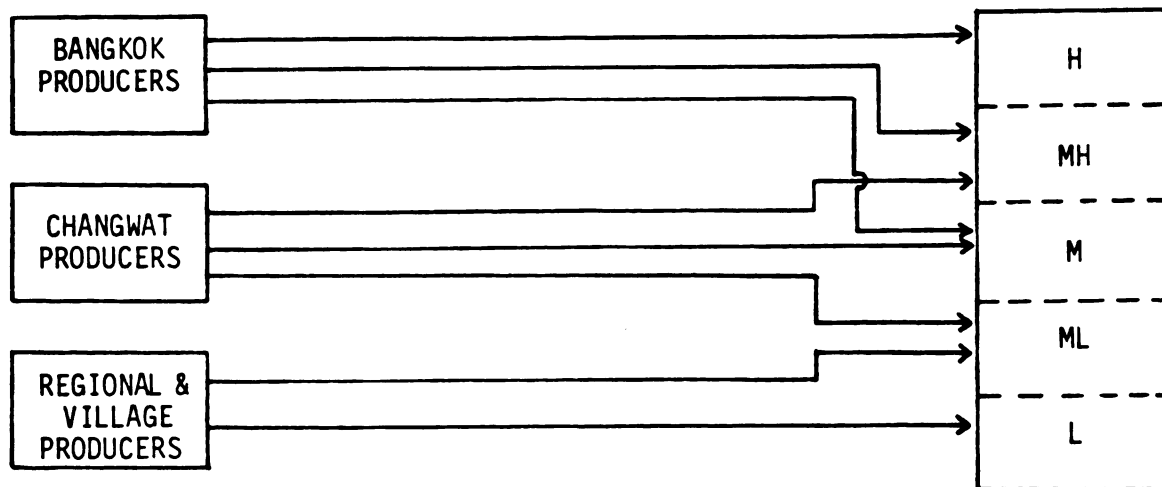
convenient use in the industry map framework because of the complexity it generates in the diagram. For the purposes of this section it will be sufficient to focus only on the locational factors and product quality which is an adequate reflection of income levels.

This study has identified four primary groups of manufacturers which serve the changwat level market for furniture. These are the changwat level firms including producer-sellers and producer-retailers, Bangkok manufacturers, village producer-sellers and regional producer-sellers. Each group of manufacturers aim at different, but somewhat overlapping portions of the market. Figure 7.1 indicates our best understanding of the markets served by the different producer types. The diagram is divided into three separate sections based on the location of the market. Figure 7.1.1 applies to the changwat capital market, 7.1.2 to the amphoe town market and 7.1.3 to the village market.

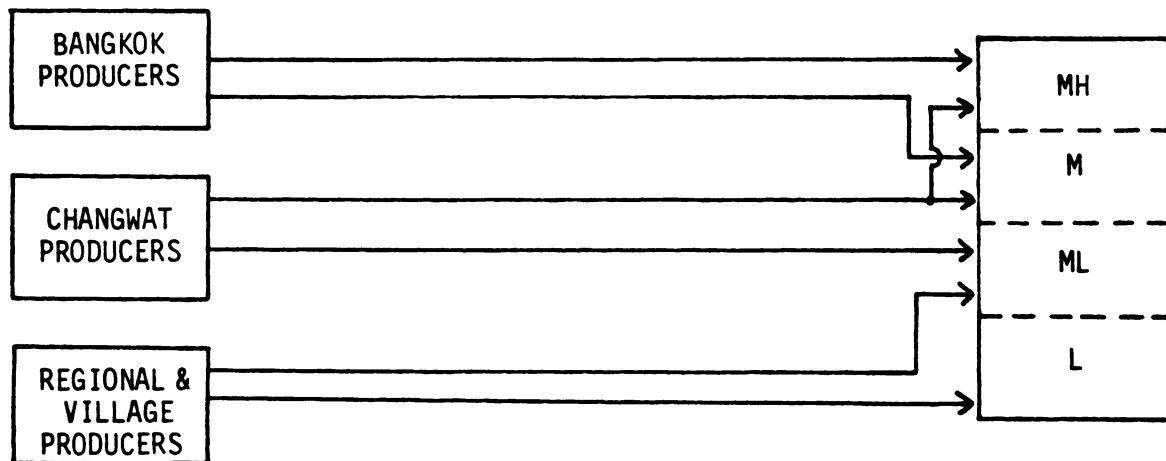
In changwat capital markets both the high quality demand and the low quality demand are each served by only one producer group: Bangkok producers in the high quality case and Northern village producers in the low quality case. Each of the other quality levels are served by two different groups. The medium-high and medium quality markets are served by Bangkok and the changwat level manufacturers; the medium-low quality market is served by changwat level producers and regional and village producers. A similar story is told in the other parts of the diagram.

The next logical step in analyzing the structure of competitive interaction is to introduce the distribution system into the picture. This has literally been done in the picture of the industry, presented in Figure 7.2. For diagrammatical simplicity the distribution system is represented by retailers and by itinerant merchants. For the moment,

7.1.1 Changwat Capital Market



7.1.2 Amphoe Town Market



7.1.3 Village Market

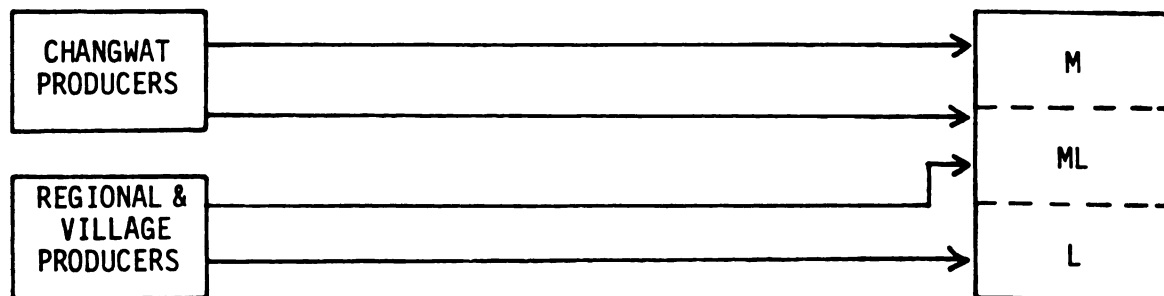
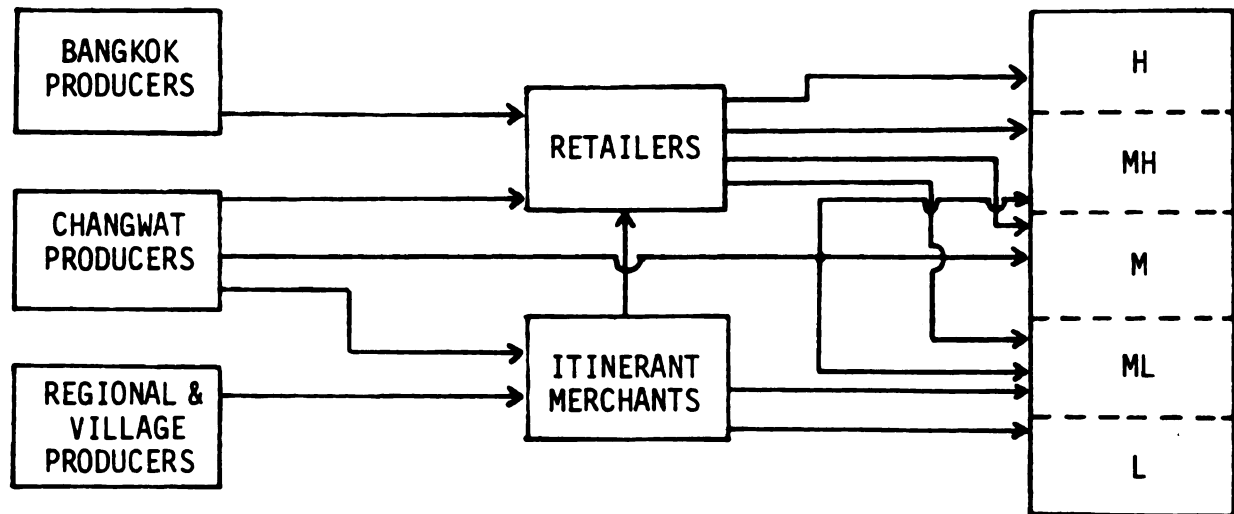
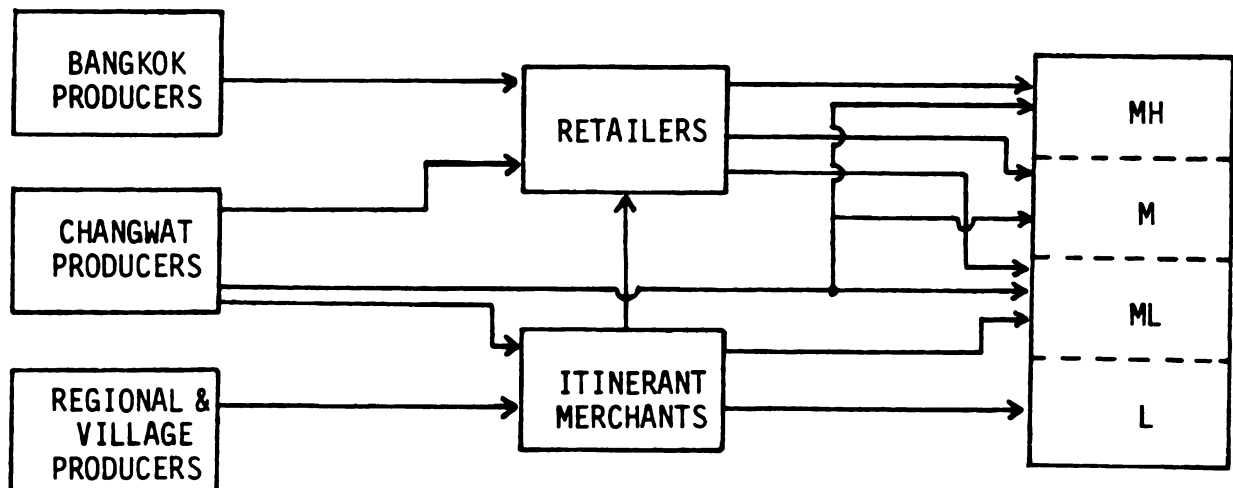


