

WOODEN FURNITURE INDUSTRY PRODUCTIVITY, COST OF PRODUCTION FOR CERTAIN SELECTED PRODUCTS, PRIMARY INPUT CONTENT AND POLICIES FOR SUSTAINABILITY

PD 192/03 Rev.3(M)

TECHNICAL REPORT NO. II



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M. Mohd Parid**



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April 2009

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First Print 2009

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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Wooden furniture industry productivity, cost of production for certain selected products, primary input content and policies for sustainability : PD 192/03 rev. 3 (M) / H. Norini ... [et al.].

(Technical report ; no. II)

ISBN 978-967-5221-14-9

1. Furniture--Malaysia--Research. 2. Forest product industry--Malaysia--Research. I. H. Norini. II. Title. III. Series.
684.10409595

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TABLE OF CONTENTS

List of Figures	v
List of Tables	vi
List of Annexes	ix
List of Acronyms	x
Executive Summary	xiii
Acknowledgements	xxiii
CHAPTER 1: INTRODUCTION	1
General Background	1
Objective	1
Justification	2
Scope of the Report	5
Problems Encountered	5
Structure of the Report	6
CHAPTER 2: RESEARCH METHODOLOGY	7
Introduction	7
Location of the Study Areas	7
Preparation of Questionnaire	11
Training Contract Research Assistants to Carry out the Survey	15
Data Collection	19
Data Analysis	21
CHAPTER 3: RESEARCH FINDINGS AND DISCUSSION	23
Introduction	23
Classification of Wooden Furniture Mills	23
Background of Companies	25
Production and Marketing	36
Human Resources	61
Machinery and Equipment	68
Wooden Furniture Industry Productivity	74
Cost of Production	94
Conclusion	98
CHAPTER 4: PRIMARY INPUT CONTENT	115
Introduction	115
A Brief Overview of Input–Output Analysis	115
Inputs Used by the Furniture Industry	118

The Furniture Primary Input Multipliers	121
Analysis of Results for the Furniture Primary Input Content	124
Results of the Total Primary Inputs Used	125
Conclusion	130
CHAPTER 5: CONCLUSION AND RECOMMENDATIONS	135
Introduction	135
Major Findings	136
Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis	154
Conclusion and Recommendations	159
REFERENCES	165

LIST OF FIGURES

Figure 1.1:	Malaysia's Exports of Furniture, 1995–2007	3
Figure 1.2:	Proportions of Exports of Malaysian Wooden Furniture by Major Destination, 1995–2007	4
Figure 2.1:	Locations of Wooden Furniture Mills Surveyed in Peninsular Malaysia Using GPS	20
Figure 2.2:	Locations of Wooden Furniture Mills Surveyed in Sabah and Sarawak Using GPS	21
Figure 2.3:	Summary of the Research Design	22
Figure 4.1:	Schematic Input–Output Table	116
Figure 4.2:	Proportions of Inputs Used for the Furniture Sector	119
Figure 4.3:	Summary of Primary Inputs for Furniture	130

LIST OF TABLES

Table 1.1:	Malaysia's Exports of Major Timber Products, 2007	3
Table 2.1:	Numbers of Mills in the Sample Frame of the Wooden Furniture Industry in Malaysia	8
Table 2.2:	Status of Wooden Furniture Mills in Malaysia from Various Sources	10
Table 2.3:	Comparison between the Total Export Value of the Surveyed Mills and the Total Export of Wooden Furniture, Malaysia, 2006	11
Table 3.1:	Classification of the Wooden Furniture Industry by Total Workforce	24
Table 3.2:	Classification of Wooden Furniture Industry by Annual Sales Turnover	25
Table 3.3:	Distribution of Wooden Furniture Mills in Malaysia by State	27
Table 3.4:	Distribution of Wooden Furniture Mills in Malaysia by Year of Establishment	28
Table 3.5:	Years of Establishment by Classification of Mills	29
Table 3.6:	Distribution of Wooden Furniture Mills in Malaysia by Ownership	31
Table 3.7:	Ownerships by Classification of Mills	32
Table 3.8:	Distribution of Wooden Furniture Mills in Malaysia by Status of the Company	34
Table 3.9:	Status of the Companies by Classification of Mills	35
Table 3.10:	Types of Furniture Produced by Wooden Furniture Mills	36
Table 3.11:	Numbers of Types of Furniture Produced	37
Table 3.12:	Distribution of Wooden Furniture Mills in Malaysia by Type of Main Product	38
Table 3.13:	Types of Main Product by Classification of Mills	39
Table 3.14:	Market Orientations of Main Products	40
Table 3.15:	Distribution of Wooden Furniture Mills in Malaysia by Market Orientation	42
Table 3.16:	Numbers of Wooden Furniture Mills by Proportion of Export Market	42
Table 3.17:	Market Orientations by Classification of Mills	43
Table 3.18:	Market Orientations by Ownership	43
Table 3.19:	Distribution of Wooden Furniture Mills in Malaysia by Target Market Strategy	45
Table 3.20:	Types of Furniture Produced by Product Specialization's Mills	45
Table 3.21:	Target Market Strategy by Classification of Mills	47
Table 3.22:	Market Destinations of Wooden Furniture Products	48
Table 3.23:	Product Design Specifications for Furniture	49
Table 3.24:	Product Design Specifications by Classification of Mills	50
Table 3.25:	Decision-making on the Designing of Furniture	51

Table 3.26:	Decision-making on the Design of Furniture by Classification of Mills	52
Table 3.27:	Sources of Ideas on Wooden Furniture Designs	53
Table 3.28:	Distribution of Wooden Furniture Mills in Malaysia by Number of Designers	54
Table 3.29:	Numbers of Designers by Classification of Mills	56
Table 3.30:	Distribution of Wooden Furniture Mills in Malaysia by Availability and Number of Persons Involved in R&D Teams	57
Table 3.31:	Availability and Numbers of Persons Involved in R&D Teams by Classification of Mills	58
Table 3.32:	Numbers of Mills with / without Quality Control (QC) System by State	59
Table 3.33:	Mills with Quality Control (QC) System: Persons Involved	60
Table 3.34:	Status of Quality Control System by Classification of Mills	60
Table 3.35:	Total Workforce by Category	62
Table 3.36:	Proportion of Foreign Workers	63
Table 3.37:	Training Practices	64
Table 3.38:	Training Practices by Classification of Mills	65
Table 3.39:	Numbers of Trained Workers and Total Expenditure on Training Programme by State	66
Table 3.40:	Total Expenditure on Training Programme by Classification of Mills	67
Table 3.41:	Most Common Machinery and Equipment Used	69
Table 3.42:	Countries of Origin for Machinery and Equipment Used	69
Table 3.43:	Utilization of Numeric Control (NC) or Computer Numeric Control (CNC) Machinery by Ownership	70
Table 3.44:	Utilization of Numeric Control (NC) or Computer Numeric Control (CNC) Machinery by Status of the Company	71
Table 3.45:	Utilization of Numeric Control (NC) or Computer Numeric Control (CNC) Machinery by Classification of Mills	72
Table 3.46:	Equipment Fabrication for Furniture	73
Table 3.47:	Overview of Main Productivity Measures	75
Table 3.48:	Mean Labour Coefficients by Main Type of Furniture Produced	77
Table 3.49:	Mean Labour Coefficient by Classifications of Mills	77
Table 3.50:	Analysis of Variance (ANOVA) for Labour Coefficients by Classification of Mills	78
Table 3.51:	Single-factor Productivity Values by Classification of Mills	80
Table 3.52:	Analysis of Variance (ANOVA) for Single-factor Productivity by Classification of Mills	81
Table 3.53:	Single-factor Productivity Values by Main Type of Furniture Produced	83
Table 3.54:	Analysis of Variance (ANOVA) for Single-factor Productivity by Main Type of Furniture Produced	84
Table 3.55:	Single-factor Productivity Values by State	85

Table 3.56:	Analysis of Variance (ANOVA) for Single-factor Productivity by State	86
Table 3.57:	Value-added Productivity Values by Classification of Mills	87
Table 3.58:	Analysis of Variance (ANOVA) for Value-added Productivity by Classification of Mills	88
Table 3.59:	Value-added Productivity Values by Main Type of Furniture Produced	90
Table 3.60:	Analysis of Variance (ANOVA) for Value-added Productivity by Main Type of Furniture Produced	91
Table 3.61:	Value-added Productivity Values by State	92
Table 3.62:	Analysis of Variance (ANOVA) for Value-added Productivity by State	93
Table 3.63:	Mean Percentages of Cost of Production for Selected Products (%)	96
Table 3.64:	Mean Percentages of Cost of Production by Classification of Mills	97
Table 4.1:	Proportions of Inputs Used by the Furniture Sector	120
Table 4.2:	The Primary Input Multipliers for Imported Commodities	121
Table 4.3:	The Primary Input Multipliers for Commodities Taxes (Imported)	122
Table 4.4:	The Primary Input Multipliers for Commodities Taxes (Domestic)	123
Table 4.5:	Value-added Multipliers	124
Table 4.6:	The Imported Commodities (RM)	125
Table 4.7:	The Commodities Taxes (Imported), RM	126
Table 4.8:	The Commodities Taxes (Domestic), RM	127
Table 4.9:	The Total Value Added (RM)	128
Table 4.10:	Summary of the Total Primary Inputs for the Furniture Sector	129
Table 5.1:	Market Orientation by Number of Mills	138
Table 5.2:	Number of Mills Engaged in Producing Various Types of Wooden Furniture Products, Malaysia, 2007	140
Table 5.3:	Mean Single-factor Productivity Values by Classification of Mills	144
Table 5.4:	Selected Single-factor Productivity Values by Main Type of Furniture Produced	147
Table 5.5:	Value-added Productivity Values by Classification of Mills	148
Table 5.6:	Mean Value-added Productivity Values by Main Type of Furniture Produced	150
Table 5.7:	Mean Costs of Production for Top Five Selected Products (in %)	151
Table 5.8:	Mean Percentage Costs of Production by Classification of Mills Based on Total Workforce	153
Table 5.9:	Mean Percentage Costs of Production by Classification of Mills Based on Annual Sales	153
Table 5.10:	SWOT Analysis for the WFI, Malaysia	155

LIST OF ANNEXES

Annex 3.1	Locations of Wooden Furniture Mills in Johore	102
Annex 3.2	Locations of Wooden Furniture Mills in Kedah	103
Annex 3.3	Locations of Wooden Furniture Mills in Kelantan	104
Annex 3.4	Locations of Wooden Furniture Mills in Malacca	105
Annex 3.5	Locations of Wooden Furniture Mills in Negeri Sembilan	106
Annex 3.6	Locations of Wooden Furniture Mills in Pahang	107
Annex 3.7	Locations of Wooden Furniture Mills in Penang	108
Annex 3.8	Locations of Wooden Furniture Mills in Perak	109
Annex 3.9	Locations of Wooden Furniture Mills in Selangor	110
Annex 3.10	Locations of Wooden Furniture Mills in Terengganu	111
Annex 3.11	Locations of Wooden Furniture Mills in Sabah	112
Annex 3.12	Locations of Wooden Furniture Mills in Sarawak	113
Annex 4.1	Description of Commodities in the Malaysian Economy	132

LIST OF ACRONYMS

AFTA	ASEAN Free Trade Agreement
ASEAN	Association of Southeast Asian Nations
CFPP	Compensatory Forest Plantation Project
CIS	Comprehensive Information System
CNC	Computer Numeric Control
DoS	Department of Statistics
FBIIs	Forest-based Industries
FDPM	Forestry Department Peninsular Malaysia
FLEGT	Forest Law Enforcement Governance and Trade
FOB	Free on Board
FRIM	Forest Research Institute Malaysia
GoM	Government of Malaysia
GPS	Global Positioning System
IMP	Industrial Master Plan
IMP2	Second Industrial Master Plan
I-O	Input-Output
IT	Information Technology
ITTO	International Tropical Timber Organization
KLEMS	Capital, Labour, Energy, Materials and Services
KLSE	Kuala Lumpur Stock Exchange
MACRES	Malaysian Centre for Remote Sensing
MDF	Medium Density Fibreboard
MFEA	Malaysian Furniture Entrepreneurs Association
MFP	Multifactor Productivity
MGCC	Malaysian-German Chamber of Commerce
MIDA	Malaysian Industrial Development Authority
MIER	Malaysian Institute of Economic Research
MITI	Ministry of International Trade and Industry
MIWT	Malaysian Institute of Wood Technology
MNCs	Multinational Corporations
MPC	Malaysia Productivity Corporation
MPIC	Ministry of Primary Industries and Commodities
MSE	Malaysian Stock Exchange
MTC	Malaysian Timber Council
MTIB	Malaysian Timber Industry Board
NATIP	National Timber Industry Policy
NC	Numeric Control
NEP	New Economic Policy
OBM	Own Brand Manufacturing
ODM	Own Design Manufacturing
OECD	Organization for Economic Co-operation and Development
OEM	Original Equipment Manufacturing
OJT	On-the-Job Training

OPT	Oil Palm Trunk
PTC	Project Technical Committee
PWG	Project Working Group
QC	Quality Control
R&D	Research & Development
RRIM	Rubber Research Institute Malaysia
RRIS	Rubberwood Resource Information System
RTA	Ready-to-Assemble
SFD	Sabah Forestry Department
SMEs	Small and Medium Enterprises
SMIDEC	Small Medium Industry Development Corporation
SPSS	Statistical Package for Social Sciences
STIDC	Sarawak Timber Industrial Development Corporation
UAE	United Arab Emirates
UK	United Kingdom
UPM	Universiti Putra Malaysia
US	United States of America
WFI	Wooden Furniture Industry
WFIS	Wooden Furniture Information System
WISDEC	Wood Industry Skills Development Centre

Exchange Rate:

<i>Year</i>	<i>USD1 = RM</i>
2000	3.8000
2001	3.8000
2002	3.8000
2003	3.8000
2004	3.8000
2005	3.7871
2006	3.6663
2007	3.4357
2008	3.3312

EXECUTIVE SUMMARY

Several studies have been conducted on the local wooden furniture industry (WFI) in Malaysia. Such research has been carried out by the Malaysian Institute of Economic Research (1996), Norchahaya (1998), Ratnasingham (2002) and Gardino (2004). However, most of these researchers did not conduct in-depth investigations. The exception was Gardino, who sampled 20 mills for the purpose of analysis. As Uma Sekaran (2001) stated, when one has a population of 643 entities, a sample of at least 242 is required for the results to be statistically significant and representative of the total population. In this small study, 384 mills were surveyed and 381 of them analysed. The total number of active wooden furniture mills gleaned from various lists was 643. To put it differently, based on the number of mills surveyed and analysed, findings from this small project are representative of the total population of wooden furniture mills in the country. Above all, because the small study analysed not only the performance of the industry from the perspectives of production and marketing, human resources, machinery and equipment, productivity and cost of production of selected products (Technical Report II) but also the supply of and demand for rubberwood in Malaysia (Technical Report I), the findings will indeed be beneficial and rewarding to interested stakeholders.

Analyses based on 381 mills revealed the following major findings:

Classification and Mill Background

On the basis of total workforce, of the 381 wooden furniture mills analysed, 258 (or 67.7%) were categorized as micro- (181 mills) and small enterprises (77 mills). Analysing the mills according to annual sales, it was also found that micro- and small enterprises constituted 82.4% of the total population. In short, from whatever angle one looked at the WFI, a majority of the manufacturers were classified as micro- and small enterprises. It also was discovered that, of the 381 mills analysed, 276 mills (72.4%) were owned by non-Bumiputras, 51 (13.4%) by Bumiputras, and 23 (6%) by foreigners. The 13.4% Bumiputra participation was way below the target of 30% stipulated in the Malaysian New Economic Policy (NEP).

Production and Marketing

Currently, Malaysian manufacturers are producing 14 types of furniture, some of which include dining tables and chairs, living room furniture, wooden kitchen furniture, wooden bedroom furniture, parts and components, doors and door frames, and others. With regard to market orientation, 259 manufacturers made 100% of their products for the local market, whereas another 65 manufacturers produced 100% of their goods for the export market.

In terms of annual sales, a majority of the medium-sized enterprises produced other products, outdoor furniture, and dining tables and chairs. In contrast, the micro-enterprises were mainly involved in the production of wooden kitchen furniture, wooden bedroom furniture, and doors and door frames.

In their efforts to capture a larger share of the market, 165 mills adopted a market- specialization strategy, whereas another 122 mills applied a product- and market-specialization strategy. Market specialization refers to production of a single product, whereas product and market specialization refers to specialization in a certain product as well as the targeted market. Analysis of furniture designs in relation to marketing disclosed that 255 mills employed original equipment manufacturing (OEM), whereas 77 mills used own design manufacturing (ODM). Eight mills indicated using their own brand manufacturing (OBM). The rest of the wooden furniture mills were equipped with mixed design manufacturing.

Human Resources

The 381 mills employed a total of 32,671 workers. Of these workers, 23,192 (almost 71%) were direct labourers in both the skilled and unskilled categories. It was also observed that 17,655 foreigners as compared with 15,016 locals were employed in the 381 mills. Such a high percentage of direct labour force indicated that the existing WFI is indeed labour intensive, coupled with having a high dependence on foreign labourers to run the production lines. With regard to training, 290 of the mills' owners prepared their workforce through on-the-job training.

Machinery and Equipment

A majority of the mills' machinery and equipment, especially new apparatus, had been imported from Taiwan (43.8%), Japan (13.3%), Italy (11.7%) and Germany (6.8%). Old and reconditioned machinery and equipment had been bought mainly from Japan (49.4%), Italy (11.5%) and China (9.4%). It was found that 292 mills (76.6%) did not have numeric control (NC) or computer numeric control (CNC) for their production, based on annual sales. These 292 mills were the micro- and small enterprises. In contrast, 27 mills used NC, 40 used CNC, and 22 used both NC and CNC.

Productivity

Labour Coefficient

Among the four classes of manufacturers, the large enterprise, namely the manufacturer of furniture for boats and yachts, was found to have the lowest mean labour coefficient of 0.00234 per thousand ringgit Malaysia (RM) of output as compared with the other wooden furniture manufacturers. This finding

indicates that the large manufacturer could generate RM1,000 in annual sales by using 0.002 of total labour or workforce.