Figure 7.1. The Structure of Producer Competition in the Changwat Level Furniture Industry

7.2.1 Changwat Capital Markets



7.2.2 Amphoe Town Market



7.2.3 Village Market

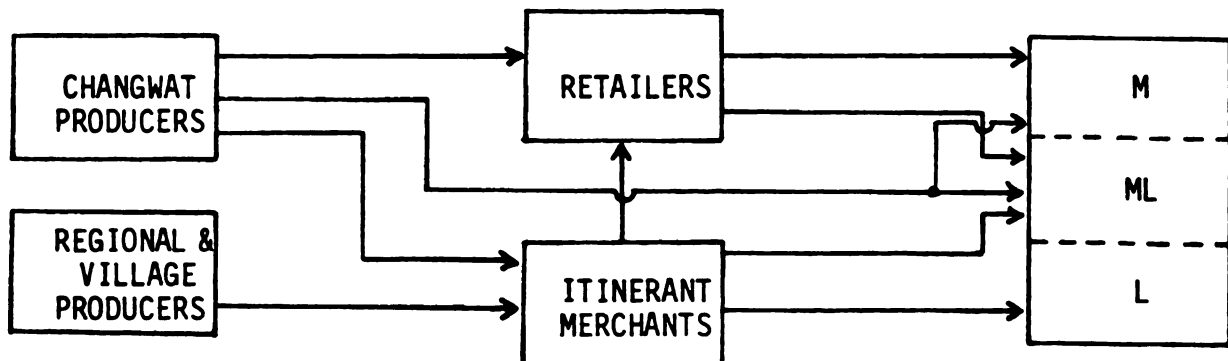


Figure 7.2. The Structure of Competition in the Changwat Level Furniture Industry

producer-retailers have not been explicitly included although they are implicitly represented by the linkages from changwat producers to retailers.

The introduction of retailers and itinerant merchants into the diagram does not change the basic structure of producer competition presented in the previous section. It does, however, alter the options available from the standpoint of the consumer. Retailers may purchase goods directly from Bangkok or changwat level producers or indirectly from changwat producers through itinerant merchants. Notice that retailers are the only outlet for Bangkok produced goods. Retailers, therefore, serve all but the low quality markets which, at the present time, are in the sole domain of the itinerant merchants. It should be recalled that while retailers are drawn separately, some are actually combination producer-retailers.

Two summary points can be made about the structure of changwat level furniture market and the production-distribution system which serves it. First, the system is complex. Both from the standpoint of the varieties of consumer types and from the standpoint of producers and distributors, there are a wide range of classes of participants in the system. This is so even at the level of detail which has been used in constructing the preceding characterizations of the system.

Secondly, in spite of this complexity, there is substantial overlap in the markets served by producers and distributors. Hence, the structural conditions are present for the existence of an extremely competitive environment. The dynamic evolution of the Thai furniture industry is a function of the relative ability of businessmen to successfully operate in this environment, both in terms of facing and solving the

problems they encounter and in progressively improving the products, technology, organization and overall functioning of their businesses.

7.1.2 Major Trends and Opportunities for the Development of the Industry

There are four major types of changes which have been taking place in the Thai furniture industry which carry considerable importance in understanding the development potential of the changwat level production-distribution system. These are:

- (1) the steady growth in the demand for furniture in municipal areas, amphoe towns and villages;
- (2) the dramatic increase in furniture reselling which has brought products manufactured in other changwats, villages and in large- and small-scale Bangkok firms into direct competition with the changwat level manufacturers and has extended the market into rural areas;
- (3) the development of modern, large-scale furniture manufacturing for the domestic Thai market in Bangkok; and
- (4) the increasing difficulty associated with acquiring necessary supplies of critical inputs for furniture manufacturing, namely, structural wood and skilled labor.

The growth in the demand for furniture was documented in Chapter 3. It was shown there that the increase is likely to be most significant in amphoe towns and villages. Fully 57 percent of all changwat furniture expenditures originate in villages and 76 percent of the projected increase will come outside of municipal areas. These markets are characterized by a preference for lower quality, lower priced products and by the dispersed location of consumers. At the present time, these markets are

served to some extent by changwat level manufacturers, but more importantly, by the regional and village manufacturers. The absolute size of this market has allowed the regional and village producers to achieve gains from specialization in production. The local manufacturers which produce for these markets through itinerant merchants including the temporary producer-sellers have also specialized to some extent, although the degree is unknown. The only sample firms serving this market did so on a job-order basis.

In larger amphoe towns there is likely to be a place for the local job-order producer-seller or the producer-retailer, especially in the relatively small, medium and medium-high quality product markets. For the most part, however, the passive producer-seller will have little hope of reaching the largest segments of the rural markets. There is a need for more active marketing practices such as developing linkages with itinerant merchants as the regional and village producers have demonstrated. This also includes the active development of linkages with fixed location retailers which are the predominant type of furniture enterprise found in smaller amphoe towns.

The dramatic increase in furniture retailing was illustrated by the age structure of firms in the industry presented in Chapter 2. Table 2.15 presented information on the mean age of different types of firms, indicating the fact that retailers are the newest entrants into the industry. The mean ages of the firms, however, disguises the variance and skewness of the distributions. Given the importance of this development, Table 7.1 presents more detailed information on the length of the time the retailers have been in business. Producer-retailers are not included because no information was collected in the year in which the

Table 7.1. Age Distribution of Retailers in Furniture Industry
Study Up-Country Sample Areas

Location	Percentage of Firms in Each Age Class:			
	Less Than 1 Year	1-5 Years	6-10 Years	10-20 Years
Chiang Mai Muang	36.4%	36.4%	0%	27.3%
Lampang Muang	0%	66.7%	33.3%	0%
Khon Kaen Muang	20.0%	30.0%	20.0%	30.0%
Khon Kaen Other Amphoes	37.0%	55.6%	3.7%	3.7%
Roi-et Muang	0%	25.0%	0%	75.0%
Roi-et Other Amphoes	28.6%	71.4%	0%	0%

Total Muangs	21.4%	35.7%	10.7%	32.1%
Total Other Amphoes	35.3%	58.8%	2.9%	2.9%
Grand Total	29.0%	48.4%	6.5%	16.1%

Source: Furniture Industry Study.

combination was established. The reported figures clearly indicate the recent development of furniture retailing. In all the survey areas 77.4 percent of the retailers interviewed were established in the past five years. For other amphoes a total of 94.1 percent are less than five years old. If it were possible to include itinerant merchants, this pattern would further be reinforced in the most rural areas.

The importance of retailing from the standpoint of the changwat level industry is that it introduces new competitive forces from outside the changwat and also that it allows manufacturers to reach more consumers, thereby facilitating gains from specialization. Of particular importance are products in the medium to high quality ranges which are manufactured in Bangkok. The higher quality products come primarily from small-scale Bangkok producers who have access to a highly skilled labor force and whose products, in the eye of the retailers, have not been able to be matched by the changwat level manufacturers.

In the medium to medium-high quality range competition from large-scale, modern manufacturers is being felt up-country. These firms, as shown earlier, are significantly more efficient than the various types of producers found in the changwat level industry. Hence, their ability to penetrate up-country markets is largely a matter of production capacity rather than a question of capability.

Local producers will be forced to adjust to the competition from Bangkok. One choice open to them is to actively pursue a sufficiently large market niche in which they are shielded from this competition. This has been the path followed by the government contractors and the decorators. There will continue to be demand for a certain amount of custom-made, job-order production, but as suggested earlier, this form

of production-marketing arrangement is even now in a difficult economic position.

Another option available to the changwat level manufacturer is to augment his production enterprises with a reselling enterprise. Producer-retailers fare better than job-order producer-sellers according to the firm budget analysis. These firms have the important advantage of being better equipped to produce according to local comparative advantage by virtue of the information which they can gather in their procurement efforts.

Finally, the increasing difficulty of acquiring needed supplies of structural wood and skilled labor may tend to further disadvantage changwat level furniture manufacturers. Adequate supplies of wood are likely to be available for some time in Bangkok and in the few areas where timber is still in abundant supplies; however, in most up-country areas the problems of continued price increases and occasional supply disruption are likely to be quite common. Skilled labor is not a problem in the Bangkok area, but some firms up-country consider it quite serious.

Undoubtedly, these difficulties have contributed to the development and growth of retailing and the combination of retailing with manufacturing. These firm types are better adapted to coping with manufacturing input supply problems. Furthermore, the wood issue has motivated the move by some firms into more plywood intensive wooden furniture production, as well as into upholstery and other alternative material product lines. Interestingly, greater use of plywood is consistent with the manufacturing of lower quality products which is the market where a good deal of demand growth will be.

The implication of skilled labor shortages is not at all clear. It was learned in Chapter 5 that greater capitalization is associated with a lower skilled labor force and thus one solution may be in the substitution of machinery and equipment for skilled labor. Furthermore, if changwat level producers move into lower quality markets, the demand for skilled labor may be reduced. For those firms which depend on a highly skilled labor force the likely impact of any shortage is to increase the price of skilled labor, which would negatively effect their competitive position.

This section has summarized the major trends and opportunities facing the changwat level industry. The sections which follow will attempt to briefly summarize and draw together the main conclusions of this study, addressing both policy considerations and issues of research methodology.

7.2 Policy Relevant Conclusions and Recommendations

Several policy recommendations are justified on the basis of this research. These relate to technical assistance, financial assistance, materials policy and institutional reorganization. Each will be considered in turn.

7.2.1 Technical Assistance

The development of the changwat level furniture industry can be facilitated through the design and implementation of a program of technical assistance aimed at improving the ability of participants in the industry to adapt to its evolving structure and organization. In particular, there appears to be justification for efforts to train managers in the skills required to develop more effective marketing linkages, to

effectively engage in product retailing, to examine the potential for using alternative materials in the production of furniture and to improve furniture design. There is also a need to make available general managerial training on personnel relations and record keeping.

As was noted earlier, one of the major opportunities for changwat level furniture manufacturers depends on their ability to secure a market niche sheltered from competition from Bangkok based producers of higher quality products. Over time, it is reasonable to expect that much of the mass market, medium and medium-high quality furniture will be manufactured in modern, large-scale factories in Bangkok. These firms are much more efficient than local firms and have achieved substantial economies of scale and size. As up-country markets continue to grow, it may eventually be profitable to locate such a factory on a regional basis, but for the immediate horizon the Bangkok location is still highly advantageous. Higher quality products will also continue to be imported from Bangkok unless the changwat level manufacturers are able to meet the standards of these products through improved product design and more highly skilled workers.

It may be desirable for producer-sellers to consider the steps required to diversify into reselling. The advantages of this type of organization have been explored earlier. The skills required to manage a factory are not the same skills required to manage a reselling enterprise. Hence, there is a justification for the provision of assistance in this area.

A second opportunity lies in the growing rural demand for furniture of a lower quality. Adaption to this market requires linkages with an active marketing system. This is documented by the experience of the

regional medium-scale manufacturers and the Northern Thai village production-distribution system. Observation suggests that managers could benefit from becoming better informed about the potential in these areas and the ways in which they can effectively compete in these markets.

A second form of technical assistance called for is in the area of labor force training. It is necessary to reorient the training provided by the Institute for Skill Development and the Industrial Services Institute to more closely correspond with the needs of the changwat level industry. Emphasis ought to be placed on basic woodworking and finishing skills, upholstering and use of other materials such as aluminum and plastic. There must be more systematic interaction between local manufacturers and these institutes and perhaps greater decentralization in program design.

7.2.2 Financial Assistance

The evidence on the need for financial assistance presented in this study is not as conclusive as would be desired. There do appear to be gaps in the commercial banking system which might best be filled by government programs which directly provide credit or which can improve the performance of the banks. There is little doubt that the resources would be available either in the private or public sector to finance a fairly large investment in furniture manufacturing which has been well thought out and documented with a careful feasibility study. It is less clear that a manufacturer could conveniently obtain a two hundred thousand Baht loan to diversify into upholstery production or to diversify into retailing.

The financial needs of the changwat level industry during the foreseeable future will primarily be for expansion of fixed assets in the

same product line or diversification into other product lines or reselling. There is also a need for working capital to finance larger batch production and to finance stocks of goods for resale. A key requirement for this type of production for inventory is that working capital requirements are increased with an attendant decrease in the ability to rely on down payments for finance.

On this basis, it is recommended that further research be carried out concerning the private sector's ability to finance the types of adaptations which are expected to be made by participants in the changwat level furniture industry. Special attention should be focused on the short- and medium-term credit needs for the finance of fixed assets and initial working capital requirements for manufacturers wishing to expand, diversify into reselling or desiring to introduce production processes using alternative materials. Also, the very short-term working capital needs of manufacturers and marketing agents of all types deserves more careful consideration.

7.2.3 Materials Policy

It is clear that the relevant departments and agencies concerned with forestry policy and regulation, especially the Royal Forestry Department and the Forest Industry Organization (FIO), should be encouraged to proceed with all due haste to implement a program of long-term, sustainable yield commercial forestry to support Thailand's wood using industries. This includes active research and development of alternative species of trees and property rights issues. In the short- and medium-term, efforts should be made to improve the distribution of usable timber between Bangkok and up-country areas and between up-country areas of differential timber endowment.

Structural wood shortages will place greater demands on the existing plywood production capacity in Thailand. It may be appropriate for the FIO to begin to carefully study the feasibility of encouraging an expansion of plywood production capacity and to look into the economies of developing a veneer or particle board industry to make more efficient use of existing woods.

7.2.4 Institutional Reorganization

The final recommendation is perhaps the most important in terms of the longer-term development of the changwat level furniture industry and, more generally, all up-country industrial activity. It was discovered during the course of the research for this study that amazingly little was known about what has been termed here the changwat level furniture industry. The only information that was systematically available on the Thai furniture industry was in regard to the export sector. This lack of knowledge severely hampers the development of effective policies towards the industry.

It is recommended that the Department of Industrial Promotion (DIP) in the Ministry of Industry reorganize itself so that it can serve as a point of collection and dissemination of information on industries in Thailand. DIP should create "industry desks" oriented towards various manufacturing subsectors with an emphasis on activities outside the Bangkok area. The desk officer and his/her staff would be responsible for developing an expertise on all aspects of the industry(s) within their purview. The desk would serve as the point where all research and other investigative activity would be assimilated. The officer would be expected to interact with researchers, the various agencies and institutes

concerned with provision of technical and financial assistance and participants in the industry.

The DIP desk officer could best carry out his/her task if given some mechanism by which necessary research could be conducted. It might be wise to have a senior level researcher on the staff to assume responsibility for assessing the kinds of work that have or need to be done.

This research could be contracted to appropriate university based scholars or to private sector research firms. It is not, however, suggested that DIP act as a primary collector of quantitative information from participants in the industry. Businessmen are very leery of interviews by government officials, especially when sensitive information is involved.

This study has identified several areas where further research is necessary on the furniture industry. Among these is the need for additional information on the commercial banking system in terms of its ability to finance the adjustments which will be made in the changwat level industry. Also, it would be desirable to examine the Northern Thai village based production-distribution system, both in terms of its role in the Thai furniture industry and as an example of a successful village based industry. Furthermore, there is a need to make more careful analysis of the economic benefits and costs of large-scale, modern, Bangkok based manufacturers compared to smaller- or medium-scale up-country production and distribution.

There are key opportunities for USAID or other donor agencies to assist in the development of effective "industry desks." A certain amount of technical assistance may be required in establishing an operational organizational structure and workable scope of work. Most

importantly, however, USAID could be instrumental in the implementation of this reform by financing the establishment of one or two industry desks on a pilot project basis.

7.3 Methodological Conclusions

On the basis of the knowledge gained from undertaking this study, several conclusions regarding the methodology of conducting this type of research are in order.

- (1) If the objective of the research is to assess the growth and development potential of small, rurally located enterprise, then it is essential to organize the research on an industry-by-industry or subsector basis.

Small enterprises, whether involved with manufacturing, product distribution, the provisions of services or any combination of these activities prosper or fail on the basis of their ability to compete for an adequate market share. They compete not with other small firms in other industries, but with all types of firms in their industry. Hence, growth and development potential are phenomena of an industry and should, therefore, be studied in that context.