On the basis of total workforce, the large enterprises again were found to be the most productive of the four classes of manufacturers. The mean labour coefficient for the large enterprises of 0.02907 was the lowest, followed by that for the medium (0.05282), micro- (0.11754) and small enterprises (0.18191). The large enterprises still led the other three groups of enterprises in terms of labour coefficient based on annual sales. From the perspective of annual sales, the large enterprises again were found to be the most efficient in terms of mean sales per employee (RM413,785) as compared with the other three sizes of enterprises. Analysis based on total workforce revealed that the medium enterprises were more productive, with RM189,000 sales per employee, than the large enterprises. On the other hand, the large enterprises still dominated first place with regard to mean sales per ringgit of fixed assets (RM21.82) as compared with the medium (RM8.19), small (RM4.94) and micro- (RM3.17) enterprises. Both the large and medium enterprises were reasonably close in terms of productivity of fixed assets per employee (RM46,506 versus RM44,119 respectively).

Among the four classes of manufacturers, the medium enterprises incurred the cheapest mean labour cost per employee (RM975), based on annual sales. The medium enterprises again registered a much lower mean cost (RM954) per employee as compared with the large enterprises when the analysis was based on the total workforce. The micro-enterprises were the most inefficient among the four classes in terms of labour cost per employee.

The large enterprises had the highest mean sales (RM479) per employee as compared with the overall mean for the four classes of wooden furniture manufacturers (almost RM87). The medium and small enterprises individually registered mean sales per employee of RM202 and RM64 respectively.

Single-factor Productivity by Main Type of Furniture Produced

Single-factor productivity by main type of furniture produced is another area of interest. In 2007, the manufacturer of furniture for boats and yachts recorded the highest mean sales per employee (RM427,672). Following closely were manufacturers of occasional furniture (RM352,135), dining tables and chairs (RM169,953) and wooden bedroom furniture (RM109,512). The two types of furniture that generated the lowest sales per employee were doors and door frames (including doors for cupboards, cabinets, etc) and wooden kitchen furniture, with sales of RM28,894 and RM25,171 respectively.

The cost of labour per employee was also higher for the manufacturer of furniture meant for boats and yachts. The mean labour cost per employee for all classes of manufacturers ranged from a low of RM668 to a high of RM1,393. Both the

manufacturers of furniture for boats and yachts and occasional furniture generated higher mean sales per employee. Indirectly, this indicates that the manufacturers of furniture for boats and yachts and occasional furniture made the most sales per employee and the most costly product based on payment to labourers.

Partial Productivity Based on Value Added

The medium enterprises were found to be the most productive in terms of total workforce (mean = RM25,090) and annual sales (mean = RM59,983). From the perspective of fixed assets, the large enterprises registered the highest means for both total workforce and annual sales. The large enterprises had the lowest value-added-to-sales ratio.

Partial Productivity Based on Value Added by Main Type of Furniture Produced

The manufacturers producing occasional furniture and furniture for boats and yachts were found to generate higher means of value added per employee (RM68,679 and RM64,151 respectively). On the other hand, means of value-added-to-sales ratio for wooden office furniture, custom-made furniture, occasional furniture, parts and components, outdoor furniture, doors and door frames, and dining tables and chairs ranged from a low of 20% to a high of 28%. Analyses of value added for every ringgit spent on labour cost revealed that the manufacturers of occasional furniture and furniture for boats and yachts had the highest mean values.

Cost of Production for Selected Products

Analyses disclosed that almost 50 to 55% of the total cost of production for the top five selected products was spent on raw materials, which included round logs, sawn timber, veneer, plywood, laminated boards and other finishing materials. The five products analysed included occasional furniture, upholstered furniture with wooden frames, wooden kitchen furniture, wooden bedroom furniture, and doors and door frames.

The percentage of labour to total cost of production for the top five products ranged from a low of 11.3% (wooden kitchen furniture) to a high of 21.2% (upholstered furniture with wooden frames). The high percentage of cost for labour should be an area of focus if the manufacturers wish to use this input of production more efficiently.

Operational costs accounted for between 8.0 and 9.4% of the total cost of production for the top five products analysed. On the other hand, marketing costs for the top five products ranged from a low of 4.3% to a high of 7.6% of the total

cost of production. The mill overheads were between 4.4 and 6.6% of the total cost of production.

Looking at the cost of production by classification of manufacturers revealed that the mean percentage cost of labour was slightly lower for the large enterprises as compared with the other three classes. The mean percentages were 14.8 and 2.8%, based on total workforce and annual sales respectively. The medium enterprises also had a much higher mean percentage marketing cost (8.4%) than the other classes of manufacturers, based on the total workforce. Analysing the marketing cost from the standpoint of annual sales disclosed that the large enterprises had a higher mean percentage (6.9%) than the other classes of manufacturers.

Primary Input Content

Analyses based on input–output (I–O) model 2000 showed that the furniture and fixtures industry imported a total of RM24.5 billion worth of commodities as inputs of production. One of the imported inputs was machinery and equipment.

The SWOT Analysis

In this report, an effort also was made to analyse the industry's strengths, weaknesses, opportunities and threats in order to provide useful guidance in formulating policy directions for sustainability of the WFI. Points related to each element are as follows:

Strengths

- vast industry experience in original equipment manufacturing (OEM);
- skilled and knowledgeable workers at the managerial and supervisory levels;
- medium level of manufacturing technology (fully mechanized and computerized equipment);
- quality processes and products for export-oriented companies;
- good track record and reputation in international trade;
- excellent networking with regional and international buyers;
- rich non-timber resources as alternatives (eg oil palm trunk [OPT]);
- strong R&D backup on alternative species or plantation timber (eg rubberwood and OPT);
- well-established government incentives to attract investors.

Weaknesses

- lack of R&D on new and innovative products at the manufacturing level (eg R&D team, in-house designer);
- high dependence on foreign workers;
- dependence on imported equipment and machinery;
- price taker (ie no bargaining power);
- lack of knowledge and understanding regarding consumers' requirements;

- insufficient updated and reliable data on the WFI;
- no brand names or undifferentiated products;
- insufficient channels of distribution in consumer countries;
- insufficient supply of rubberwood.

Opportunities

- government initiative to promote brand names (OEM to ODM & OBM);
- mergers, joint ventures and strategic alliances to increase competitiveness (including establishing Malaysia's own franchise companies);
- new market segment (non-traditional markets);
- substitutes or combined with non-timber produce (eg glass, OPT);
- change of taste (consumers' preferences).

Threats

- both tariff and non-tariff trade barriers, eg chain of custody, AFTA, regulatory, eco-labelling, FLEGT and subsidies;
- competition from low-cost producing countries like China, Indonesia, Viet-Nam and others;
- cheaper products and processing technologies;
- rapid product development by other producers;
- high production capacity of resource-rich countries.

To ensure sustainability of the WFI, policies are recommended in the following areas:

Resource Supply

Resource supply has been a concern for some time. With the expected shortage of timber supply from the natural forests back in the 1990s, efforts have been geared to plant fast-growing species under forest plantations through an activity called the Compensatory Forest Plantation Project (CFPP). Nonetheless, the volume of timber from forest plantations still cannot alleviate the shortage of supply from the natural forests. Results of this small project revealed that there will be a shortage of rubberwood logs in the next eight years (2008–2015). On the basis of analyses using the conventional approach, the estimated gap between supply of and demand for rubberwood ranged from 500 thousand m³ to 1.33 million m³. Such analyses also revealed that there are substantial leftovers or residues after conversion of rubberwood logs into sawn timber. The estimated volume of residues ranged from 2.58 million to 7.13 million m³ between 2008 and 2015. Estimations using the econometric approach indicated that the supply of rubberwood logs cannot meet the WFI's demand. The forecasted volume of supply ranged from a low of 1.05 million m³ in 2015 to a high of 1.22 million m³ in 2008.

With this expected shortage, providing a continuous supply of rubberwood logs can be accomplished only through forest plantation projects. To overcome the resource-supply problem, the following suggested policy directions are deemed appropriate:

- Ensure a continuous supply of timber from natural and plantation forests.
- Encourage the use of rubberwood residues in the production of composite timber products.
- Enforce the use of large-diameter logs for the production of wooden furniture and small branches for reconstituted products (such as MDF, particleboard, block board and other composite products).
- Encourage the development of new innovative materials.
- Regulate or, if need be, enforce a total ban on the export of rubberwood sawn timber to stimulate the growth of the export-oriented WFI.
- Improve existing databases on the furniture industry (ie include supply, demand, markets, products and standards/certification).

Industry Productivity

On the basis of partial productivity, the large and medium enterprises were found to be more productive and efficient than the micro- and small enterprises. To ensure the sustainability of the WFI, producing ready-to-assemble and specialized products is viewed as the way forward. In other words, the micro- and small enterprises should be the main targets of the Government of Malaysia (GoM) if we want the WFI to sustain its performance, if not to flourish, especially in the international market. Above all, of the 381 mills analysed, 292 (76.6%) did not have numeric control (NC) or computer numeric control (CNC) for production. A majority of these 292 mills were micro- and small enterprises.

The following policy directions are recommended for further advancement in the WFI:

- Encourage mergers, joint ventures and strategic alliances, especially of small and micro-enterprises, for better efficiency and market penetration.
- Enhance the level of manufacturing technology (fully mechanized and computerized equipment).
- Steer more of the medium and small wooden furniture manufacturers into the export-oriented market.
- Encourage manufacturers sending workers for industrial training in all aspects of quality processing or manufacturing systems to improve productivity.
- Enhance networking with regional and international buyers, especially in new and emerging markets.

Marketing and Promotion

Marketing and promotion are two activities that also need attention. Analyses of the survey responses indicated that 165 manufacturers chose market specialization, ie producing a single product, and 122 chose product and market specialization. Further market analysis indicated that of the 381 wooden furniture mills analysed, 259 mills made 100% of their products for the local market and 65 made all of their products for overseas markets. Capturing a larger share of the international market calls for more attractive policy directions from the GoM. Some suggested policy directions are as follows:

- Encourage the production of certified wooden furniture products.
- Encourage the small and micro-enterprises to engage in more value-added processing activities and to produce specialized products for the export market.
- Encourage the use of locally produced wooden furniture products.
- Promote Malaysian brand names, designs and quality end-products.
- Promote more Bumiputra wooden furniture companies to export products overseas.
- Encourage the establishment of more own distribution channels or retail outlets.
- Continuously carry out aggressive trade promotional activities, especially in new and emerging markets.

Human Resources

It was found that 54% of the workforce in the 381 mills analysed came from overseas. Such a high percentage of foreign labourers indirectly indicated to us how dependent the WFI is on foreigners. Analysis of human resources also indicated that about 290 mills out of the 381 surveyed provided on-the-job training for staff. With changing demands and tastes, training the workforce based on other forms of training options is necessary. Below are some policy directions for consideration:

- Ensure that manufacturers provide more favourable and attractive workplaces to attract local workers (ie from the aspects of cleanliness, work safety and health).
- Apply the concept of 'local first' in hiring both skilled and unskilled workers/labourers.
- Encourage manufacturers to make use of the training incentives provided by the Ministry of Human Resource Development or other training centres, such as the Wood Industry Skills Development Centre (WISDEC).
- Incorporate the industry's training needs into technical/vocational curricula at the college and university levels.

Research and Development (R&D)

Some of the policy directions needed for R&D are listed below:

- Allocate more public funding for R&D to be conducted by research institutes and universities, or as a joint effort with the industry.
- Allocate more funding for development of testing facilities to accommodate changing market requirements.
- Encourage manufacturers to establish their own R&D team for design, product development and quality products.
- Establish attractive incentives to nurture innovative products, including manufacturing systems of production.

Other General Policy Directions

Other general policy directions listed below are designed to further assist in the development of the WFI. They are:

- Reduce the importation of foreign machinery and equipment and encourage the development of indigenous technology.
- Continuously promote foreign investment wherever possible with the thought of better market penetration and new-product development.
- Continuously create awareness of existing government incentives to wooden furniture manufacturers.
- Continuously support the development of Bumiputra participation in the WFI, eg reviving the concept of 'umbrella' for Bumiputra wooden furniture entrepreneurs.
- Revive public investment in the establishment of industrial estates (eg furniture complexes), well-equipped with infrastructure and support services.

In this report, readers were exposed to an in-depth study of the WFI from the perspective of production and marketing, human resources, machinery and equipment, productivity and cost of production of selected products. To assist interested stakeholders, a SWOT analysis was also conducted. Detailed analyses contained in this report, together with Technical Report I on the supply of and demand for rubberwood and various databases developed, such as the Rubberwood Resource Information System (RRIS), Wooden Furniture Information System (WFIS) and Comprehensive Information System (CIS), are seen as crucial because strategies to be formulated later on will be more applicable and helpful in our effort to sustain the performance of the WFI. Comprehensive information at hand can also be used to chart the future growth of the WFI--a rising star of the forest-based industries in Malaysia.

ACKNOWLEDGEMENTS

The research team wishes to convey its utmost gratitude to the International Tropical Timber Organization (ITTO) for sponsoring this small project of ITTO-PD 192/03 RV.3 (M), entitled "A Comprehensive Information System for Sustainability of the Wooden Furniture Industry in Malaysia," and for making this in-depth study possible. This Technical Report II, which is focused on production and marketing, human resources, machinery and equipment, productivity and cost of production of selected products, is another major output that we believe will help interested stakeholders not only to sustain but also to better chart future growth of the wooden furniture industry (WFI) in Malaysia. To ensure that the WFI—a rising star of the forestry sector—continues to shine and play its leading role as an export earner, an in-depth understanding of the industry is crucial.

The research team also would like to extend its sincere thanks to two ministries, namely the Ministry of Natural Resources and Environment (NRE) and the Ministry of Plantation Industries and Commodities (MPIC), for their full support throughout the project. Our special thanks also go to several collaborating agencies, the Forestry Department Peninsular Malaysia (including the Headquarters, the State Forestry Departments and District Forest Offices), the Sarawak Timber Industry Development Corporation (STIDC), the Malaysian Timber Industry Board (MTIB), the Sabah Forestry Department (SFD), the Malaysia Furniture Entrepreneurs Association (MFEA), the Malaysia Furniture Industry Council (MFIC), Sabah Timber Industries Association (STIA) and the Sarawak Timber Association (STA), for the support and assistance they provided during the field visits. Without their full support, the collection of data at the industry level would have been much more difficult and challenging. Representatives from the ministries and agencies who sat in as Project Technical Committee members also were helpful in offering constructive comments during the various Project Technical Committee meetings.

Our thanks also go to Dato' Dr Abd Latif Mohmod, Director General of FRIM, and Datuk Dr Abdul Razak Mohd Ali, former Director General of FRIM, for giving their full backing and encouragement to the team in conducting the small project. A word of thanks is due to Dr Woon Weng Chuen and Mr Mohd Arshad Saru for their inputs and for sharing their many experiences in the WFI with the research team. Last but not least, due credit is given to all respondents, namely the wooden furniture manufacturers, medium density fibreboard and particleboard mill owners, and support staff from the Research Management and Economics Division of FRIM.

CHAPTER 1

INTRODUCTION

General Background

This is Technical Report II of the small project ITTO-PD 192/03 REV.3 (M) entitled, "A Comprehensive Information System for Sustainability of the Wooden Furniture Industry in Malaysia." This report is one of the six major outputs planned for the small project; other outputs include Technical Report I; three software programs, namely the Rubberwood Resource Information System (RRIS), the Wooden Furniture Information System (WFIS), and the Comprehensive Information System (CIS)—a merging of RRIS and WFIS; and users' manuals related to the various software programs.

As pointed out in Technical Report I, detailed empirical research on the wooden furniture industry (WFI) is scanty, especially when one refers to productivity and cost of production. An early attempt to look at the cost structure of the WFI was undertaken by Saroni et al. (1994). According to these authors, the three major elements constituting cost of production were raw materials (66.0%), labour (20.1%) and electricity (2.7%). The second attempt to examine cost structure was made by Ismariah et al. in 2003. Nonetheless, because of diversity of products in terms of both fashion and function, Ismariah et al. (2003) failed to formulate a quantitative economic analysis with respect to the industry's production function and performance. Their analysis was based on feedback from a survey conducted in 1994. More recently, in July 2006, the Malaysian Institute of Economic Research (MIER) conducted a study which focused on prospects, challenges and proposals, with special emphasis on linkages and key sectors.

Objective

As readers will recall, Technical Report I focused on the major findings regarding estimation of supply of and demand for rubberwood, challenges and future prospects of rubberwood, and recommendations for ensuring the sustainability of the WFI in Malaysia. In contrast, Technical Report II was written with the general objective of concentrating on the WFI's productivity, cost of production of selected products, primary input content and policies for sustainability. This report will enlighten readers as to the performance of the WFI per se, as well as help them understand strategies to be undertaken for sustainability of the WFI. In some instances, recommendations put forward in Technical Report I might overlap with policies suggested in Technical Report II. Nevertheless, recommendations or suggested policies are meant not only to ensure the existing

performance of the WFI but, most important, to help manufacturers garner a larger share of the world's furniture market.

The specific objectives of Technical Report II are (a) to identify active wooden furniture mills in Malaysia based on various sources of information, (b) to gather information on the mills' backgrounds, (c) to estimate cost of production for selected products, (d) to measure productivity of the WFI, (e) to identify the primary input content of the WFI and (f) to suggest policies for sustainability.

Justification

Forest-based industries (FBIs) are some of the oldest industries in Malaysia. According to Ho et al. (2000), if one were to trace the development of the FBIs, one would see that they started back in the 1940s. At that time, FBIs' activities were centred on primary processing, namely sawmilling, making plywood/veneer and logging. Today, the types of timber products produced and exported have expanded to include sawn timber, plywood/veneer, moulding, wooden furniture and others. Malaysia's export of timber and timber products has increased steadily over the last few decades, achieving its highest level (RM23.3 billion) in 2006 (MIDA 2007). From the perspective of employment, forestry and FBIs as a group employed almost 196 thousand workers in 2005 and were expected to employ more than 203 thousand workers in 2006 (Anonymous 2007). Clearly, the FBIs as an expanding sector have played a significant role not only in contributing to foreign exchange earnings but also in creating jobs for the rural poor. Considering this background, Malaysia has come a long way from being an exporter of unprocessed or semi-processed wood, to establishing herself as a major tropical-timber-producing country that exports wooden furniture, panel products (plywood, medium density fibreboard, and chipboard), flooring, doors and various other joinery products (Gaya Tunas 2007).

Among the FBIs, the WFI is the emerging subsector that has recorded remarkable achievements in the past 20 years. Table 1.1 shows that the WFI contributes the highest export earnings of all the timber industries. For instance, in 2007 alone, wooden furniture products contributed RM6.66 billion to the national export earnings, which was 29.28% of the total export value of timber products (Anonymous 2008). Statistics indicate that, in 2005, there were 1,771 export-oriented wooden furniture factories in Peninsular Malaysia (Anonymous 2006a). Most of the establishments are concentrated on the west coast of the Peninsula. The types of product they produce range from traditional to contemporary and include designs by overseas buyers under international brand names. Examples include bedroom furniture, dining room and lounge suites, office furniture and a variety of occasional furniture. According to the Department of Statistics, the best-selling made-in-Malaysia furniture consists of living room, kitchen, bedroom and office items.