This conclusion was independently reached and reported in a recent paper by Hubert Schmitz of the IDS at Sussex. He noted that:

...if the objective of the research is to understand the growth and employment potential of small producers, it seems sensible to delimit the field of study along the same lines as those of the real world, i.e., according to branches and not according to academic concepts such as the informal sector. What is of concern to the small-scale weavers are the actions of larger weaving firms, not what the small shoemakers or street sellers do. (Schmitz, 1982, p. 443).

In fact, he goes on to argue that it is further essential to place the branch or industry studies in the context of a yet wider study of the

whole national economy. While this would be desirable, the methodological concern of our study is to find a meaningful and manageable unit of analysis.

Within the content of a subsector study, it is first necessary to understand the structure and organization of the industry as a whole. This includes the products, markets, structure of competition for markets and the various types of participants in the system. Given this understanding, it is then necessary to identify and analytically separate that portion of the industry most relevant to the question at hand. In this case, that unit was the changwat level industry. The dismemberment of the industry, however, must keep in tact the key interrelationships between the separable unit and the rest of the industry. Many of the dynamic forces at work in the industry are manifest in these relationships.

- (2) The industry and all of its separable components must be understood to contain both vertical and horizontal dimensions and research must be organized along both of these dimensions.

An industry is more than just a collection of manufacturers. It is composed of a variety of heterogenous enterprises involved in the transformation of raw materials into finished products in the hands of consumers. Research on the industry must account for the enterprises involved in the vertical movement of products through the various stages required to turn materials into final, distributed products. Furthermore, it is necessary to account for alternative and competing vertical channels which give the industry its horizontal dimension.

The research for this study began without explicit consideration of either of these dimensions. Only after some understanding was gained relative to the heterogeneity and complexity of the industry was an effort made to examine the enterprises in line vertically with the sample firms and those competing with the identified production-distribution channels. As has been seen, much of the insight gained into the dynamic changes in the furniture industry are directly a result of these broader considerations.

- (3) Sampling procedures for survey research are dependent on a prior understanding of the structure and organization of the industry in both its vertical and horizontal dimensions.

It has been a common procedure in research on small industries to organize research areas and choose samples of firms to study which correspond to areas targeted for programs or assistance packages. The research project from which this study emerged was guided by political considerations to examine the needs of rural industries in Northeastern Thailand. Prior to the initiation of any research activities, it was decided to also conduct research in one Northern changwat, Chiang Mai and one Central changwat, Suphan Buri. These research areas would be interesting in their own right, but would also offer a useful contrast with the results of the work in the Northeast.¹

There is nothing inherently wrong with the strategy followed to this point. The problem comes with the implicit assumption that it would be possible to understand the development potential of various types of

¹These issues are briefly discussed in Onchan, et al., 1979, pp. 17-19.

firms from information collected from a randomly selected sample of producers located in several specific locations within these changwats. This is especially true because the locations were selected, not on the basis of a prior understanding of the structure of particular industries, but instead on the basis of accessibility to Kasetsart, Chiang Mai and Khon Kaen Universities, the location of previous studies and USAID target areas (Mead and Meyer, 1981, p. 5).

To study the development of the furniture industry in Northeastern Thailand it is obviously necessary to study some of the firms which are located there. It is equally important, however, to study those firms which are competing with the Northeastern firms. This is not a function of geography, but a function of the structure and organization of industries. Furthermore, it is also important to study a variety of enterprise types, including producers, distributors and input suppliers.

The key point of this discussion is that the industry or subsector is the proper sampling frame and not a random collection of producers discovered in particular geographic areas. This implies that a substantial amount of research is required prior to the initiation of sample survey work. Given the understanding of the Thai furniture industry and the analytical framework of the changwat level industry presented in Chapter 2, it would be possible to select a good sample to use for detailed survey work. Without that understanding, however, such studies are difficult to justify and even more difficult to interpret.

- (4) It is essential that the researcher develops an "industry expertise" through direct contact with participants in the industry rather than through enumerators and answers to questionnaires.

The kind of understanding of the industry argued for in this section cannot be obtained through intermediaries and from answers written on questionnaires. The person responsible for analyzing survey data and other research information must have an intimate knowledge of the industry under study. This implies one of two things with regard to the organization of research projects. First, in a study covering a range of industries it is necessary to entrust the primary responsibility on an industry-by-industry basis to qualified researchers. These researchers must gain a first-hand knowledge of their industries and provide close supervision of any survey work delegated to enumerators. This role is an excellent place to make use of graduate students in research projects.

Alternatively, in a smaller project the scope of the study should be limited in accordance with the ability of senior staff members to develop the same type of industry expertise. In the absence of this knowledge the processing of data is more an academic exercise than one of practical value.

A final methodological conclusion is that extreme care must be exercised in obtaining information used in the analysis of enterprise profitability. No other study of small-scale firms to our knowledge has approached profitability from both a product and firm point of view. Hence, there is no way to know if the incongruity found in this study between the two measures of profit is a product of the particular nature of the respondents in the Thai furniture industry or would also be found in other situations. It is an especially troublesome problem because profit data can be quite important in the analysis of economic performance.

There are at least three different ways this type of problem can be addressed. The first approach would be to exercise greater care in obtaining quantitative information from sample firms. This is easier said than done. The data used in this study were collected as carefully as possible, given the limitations of the experience of the researchers and the degree of cooperation of the interviewees.

Secondly, it may be necessary to invent new ways of studying profitability. There may be inherent limitations to the approach of relying on the answers of a sample of firm managers who cooperate with differential degrees of honesty. One possible alternative could be the construction of a model firm based on selected interviews with those respondents thought to be most reliable. The parameters of the model could be varied to simulate different firm sizes, capital structures, organizational types, etc. Further investigation of this approach may be justified.

Lastly, regardless of the method used to analyze profitability, it is desirable to find ways of diminishing the dependency of study conclusion on precise profit figures. The industry or subsector approach has the advantage, in this context, examining the dynamics of the system from a perspective which depends less than a cross-section study on profit figures. By looking at demand and opportunities to capture growing markets, static profitability information is less important than the ability of firms to adapt to the changing constellation of opportunities.

These methodological conclusions should be placed in the context of the evolving role for research on small-scale enterprises. Cross-section, longitudinal research approaches to rural nonfarm activities such as those carried out under the Off-Farm Employment Project at Michigan State

University were developed to answer a particular set of questions concerning the macro economic development potential of these activities. Key questions which had not yet been answered related to the role of small-scale activities in solving an apparent output-employment trade-off and to whether or not these enterprises were deserving of the attention of government policy makers, international donor agencies and interested scholars.

It was partially as a result of these cross-section studies that small-scale enterprises came into vogue among all of the aforementioned parties (see Chapter 1). Once this concern was legitimized, an entirely different set of questions became relevant, especially those regarding what could be done to promote these activities. Policy makers and program officers were disappointed to find that the bulk of previous studies did not offer a lot of insight into what particular course should be followed. This has been the source of much of the criticism of cross-section research on small enterprises in the past few years and has evolved into an almost "anti-research" attitude on the part of many people concerned with these activities.

The conclusion of this study, however, is that research should not be abandoned as a guide to policy, program and project development, but it should be reformulated to address issues in the context of industries. The research on the changwat level furniture industry reported here began as a part of a cross-section research project, but evolved into an industry study. It is hoped that the utility of this approach has been validated.

7.4 A Final Note

During the time that the research for this study was being undertaken in Thailand an article on the furniture industry appeared in the highly regarded and widely read annual Economic Report of the Bangkok Post, Thailand's leading English language daily. The article contained the following statement summarizing the structure of the Thai furniture industry:

Most furniture factories are located in Bangkok. A relatively small number of factories are operating in Chiang Mai, Phrae and Nakorn Sawan.... There are approximately thirty important manufacturing concerns in Thailand. (Bangkok Post, 1980).

This point of view perhaps is indicative of the greatest danger faced by the changwat level furniture industry; the fact that it is normally overlooked in discussions concerning the future of the Thai furniture industry.

By emphasizing the 30 large producers and neglecting the hundreds of other manufacturers and sellers throughout the country, the importance of the smaller firms is diminished. If policy is made with the interests of the "most important" firms in mind, the prospects for the changwat level industry is quite bleak. Part of the objective of this study is to put the smaller producers on the map. There is no political lobby or "Changwat Furniture Association" to generate political clout. Thus, even if our research work has no immediate policy response, its contribution will be felt if it helps make consideration of small, decentralized enterprises part of the agenda of the policy makers.

APPENDIX A
FURNITURE EXPORTS

Exports of Thai furniture have increased dramatically over the past several years. Data on the value of exports are compiled in Table A.1. According to the Customs Department records, the F.O.B. value of furniture exports increased 650 percent between 1972 and 1978, and nearly doubled between 1978 and 1979. The statistics for 1979 and the projected 1980 figure show a continuation of the rising trend in the value of exports. Expressed in 1975 prices, while somewhat less dramatic, the growth is still quite substantial.

An additional indicator of the success of Thai furniture exports is the changing composition of the foreign markets served. Table A.2 reports the relative shares of exports by destinations. In 1975, North America and Europe accounted for 10.5 percent of foreign sales, while in the first half of 1980 these two areas accounted for 41.1 percent. This speaks well for the ability of Thai producers to compete in those difficult markets. Furthermore, the increased exposure in these areas can reinforce the trends in value and destination. At the same time, however, continued competitiveness in North America and Europe will depend on the maintenance of consistently strict quality control standards, as well as the sustained ability to adapt to the fashion and design trends in these markets.

The recent success of Thai furniture exports has been attributed to several factors. Often mentioned is the 1977 ban on the exports of logs, sawn wood and teak. Countries which once purchased high quality Thai wood for use in their own furniture industries have, in part,

Table A.1. Value of Thai Furniture Exports: 1972-80

Year	Nominal F.O.B. Value of Furniture Exports (Million ฿)	Deflated F.O.B. Value of Furniture Exports ^a (Million ฿)
1972	2.8	6.1
1973	29.9	38.9
1974	79.3	74.5
1975	62.8	62.8
1976	71.3	73.3
1977	107.0	106.6
1978	197.2	183.6
1979	378.2	294.7
1980	500.0 ^b	406.9

^aValue of exports is deflated by the overall export price index (1975 = 100). Since the export price index covers all exported products it may not reflect actual furniture price changes. Source: Bank of Thailand, Monthly Bulletin.

^bData for 1980 was not available at the time this table was compiled. Projection of the 1980 figure was based on comparable monthly data from 1979 and 1980.

Source: Computed from Customs Department data.

Table A.2. Destination of Thai Furniture Exports, 1975, 1979 and 1980

Destination	Percent of Thai Furniture Exports Delivered to Each Destination in the Year:		
	1975	1979	1980 ^a
Asia	80.7%	54.2%	51.4%
North America	5.8%	19.6%	17.8%
Europe	4.7%	18.4%	23.3%
Middle East	2.2%	4.9%	5.9%
Oceanic	7.0%	2.8%	1.4%
Africa	.3%	.1%	.2%

^aJanuary to June only.

Source: Computed from Customs Department data.

adjusted to the ban by purchasing greater quantities of Thai furniture. This argument is given a great deal of credence in popular discussion of the export trends. It is important to exercise caution before taking this claim too far. The process of adjustment to the export ban also includes increased purchases of furniture and timber from other countries. There are also reported leakages of Thai timber through the ports of neighboring countries. Even more important, however, is the claim made by certain participants in furniture exporting that the ban has created greater difficulties in obtaining supplies of teak which can be used by the industry. Speculation that the ban will eventually be lifted has encouraged sawmills and wood merchants to hoard teak logs in hopes of obtaining the high prices which can be secured in the world

market. If the sawmills are not sawing the logs for export, the supplies of the lower priced residue used in furniture production are reduced. This results in higher input costs which, in turn, affects the competitive position of the export producer. This argument is endorsed by the Furniture Manufacturing Association of Thailand. Hence, the proponents of the export ban, who point to furniture exports as a clear example of its effectiveness, might profit from a careful evaluation of the potential negative effects on local wood prices.¹

Other factors which have contributed to the remarkable export growth include the relatively low level of wages in Thailand, the popularity at this time of tropical material based furniture and increased abilities in product design, in part made possible through the increased number of international joint ventures and a greater willingness to make use of market information. Thai exporters have also been quick to adopt the use of transport cost saving CKD product lines.

In spite of the apparent success of the Thai exporters, a recent review of the export sector by a UN advisor has highlighted a number of weaknesses in the sector, especially when compared with Western standards (Cody, 1980). The most critical observation concerned unsuitable buildings and layout, inadequate machinery, absence of timber drying facilities, low level of production technology, incompetent management, absence of well organized materials supply channels, poor product design and inadequate government support. What this report highlights

¹Since the major proponent appears to be the Thai government, any sign of potential policy reevaluation will further increase the incentive for hoarding logs, which may exasperbate the input price effects.

is the tremendous potential for further development of the export sector over and above its recent successful history.

Thai furniture exports are concentrated in the hands of a relatively small number of medium and small sized firms. The five largest firms of the approximately 30 which are considered important exporters account for more than 25 percent of total exports. Some summary information on these firms are presented in Table A.3. All of these factories are supported by Board of Investment subsidies.

Aside from the complaints concerning material prices and the export ban, the exporters also express dissatisfaction with the practices of customs and port officials. Given the importance of having a reliable, smooth flow of products to foreign purchasers to assure the continued success of the export trade, this concern is not misplaced.² Producers claim that excessive amounts of time are taken to inspect goods before shipment. One factory reports cases where letters of credit have expired as a result of these delays. As well, burdens are placed on exporters who must finance, at high costs, high import duties on component parts which they await the refunds to which they are entitled.

Other problems mentioned include skilled labor shortages, especially skills required for operating the highly mechanized production processes and the absence of greater efforts by the government for product promotion. In spite of these difficulties, the bouyant demand conditions existing at present have all exporters working at full capacity (Business in Thailand, 1979).

²For an enlightening discussion of the problems that disruptions and unreliability can create for exporters, see Morawetz, 1980. While he focuses on Colombian clothing exports, his remarks concerning the significance of these issues are worth serious consideration.

Table A.3. Selected Characteristics of Five Major Furniture Exporters

Name of Company	Production Location	Primary Raw Material	Registered Capital (Million ฿)	Number of Employees	Value of Exports 1979 (Million ฿)	Value of Exports 1980 (Million ฿)	Primary Markets	Date Established	Ownership
Siam Wood Company	Haad Yai	Para-rubber	5.0	150	30	50	Japan	1974	Thai
Hawaii-Thai Export Company	Miniburi	Rattan	6.0	100	25	30	USA Europe	1977	Thai-German, Joint Venture
Chada Furniture and Construction Company, LTD.	NA ^a	Teak	5.0	NA	NA	NA	USA Europe Japan	NA	Thai
Scan Thai	Samut Sakorn	Teak	10.0	150	30	40	USA Europe	1977	Thai-Danish, Joint Venture
Raja Company, LTD.	NA	Teak	12.0	NA	1	5	USA Europe	NA	NA

^aNA = not available.

Source: Business in Thailand, 1980; Bangkok Post, 1980 a,b; Iamkamala, 1980.

APPENDIX B
REPRESENTATIVE FIRM BUDGET ANALYSIS

This appendix reports the findings of the additional budget analyses referred to in Chapter 5. Reported here are budgets for breakdowns by technology, firm size and location. Explanation of the structure of the analyses is contained in Chapter 5.

B.1 Variations in Technology of Production

There are no clear criteria on which to group the sample firms by technology. While there are important differences between the most "traditional" and most "modern" firms, it is not obvious on a purely descriptive basis where to draw a line which would separate the technological alternatives. A firm may be equipped with one sophisticated saw, but then use only hand planing. Since the technologies differ primarily in their use of cheaper hand tools or more expensive power machinery, it is appropriate to group firms on the basis of their respective capital-labor ratio. It should be remembered that all of the sample firms would be considered relatively labor-intensive. Analytically, however, it is instructive to distinguish between two groups of firms: those which are relatively labor-intensive (L-firms) and those which are relatively capital-intensive (K-firms). Both types use some electrically powered machinery; however, the more capital-intensive alternative makes greater use of stationary saws, drill presses, and may own a stationary planer or surfacer and thicknesser. The central difference in production organization between the two types of firms is that the more capital-intensive process is more amenable to the bulk preliminary processing

of wood, regardless of whether there is single-order or small-batch production.

The sample contains 11 firms which can be classified as relatively labor-intensive firms and eight relatively capital-intensive firms. The economic characteristics of these two representative firm types are reported in Table B.1. The K-firms are substantially larger in terms of output and value-added than the L-firms nearly by a factor of two. The percentage of value added, however, is similar. The labor force is somewhat larger in the K-firms, both in the number of employees and total man-hours. The major labor force differences appear to be in the greater amount of administrative labor and the slightly lower percentage of skilled workers in the K-firms. Wage rates are substantially higher in the L-firms, perhaps reflecting the relatively higher carpentry and woodworking requirements of the less mechanized production process. As would be expected, the annual flow of capital services is much larger for the K-firms, especially for machinery and equipment. The K-firms use 8.2 times more machinery and equipment and 2.5 times more total fixed assets. The composition adjusted average product price, a rough measure of product quality, indicates that the L-firms produce a higher quality product than the K-firms.