Table 1.1: Malaysia's Export of Major Timber Products, 2007

Timber product	FOB value (RM)	% Share of total FOB value
Logs	2,111,987,326	9.28
Sawn timber*	3,159,831,928	13.88
Sleepers	18,936,121	0.08
Veneer	389,982,858	1.71
Mouldings	915,314,887	4.02
Chipboard/particleboard	364,983,609	1.60
Fibreboard	1,180,917,563	5.19
Plywood**	6,274,137,563	27.56
Wooden frames	132,195,786	0.58
Builders joinery & carpentry	1,017,594,173	4.47
Wooden furniture	6,664,885,981	29.28
Rattan furniture	50,479,548	0.22
Other timber products***	483,043,534	2.12
Grand total****	22,764,290,877	100.00

Source: Anonymous (2008)

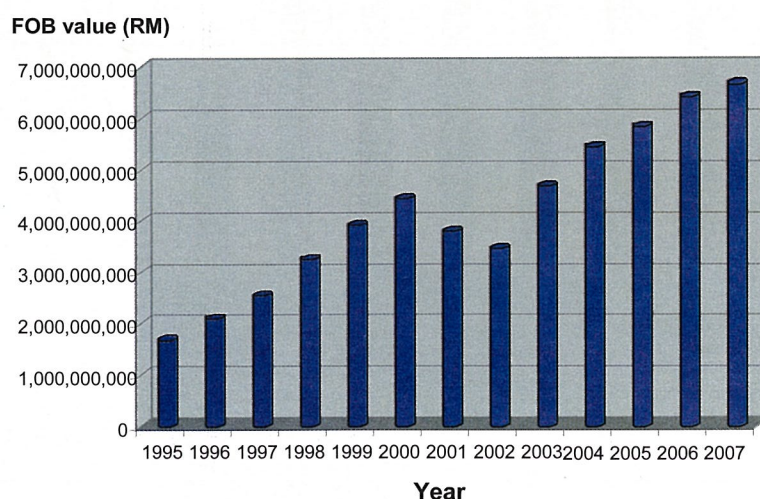
Note: * Sawn timber includes dressed timber. ** Plywood includes blockboard

***Other timber products include fuelwood, wood charcoal, hoop wood, wood wool & wood flour, packing cases, cask, barrel, vat & tubs, tool bodies & handles, tableware, kitchenware, wood marquetry and other articles of wood

**** Grand total does not include shipments between Peninsular Malaysia, Sabah and Sarawak

To better appreciate the performance of the WFI, trends of exports for the past 12 years or so are presented in this section. The exports of wooden furniture from 1995 through 2007 are illustrated in Figure 1.1.

Figure 1.1: Malaysia's Export of Furniture, 1995–2007

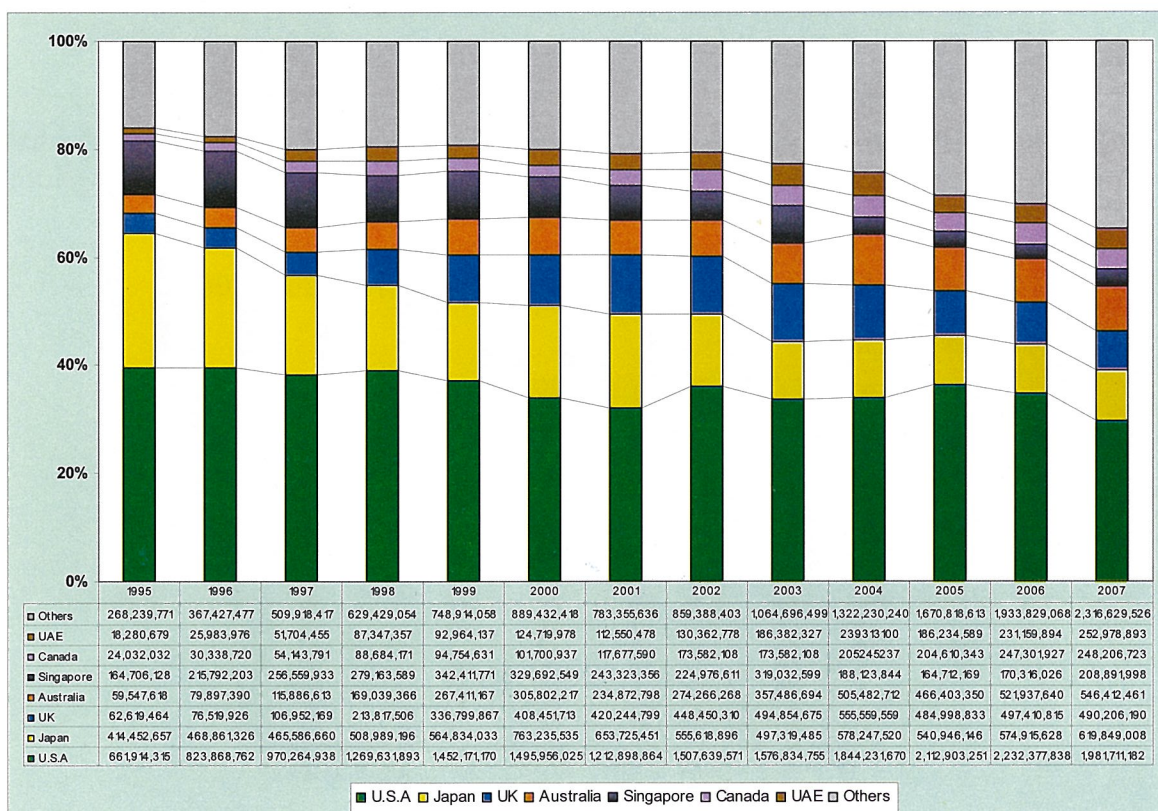


Source: Anonymous (2008)

Traditionally, Malaysia has been a location of choice for original equipment manufacturing (OEM) furniture manufacturers. Nevertheless, Malaysia is now moving to own design manufacturing (ODM). Local furniture manufacturers are upgrading their production lines to produce higher-value-added furniture incorporating both indigenous design and better finishing. These products are penetrating up-market segments in developed countries such as the US, the UK and Japan.

The main reason behind this growth is strong government support through schemes such as the Umbrella Scheme and developing furniture villages for the purpose of bringing all manufacturers under one roof. Furniture trade fairs to promote Malaysian-made furniture locally and internationally also have encouraged the establishment of more furniture complexes in Malaysia. As a result, Malaysia managed to diversify her markets to some 170 countries worldwide by 2002 (Anonymous 2003). Malaysia's proportions of exports of wooden furniture by major destinations from 1995 through 2007 are illustrated in Figure 1.2.

Figure 1.2: Proportions of Exports of Malaysian Wooden Furniture by Major Destination, 1995–2007



Source: Anonymous (2008)

With the WFI's remarkable performance to date and its growing importance in the export structure of the Malaysian economy, documenting the industry's success story is worthwhile. Nonetheless, to ensure that such success is sustained in the long run and that expansion into new market segments is achieved, it is crucial to understand the WFI in depth. Above all, the WFI is viewed as one of the few successful clusters under the Second Industrial Master Plan (1996–2005), according to the latest assessment by the Malaysian Institute of Economic Research (MIER 2005).

Scope of the Report

Geographically, the focus of this report extends over the whole country; ie it includes Peninsular Malaysia, Sabah and Sarawak. This report covers a total of 384 wooden furniture mills in Malaysia. Of the 384 mills, 296 are in Peninsular Malaysia, 7 in Sabah, and 81 in Sarawak.

Similar to Technical Report I, the approach used in Technical Report II was to collect data at both the primary and secondary levels. Primary data on the various cost structures were collected through a survey of wooden furniture manufacturers, whereas secondary data comprised information used to develop the Malaysian input-output (Input–Output) tables for the year 2000.

Problems Encountered

Problems encountered in preparing this technical report are related to the survey of the wooden furniture mills. They are as follows:

- different lists of wooden furniture mills;
- cooperation in getting information from mills' owners;
- time needed to verify the data collected from the survey.

First, as emphasized in Technical Report I, different lists of mills were received from the Forestry Department Peninsular Malaysia (FDPM), Malaysian Timber Industrial Board (MTIB), Sarawak Timber Industrial Development Corporation (STIDC), Sabah Forestry Department (SFD) and Malaysian Furniture Entrepreneur Association (MFEA), which delayed the cross-checking process. The delay was compounded by the time manufacturers took to confirm whether they owned a production line, ie whether they were directly involved in processing wooden furniture or parts of furniture. Confirmation from owners was crucial to ensure that they truly were producers and not merely retailers of wooden furniture products.

The second problem concerned cooperation in getting information asked for in the survey form. In some instances, mill owners refused to provide the information asked for, as they considered it to be confidential or a trade secret. Nonetheless, the presence of uniformed staff from the respective district forest offices and officers from the STIDC helped in ensuring that mill owners fully cooperated with enumerators. In other words, having relevant officers accompany enumerators is a prerequisite to a successful survey, especially when one needs complete cooperation from mill owners.

The third problem was verification of data collected from the survey. All data related to the survey were verified before keying them into the computer. The process of verification sometimes required enumerators to telephone mill owners a number times. Obviously, that process took some time.

Structure of the Report

Altogether, the report comprises five main chapters. In the first chapter, readers are introduced to the WFI, followed by a review of literature on the development of the WFI in Malaysia. Justification as to why there is a need to take a closer look at the industry from the perspectives of cost of production for selected products, primary input content and policies for sustainability also are provided in Chapter 1. The research methodology is explained in Chapter 2. The sample frame and selection of the sample are discussed at length in Chapter 2. Research findings from the survey are discussed in Chapter 3 by focusing on production and marketing, human resources, machinery and equipment used, productivity and cost of production of selected products. Using an Input–Output table from 2000, Chapter 4 highlights findings from the analyses of primary input content. Technical Report II ends with Chapter 5, which wraps up the small project with conclusions and recommendations to ensure the sustainability of the WFI in the future.

CHAPTER 2

RESEARCH METHODOLOGY

Introduction

The studies and modelling reviewed in Chapter 2 provide the framework needed to conduct the study of the wooden furniture industry in Malaysia. The following sections in this chapter are to illustrate the method and process adopted to fulfill the objectives of this study. The next part of this chapter will discuss further the sample frame, sampling method, preparation of the questionnaire, training of contract research assistants, the method in data collection and data analysis.

Locations of the Study Areas

Sample Frame

The target population (sample frame) for this cross-sectional survey consisted of 1,435 wooden furniture mills in Malaysia.

These mills' lists are from various sources such as the Forestry Department Peninsular Malaysia (FDPM), Sarawak Timber Industry Development Corporation (STIDC), Sabah Forestry Department (SFD), Malaysia Timber Industry Board (MTIB), Malaysia Furniture Entrepreneurs Association (MFEA) and newly identified mills.

There were a few steps involved before we came up with this sample frame. The first step was identifying the manufacturers' names from the Directory of Timber Trade Malaysia (2005–2006), published by the Malaysian Timber Industrial Board (MTIB). This directory is the official publication that contains basic information on all the furniture companies registered as furniture exporters. Based on the list from the MTIB, we discovered 73 names of furniture exporters. After that, we sent official letters seeking the wooden furniture manufacturers' confirmation on whether they did, indeed, own a mill. Besides sending letters, telephone calls were also made when manufacturers did not respond to the respective researchers on time. In the process of confirming the status of the mills, researchers involved in the project discovered a different list of furniture manufacturers that had been compiled by the Forestry Department of Peninsular Malaysia (FDPM) in 1998. There are 412 mills registered with the FDPM as wooden furniture mills. As a result, the two lists had to be cross-checked to ensure there was no duplication.

Besides that, with the help of the Sabah Forestry Department (SFD), FRIM was able to identify those manufacturers who are still active in Sabah based on the lists. There are 25 registered manufacturers in Sabah. In Sarawak, the STIDC had come out with a different list of 260 manufacturers in 2007. Thus FRIM had to go over the list to confirm the number of manufacturers in Sarawak.

FRIM also received a list of registered members of the Malaysia Furniture Entrepreneurs Association (MFEA) until the year 2007. The record shows that the MFEA has 665 registered manufacturers in Malaysia. Thus FRIM was able to identify those active manufacturers only without conducting a survey due to time and financial constraints. Table 2.1 below shows the numbers of registered manufacturers from different sources according to the states in Malaysia.

Table 2.1: Numbers of Mills in the Sample Frame of the Wooden Furniture Industry in Malaysia

State	from FDPM ¹ , STIDC ² and SFD ³	from MTIB ⁴	from MFEA ⁵	Total
Selangor	20	15	23	58
W. Persekutuan	0	2	0	2
Negeri Sembilan	15	4	33	52
Malacca	4	4	55	63
Pahang	24	7	37	68
Terengganu	14	3	0	17
Kedah	99	14	22	135
Penang	1	2	40	43
Perak	120	8	24	152
Johore	30	14	241	285
Kelantan	85	0	13	98
Subtotal Peninsular	412	73	488	973
Sabah	25	0	33	58
Sarawak	260	0	144	404
Grand total	697	73	665	1,435

Note: ¹Forestry Department Peninsular Malaysia (FDPM) (1998)

²Sarawak Timber Industry Development Corporation (STIDC) (2007)

³Sabah Forestry Department (SFD) (2007)

⁴Malaysian Timber Industrial Board (MTIB) (2005–2006)

⁵Malaysia Furniture Entrepreneurs Association (MFEA) (2007)

Selection of Samples

In the beginning, FRIM wanted to conduct a census of all active manufacturers in Malaysia. It means that there would be no sample selections conducted because the main intention was to conduct census on all manufacturers. However, the list of MFEA registered members came only after the survey conducted by FRIM on all active manufacturers was completed. Thus the survey did not include the list from the MFEA.

There were three phases involved in the survey. This was mainly due to the lists of manufacturers received from different sources. The first phase was the survey of all manufacturers registered with the MTIB. Forty out of 73 manufacturers listed with MTIB are still active. During the first phase, the contact research assistants needed to identify the status of the manufacturers registered with the FDPM and the new manufacturers not registered because the information received from the FDPM was incomplete. From this first phase survey, we were able to identify 121 active manufacturers in Peninsular Malaysia based on the FDPM list. There are 143 newly identified manufacturers which are not in the MTIB and FDPM lists.

The second phase included a survey conducted of all active manufacturers based on the information received from the first survey in Peninsular Malaysia. Then we conducted a survey in Sabah after one was completed in Peninsular Malaysia. A survey of seven active manufacturers was successful with help from the SFD. In Sarawak, the survey was done simultaneously in Kuching, Sibul and Miri to identify the status of manufacturers. The survey was also divided into eight different groups due to the geographical and time constraints. There are 81 active manufacturers and eight new manufacturers identified in Sarawak.

The third phase was conducted to know the current status for those registered manufacturers under MFEA. The list from MFEA was received after FRIM completed the first and second phases of the survey. Thus FRIM could not conduct a survey of all the MFEA manufacturers due to the time and financial constraints.

There are 643 active wooden furniture manufacturers in Malaysia. The survey only covered 381 manufacturers, which is 58.3% of the overall active manufacturers. According to Sekaran (2001), from a sample frame of 643, 242 samples are enough to represent the whole population. Table 3.2 shows the status of wooden furniture manufacturers in Malaysia from different sources.

Table 2.2: Status of Wooden Furniture Mills in Malaysia from Various Sources

State	from FDPM, STIDC, SFD		from MTIB		from MFEA		Newly identified active mills*	Total number of mills visited (a)+(c)	Number of active mills from various lists* (b)+(c)	Number of mills surveyed	Number of mills analysed
	Number of mills (a)	Active* (b)	Number of mills (a)	Active* (b)	Number of mills (a)	Active* (b)					
Selangor	20	5	15	9	23	14	5	63	33	19	19 (57.6%)
W. Persekutuan	0	0	2	0	0	0	0	2	0	0	0 (0.0%)
Negeri Sembilan	15	3	4	3	33	15	1	53	22	7	7 (31.8%)
Malacca	4	2	4	4	55	22	15	78	43	21	21 (48.8%)
Pahang	24	6	7	4	37	9	13	81	32	23	23 (71.9%)
Terengganu	14	3	3	1	0	0	8	25	12	12	12 (100%)
Kedah	99	37	14	5	22	12	6	141	60	48	48 (80.0%)
Penang	1	0	2	0	40	22	3	46	25	3	3 (12.0%)
Perak	120	41	8	5	24	10	50	202	106	96	96 (90.6%)
Johore	30	8	14	9	241	119	29	314	165	46	46 (27.9%)
Kelantan	85	16	0	0	13	3	5	103	24	21	21 (87.5%)
Sub-total Peninsular	412	121	73	40	488	226	135	1,108	522	296	296 (56.7%)
Sabah	25	7	0	0	33	21	0	58	18	7	7 (25.0%)
Sarawak	260	73	0	0	144	22	8	412	103	81	78 (75.7%)
Grand total	697	201	73	40	665	269	143	1,578	643	384	381 (58.3%)

MTIB - Malaysia Timber Industry Board (2005-2006)

MFEA - Malaysia Furniture Entrepreneurs Association (2007)

FDPM - Forestry Department Peninsular Malaysia (1998)

STIDC - Sarawak Timber Industry Development Corporation (2007)

SFD - Sabah Forestry Department (2007)

* Based on the survey conducted in 2007-2007

In comparison, the total export value of the 381 manufacturers in Malaysia in the year 2006 covered 63.6% of the total export value of wooden furniture (Table 2.3).

Table 2.3: Comparison between the Total Export Value of the Surveyed Mills and the Total Export Value of Wooden Furniture, Malaysia, 2006

	Value
Total export value (n=381)	RM 4,075,202,332.73
Total export of wooden furniture, Malaysia in 2006	RM 6,409,248,836.00
Percentage covered	63.6 %

Preparation of Questionnaire

Questionnaire Design

The questionnaire was designed to fulfill the objectives and expected outputs of this study. A questionnaire is a pre-formulated written set of questions to which respondents record their answers. Administering questionnaire is a good way to collect data. The questionnaire had five sections which were:

- Section A: Mill Background (19 questions)
- Section B: Machinery and Equipment (5 questions)
- Section C: Human Resources (5 questions)
- Section D: Production and Marketing (16 questions)
- Section E: Raw Material (5 questions)

The questionnaire design contained mainly closed-ended questions with the advantage of an easier analysis of data. However, for some information, like total paid-up capital, total fixed assets, mill's capacity, number of workers, total expenditure on salaries and wages, total sales and other production cost, open-ended questions were unavoidable and respondents were requested to indicate the actual figures.