The relative efficiency of the two classes of firms can be examined in the ratios presented in the lower section of Table B.1. The labor and capital coefficients are used to construct the unit output isoquant shown in Figure B.1. As expected, the K-firms are more efficient users of labor and the L-firms more efficient users of capital. Given the relative prices of capital and labor, however, the K-firms are clearly more economically efficient. The ratio of the price of capital to the

Table B.1. Economic Characteristics of the Changwat Level Furniture Industry: Variation by Technology

Characteristics	Labor-Intensive Process	Capital-Intensive Process
Number of Firms	11	8
Annual Output (1,000 ฿)	693.50	1,141.83
Production/Sales	.887	.802
Annual Value Added (1,000 ฿)	233.02	373.48
Percent Value Added	33.6%	32.7%
Number of Employees	11.4	16.0
Annual Man-hours of Labor/ (Percent of Total)		
- Administrative	1,953 (8.0%)	5,071 (12.4%)
- Skilled Production	15,092 (61.5%)	23,382 (57.2%)
- Unskilled Production	7,489 (30.5%)	12,391 (30.3%)
- Total Production	22,581 (92.0%)	35,773 (87.6%)
- Skilled/Unskilled	2.02	1.89
Average Wage Rates (฿/Hour)		
- Skilled Production	12.38	9.84
- Unskilled Production	6.99	4.98
- Average Production	10.59	8.16
Average Annual Flow of Capital Services (1,000 ฿)		
- Machinery and Equipment	5.75	47.36
- Total Fixed Assets	62.24	152.87

Value Added/Labor Cost (Labor Cost/Value Added)	.974 (1.027)	1.279 (.782)
Value Added/Machinery and Equipment (Machinery and Equipment/ Value Added)	40.50 (.025)	7.890 (.127)

Source: Furniture Industry Study.

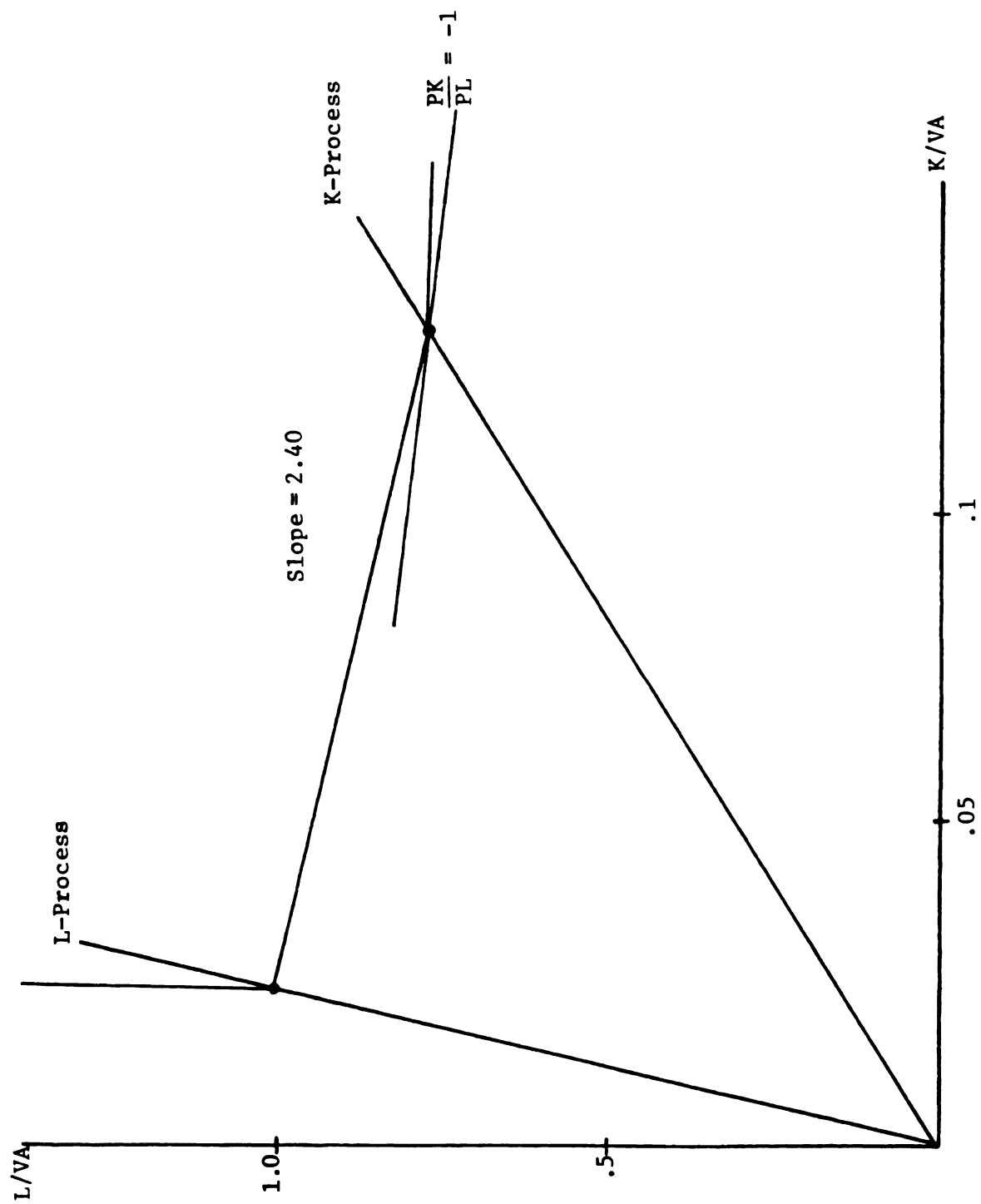


Figure B.1.1. Unit Output Isoquant: Variation by Technology

price of labor would have to increase by more than 2.4 times in order for the L-firms to become allocatively efficient.

The results of the profitability analysis are reported in Table B.2. The structure of materials and overhead costs are roughly similar for the two types of firms. Labor costs, however, represent approximately 31 percent of total output for the L-firms, but only 26 percent for the K-firms. Relative capital costs differences are large enough to offset the lower labor costs in the K-firms. As was the case with the sample average firms, returns become negative after deducting the capital costs associated with buildings and land. Overall, the rate of economic profit is much better for the K-firms, -10 percent, compared with the -23.3 percent for the L-firms.

B.2 Variations in Firm Size

Firm size can be measured along any number of dimensions. Normally, in this type of study, size classes are distinguished by the value of output, value added, the size of the capital stock or the number of employees. In the ROFEAP sample of furniture producers there are no large firms, even by Thai standards. From the standpoint of the chang-wat level production-distribution system, however, there are a range of sizes and account will be taken of the differences between firm sizes in the budgeting exercise. It is therefore necessary to adopt an explicit standard for scaling the firms.

Rank orderings of the 19 firms were arrayed along three dimensions: (1) the value of output; (2) the annual capital service flow associated with directly productive machinery and equipment; and (3) the total number of man-hours of production labor. Not surprisingly, each dimension

Table B.2. Profitability Budget for Changwat Level Furniture Industry: Variations by Technology

Account Item	Labor-Intensive Process	Capital-Intensive Process
Total Output (1,000 ฿)	693.50 (100%)	1,141.83 (100%)
Materials Cost (1,000 ฿)	405.71 (58.5%)	659.18 (57.7%)
Overhead Cost (1,000 ฿)	54.78 (7.9%)	109.18 (9.6%)
Hired Labor Cost (1,000 ฿)		
- Administrative	2.94	12.79
- Production	199.96	273.12
- Worker Benefits	10.69	10.05
- Total Labor Cost	213.59 (30.8%)	295.95 (25.9%)
Capital Costs (1,000 ฿)		
- Machinery and Equipment	5.75 (.8%)	47.36 (4.1%)
- Building and Land	56.49 (8.1%)	105.52 (9.2%)
- Total Capital Costs	62.24 (8.9%)	152.87 (13.3%)
Capital Stock (1,000 ฿)	349.98	1,251.30
Total Returns to Capital and Family Labor (1,000 ฿)	19.42	77.52
Returns to Family Labor and Building and Land (1,000 ฿)		
- Gross	13.67	30.16
- Per Hour of Family Labor	.003	.006
Returns to Family Labor (1,000 ฿)		
- Gross	-42.82	-75.36
- Per Hour of Family Labor	-.001	-.015
Economic Profits (1,000 ฿)		
- Gross	-92.10	-125.52
- Rate of Profit	-23.3%	-10.0%

Source: Furniture Industry Study.

yielded a slightly different rank ordering of firms. Table B.3 reports the nonparametric correlation coefficient (Spearman's rho) among the different scale criteria. None of the three primary ranking criteria provides an ideal estimation of overall firm size. Therefore, an aggregate ranking was computed based on gross means of the ranks along each dimension. This procedure maximizes the value of Spearman's rho for this index. These correlations are satisfactorily high and will serve as the basis for the size analysis of this section.

Table B.4 presents the economic characteristics of the three representative firms when broken down by firm size. In the sample there are six smaller firms, six medium firms and seven larger firms. There are larger differences in the value of production with the larger firms' production more than nine times more than the smaller firms. It is interesting to note also that the ratio of production to total sales declines as firm size increases. Hence, the larger firms also tend to resell more furniture. The percentage of value added in total production is similar for each class of firms. Employment and man-hours also increase as firm size increases. Larger firms appear to require greater amounts of administrative labor hours than smaller firms and they use relatively less unskilled labor. Wage rates in both skilled and unskilled workers increase from small to the medium sized firms, but then decline to their lowest level for the largest firms. This may reflect lower average skill levels in the larger firms. The annual cost of machinery and equipment and total fixed asset rises with firm size. Larger firms use 17 times more machinery than small firms and five times more total fixed assets.