The questionnaire used was the third version after being improved based on the feedback received from the pre-testing stage and during the Project Working Group (PWG) meeting.

Pre-testing the Questionnaire

The pre-testing questionnaire was conducted on two manufacturers on 10 and 12 January 2007 at Meadow Wood Sdn Bhd and Rhong Khen Sdn Bhd respectively. It was also conducted with the assistance of the Hulu Selangor District Forestry Department. The manufacturers were given explanations of the objectives and importance of this pre-testing questionnaire. Thus their full co-operation was

needed to achieve the objective of this pre-testing. The questionnaire had been set in a flexible way to receive good response from the manufacturers. If they were unable to comprehend the questions, the researchers would try to improve the questions. Comments and suggestions were received at the end of the session to further improve the questionnaire. The following three photos show the pre-testing questionnaire session. The questionnaire was improved based on the feedback received during the pre-testing.



Courtesy call on the District Forestry Officer (Hulu Selangor) on 10 January 2007



Pre-testing of the questionnaire with Meadow Wood Sdn Bhd on 10 January 2007



Pre-testing of the questionnaire with Rhong Khen Sdn Bhd on 12 January 2007

Feedback from the Project Working Group (PWG) Meeting

The Project Working Group (PWG) meeting was held on 25 January 2007 at Hevea Meeting Room, Forest Research Institute Malaysia (FRIM) in Kepong, Selangor. It was attended by 15 members of different agencies such as the Forestry Department Peninsular Malaysia (FDPM), Malaysian Timber Industrial Board (MTIB), Sabah Forestry Department (SFD), Sarawak Timber Industry Development Corporation (STIDC), Malaysia Furniture Entrepreneurs Association (MFEA) and FRIM researchers involved in this project.

Members of the PWG were briefed on the current stage of the project and terms of reference for all PWG members. The PWG members were also asked for suggestions and comments to improve the questionnaire. This was because the PWG members were representatives of the government agencies and furniture associations. The next three photos show the meeting of the PWG. Feedback received from all PWG members would help to improve the questionnaire before it was used for the actual survey. Thus this would be the third version of the questionnaire.



Project Working Group (PWG) meeting on 26 January 2007 chaired by Dr Norini Haron from FRIM



Open discussion among all PWG members



Open discussion among all PWG members

Training Contract Research Assistants to Carry Out the Survey

Fifteen contract research assistants were appointed to carry out the survey where five would be assigned in Sabah and Sarawak and ten in Peninsular Malaysia. Those selected were fresh graduates tasked to assist in collecting and gathering information from the manufacturers. They would undergo appropriate training before carrying out the survey. There were three types of interactive training, such as:

Training 1: Training on Project Brief, Questionnaire and Survey Process

This training, headed by Dr Norini Haron, the project leader, was held on 29 January 2007. She explained the project to all the contract research assistants. The job description such as conducting the survey, questionnaire, how to follow up and key in data into computer was explained by Dr Hj Ahmad Fauzi Puasa. After that, Ms Rohana Abd Rahman explained the questionnaire and survey method used to conduct the survey. The training was important in understanding the project's objective. Any arising questions regarding the questionnaire were considered very critical. The contract research assistants would be explaining the objective and the importance of this survey to the manufacturers. Besides that, they were also given the opportunities to gain more experience from FRIM researchers involved in this project. The following photos show the training programme in session.



Dr Hj Ahmad Fauzi Puasa explaining the job description to the research assistants



Open discussion between the trainees and trainers

Training 2: Training on the Application of Global Positioning System (GPS)

Global Positioning System (GPS) training was handled by En Ismail Adnan, a lecturer from Universiti Putra Malaysia (UPM), on 2 February 2007. It was compulsory for all research assistants to undergo the GPS training as the subject of GPS was new and all the research assistants needed to get the mills' coordinates. The training was divided into three parts. The first part was a talk on the GPS application. Then the research assistants were put into four different groups. Each group needed to get three coordinates for three different places by using the GPS. Finally they were taught to transfer the coordinates from GPS into the computer. The following three photos show the training in session.



Mr Ismail Adnan giving a lecture on the application of GPS



Research assistants divided into four groups



Trainees trying to transfer data from GPS to the computer

Training 3: Training on Actual Survey/Field Work

The third training was held from 5 to 21 February 2007 on how to handle the actual survey or field work. A FRIM research officer would demonstrate the actual survey. Small groups which consisted of two research assistants and a FRIM research officer each were formed to conduct the actual survey. These small groups would be monitored until the research officer was satisfied with the results. The next two photos show the training on the field work.



Training on field work conducted by FRIM research officers



Interview by research assistants monitored by research officer

Data Collection

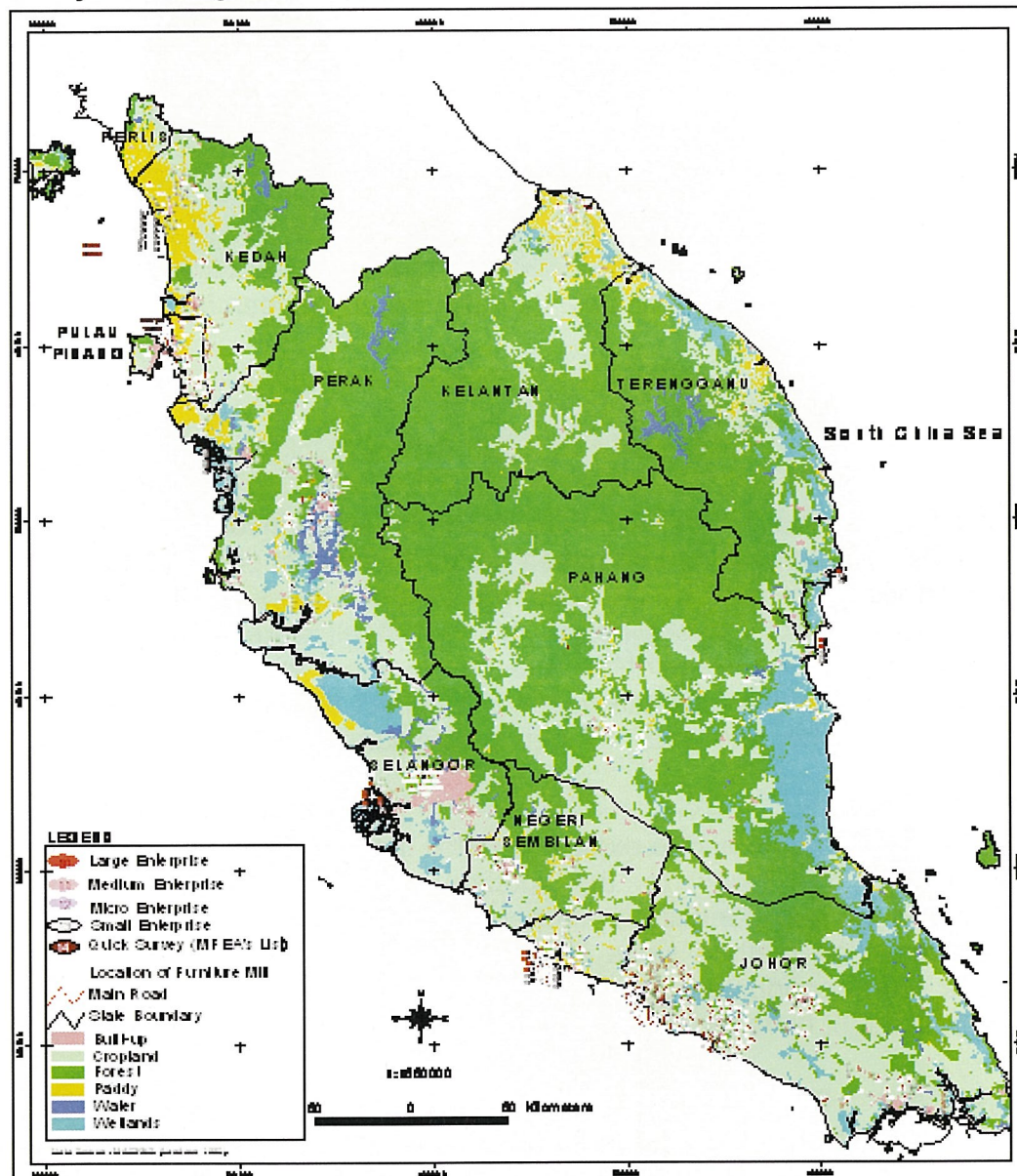
In conducting a survey, there are three important steps involved: before, during and after visit. A survey schedule based on the factory list prepared and booking of transport were be done by the research officer. Letters seeking cooperation were sent two or three weeks before the visit to all state and district forestry departments including the factories. Attached together was the questionnaire to all factories. Research assistants needed to collect basic information about the factories before the site visit to get preliminary information on the mills' background.

- ✓ The research assistants had to explain in detail the objectives of the visit and the importance of the study to the industry while conducting the survey. Administering the questionnaire, personal interview and industry site visit formed the data collection method since the study was a survey research. Personal interviews were conducted within a short period of time. Any doubts that respondents might have regarding any question could be clarified on the spot.

Besides, all the mills surveyed were recorded and positioned through GPS equipment. For the purpose of this study, the teams captured the points of the mills from locations throughout Malaysia using a GARMIN GPSMAP 76Sx. These positions are called waypoints. The positions of the mills can all be stored within the accuracy of the device of 10 m or less. The points were converted into an ArcView shapefile using the GPS software and the ArcView program. The GPS points then show on a map the positions they are in the real world. The

points stored on maps can also be displayed with roads and other major features labelled. Locating the mills was easy if their exact latitudes and longitudes were provided. In most GPS you can put in the position that you want to locate and the unit will direct you by displaying the directions and distances away from the point. The detailed locations of the mills surveyed are shown in Figures 2.1 and 2.2.

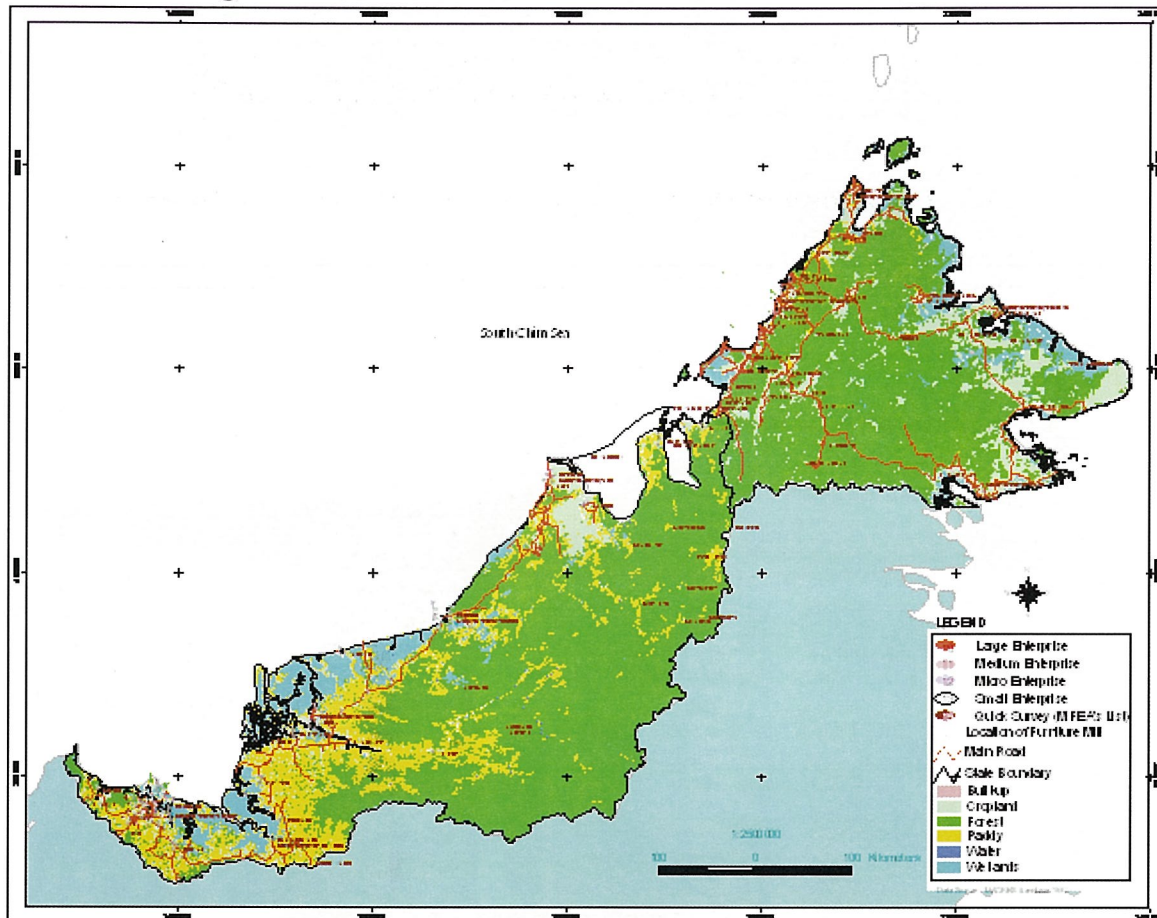
Figure 2.1: Locations of Wooden Furniture Mills Surveyed in Peninsular Malaysia Using GPS



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES (landuse 1990)

Figure 2.2: Locations of Wooden Furniture Mills Surveyed in Sabah and Sarawak Using GPS



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES (landuse 1990)

The research assistants had to do a follow-up if the questionnaire forms were not completed. Besides, they also needed to prepare survey and questionnaire reports for monitoring purposes. As token, letters of appreciation were then sent to all factories and forestry departments for their cooperation.

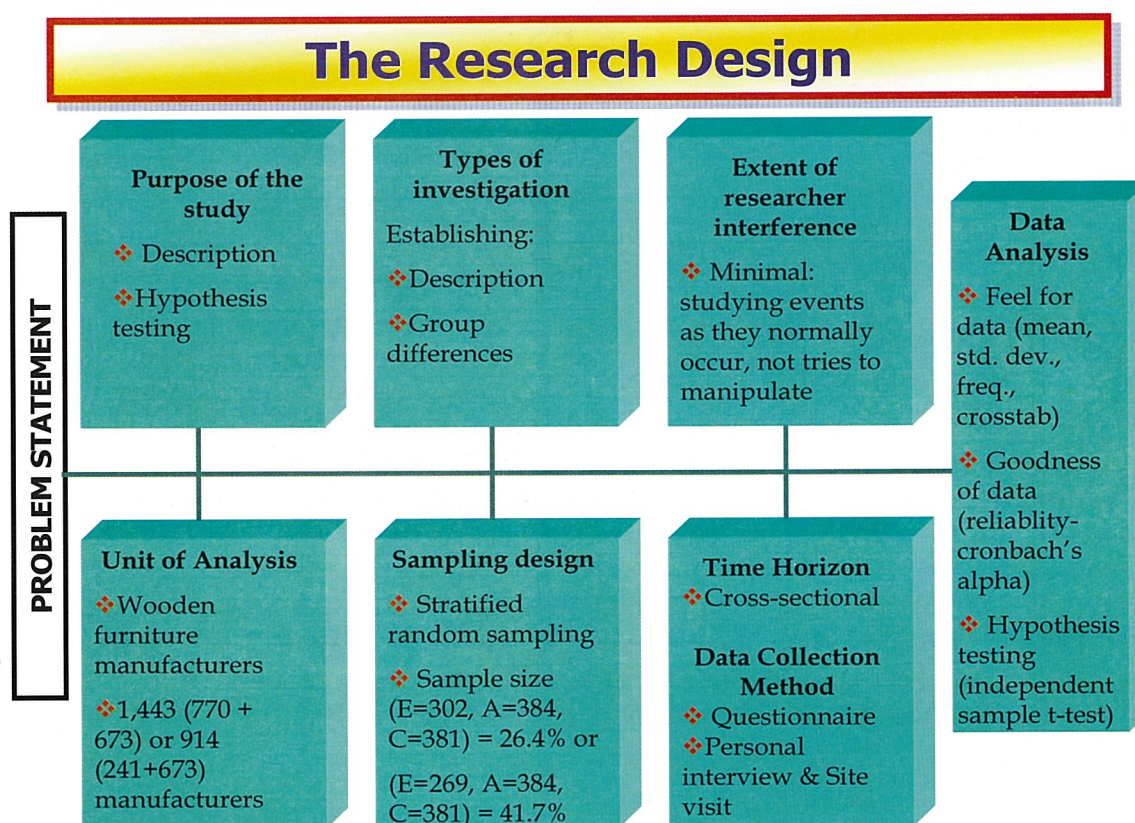
Data Analysis

Data collected were reviewed and keyed in using SPSS software into the computers. To avoid error, the data were checked again before they were analysed. As a whole, the analysed data comprised information as in Technical Report 2: Wooden Furniture Industry Productivity, Cost of Production for Certain Selected Products, Primary Input Content and Policies for Sustainability.

Quantitative method was used to analyse the data based on the factory background, productivity and production cost of products.

Descriptive statistics were used holistically to study the performance of the furniture industry in Malaysia. The industry was classified into four groups: micro-, small, medium and large enterprises based on the classification of the Ministry of International Trade and Industry (MITI). Besides, analysis of variance (ANOVA) test was also used to test whether there were significant differences between categories/classifications. Results from these analysed data were shown in the form of tables, histograms and graphs. Figure 2.3 shows a summary of the research design in the study.

Figure 2.3: Summary of the Research Design



CHAPTER 3

RESEARCH FINDINGS AND DISCUSSION

Introduction

Data obtained from the survey were analysed using SPSS 16.0 for Windows. The research findings are discussed in detail in this chapter. The deliverables of this chapter contain various aspects of the wooden furniture industry including classification of wooden furniture mills, company background, production and marketing, human resource, machinery and equipment, productivity and cost structure for selected products.

Classification of Wooden Furniture Mills

Small Medium Industry Development Corporation (SMIDEC), an agency under the Ministry of International Trade and Industry (MITI), has underlined criteria for the classification of industries in Malaysia. There are two aspects used to classify an industry, based on annual sales turnover and total workforce. A manufacturing company can be classified as a micro-, small, medium or large enterprise based on the following criteria:

- micro-industry: the industry with annual sales turnover of less than RM250,000 or total workforce of less than 5 workers;
- small industry: the industry with annual sales turnover of between RM250,000 and RM10 million or total workforce of 5–50 workers;
- medium industry: the industry with annual sales turnover of more than RM10 million but not more than RM25 million or total workforce of 51–150 workers;
- large industry: the industry with annual sales turnover of more than RM25 million or total workforce of more than 150 workers.

Information on wooden furniture mills was obtained from the survey carried out and analysed according to the criteria stated above. Although the PTC recommended reclassifying the industry into smaller groups as shown in Tables 3.1 and 3.2, the research team decided to follow the original classification by SMIDEC for the rest of the analysis. It is because there are insignificant differences in terms of number within the small and medium enterprises groups (refer to Tables 3.1 and 3.2).

Classification Based on Total Workforce

Table 3.1 shows the classification of the wooden furniture industry based on total workforce. There are 181 mills, 47.5% of the wooden furniture mills in Malaysia, classified as small enterprises. The next largest are 77 (20.2%) wooden furniture

mills as micro-enterprises with total workforce of less than from 5 workers. This means there are about 67.7% micro- and small enterprises in the wooden furniture industry. This figure is lower than that given by Ratnasingam (2002) who stated that more than 80% of the furniture industry comprised small industrial and cottage units manufacturing for the low-end segment of the domestic market or acting as subcontractors to bigger factories. Aseansources.com (2008) estimated that 90% of furniture industries were small and medium companies. Norchahaya (1998) found that 70% of Malaysia's furniture industry comprised small units of factories.

As many as 59 wooden furniture mills (15.5%) are in the large enterprises category with total workforce of more than 150 workers, while 45 (11.8%) wooden furniture mills are classified as medium enterprises 1 with total workforce of between 51 and 100 workers and just 19 (5.0%) mills with total workforce of between 101 and 150 workers belong to medium enterprises 2.

Table 3.1: Classification of the Wooden Furniture Industry by Total Workforce*

	Frequency	Percent
Micro-enterprises (total employees <5)	77	20.2
Small enterprises (total employees 5–50)	181	47.5
Medium enterprises 1 (total employees 5–100)	45	11.8
Medium enterprises 2 (total employees 101–150)	19	5.0
Large enterprises (total employees >150)	59	15.5
Total	381	100.0

* Based on classification by SMIDEC, Ministry of International Trade & Industry

Classification Based on Annual Sales Turnover

The distribution pattern from the classification based on annual sales turnover is quite different from that based on total workforce. Table 3.2 shows that as many as 48.6% wooden furniture mills (185 mills) in Malaysia are micro-enterprises, namely having annual sales turnover of less than RM250,000. Small enterprises 1, those with annual sales turnover of between RM250,000 and RM 4.15 million, number 101 (26.5%). Meanwhile, only 38 mills (10%) are large enterprises where annual sales turnovers are more than RM25 million, and respectively 10 mills (2.6%) are classified as small enterprises 3 and medium enterprises 2.

The overall findings show that most wooden furniture mills in Malaysia are micro-enterprises or small enterprises based on either total workforce or annual sales turnover. Based on total workforce, as many as 181 mills (47.5%) enter into the classification of small enterprises and 77 mills (20.2%) into the classification of

micro-enterprises. These form 67.7% of the wooden furniture industry in Malaysia. If seen from the aspect of annual sales turnover, 185 mills (48.6%) are classified as micro-enterprises and 129 mills (33.1%) small enterprises. Therefore, based on annual sales turnover, practically 82% of the wooden furniture industry in Malaysia are micro- and small enterprises. Based on total workforce, 64 mills (16.8%) are categorized as medium enterprises and 59 mills (15.5%) large enterprises, while based on annual sales turnover, only 29 mills (7.6%) are medium enterprises and 38 mills (10.0%) large enterprises.

Table 3.2: Classification of Wooden Furniture Industry by Annual Sales Turnover*

	Frequency	Percent
Micro-enterprises (sales turnover < RM250,000)	185	48.6
Small enterprises 1 (sales turnover RM250,000–RM4,150,000)	101	26.5
Small enterprises 2 (sales turnover RM4,150,00–RM8,050,000)	18	4.7
Small enterprises 3 (sales turnover RM8,050,001–RM10,000,000)	10	2.6
Medium enterprises 1 (sales turnover RM10,000,001–RM13,900,000)	6	1.6
Medium enterprises 2 (sales turnover RM13,900,001–RM17,800,000)	10	2.6
Medium enterprises 3 (sales turnover RM17,800,001–RM21,700,000)	8	2.1
Medium enterprises 4 (sales turnover RM21,700,001–RM25,000,000)	5	1.3
Large enterprises (sales turnover >RM25,000,000)	38	10.0
Total	381	100.0

* Based on classification by SMIDEC, Ministry of International Trade & Industry

Background of Companies

Distribution by State

Overall as many as 77.7% of the wooden furniture mills in Malaysia are located in Peninsular Malaysia. Gardino (2004) reported that almost 98% of wooden furniture are manufactured in the Peninsula which has developed significantly into specializing in furniture manufacturing compared with East Malaysia. MIDA (2008) reported that about 2,300 furniture companies are located in Peninsular Malaysia. Table 3.3 shows that wooden furniture mills are located mainly in Perak, Sarawak, Johore and Kedah. Aseansources.com (2008) reported that the furniture mills are located mainly in Johore, Selangor, Sarawak, Perak and Malacca. There are 96 mills (25.2%) located in Perak, followed by Sarawak with 78 mills (20.5%) and Kedah with 48 mills (12.6%), from the overall total mills surveyed. Even based on annual sales turnover, Perak, with the most number of wooden furniture mills, has as many as 95% from these mills in the micro- and small enterprises' categories. Similarly in Sarawak and Kedah, 98.7 and 89.6%

respectively of wooden furniture mills are micro- and small enterprises. The distribution of wooden furniture mills in Selangor is quite different from that in Perak, Sarawak and Kedah because mills in Selangor only covered 5% (19 mills) of the overall total wooden furniture mills surveyed. However, 52.6% of the wooden furniture mills in Selangor belong to the large-enterprises category from the aspect of total workforce or 42.1% based on annual sales turnover. Based on annual sales turnover, 47.8% wooden furniture mills in Johore are small enterprises and in terms of total workforce about 41.3% of the wood furniture mills in Johore could be categorized as large enterprises. Based on annual sales turnover and total workforce, there are no micro-enterprises in Malacca, Selangor and Sabah. Annexes 3.1–3.12 show clearly the distribution and locations of wooden furniture mills by state.

Years of Establishment

Table 3.4 shows the distribution of wooden furniture mills in Malaysia by year of establishment. The establishment trend of wooden furniture mills in Malaysia increased from before 1966 to 1995. The period 1991–1995 was the peak period of development with 78 mills (20.5%) established, followed by the period 1986–1993 with 65 mills (17.1%) established. By the mid-1980s, rubberwood had been introduced to the wooden furniture industry and demand for rubberwood blossomed until the year 2001 when the supply of rubberwood decreased and was not sufficient. The number of manufacturers which was established in the years 2001–2005 saw a decrease by almost 50% compared with the years 1996–2000. In 1996, there was no wooden furniture manufacturer in Negeri Sembilan and just one manufacturer in Malacca. Most of the wooden furniture mills in both states were established in the years 1991–1995 accounting for about 45% of the total.

This trend was seen in all mills established, whether micro-, small, medium or large enterprises. We may note that as many as 143 mills (37.5%) succeeded to be formed during the Industrial Master Plan (IMP) and have been sustained until today. This was in line with the IMP objective to transform the wood-based industry into a major resource-based industry. The IMP was accomplished through the establishment of a large production base. The increasing number of wooden furniture mills established from before 1966 to 1996 reflects the success of the IMP in promoting the government policy of encouraging the growth of resource-based industries.

Table 3.3: Distribution of Wooden Furniture Mills in Malaysia by State

State	Micro-enterprises				Small enterprises				Medium enterprises				Large enterprises				Total	
Johore	0	0.0%	3	6.5%	12	26.1%	22	47.8%	15	32.6%	11	23.9%	19	41.3%	10	21.7%	46	12.1%
Kedah	13	27.1%	33	68.8%	27	56.3%	10	20.8%	3	6.3%	3	6.3%	5	10.4%	2	4.2%	48	12.6%
Kelantan	3	14.3%	16	76.2%	16	76.2%	5	23.8%	2	9.5%	0	0.0%	0	0.0%	0	0.0%	21	5.5%
Malacca	0	0.0%	0	0.0%	7	33.3%	12	57.1%	8	38.1%	0	0.0%	6	28.6%	9	42.9%	21	5.5%
Negeri Sembilan	0	0.0%	2	28.6%	2	28.6%	1	14.3%	0	0.0%	2	28.6%	5	71.4%	2	28.6%	7	1.8%
Pahang	2	8.7%	6	26.1%	12	52.2%	9	39.1%	5	21.7%	3	13.0%	4	17.4%	5	21.7%	23	6.0%
Penang	0	0.0%	1	33.3%	0	0.0%	1	33.3%	2	66.7%	0	0.0%	1	33.3%	1	33.3%	3	0.8%
Perak	42	43.8%	61	63.5%	39	40.6%	30	31.3%	12	12.5%	5	5.2%	3	3.1%	0	0.0%	96	25.2%
Selangor	0	0.0%	0	0.0%	5	26.3%	8	42.1%	4	21.1%	3	15.8%	10	52.6%	8	42.1%	19	5.0%
Terengganu	0	0.0%	4	33.3%	8	66.7%	7	58.3%	2	16.7%	1	8.3%	2	16.7%	0	0.0%	12	3.1%
Peninsular Malaysia	60	20.3%	126	42.6%	128	43.2%	105	35.5%	53	17.9%	28	9.5%	55	18.6%	37	12.5%	296	77.7%
Sabah	0	0.0%	0	0.0%	0	0.0%	6	85.7%	4	57.1%	0	0.0%	3	42.9%	1	14.3%	7	1.8%
Sarawak	17	21.8%	59	75.6%	53	67.9%	18	23.1%	7	9.0%	1	1.3%	1	1.3%	0	0.0%	78	20.5%
Total	77	20.2%	185	48.6%	181	47.5%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	38	10.0%	381	100.0%

Source: Actual survey, 2007

Table 3.4: Distribution of Wooden Furniture Mills in Malaysia by Year of Establishment

State	Before 1966	1966- 1970	1971- 1975	1976- 1980	1981- 1985	1986- 1990	1991- 1995	1996- 2000	2001- 2005	After 2005	Total
Johore	1	0	0	2	4	4	17	11	6	1	46
Kedah	0	3	1	10	4	8	10	8	4	0	48
Kelantan	0	1	2	3	5	5	1	3	0	1	21
Malacca	0	0	1	2	1	6	10	0	1	0	21
Negeri Sembilan	0	1	1	1	1	0	3	0	0	0	7
Pahang	3	0	0	0	5	5	3	5	2	0	23
Penang	1	0	0	0	1	1	0	0	0	0	3
Perak	2	4	7	11	13	9	20	14	9	7	96
Selangor	1	1	1	1	3	7	2	2	1	0	19
Terengganu	0	0	1	1	2	2	2	3	0	1	12
Peninsular Malaysia	8	10	14	31	39	47	68	46	23	10	296
Sabah	0	0	0	0	0	1	1	2	3	0	7
Sarawak	6	3	5	7	17	17	9	9	3	2	78
Total	14	13	19	38	56	65	78	57	29	12	381

Source: Actual survey, 2007

Table 3.5: Years of Establishment by Classification of Mills

Year of establishment	Micro-enterprises				Small enterprises				Medium enterprises				Large enterprises				Total
	4	28.6%	8	57.1%	7	50.0%	4	28.6%	1	7.1%	2	14.3%	0	0.0%	14	3.7%	
Before 1966	6	46.2%	10	76.9%	4	30.8%	3	23.1%	1	7.7%	0	0.0%	2	15.4%	13	3.4%	
1966–1970	6	31.6%	13	68.4%	8	42.1%	5	26.3%	3	15.8%	1	5.3%	2	10.5%	19	5.0%	
1971–1975	14	36.8%	25	65.8%	16	42.1%	10	26.3%	5	13.2%	0	0.0%	3	7.9%	38	10.0%	
1976–1980	11	19.6%	35	62.5%	33	58.9%	14	25.0%	7	12.5%	3	5.4%	5	8.9%	56	14.7%	
1981–1985	11	16.9%	25	38.5%	32	49.2%	26	40.0%	10	15.4%	5	7.7%	12	18.5%	65	17.1%	
1986–1990	12	15.4%	27	34.6%	28	35.9%	26	33.3%	16	20.5%	9	11.5%	22	28.2%	78	20.5%	
1991–1995	5	8.8%	23	40.4%	31	54.4%	22	38.6%	10	17.5%	7	12.3%	11	19.3%	57	15.0%	
1996–2000	3	10.3%	10	34.5%	16	55.2%	17	58.6%	10	34.5%	1	3.4%	0	0.0%	29	7.6%	
2001–2005	5	41.7%	9	75.0%	6	50.0%	2	16.7%	1	8.3%	1	8.3%	0	0.0%	12	3.1%	
after 2005																	
Total	77	20.2%	185	48.6%	181	47.5%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	38	10.0%	
	Total workforce (based on SMIDEC classification)																
	Annual sales turnover (based on SMIDEC classification)																

Source: Actual survey, 2007

Ownership

Of the wooden furniture mills in Malaysia, 72.4% (276) are fully owned by non-Bumiputras, followed by about 13.4% (51) fully by Bumiputras, while only 6% (23) belong 100% to foreigners (30% each from Japan and Taiwan, and 17% from Singapore). Foreign investors actively started to invest in Malaysia during the First Industrial Master Plan's implementation period 1986–1995, when 65.2% (15) of the 100% foreign-owned mills were established. This indirectly proves that the government incentives to promote foreign investment had significant impact on the development of wooden furniture industry in Malaysia. Almost 40% of the wooden furniture mills are located in Johore, followed by Malacca, Perak and Pahang.

Even though there is a gap between the number of mills owned by Bumiputras and that owned by non-Bumiputras, from the aspect of classification based on annual sales turnover whether in the micro-, small, medium or large enterprises category, there is not much difference. Based on the total workforce as many as 88.2% (45) of the wooden furniture mills are Bumiputra and 73.6% (203) non-Bumiputra under micro- and small enterprises. Based on annual sales turnover, there is no notable difference between Bumiputra (90.2%) and non-Bumiputra (87.3%) mills. Norchahaya (1998) reported that 75% of medium and large factories are locally owned and the remaining are either joint ventures or foreign owned.

A different scenario is seen in the foreign-owned mills where, in terms of workforce, most (13 mills or 56.5%) fall in the large enterprises category whereas, in terms of annual sales turnover, most (10 mills or 43.5%) fall in the small enterprises category. Interestingly, there are no wooden furniture mills fully owned by foreigners or in partnerships classified as micro-enterprises. This matter is worthy of further study (Table 3.7).

Table 3.6: Distribution of Wooden Furniture Mills in Malaysia by Ownership

State	Bumiputra	Non-Bumiputra	Foreigner	Bumiputra & non-Bumiputra	Bumiputra & foreigner	Non-Bumiputra & foreigner	Bumiputra, non-Bumiputra & foreigner	Total
Johore	1 2.2%	28 60.9%	9 19.6%	2 4.3%	0 0.0%	4 8.7%	2 4.3%	46 12.1%
Kedah	6 12.5%	40 83.3%	0 0.0%	1 2.1%	0 0.0%	0 0.0%	1 2.1%	48 12.6%
Kelantan	11 52.4%	10 47.6%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	21 5.5%
Malacca	3 14.3%	7 33.3%	8 38.1%	2 9.5%	1 4.8%	0 0.0%	0 0.0%	21 5.5%
Negeri Sembilan	2 28.6%	3 42.9%	0 0.0%	0 0.0%	0 0.0%	1 14.3%	1 14.3%	7 1.8%
Pahang	2 8.7%	19 82.6%	2 8.7%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	23 6.0%
Penang	0 0.0%	3 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	3 0.8%
Perak	6 6.3%	83 86.5%	4 4.2%	0 0.0%	0 0.0%	1 1.0%	2 2.1%	96 25.2%
Selangor	0 0.0%	15 78.9%	0 0.0%	0 0.0%	0 0.0%	2 10.5%	2 10.5%	19 5.0%
Terengganu	6 50.0%	4 33.3%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	2 16.7%	12 3.1%
Peninsular Malaysia	37 12.5%	212 71.6%	23 7.8%	5 1.7%	1 0.3%	8 2.7%	10 3.4%	296 100.0%
Sabah	1 14.3%	4 57.1%	0 0.0%	0 0.0%	1 14.3%	1 14.3%	0 0.0%	7 1.8%
Sarawak	13 16.7%	60 76.9%	0 0.0%	5 6.4%	0 0.0%	0 0.0%	0 0.0%	78 20.5%
Total	51 13.4%	276 72.4%	23 6.0%	10 2.6%	2 0.5%	9 2.4%	10 2.6%	381 100.0%

Source: Actual survey, 2007

Table 3.7: Ownerships by Classification of Mills

Ownership	Micro-enterprises			Small enterprises			Medium enterprises			Large enterprises			Total			
Bumiputra	7	13.7%	26	51.0%	38	74.5%	20	39.2%	4	7.8%	2	3.9%	3	5.9%	51	13.4%
Non-Bumiputra	70	25.4%	156	56.5%	133	48.2%	85	30.8%	43	15.6%	17	6.2%	18	6.5%	276	72.4%
Foreigner	0	0.0%	0	0.0%	2	8.7%	10	43.5%	8	34.8%	6	26.1%	7	30.4%	23	6.0%
Bumiputra & non-Bumiputra	0	0.0%	3	30.0%	3	30.0%	3	30.0%	3	30.0%	2	20.0%	4	40.0%	2	20.0%
Bumiputra & foreigner	0	0.0%	0	0.0%	0	0.0%	1	50.0%	2	100.0%	0	0.0%	0	0.0%	1	50.0%
Non-Bumiputra & foreigner	0	0.0%	0	0.0%	2	22.2%	7	77.8%	4	44.4%	0	0.0%	3	33.3%	2	22.2%
Bumiputra, non-Bumiputra & foreigner	0	0.0%	0	0.0%	3	30.0%	3	30.0%	0	0.0%	2	20.0%	7	70.0%	5	50.0%
Total	77	20.2%	185	48.6%	181	47.5%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	38	10.0%
												</				

Source: Actual survey, 2007

Status of the Companies

Table 3.8 shows the distribution of wooden furniture mills based on the status of the companies. There are four types of company status, namely individual, partnership, private limited company and public limited company. Individual company, also known as sole proprietorship, is the simplest, oldest, and most common form of business ownership in which only one individual acquires all the benefits and risks of running an enterprise. In a sole proprietorship there is no legal distinction between the assets and liabilities of a business and those of its owner. There are 137 mills (36%) of wooden furniture in Malaysia having individual or sole proprietorship. In Kedah and Perak, 52 and 54% of their mills are individual companies. A similar scenario appears also in Kelantan and Sarawak where most of their mills are individuals. It is by far the most popular business structure for start-ups because of its ease of formation and record keeping, minimal regulatory controls, and avoidance of double taxation. That is also the reason why most of the individual companies are micro- and small enterprises (Table 3.9).