Table B.3. Spearman's Rho^a Correlation Coefficients for Alternative Rankings of Firm Size

Dimension	Spearman's Rho for p s of Rank Orderings:			
	Output	Machinery and Equipment	Man-Hours	Aggregate Index
Output	1.0	.591	.581	.814
Machinery and Equipment	--	1.0	.719	.870
Man-Hours	--	--	1.0	.858
Aggregate Index	--	--	--	1.0
All coefficients are significant at the 95% level				

$$^a\text{Spearman's rho} = 1 - \frac{6 \sum_{i=1}^n d_i^2}{N^3 - N},$$

where, d_i is the difference between ranks and N is the sample size.

The test statistic $\text{rho} \left(\frac{N-2}{1 - \text{rho}^2} \right)$ is distributed as Student's t with $N-2$ degrees of freedom.

Table B.4. Economic Characteristics of the Changwat Level Furniture Industry: Variations in Firm Size

Characteristics	Smaller Firms	Medium Firms	Larger Firms
Number of Firms	6	6	7
Annual Output (1,000 ฿)	168.53	851.45	1,520.47
Production/Sales	.928	.850	.826
Annual Value Added (1,000 ฿)	55.82	300.32	487.74
Percent Value Added	33.1%	35.3%	32.1%
Number of Employees	6.4	14.5	18.3
Annual Man-Hours of Labor (Percent of Total)			
- Administrative	985 (6.9%)	2,705 (6.8%)	5,702 (12.7%)
- Skilled Production	8,480 (59.1%)	17,701 (56.5%)	26,855 (59.8%)
- Unskilled Production	4,884 (34.0%)	10,990 (35.1%)	12,322 (27.4%)
- Total Production	13,364 (93.1%)	28,691 (91.6%)	39,176 (87.3%)
- Skilled/Unskilled	1.74	1.61	2.18
Average Wage Rates (฿/Hour)			
- Skilled Production	11.39	12.71	10.11
- Unskilled Production	5.52	6.74	5.37
- Average Production	9.24	10.42	8.62
Average Annual Flow of Capital Services (1,000 ฿)			
- Machinery and Equipment	3.68	10.45	51.03
- Total Fixed Assets	48.99	63.21	233.60

Value Added/Labor Cost (Labor Cost/Value Added)	.452 2.212	1.005 .995	1.444 .692
Value Added/Machinery and Equipment (Machinery and Equipment/Value Added)	45.820 .022	28.720 .035	9.558 .105

Source: Furniture Industry Study.

The unit output isoquant, drawn in Figure B.2 illustrates that the larger firms, which are also the more capital intensive firms, are dominant in terms of allocative efficiency. For the medium firms to become most efficient would require the ratio of the price of capital to labor to increase by more than 4.33 times and for small firms the price ratio would have to increase by more than 93 times. This shows clearly that the position of the larger firms is quite secure.

Profitability and cost structure by firm size is reported in Table B.5. Once again, the structure of value added is for all practical purposes similar among the firm types. Labor costs exhibit a sharp decline as firm size increases, while capital costs decline for medium firms and then increase for larger firms. Surprisingly, building and land costs for the smaller firms are quite high, 29.1 percent of total production, but are much lower for even the larger firms. Returns to capital and family labor are negative from the very start for the smaller firms and then by the time economic profits are reached, the loss is nearly as large as their total production. The performance is somewhat better for medium and larger firms, however, as their economic profit rate is the highest. Again, all of the rates of profit are negative, but for the largest firms, the financial returns at least are positive.

B.3 Variation by Location

Eight of the sample firms are located in the North and 11 firms in the Northeast. The analysis by location can help address the question of differences in what has been grouped together as the changwat level furniture industry. In addition, there is some differences in the historical pattern of the industries' development in the two areas. This applies to both the materials used (greater reliance on teak in the

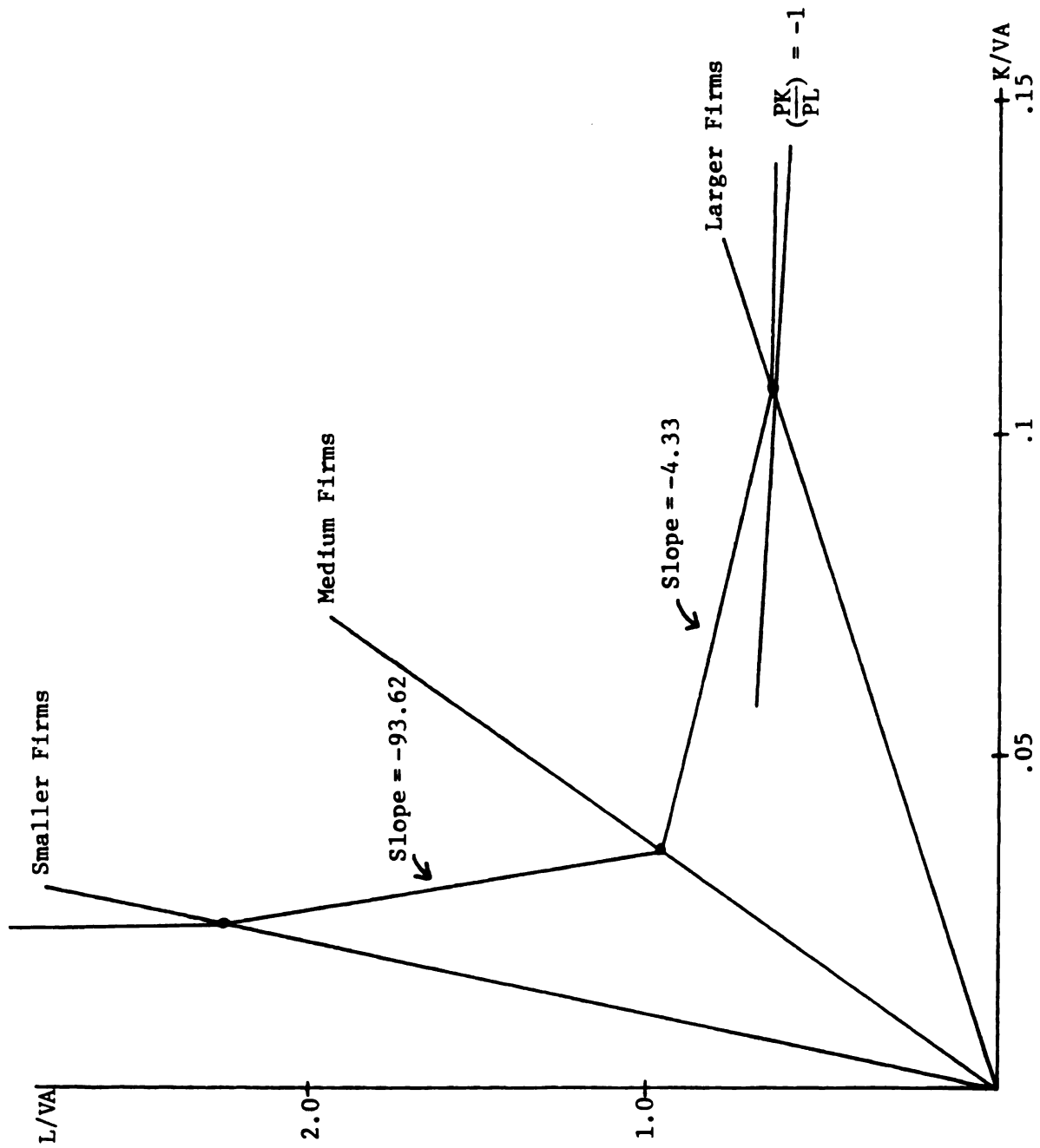


Figure B.2. Unit Output Isoquant: Variation by Firm Size

Table B.5. Economic Budget for Changwat Level Furniture Industry:
Variations by Firm Size

Account Item	Smaller Firms	Medium Firms	Larger Firms
Total Output (1,000 ฿)	168.53 (100)	851.45 (100)	1,520.47 (100)
Materials Cost (1,000 ฿)	96.45 (57.3)	482.45 (56.7)	894.22 (55.8)
Overhead Cost (1,000 ฿)	16.17 (9.6)	68.22 (8.0)	138.52 (9.1)
Hired Labor Costs (1,000 ฿)			
- Administrative	.17	2.98	16.54
- Production	81.78	271.95	323.16
- Worker Benefits	15.80	2.00	14.74
- Total Labor Costs	97.75 (58.0)	276.93 (32.5)	354.44 (23.3)
Capital Costs			
- Machinery and Equipment	3.68 (2.1)	10.45 (1.2)	51.03 (3.4)
- Building and Land	45.32 (26.9)	52.76 (6.2)	182.57 (12.0)
- Total Capital Costs	48.99 (29.1)	63.21 (7.4)	233.60 (15.4)
Capital Stock	276.60	399.88	1,470.90
Total Returns to Capital and Family Labor (1,000 ฿)	-41.93	23.39	133.30
Returns to Family Labor and Building and Land			
- Gross (1,000 ฿)	-45.60	12.94	82.272
- Per Hour (1,000 ฿)	-.011	.003	.018
Returns to Family Labor			
- Gross (1,000 ฿)	-90.92	-39.82	-100.30
- Per Hour (1,000 ฿)	-.021	-.009	-.021
Economic Profits			
- Gross (1,000 ฿)	-139.57	-95.43	-147.52
- Rate of Profit	-50.5%	-23.9%	-10.0%

Source: Furniture Industry Study.