Partnership is practised by 36 mills (9.4%) where two or more individuals pool money, skills and other resources, and share profits and losses in accordance with the terms of the partnership agreement. In the absence of such agreement, a partnership is assumed to exist where the participants in an enterprise agree to proportionately share the associated risks and rewards.

Most of the wooden furniture mills in Malaysia are private limited companies which cover 50% (191 mills) of the total 381 mills. All wooden furniture mills in Sabah and more than 50% of the mills in Johore, Malacca, Negeri Sembilan, Pahang, Selangor and Terengganu are private limited companies. A private limited company is a type of incorporated firm which (like a public firm) offers limited liability to its shareholders but which (unlike a public firm) places certain restrictions on its ownership. These restrictions as spelled out in the firm's articles of association or bylaws are meant to prevent any hostile takeover attempt.

The last type of company status is public limited company. A public limited company can be defined as an incorporated, limited liability firm whose securities are traded on a stock exchange and can be bought and sold by anyone. Public companies are strictly regulated, and are required by law to publish their complete and true financial positions so that investors can determine the true worth of their stocks (shares). Also called publicly-held or public-listed companies, there were 17 mills (4.5%) registered with the Malaysian Stock Exchange (MSE), formally known as the Kuala Lumpur Stock Exchange (KLSE), and categorized as public limited companies. Gardino (2004) reported about 14 companies listed in the KLSE. Thus there is an increase in the number of listed wooden furniture companies in 2007 compared with 2004. Most of these public-listed companies are located in Johore, followed by Selangor, Malacca and

Negeri Sembilan. Besides, three manufacturers, each in Kedah, Penang and Terengganu, are public-listed companies. However, there are no public-listed companies in the other states including Sabah and Sarawak. As many as nine mills (52.9%) were 100 percent owned by non-Bumiputras, while four mills (23.5%) were owned jointly by Bumiputras, non-Bumiputras and foreigners. There were also two mills (11.8%) owned 100% by foreigners.

Table 3.8: Distribution of Wooden Furniture Mills in Malaysia by Status of the Company

State	Individual		Partnership		Private limited company		Public limited company		Total	
Johore	2	4.3%	0	0.0%	38	82.6%	6	13.0%	46	12.1%
Kedah	25	52.1%	5	10.4%	17	35.4%	1	2.1%	48	12.6%
Kelantan	9	42.9%	6	28.6%	6	28.6%	0	0.0%	21	5.5%
Malacca	3	14.3%	0	0.0%	15	71.4%	3	14.3%	21	5.5%
Negeri Sembilan	1	14.3%	0	0.0%	4	57.1%	2	28.6%	7	1.8%
Pahang	6	26.1%	3	13.0%	14	60.9%	0	0.0%	23	6.0%
Penang	0	0.0%	1	33.3%	1	33.3%	1	33.3%	3	0.8%
Perak	52	54.2%	7	7.3%	37	38.5%	0	0.0%	96	25.2%
Selangor	0	0.0%	0	0.0%	16	84.2%	3	15.8%	19	5.0%
Terengganu	3	25.0%	0	0.0%	8	66.7%	1	8.3%	12	3.1%
Peninsular Malaysia	101	34.1%	22	7.4%	156	52.7%	17	5.7%	296	100.0%
Sabah	0	0.0%	0	0.0%	7	100.0%	0	0.0%	7	1.8%
Sarawak	36	46.2%	14	17.9%	28	35.9%	0	0.0%	78	20.5%
Total	137	36.0%	36	9.40%	191	50.1%	17	4.5%	381	100.0%

Source: Actual survey, 2007

From Table 3.9 we can see that most large enterprises are private limited and public-listed companies. Public-listed companies form the bulk of the large enterprises, whether based on total workforce (15 mills, 88.2%) or on annual sales turnover (11 mills, 64.7%). Micro-enterprises are monopolized by individual companies with 64 mills (46.7%) based on total workforce and 116 mills (84.7%) based on annual sales turnover.

Table 3.9: Status of the Companies by Classification of Mills

Status	Micro-enterprises				Small enterprises		Medium enterprises		Large enterprises		Total					
Individual	64	46.7%	116	84.7%	72	52.6%	20	14.6%	1	0.7%	0	0.0%	1	0.7%	137	36.0%
Partnership	8	22.2%	27	75.0%	25	69.4%	8	22.2%	3	8.3%	1	2.8%	0	0.0%	36	9.4%
Private limited	5	2.6%	42	22.0%	84	44.0%	100	52.4%	58	30.4%	23	12.0%	44	23.0%	191	50.1%
Public limited	0	0.0%	0	0.0%	0	0.0%	1	5.9%	2	11.8%	5	29.4%	15	88.2%	17	4.5%
Total	77	20.2%	185	48.6%	181	47.5%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	381	100.0%

Total workforce (based on SMIDEC classification)

Annual sales turnover (based on SMIDEC classification)

Source: Actual survey, 2007

Production and Marketing

Types of Furniture

Furniture made from various types of wood and simulated wood are very popular and on demand until today. There are different types of furniture produced by the wooden furniture industry in Malaysia and categorized into 14 types such as dining tables & chairs, living room furniture, wooden kitchen furniture, wooden bedroom furniture, parts & components, doors & door frames, and others (Table 3.10). Doors & door frames include doors for cupboards, cabinets, etc and these mills are registered as wooden furniture mills. As many as 44.9% of wooden furniture mills produce doors & door frames, 38.6% produce wooden bedroom furniture, and 31.8% produce wooden kitchen furniture. More than one type of furniture are produced by 204 (53.5%) mills (Table 3.11).

Table 3.10: Types of Furniture Produced by Wooden Furniture Mills

Type of furniture	Number of companies	Percentage (%)
Dining tables & chairs	67	17.6
Living room furniture	37	9.7
Occasional furniture	34	8.9
Outdoor furniture	28	7.3
Upholstered furniture with wooden frames	7	1.8
Wooden office furniture	40	10.5
Wooden kitchen furniture	121	31.8
Wooden bedroom furniture	147	38.6
Wooden baby furniture	5	1.3
Custom-made furniture	10	2.6
Other products	102	26.8
Furniture for boats & yachts	1	0.3
Parts & components (including ready-to-assemble [RTA] furniture)	53	13.9
Doors & door frames (including doors for cupboards, cabinets, etc)	171	44.9

Source: Actual survey, 2007

Table 3.11: Numbers of Types of Furniture Produced

Number of types	Number of companies	Percentage (%)
One type of furniture	177	46.5
Two types of furniture	127	33.3
Three types of furniture	59	15.5
Four types of furniture	14	3.7
Five types of furniture	4	1.0
Total	381	100.0

Source: Actual survey, 2007

Doors & door frames (including doors for cupboards, cabinets, etc) are the major type of product produced by wooden furniture mills in Sarawak, Perak, Kedah, Pahang and Kelantan. Most of the mills in these states comprise micro- and small enterprises. Other states including Johore, Malacca and Selangor, produce dining tables & chairs. An interesting note is that all the wooden furniture mills in Sabah produce outdoor furniture and nothing else. However, the distributions for other types of furniture show not much difference (Table 3.12).

Of the 95 mills producing doors & door frames as their main product, 89.5 and 94.8% are from micro- and small enterprises based on total employees and total annual sales turnover respectively. Almost a similar scenario can also be seen for wooden bedroom and wooden kitchen furniture. On the other hand, 57.1% of the mills for dining tables & chairs are large enterprises based on total workforce and 45.7% based on annual sales turnover (Table 3.13).

Market Orientations

Besides, 90.5% percent of doors & door frames mills produce 100% for the local market and about 97.9% for the local and mixed markets, while for wooden kitchen and wooden bedroom furniture mills about 95.5 and 83.1% respectively produce for the local and mixed markets. In contrast, 77.1% of dining tables & chairs mills and 81.3% of outdoor furniture mills produce for the export market (Table 3.14). Most of the dining tables & chairs are exported to the US, Japan, the UK, Australia and other markets, while outdoor furniture is exported to the UK, Germany, Spain Belgium, France and other destinations. MIDA (2008) reported that the export of outdoor furniture is mainly for the European market and Malaysia is a major supplier of office furniture for the Middle East market.

Table 3.12: Distribution of Wooden Furniture Mills in Malaysia by Type of Main Product

Classification of main product	Johore	Kedah	Kelan-tan	Malacca	Negeri Sembilan	Pahang	Penang	Perak	Selangor	Tereng-ganu	Peninsular Malaysia	Sabah	Sarawak	Total
Dining tables & chairs	8	2	0	3	1	2	2	7	7	1	33	0	2	35
Living room furniture	2	1	0	1	0	2	0	0	0	0	6	0	3	9
Occasional furniture	2	1	1	2	0	2	0	5	0	0	13	0	4	17
Outdoor furniture	0	0	0	1	2	0	0	2	2	1	8	7	1	16
Upholstered furniture with wooden frames	4	0	0	0	0	0	0	1	1	0	6	0	1	7
Wooden office furniture	3	0	0	1	0	0	0	3	2	1	10	0	4	14
Wooden kitchen furniture	4	11	4	2	2	1	0	22	0	3	49	0	17	66
Wooden bedroom furniture	8	16	2	3	1	3	0	21	0	0	54	0	11	65
Wooden baby furniture	0	1	0	0	0	1	0	0	0	0	2	0	0	2
Custom-made furniture	0	0	1	1	0	0	0	2	0	0	4	0	3	7
Other products	6	2	2	3	0	1	0	6	0	1	21	0	2	23
Furniture for boats & yachts	1	0	0	0	0	0	0	0	0	0	1	0	0	1
Parts & components*	4	1	2	3	0	4	0	2	4	3	23	0	1	24
Doors & door frames**	4	13	9	1	1	7	1	25	3	2	66	0	29	95
Total	46	48	21	21	7	23	3	96	19	12	296	7	78	381

Source: Actual survey, 2007

* including ready-to-assemble (RTA) furniture

** including doors for cupboards, cabinets, etc

Table 3.13: Types of Main Product by Classification of Mills

Type of main product	Micro-enterprises		Small enterprises		Medium enterprises		Large enterprises		Total							
Dining tables & chairs	3	8.6%	3	8.6%	9	25.7%	7	20.0%	20	57.1%	16	45.7%	35	9.2%		
Living room furniture	1	11.1%	1	33.3%	6	66.7%	1	11.1%	4	44.4%	1	11.1%	9	2.4%		
Occasional furniture	0	0.0%	4	23.5%	7	41.2%	4	23.5%	1	5.9%	3	17.6%	17	4.5%		
Outdoor furniture	0	0.0%	1	6.3%	10	62.5%	6	37.5%	4	25.0%	1	6.3%	16	4.2%		
Upholstered furniture with wooden frames	0	0.0%	1	14.3%	5	71.4%	3	42.9%	0	0.0%	1	14.3%	7	1.8%		
Wooden office furniture	0	0.0%	3	21.4%	9	64.3%	3	21.4%	0	0.0%	2	14.3%	14	3.7%		
Wooden kitchen furniture	26	39.4%	54	81.8%	10	15.2%	3	4.5%	2	3.0%	0	0.0%	66	17.3%		
Wooden bedroom furniture	21	32.3%	43	66.2%	15	23.1%	9	11.8%	2	3.1%	5	7.7%	65	17.1%		
Wooden baby furniture	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%	1	50.0%	2	0.5%		
Custom-made furniture	2	28.6%	3	42.9%	4	57.1%	1	14.3%	0	0.0%	0	0.0%	7	1.8%		
Other products	5	21.7%	7	30.4%	9	39.1%	8	34.8%	6	26.1%	5	21.7%	23	6.0%		
Furniture for boats & yachts	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	1	0.3%		
Parts & components (including ready-to-assemble [RTA] furniture)	0	0.0%	3	12.5%	16	66.7%	10	41.7%	2	8.3%	4	16.7%	24	6.3%		
Doors & door frames (including doors for cupboards, cabinets, etc)	19	20.0%	62	65.3%	28	29.5%	6	6.3%	2	2.1%	4	4.2%	95	24.9%		
Total	77	20.2%	185	48.6%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	38	10.0%	381	100.0%

Total workforce (based on SMIDEC classification)

Annual sales turnover (based on SMIDEC classification)

Source: Actual survey, 2007

Table 3.14: Market Orientations of Main Products

Classification of main product	Market Orientation					Total
	Local-oriented market	Export-oriented market	Mixed-oriented market	100% local market	100% export market	
Dining tables & chairs	0	7	0	8	20	35
Living room furniture	0	2	0	5	2	9
Occasional furniture	4	1	0	12	0	17
Outdoor furniture	1	0	1	2	12	16
Upholstered furniture with wooden frames	0	3	0	2	2	7
Wooden office furniture	0	4	1	7	2	14
Wooden kitchen furniture	3	2	0	58	3	66
Wooden bedroom furniture	3	2	0	49	11	65
Wooden baby furniture	0	2	0	0	0	2
Custom-made furniture	0	0	0	7	0	7
Other products	1	5	0	11	6	23
Furniture for boats & yachts	0	0	0	0	1	1
Parts & components (including ready-to-assemble [RTA] furniture)	3	5	0	12	4	24
Doors & door frames (including door for cupboards, cabinets, etc)	2	4	1	86	2	95
Total	17	37	3	259	65	381

Source: Actual survey, 2007

Market orientation can be defined as a business approach or philosophy that focuses on identifying and meeting the stated or hidden needs or wants of the customers, through own or acquired products. As shown in Table 3.15, there are 259 mills (68.0%) producing furniture totally for the local market. Most of these mills are from Perak, Sarawak, Kedah and Kelantan. About 97.4% of the wooden furniture mills in Sarawak and 95.2% in Kelantan are 100% local-market oriented. Besides, 105 mills (27.6%) are export-oriented, mixed-oriented, and 100% export-oriented. Export-oriented market is where the manufacturer produces more than 50% for the export market, while local-oriented market is where the manufacturer produces more than 50% for the local market and mixed-oriented market is where the manufacturer produces 50% each for the local and export markets. About 73.9% of wooden furniture mills in Johore and 84.2% in Selangor are export-oriented companies. Table 3.16 shows the numbers of mills by proportion of their exports. About 32.0% (122 mills) of the mills have an export component in their annual sales turnover.

Based on total workforce, 93.2% of the large enterprises are export-oriented companies (Table 3.17), while based on annual sales turnover, 81.6% of the large enterprises have also the same market orientation. Gardino (2004) reported that as a proportion of sales, the exports of medium firms reached over 80 and 100% for large enterprises. This study found that 56.3% of medium enterprises have export proportion of more than 50% for the export market based on total workforce; however, based on annual sales turnover 86.2% of medium enterprise achieved this proportion. As we expected, all micro-enterprises (100%) are local-oriented companies based on total workforce. Hence, if wooden furniture mills want to increase their performance and annual sales turnover, they must strive to explore the global market. MIER (1996) reported that about 90% of the total furniture exports are from locally-owned larger companies and companies with foreign investment. However, the survey found that 38 out of 105 export-oriented mills (36.2%) have foreign investment. On the other hand, 96.1% of the mills owned by Bumiputras and 78.3% owned by non-Bumiputras are local-oriented manufacturers (Table 3.18).

Table 3.15: Distribution of Wooden Furniture Mills in Malaysia by Market Orientation

State	Local-oriented market		Export-oriented market		Mixed-oriented market		100% local market		100% export market		Total	
Johore	3	6.5%	15	32.6%	0	0.0%	9	19.6%	19	41.3%	46	12.1%
Kedah	2	4.2%	5	10.4%	0	0.0%	37	77.1%	4	8.3%	48	12.6%
Kelantan	0	0.0%	0	0.0%	1	4.8%	20	95.2%	0	0.0%	21	5.5%
Malacca	6	28.6%	1	4.8%	1	4.8%	6	28.6%	7	33.3%	21	5.5%
Negeri Sembilan	0	0.0%	1	14.3%	0	0.0%	2	28.6%	4	57.1%	7	1.8%
Pahang	1	4.3%	4	17.4%	0	0.0%	15	65.2%	3	13.0%	23	6.0%
Penang	0	0.0%	1	33.3%	0	0.0%	1	33.3%	1	33.3%	3	0.8%
Perak	2	2.1%	4	4.2%	1	1.0%	81	84.4%	8	8.3%	96	25.2%
Selangor	1	5.3%	6	31.6%	0	0.0%	2	10.5%	10	52.6%	19	5.0%
Terengganu	1	8.3%	0	0.0%	0	0.0%	9	75.0%	2	16.7%	12	3.1%
Peninsular Malaysia	16	5.4%	37	12.5%	3	1.0%	182	61.5%	58	19.6%	296	100.0%
Sabah	0	0.0%	0	0.0%	0	0.0%	1	14.3%	6	85.7%	7	1.8%
Sarawak	1	1.3%	0	0.0%	0	0.0%	76	97.4%	1	1.3%	78	20.5%
Total	17	4.5%	37	9.7%	3	0.8%	259	68.0%	65	17.1%	381	100.0%

Source: Actual survey, 2007

Table 3.16: Numbers of Wooden Furniture Mills by Proportion of Export Market

Proportion of export market (%)	Number of mills	Percent
0	259	68.0
1 – 10	9	2.4
11 – 20	3	0.8
21 – 30	3	0.8
31 – 40	2	0.5
41 – 50	3	0.8
51 – 60	3	0.8
61 – 70	7	1.8
71 – 80	10	2.6
81 – 90	6	1.6
91 – 99	11	2.9
100	65	17.1
Total	381	100.0

Source: Actual survey, 2007

Table 3.17: Market Orientations by Classification of Mills

Market orientation	Micro-enterprises		Small enterprises		Medium enterprises		Large enterprises		Total
Local-oriented market	0	0.0%	3	17.6%	9	52.9%	2	11.8%	17
Export-oriented market	0	0.0%	0	0.0%	17	45.9%	18	48.6%	37
Mixed-oriented market	0	0.0%	0	0.0%	3	100.0%	0	0.0%	3
100% local market	77	29.7%	181	69.9%	72	27.8%	2	0.8%	259
100% export market	0	0.0%	1	1.5%	28	43.1%	37	56.9%	65
Total	77	20.2%	185	48.6%	129	33.9%	59	15.5%	381

Total workforce (based on SMIDEC classification)

Annual sales turnover (based on SMIDEC classification)

Source: Actual survey, 2007

Table 3.18: Market Orientations by Ownership

Ownership	Local-oriented market	Export-oriented market	Mixed-oriented market	100% local market	100% export market	Total
Bumiputra	5	0	1	44	1	51
Non-Bumiputra	9	27	2	207	31	276
Foreigner	2	5	0	1	15	23
Bumiputra & non-Bumiputra	1	2	0	4	3	10
Bumiputra & foreigner	0	0	0	1	1	2
Non-Bumiputra & foreigner	0	2	0	0	7	9
Bumiputra, non-Bumiputra & foreigner	0	1	0	2	7	10
Total	17	37	3	259	65	381

Source: Actual survey, 2007

Target Market Strategy

Another marketing aspect that we looked into was the target market strategy of the mills. Target market gives an idea of managing the particular market segment at which a marketing campaign is focused. The targeting strategy involves segmenting the market, choosing which segments of the market are appropriate, and determining the products that will be offered in each segment. A business offering multiple products can determine if the various segments should receive one generic product (such as in mass marketing), or if each segment should receive a customized product (multi-segment), based upon the market's diversity, maturity, the level of competition and the volume of sales expected (businessdictionary.com 2008).

There are four types of target market strategy, namely product specialization, market specialization, full market coverage, and product and market specialization. Product specialization can be defined as where the manufacturer specializes in producing only one type of furniture but to more than one market. There are 55 mills (14.4%) specializing in one type of furniture and most of these mills are located in Johore and Selangor (Table 3.19). About 27.3% of these mills produce dining tables and chairs and 16.4% outdoor furniture (Table 3.20).

Most of the wooden furniture mills in Malaysia use market specialization as target market strategy. That means, the mills specialize in producing furniture for one market only including the domestic market. In Sarawak 79.5% of the wooden furniture mills use this target market strategy, which is also used by 43.8 and 50.0% of the mills in Perak and Kedah respectively (Table 3.19).

The second highest target market strategy is product and market specialization which is used by 122 mills. Almost 47.9% of the mills in Perak use this approach as their marketing strategy. Another target market strategy is full market coverage, which means that the manufacturer produces more than one type of furniture and has more than one target market destination. Only 39 wooden furniture mills use this strategy and 10 mills are located in Johore.

Table 3.19: Distribution of Wooden Furniture Mills in Malaysia by Target Market Strategy

State	Product specialization	Market specialization	Full market coverage	Product & market specialization	Total
Johore	18	8	10	10	46
Kedah	5	24	4	15	48
Kelantan	0	10	1	10	21
Malacca	6	4	7	4	21
Negeri Sembilan	2	4	1	0	7
Pahang	3	5	4	11	23
Penang	1	0	1	1	3
Perak	3	42	5	46	96
Selangor	11	1	3	4	19
Terengganu	1	5	1	5	12
Sabah	4	0	1	2	7
Sarawak	1	62	1	14	78
Total	55	165	39	122	381

Source: Actual survey, 2007

Table 3.20: Types of Furniture Produced by Product Specialization's Mills

Type of furniture	Frequency	Percent
Dining tables & chairs	15	27.3
Living room furniture	3	5.5
Occasional furniture	2	3.6
Outdoor furniture	9	16.4
Upholstered furniture	5	9.1
Office furniture	4	7.3
Bedroom furniture	3	5.5
Other products	3	5.5
Furniture for boats & yachts	1	1.8
Furniture parts & components (including ready-to-assemble [RTA] furniture)	6	10.9
Doors & door frames (including doors for cupboards, cabinets, etc)	4	7.3
Total	55	100.0

Source: Actual survey, 2007

Table 3.21 shows the target market strategy by classification of mills. Based on the total workforce, 57.0% of micro- and small enterprises specialize in one market and based on annual sales turnover 50.3% of micro- and small enterprises use the same approach. Also, most of the micro- and small enterprises use product and market specialization strategy. On the other hand, most of the large enterprises specialize in producing only one type of furniture. In other words, we can say that product specialization strategy is one of the approaches to enhance productivity of the manufacturer to fulfill demand for a specific type of furniture, so the manufacturer would be able to become a large enterprise.

Andersson et al. (2006) wrote that smaller companies showed greater willingness to try new markets, whereas the larger firms were often dependent on one large market (the US). The survey shows that 93 out of 122 export-oriented manufacturers (76.2%) export their products to the US. The second largest market destination for wooden furniture products is the UK with 90 mills (73.8%). Next come Japan, Australia, Singapore, UAE, Canada, Germany, France and South Africa as the top ten market destinations chosen by the wooden furniture mills in Malaysia (Table 3.22). Andersson et al. (2006) found that the predominant target market for Malaysian furniture mills was Australia: 12 out of the 15 companies (80%) had Australia as one of their 'top-10' export markets. The second most frequently entered market for the Malaysian furniture companies was the UK, followed by the US. The US market was, however, of greater significance because it was more often entered into at the initial stage of internationalization, and because of its overall economic importance. Other important markets were Scandinavia, Japan, Korea and United Arab Emirates (UAE), while European countries such as Germany, France and Italy were seldom among the ten first-entered markets.

Table 3.21: Target Market Strategy by Classification of Mills

Target market strategy	Micro-enterprises		Small enterprises		Medium enterprises		Large enterprises		Total									
Product specialization	1	1.8%	1	1.8%	15	27.3%	16	29.1%	33	60.0%	19	34.5%	55	14.4%				
	44	26.7%	113	68.5%	103	62.4%	45	27.3%	12	7.3%	3	1.8%	6	3.6%	165	43.3%		
Full market coverage	0	0.0%	0	0.0%	6	15.4%	21	53.8%	18	46.2%	7	17.9%	15	38.5%	39	10.2%		
Product & market specialization	32	26.2%	71	58.2%	66	54.1%	44	36.1%	19	15.6%	3	2.5%	5	4.1%	122	32.0%		
Total	77	20.2%	185	48.6%	181	47.5%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	38	10.0%	381	100.0%
Total workforce (based on SMIDEC classification)																		
Annual sales turnover (based on SMIDEC classification)																		

Source: Actual survey, 2007

Table 3.22: Market Destinations of Wooden Furniture Products

Country	Total number of mills	Percentage of export-oriented manufacturers	Country	Total number of mills	Percentage of export-oriented manufacturers
AFRICA			EUROPE		
Algeria	1	0.8	Belgium	9	7.4
Libya	3	2.5	Denmark	7	5.7
Madagascar	3	2.5	France	16	13.1
Mauritius	3	2.5	Germany	19	15.6
South Africa	14	11.5	Netherlands	9	7.4
ASIA			UK	90	73.8
China	12	9.8	Italy	6	4.9
Japan	73	59.8	Sweden	2	1.6
South Korea	2	1.6	Finland	4	3.3
Philippines	3	2.5	Spain	4	3.3
Thailand	9	7.4	Ireland	9	7.4
Singapore	35	28.7	Hungary	1	0.8
Hong Kong	5	4.1	Netherlands		
Brunei	5	4.1	Antilles	3	2.5
India	13	10.7	Greece	1	0.8
Taiwan	5	4.1	Bosnia		
Bangladesh	1	0.8	Hezogovinna	1	0.8
Viet Nam	1	0.8	Spain	4	3.3
Pakistan	1	0.8	MIDDLE EAST		
Commonwealth of Independent States (former USSR)			Bahrain	2	1.6
Russian Federation	2	1.6	Iraq	1	0.8
Ukraine	1	0.8	Qatar	3	2.5
AMERICA			Saudi Arabia	12	9.8
Canada	28	23.0	Kuwait	5	4.1
US	93	76.2	Jordan	1	0.8
Argentina	2	1.6	Palestine	2	1.6
Colombia	2	1.6	United Arab Emirates (UAE)	32	26.2
Chile	2	1.6	OCEANIA		
Mexico	2	1.6	Australia	65	53.3
Peru	1	0.8	New Zealand	7	5.7

Source: Actual survey, 2007

Product Design

Table 3.23 shows that most Malaysian wooden furniture mills (67%) fall into the original equipment manufacturing (OEM) category, relying heavily on designs supplied by buyers and imported technology. OEM enables the wooden furniture mills to be involved with mass production at a competitive price. However, 77 mills (20.2%) have their own design manufacturing (ODM) and eight mills (2.1%) have their own brand manufacturing (OBM). At the same time, 25 mills (6.6%) implement more than one manufacturing system or a combination of different production systems in designing their products. This finding is in line with the study done by Rohana (2005) who reported that Malaysia was a location of choice for original equipment manufacturing (OEM) furniture mills. However, Malaysia is now moving towards its own design manufacturing (ODM). The mills are being upgraded to produce higher value-added furniture incorporating indigenous design and better finishing.

Gardino (2004) reported that different-sized firms exhibited slightly different strategies. The small and medium firms reported greater use of ODM and OBM strategies. In contrast the large enterprises had a greater proportion in OEM strategies. It is possible that the larger enterprises are therefore more dependent on volume sales than the medium and small firms. The medium-sized firms appeared to have larger use of ODM strategy with 87% of all mid-sized firms reporting the use of this strategy, compared with 61% of the small firms. But equally for OBM strategies, the small and medium firms reported 62 and 70% respectively, and the large firms slightly higher than 50%. However, the present study shows different trends with most wooden furniture mills using OEM strategies regardless of the size of mills (Table 3.24). Besides, the distribution for other strategies and combination are quite similar. In the new era of globalization and liberalization, Malaysian furniture mills have given greater emphasis on the finishing, designing and production of higher quality products with their own brands mostly for the export market. Some of these companies have moved towards manufacturing own-designed furniture (MIDA 2008).

Table 3.23: Product Design Specifications for Furniture

Manufacturing system	Frequency	Percent
Original equipment manufacturing (OEM)	255	66.9
Own design manufacturing (ODM)	77	20.2
Own brand manufacturing (OBM)	8	2.1
Others	16	4.2
OEM & ODM	18	4.7
OEM, ODM & OBM	5	1.3
OEM & OBM	2	0.5
Total	381	100.0

Source: Actual survey, 2007

Table 3.24: Product Design Specifications by Classification of Mills

Manufacturing system	Micro-enterprises		Small enterprises		Medium enterprises		Large enterprises		Total									
Original equipment manufacturing (OEM)	60	23.5%	144	56.5%	138	54.1%	84	32.9%	33	12.9%	14	5.5%	24	9.4%	13	5.1%	255	66.9%
Own design manufacturing (ODM)	11	14.3%	29	37.7%	32	41.6%	28	36.4%	18	23.4%	8	10.4%	16	20.8%	12	15.6%	77	20.2%
Own brand manufacturing (OBM)	0	0.0%	1	12.5%	2	25.0%	4	50.0%	3	37.5%	2	25.0%	3	37.5%	1	12.5%	8	2.1%
Others	5	31.3%	10	62.5%	7	43.8%	4	25.0%	3	18.8%	2	12.5%	1	6.3%	0	0.0%	16	4.2%
OEM & ODM	1	5.6%	1	5.6%	1	5.6%	6	33.3%	5	27.8%	2	11.1%	11	61.1%	9	50.0%	18	4.7%
OEM, ODM & OBM	0	0.0%	0	0.0%	0	0.0%	1	20.0%	1	20.0%	1	20.0%	4	80.0%	3	60.0%	5	1.3%
OEM & OBM	0	0.0%	0	0.0%	1	50.0%	2	100.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	2	0.5%
Total	77	20.2%	185	48.6%	181	47.5%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	38	10.0%	381	100.0%
Total workforce (based on SMIDEC classification)																		
Annual sales turnover (based on SMIDEC classification)																		

Source: Actual survey, 2007

In terms of decision-making on the design of furniture, 171 wooden furniture mills (44.9%) claimed that the buyers would decide the designs for their products. And 104 mills (27.3%) stated that the management of the company makes the decision on design. Table 3.25 shows clearly that the buyers and the management of the company have significant roles in the design aspect with 87.9% of the mills. This scenario is quite similar across the classification of mills (Table 3.26). However, Gardino (2004) reported that most of the design work in small firm is done by the owner/production manager, and rarely by a multi-discipline decision-making team.

Table 3.25: Decision-making on the Designing of Furniture

Designing by	Frequency	Percent
A designer employed by the mill	11	2.9
A designer from outside	10	2.6
The management of the company	104	27.3
The skilled workers of the company	5	1.3
The buyers	171	44.9
A designer employed by the mill, the management of the company & the buyers	3	0.8
The management of the company & the buyers	60	15.7
A designer employed by the mill, a designer from outside & the buyers	1	0.3
A designer employed by the mill & the management of the company	2	0.5
The skilled workers of the company & the buyers	1	0.3
A designer from outside & the buyers	2	0.5
A designer from outside & the management of the company & the buyers	2	0.5
A designer from outside & the management of the company	1	0.3
A designer employed by the mill, the management of the company, the skilled workers of the company & the buyers	3	0.8
The management of the company & the skilled workers of the company	3	0.8
A designer employed by the mill & the buyers	2	0.5
Total	381	100.0

Source: Actual survey, 2007

Table 3.26: Decision-making on the Design of Furniture by Classification of Mills

Designing by	Micro-enterprises		Small enterprises		Medium enterprises		Large enterprises		Total	Percent
A designer employed by the mill	0	2	3	8	5	0	3	1	11	2.9
A designer from outside	1	4	7	6	0	0	2	0	10	2.6
The management of the company	24	54	49	39	18	6	13	5	104	27.3
The skilled workers of the company	1	3	3	1	0	1	1	0	5	1.3
The buyers	37	91	84	52	30	16	20	12	171	44.9
A designer employed by the mill, the management of the company & the buyers	0	0	0	0	1	1	2	2	3	0.8
The management of the company & the buyers	10	25	30	19	9	3	11	13	60	15.7
A designer employed by the mill, a designer from outside & the buyers	0	0	0	0	0	0	1	1	1	0.3
A designer employed by the mill & the management of the company	0	1	1	0	0	1	1	0	2	0.5
The skilled workers of the company & the buyers	0	1	1	0	0	0	0	0	1	0.3
A designer from outside & the buyers	1	1	1	1	0	0	0	0	2	0.5
A designer from outside, the management of the company & the buyers	1	1	0	0	0	0	1	1	2	0.5
A designer from outside & the management of the company	0	0	0	1	1	0	0	0	1	0.3
A designer employed by the mill, the management of the company, the skilled workers of the company & the buyers	0	0	1	1	0	0	2	2	3	0.8
The management of the company & the skilled workers of the company	2	2	1	1	0	0	0	0	3	0.8
A designer employed by the mill & the buyers	0	0	0	0	0	1	2	1	2	0.5
Total	77	185	181	129	64	29	59	38	381	100.0

Source: Actual survey, 2007

As mentioned, most of the wooden furniture designs are decided by the buyers. Hence, most ideas of designs are also given by the contracts/buyers. On the other hand, 80 wooden furniture mills (21.0%) follow the market with their own designs. Details of the sources of ideas of wooden furniture designs are listed in Table 3.27. Gardino (2004) found that the inspirations for designs came mainly from trade shows, magazines and OEM clients, but almost nothing came from in-house designers, from R&D institutes or from other sources.

Table 3.27: Sources of Ideas of Wooden Furniture Designs

Source of ideas	Frequency	Percent
Following the market with own designs	80	21.0
Modifying contemporary furniture	9	2.4
Designs given by the contracts /buyers	142	37.3
Copying from overseas/buyers	16	4.2
Copying antique designs	2	0.5
Following the market with own designs, modifying contemporary furniture, designs given by the contracts /buyers & copying from overseas/buyers	10	2.6
Modifying contemporary furniture, designs given by the contracts /buyers & copying from overseas/buyers	3	0.8
Following the market with own designs & designs given by the contracts/buyers	64	16.8
Following the market with own designs & copying from overseas/buyers	12	3.1
Following the market with own designs & modifying contemporary furniture	5	1.3
Following the market with own designs, modifying contemporary furniture & designs given by the contracts /buyers	12	3.1
Following the market with own designs, modifying contemporary furniture & others	1	0.3
Following the market with own designs & designs given by the contracts /buyers & copying from overseas/buyers	6	1.6
Other combinations	19	5.0
Total	381	100.0

Source: Actual survey, 2007

Number of Designers

The designer has a major role in the decision-making on furniture design in giving ideas and suggestions to be chosen by the management. The furniture designer is responsible for transferring an intangible idea to designing an actual product from it. The designer is a skilled individual who understands design, size, colour and proportion. He / she needs to know about market trends and a better way than through trade shows, magazines or via their principal customers. It is important because the mills need to differentiate their products in the market and

sustain their competitive advantage. Even though the number of designers is crucial for wooden furniture mills, only 26.2% of the wooden furniture mills in Malaysia have in-house designers (100 out 381 mills). More than 50% of the mills in the states, except for Penang (33.3%) and Sabah (28.6%), have no designers (Table 3.28).

Table 3.28: Distribution of Wooden Furniture Mills in Malaysia by Number of Designers

State	No designer	1-2 designers	More than 2 designers	Total
Johore	30	13	3	46
Kedah	34	11	3	48
Kelantan	16	5	0	21
Malacca	15	5	1	21
Negeri Sembilan	4	2	1	7
Pahang	16	6	1	23
Penang	1	2	0	3
Perak	73	21	2	96
Selangor	13	4	2	19
Terengganu	9	2	1	12
Peninsular Malaysia	211	71	14	296
Sabah	2	5	0	7
Sarawak	68	9	1	78
Total	281	85	15	381

Source: Actual survey, 2007

Table 3.29 shows clearly that the number of designers has a significant correlation with the size of manufacturer. As we go along, the larger the manufacturer, the more are the designers. Designing is important for the furniture industry because the furniture industry is classified as a fashion industry. Periodically, new colours and styles become more popular, displacing other colours and styles. To ignore changes in fashion and consumer tastes will place a company at a competitive disadvantage. Moreover, furniture is a product that is purchased for function as well as design appeal. In other words, furniture performs a dual role. For example, a dresser or chest must serve the purpose of providing storage space, and at the same time, its appearance must also appeal to the consumer. Therefore, furniture is consciously designed to fulfill both functional and aesthetic needs (Bennington 2004).

JETRO (1999) suggested that design is a major factor in the marketability of furniture. A few successful mills are able to export their own designs but mainly in foreign markets the buyer provides the design. There is a need to upgrade design capability in order to complement production capability. JETRO (1999) also reported that mills lack exposure and knowledge of the preference, taste and culture of foreign buyers.

R&D Team

Hence, it is important for wooden furniture mills to have their own R&D teams to enhance their capability and product marketability. However, 83.7% of the mills (319 out of 381 mills) do not have an R&D team for their product development. If we look at the distribution according to state, only Johore, Negeri Sembilan, Penang and Selangor have more than 50% of the mills with R&D teams. Most of wooden furniture mills which have R&D teams involve one to four persons per team. However, 13 mills (3.4%) have R&D teams which involve more than six persons (Table 3.30).