North), the general development of the region (the Northeast has lagged behind the North) and the development of competition (retailing) in the two regions.

Table B.6 contains the descriptive economic characteristics of the sample firms in the two areas. The average output is quite similar, but it can be seen that the percentage of value added is significantly lower in the North. This is attributable, in large part, to the higher costs paid for materials in the North. Northern firms employ slightly more persons than in the Northeast and also relatively more highly skilled labor forces. Wages are significantly different between the regions, perhaps reflecting the greater supply of skilled woodworkers in the Chiang Mai area. Capital costs, measured by machinery and equipment are higher in the North, while total assets are larger in the Northeast. Interestingly, there is a substantial difference in the ratio of production to total sales reflecting the more general practice of combining production and resale enterprises in the Northeast.

There are also differences in the efficiency of resource use in the two areas. The Northeastern firms use both labor and capital more productively. This is illustrated in Figure B.3 where the dominance in terms of technical efficiency by the Northeastern firms is clearly shown. At no set of input prices could the Northern firms be efficient relative to the Northeastern firms. This result should be taken with some caution, however, because of the historical problems with the regulation of teak in the North. There is a great deal of fear among the firms in the North of the government. Hence, the level of cooperation and the accuracy of data were both considerable less in the North than in the Northeast.

Table B.6. Economic Characteristics of the Changwat Level Furniture Industry: Variation by Location

Characteristics	North	Northeast
Number of Firms	8	11
Annual Output (1,000 ฿)	813.33	
Production/Sales	.984	.775
Annual Value Added (1,000 ฿)	221.35	343.66
Percent Value Added	22.7%	36.9%
Number of Employees	15.7	11.7
Annual Manhours of Labor/ (Percent of Total)		
- Administrative	3,022 (8.8%	3,443 (12.1%)
- Skilled Production	21,238 (61.8%)	15,924 (55.8%)
- Unskilled Production	10,101 (29.4%)	9,154 (32.1%)
- Total Production	31,339 (91.2%)	25,078 (87.9%)
- Skilled/Unskilled	2.10	1.74
Average Wage Rates (฿/Hour)		
- Skilled Production	9.72	12.44
- Unskilled Production	5.14	6.50
- Average Production	8.24	10.27
Average Annual Flow of Capital Services (1,000 ฿)		
- Machinery and Equipment	29.26	18.90
- Total Fixed Assets	103.02	134.95

Value Added/Production Labor Cost	.857	1.334
(Labor Cost/Value Added)	1.167	.749
Value Added/Machinery and Equipment	7.565	18.185
(Machinery and Equipment/ Value Added)	.132	.54
Capital/Labor		

Source: Furniture Industry Study.

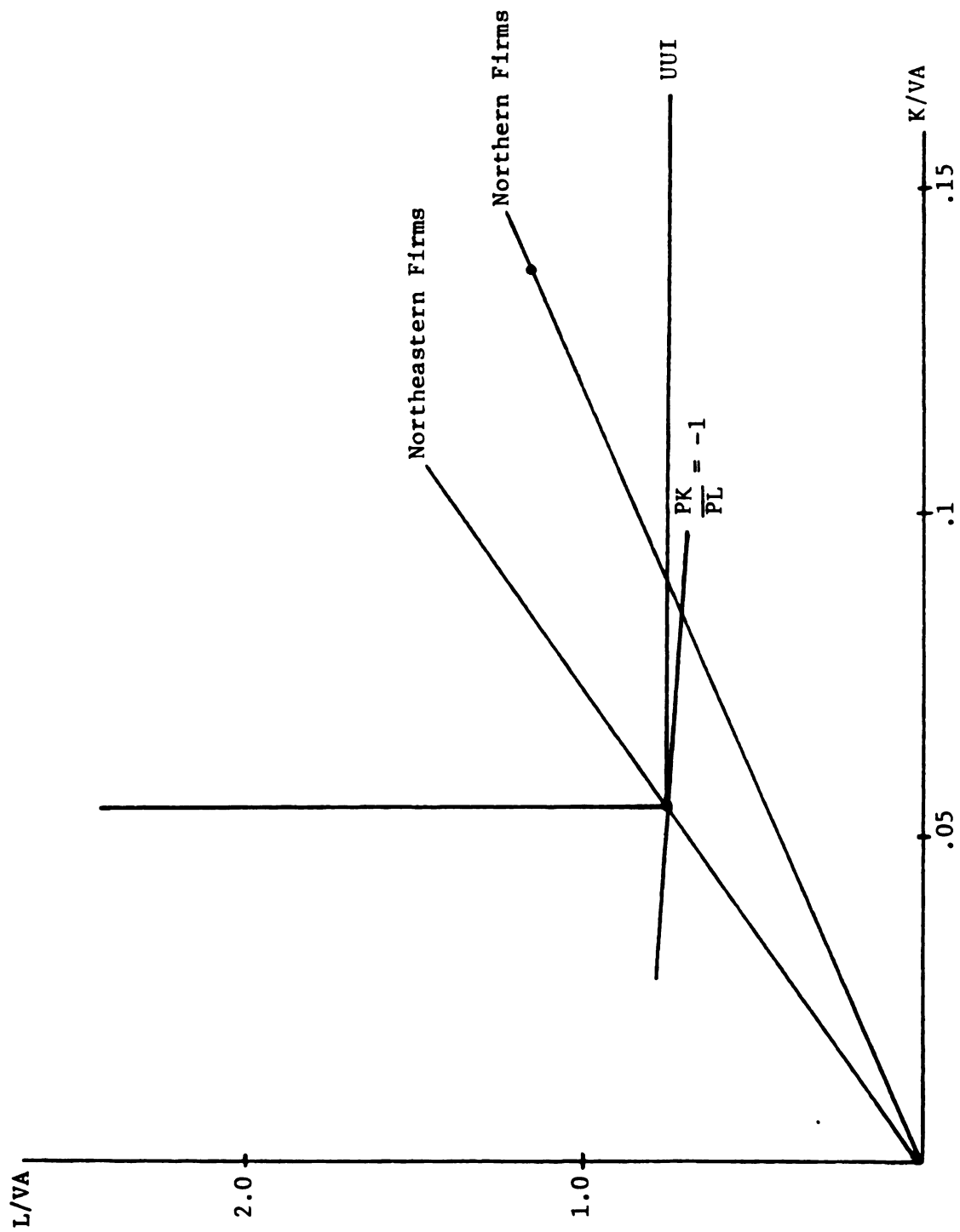


Figure B.3. Unit Output Isoquant: Variation by Firm Location

The profitability budget in Table B.7 may also be affected by the suspected relative underestimation of output in the North. The structure of costs are quite similar between the two regions. The only notable exception appears in the higher building and land costs in the Northeast. Returns are higher in the Northeast and the very low returns to capital and family labor reinforce the suspected underreporting of total output in the North. The economic profit rates are both negative, but the superior performance of the Northeastern firms is evident.

Table B.7. Profitability Budget for Changwat Level Furniture
Industry: Variation by Location

Account Item	North	Northeast
Total Production (1,000 ฿)	813.33 (100)	932.41 (100)
Materials Cost (1,000 ฿)	498.90 (61.3)	522.27 (56.0)
Overhead Cost (1,000 ฿)	93.08 (11.4)	66.48 (7.1)
Hired Labor Cost (1,000 ฿)		
- Administrative	12.91	2.85
- Production	244.96	220.44
- Worker Benefits	3.00	16.91
- Total Labor Cost	260.87 (24.6)	240.20 (25.8)
Capital Costs (1,000 ฿)		
- Machinery and Equipment	29.26	18.90
- Building and Land	73.76	116.04
- Total Capital Costs	103.02	134.94
Capital Stock (1,000 ฿)	669.13	818.37

Total Returns to Capital and Family Labor	-39.52	103.46
Returns to Family Labor and Building and Land		
- Gross	-68.78	84.56
- Per Hour of Family Labor	-.021	.016
Returns to Family Labor		
- Gross	-142.54	-31.47
- Per Hour of Family Labor	-.042	-.006
Economic Profits		
- Gross	-175.15	-96.77
- Rate of Profit	-26.2%	-11.8%

Source: Furniture Industry Study.

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