Availability of R&D team is important because of the competitive environment in the furniture industry. The market power in the furniture industry is diffused and no single manufacturer or retailer dominates a significant portion of the industry, although selected mills are very important in particular style or product categories. The competitive situation in the furniture industry has also changed because the industry has become a global industry where domestic mills face competition from manufacturers located throughout the world (Bennington 2004). Also, a good market research and information system provides the necessary information that will help the management make better decisions for the organization. This is supported by the findings which show that large enterprises give more emphasis to R&D: 57.9% of the large enterprises have their own R&D teams with 45.5% of them having more than six persons involved in R&D based on annual sales turnover. Based on total workforce, 67.8% of the large enterprises have their own R&D teams with 32.5% of them having more than six persons involved in R&D. On the other hand, 99.5 and 98.7% of the micro-enterprises do not have R&D teams based on annual sales turnover and total workforce respectively. As shown in Table 3.31, most of the medium and large enterprises have R&D teams indicating that R&D is crucial for these enterprises for their business sustainability and competitiveness. Gardino (2004) also supported this finding with 33% of small enterprises and 83% of large enterprises having an R&D or design department (n=20).

Table 3.29: Numbers of Designers by Classification of Mills

Number of designers in mill	Micro-enterprises				Small enterprises				Medium enterprises				Large enterprises				Total	
No designer	64	22.8%	154	54.8%	143	50.9%	88	31.3%	38	13.5%	20	7.1%	36	12.8%	19	6.8%	281	73.8%
1-2 designers	13	15.3%	30	35.3%	33	38.8%	34	40.0%	23	27.1%	7	8.2%	16	18.8%	14	16.5%	85	22.3%
More than 2 designers	0	0.0%	1	6.7%	5	33.3%	7	46.7%	3	20.0%	2	13.3%	7	46.7%	5	33.3%	15	3.9%
Total	77	20.2%	185	48.6%	181	47.5%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	38	10.0%	381	100.0%

Total workforce (based on SMIDEC classification)

Annual sales turnover (based on SMIDEC classification)

Source: Actual survey, 2007

Table 3.30: Distribution of Wooden Furniture Mills in Malaysia by Availability and Number of Persons Involved in R&D Teams

State	No R&D team	1-2 persons	3-4 persons	5-6 persons	More than 6 persons	Total
Johore	30	5	5	4	2	46
Kedah	43	2	1	0	2	48
Kelantan	21	0	0	0	0	21
Malacca	16	0	0	2	3	21
Negeri Sembilan	3	2	2	0	0	7
Pahang	16	4	2	0	1	23
Penang	1	0	1	0	1	3
Perak	87	3	2	4	0	96
Selangor	9	3	4	1	2	19
Terengganu	11	0	0	0	1	12
Peninsular Malaysia	237	19	17	11	12	296
Sabah	5	1	0	0	1	7
Sarawak	77	0	1	0	0	78
Total	319	20	18	11	13	381

Source: Actual survey, 2007

Table 3.31: Availability and Numbers of Persons Involved In R&D Teams by Classification of Mills

R&D team in mill	Micro-enterprises				Small enterprises				Medium enterprises				Large enterprises				Total	
No R&D team	76	23.8%	184	57.7%	174	54.5%	107	33.5%	50	15.7%	12	3.8%	19	6.0%	16	5.0%	319	83.7%
1-2 persons	1	5.0%	1	5.0%	4	20.0%	12	60.0%	7	35.0%	5	25.0%	8	4.0%	2	10.0%	20	5.2%
3-4 persons	0	0.0%	0	0.0%	3	16.7%	5	27.8%	4	22.2%	7	38.9%	11	61.1%	6	33.3%	18	4.7%
5-6 persons	0	0.0%	0	0.0%	0	0.0%	3	27.2%	3	27.3%	4	36.4%	8	72.7%	4	36.4%	11	2.9%
More than 6 persons	0	0.0%	0	0.0%	0	0.0%	2	15.4%	0	0.0%	1	7.7%	13	100.0%	10	76.9%	13	3.4%
Total	77	20.21%	185	48.6%	181	47.51%	129	33.9%	64	16.8%	29	7.6%	59	15.5%	38	10.0%	381	100.00%

Total workforce (based on SMIDEC classification)

Annual sales turnover (based on SMIDEC classification)

Source: Actual survey, 2007

Quality Control (QC) System

Table 3.32 shows the availability of quality control (QC) system by state with 234 mills (61.4%) having quality control (QC) system. All the wooden furniture mills in Penang, Selangor and Sabah have QC system. However, only 37.5 and 44.9% of the mills in Kedah and Sarawak have QC system, while for the other states, more than 50% of the mills implement QC system. About 57.5% of the mills (219 mills) have their own workers who are in charge in QC system. However, there are also mills who use QC system provided by the buyers (Table 3.33). Gardino (2004) reported that 70% of furniture mills had their products quality tested. Almost all of the testing was done in-house and only 10% which had their quality check outside were large enterprises, indicating perhaps that their clients required certified testing or such tests could not be done in-house.

This study showed that almost all of medium and large enterprises have their own QC system. This indicates that most of these enterprises emphasize on the quality of their products to meet customer needs and requirements (Table 3.34).

Table 3.32: Numbers of Mills with / without Quality Control (QC) System by State

State	No QC	Yes	Total
Johore	6	40	46
Kedah	30	18	48
Kelantan	8	13	21
Malacca	4	17	21
Negeri Sembilan	1	6	7
Pahang	9	14	23
Penang	0	3	3
Perak	43	53	96
Selangor	0	19	19
Terengganu	3	9	12
Peninsular Malaysia	104	192	296
Sabah	0	7	7
Sarawak	43	35	78
Total	147	234	381

Source: Actual survey, 2007

Table 3.33: Mills with Quality Control (QC) System: Persons Involved

Persons involved	Frequency	Percent
In-house staff	166	43.6
Clients offering the contracts/QC from buyers	14	3.7
Others	2	0.5
In-house staff & clients offering the contracts/QC from buyers	49	12.9
In-house staff, clients offering the contracts /QC from buyers & government officials	2	0.5
In-house staff & government officials	2	0.5
Clients offering the contracts /QC from buyers & government officials	1	0.3

Source: Actual survey, 2007

Table 3.34: Status of Quality Control System by Classification of Mills

Mills	No	Yes	Total
Micro-enterprises	55	22	77
Small enterprises	86	95	181
Medium enterprises	6	58	64
Large enterprises	0	59	59
Micro-enterprises	111	74	185
Small enterprises	35	94	129
Medium enterprises	0	29	29
Large enterprises	1	37	38
Total	147	234	381

	Total workforce (based on SMIDEC classification)
	Annual sales turnover (based on SMIDEC classification)

Source: Actual survey, 2007

Human Resources

Numbers of Workers

Table 3.35 shows the total numbers of workers by category in Malaysia. About 32,671 total workforce are involved in wooden furniture manufacturing in year 2006 based on the survey. The Ministry of Plantations, Industries and Commodities reported that there were 203,102 total employment in forestry and timber in 2006. Thus these findings cover 16.0% percent of the total employment in forestry and timber industries. The majority of the total workforces for the wooden furniture mills are direct labour force, those directly involved with production, which is as many as 70.9% (23,192 workers). This figure includes 12,303 skilled and 10,889 non-skilled workers. This is followed by general workers, indirect labour force and clerical staffs and typists. In addition, 1,492 (4.6%) work as managerial workers and professionals. However, only 18 workers are unpaid family workers in Johore, Perak, Kedah, Sarawak, Kelantan, Penang and Terengganu. In terms of proportion by state, the highest is in Johore with 32.6% (10,664 workers) of the total workforce, while the lowest total workforce is in Kelantan with only 1.2% (380 workers).

Males make up the majority of the workforce, accounting for 81.93%. The study also found that 54.2% of the total workforce are foreign (17,655 workers) and the rest are Malaysian. Selangor recorded the highest percentage of foreign workers (as many as 75.3%), followed by Malacca (about 73.3%), Negeri Sembilan (62.8%) and Johore (60.2%). This trend is related with the establishment of most of the medium and large enterprises in these states. Indirectly we can conclude that there is a relationship between the size of manufacturer and the proportion of foreign workers. Hence, larger enterprises are more dependent on foreign workers than micro- and small enterprises (Table 3.36).

Table 3.35: Total Workforce by Category

State	Working proprietors, active business partners	Unpaid family workers	Management workers & professionals	Management workers & non-professionals	Technicians	Clerical staffs & typists	General workers	Direct labour force : skilled	Direct labour force : non-skilled	Indirect labour force	Total
Johore	88	47	290	177	240	515	259	3,761	4,626	704	10,664
Kedah	63	3	44	15	24	92	258	976	502	69	2,046
Kelantan	36	1	8	5	8	27	6	170	102	17	380
Malacca	43	0	180	27	79	148	659	2,196	358	122	3,812
Negeri Sembilan	3	0	14	11	78	65	46	640	583	0	1,440
Pahang	34	1	29	39	75	192	82	701	698	188	2,039
Penang	8	1	68	13	10	10	214	103	5	0	432
Perak	147	5	101	15	39	107	427	613	667	229	2,350
Selangor	41	0	112	197	164	214	619	2,236	1,888	231	5,702
Terengganu	24	1	13	14	55	51	509	155	244	190	1,256
Sabah	11	0	33	12	17	64	30	124	839	39	1,169
Sarawak	94	2	55	20	52	73	60	628	377	20	1,381
Total	592	18	947	545	841	1,558	3,169	12,303	10,889	1,809	32,671

Source: Actual survey, 2007

Table 3.36: Proportion of Foreign Workers

State	Malaysian			Foreigner			Total workforce		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Johore	2,861	1,444	4,305	6,242	117	6,359	9,103	1,561	10,664
Kedah	684	470	1,154	892	0	892	1,576	470	2,046
Kelantan	261	85	346	34	0	34	295	85	380
Malacca	556	461	1,017	2,782	13	2,795	3,338	474	3,812
Negeri Sembilan	234	302	536	889	15	904	1,123	317	1,440
Pahang	662	394	1,056	968	15	983	1,630	409	2,039
Penang	203	69	272	160	0	160	363	69	432
Perak	1,087	519	1,606	743	1	744	1,830	520	2,350
Selangor	741	675	1,416	4,060	226	4,286	4,801	901	5,702
Terengganu	1,050	140	1,190	66	0	66	1,116	140	1,256
<i>Peninsular Malaysia</i>	<i>8,339</i>	<i>4,559</i>	<i>12,898</i>	<i>16,836</i>	<i>387</i>	<i>17,223</i>	<i>25,175</i>	<i>4,946</i>	<i>30,121</i>
Sabah	410	558	968	138	63	201	548	621	1,169
Sarawak	846	304	1,150	199	32	231	1,045	336	1,381
Grand Total	9,595	5,421	15,016	17,173	482	17,655	26,768	5,903	32,671

Source: Actual survey, 2007

Training Practices

One of the most critical aspects of human resources management and development is training. Training is very important in imparting information and/or instructions to improve the human resources' performance or to help workers/employees attain a required level of knowledge or skill. Table 3.37 shows that 76.0% of wooden furniture mills use on-the-job training (OJT) as their training method. This finding is in line with the study done by Gardino (2004) who reported that the most common training method is on-the-job training (100%), the main form of training. On-the-job training (OJT) can be defined as the worker/employee training at the place of work while he or she is doing the actual job. Usually an experienced employee serves as the course instructor, and employs the principles of learning (participation, repetition, relevance, transference and feedback), often supported by formal classroom training. The second most common training practice is in-house training with 28 mills (7.0%) implementing this method. Only three mills (1%) send their workers/employees to industrial training institute and three mills (1%) to the Wood Industry Skill Development Centre (WISDEC). Other mills implement more than one type of

training, which is a combination of the training practices mentioned above. Gardino (2004) reported that only 10% of firms had sent any workers for training organized by the government. Any training method other than OJT is also known as off-the-job training. That means employee training is at a site away from the actual work environment. It often utilizes lectures, case studies, role playing, simulation, etc.

Brandt and Lew (2005) reported that the industry faced a shortage of skilled workers at all levels and the majority of the workers were receiving on-the-job training. There is a need to develop sufficient design expertise locally to support the development of the furniture industry so that it is able to move into higher market segments. Hence, the wooden furniture mills need to diversify their training methods to further enhance productivity of the industry and go beyond the expectation.

Table 3.37: Training Practices

Type of training	Number of mills	Percent
On-the-job training (OJT) only	290	76.0
Vocational training only	0	0.0
In-house training programme only	28	7.0
Industrial training institute only	3	1.0
Wood Industry Skills Development Centre (WISDEC) only	3	1.0
Combination of in-house training programme & others	7	2.0
Combination of OJT & in-house training programme	13	3.0
Combination of OJT & industrial training institute	6	2.0
Other combinations in type of training	23	6.0
Others	8	2.0
Total	381	100.0

Source: Actual survey, 2007

Gardino (2004) reported 32% of furniture companies training their workers. However, this percentage is not distributed equally across the size of firms. Small firms (17%), medium-sized firms (29%) and large enterprises (50%) reported that they conducted training. The present study reveals that awareness of the importance of training of workers/employees increases as the enterprise becomes larger. As shown in Table 3.38, the percentage of large enterprises implementing on-the-job training is higher than the percentages of medium, small and micro-enterprises based either on annual sales turnover or total workforce. Only about 12.9% of the mills use more than one type of training and most of them are small, medium and large enterprises. Other types of training attended by employees are public speaking course, administration, marketing and production course, safety training and other training courses to improve their skills.

Table 3.38: Training Practices by Classification of Mills

Type of training	Micro-enterprises		Small enterprises		Medium enterprises		Large enterprises		Total
On-the-job training (OJT) only	75	172	157	97	41	12	17	9	290
Vocational training only	0	0	0	0	0	0	0	0	0
In-house training programme only	1	8	10	10	7	3	10	7	28
Industrial training institute only	0	1	1	1	1	0	1	1	3
Wood Industry Skills Development Centre (WISDEC) only	1	1	0	1	1	1	1	0	3
Combination of in-house training programme & others	0	0	2	4	2	0	3	3	7
Combination of OJT & in-house training programme	0	0	2	3	4	4	7	6	13
Combination of OJT & industrial training institute	0	0	0	3	3	3	3	0	6
Other combinations in type of training	0	1	6	7	2	3	15	12	23
Others	0	2	3	3	3	3	2	0	8
Total	77	185	181	129	64	29	59	38	381
Total workforce (based on SMIDEC classification)									
Annual sales turnover (based on SMIDEC classification)									

Source: Actual survey, 2007

In 2006, as many as 13,580 workers followed programmes organized and these workers can be categorized as trained workers with total expenditure amounting to RM2.25 million. On average, the wooden furniture manufacturer spent only RM165.71 per trained worker for training expenditure in 2006. This figure is quite low and most of the wooden furniture mills spent less than 0.1% of their total annual sales on training expenditure, averaging 0.07%. This finding is parallel with the finding of Gardino (2004) who noted that Malaysian industries were spending too little on personnel training. Johore recorded the highest expenditure to train its workers with RM1.38 million, which is about 61.4% of the total expenditure on training programmes in Malaysia. However, wooden furniture mills in Kelantan did not allocate their budget for training purpose. On average, training expenditure cost per trained worker in Penang is the highest at RM1,315.79 per trained worker and the lowest cost is in Negeri Sembilan at only RM26.15 (Table 3.39).

Gardino (2004) reported that small firms spent on average 2.5% of sales on training, medium-sized firms 1.7%, while large firms spent 0.8%. This is because in Malaysia the majority of non-skilled workers are immigrants, without the possibility of working in the country for many years; therefore companies do not invest in training and turnover is high, since there is quite abundant availability of immigrant workers.

Table 3.39: Numbers of Trained Workers and Total Expenditure on Training Programme by State

State	Total number of trained workers, 2006	Total expenditure on training programme (RM)	Average training expenditure (RM/trained worker)
Johore	3,615	1,381,904.00	382.27
Kedah	1,080	29,500.00	27.31
Kelantan	47	0.00	0.00
Malacca	1,831	160,089.20	87.43
Negeri Sembilan	956	25,000.00	26.15
Pahang	349	100,600.00	288.25
Penang	38	50,000.00	1,315.79
Perak	771	180,800.92	234.50
Selangor	4,007	205,810.00	51.36
Terengganu	175	43,880.00	250.74
<i>Peninsular Malaysia</i>	12,869	2,177,584.12	169.21
Sabah	439	52,500.00	119.59
Sarawak	272	20,300.00	74.63
Grand total	13,580	2,250,384.12	165.71

Source: Actual survey, 2007

However, Table 3.40 shows clearly that large enterprises spend more on training expenditure compared with micro-, small and medium enterprises. On average, large enterprises spend about RM44,705.08 and RM35,667.78 per year on training based on annual sales turnover and total workforce respectively, while small enterprises spend only RM1,452.83 on average based on annual sales turnover.

Table 3.40: Total Expenditure on Training Programme by Classification of Mills

Mills	Total expenditure on training programme (RM/year)		Number of mills		Average expenditure on training (RM/manufacturer/year)	
	Based on total workforce	Based on annual sales turnover	Based on total workforce	Based on annual sales turnover	Based on total workforce	Based on annual sales turnover
Micro-enterprises	0.00	7,000.00	77	185	0.00	37.84
Small enterprises	27,420.00	187,414.92	181	129	151.49	1,452.83
Medium enterprises	118,564.92	357,176.00	64	29	1,852.58	12,316.41
Large enterprises	2,104,399.20	1,698,793.20	59	38	35,667.78	44,705.08
Total	2,250,384.12	2,250,384.12	381	381	5,906.52	5,906.52

Source: Actual survey, 2007

Machinery And Equipment

Most Common Machinery and Equipment Used

There are more than 200 types of machinery and equipment used by the wooden furniture mills in Malaysia. Table 3.41 gives the most common machinery and equipment used in 2006. For new machinery, the plane is the most common equipment in the mill accounting for about 28.6%, followed by the sander (21.8%), band-saw (17.8%) and drill (17.8%). For reconditioned machinery, the plane also gave the highest percentage of usage among other machinery accounting for 31.0%. Other machines such as drill (16.0%), sander (15.5%) and band-saw (14.2%) rank among the highest in usage in the mill.

Table 3.42 shows the countries of origin for all the machinery and equipment used in 2006. New machinery and equipment were imported mainly from Taiwan (43.8%), Austria (14.0%), Japan (13.6%), Italy (11.7%) and Germany (6.8 %). On the other hand, the old/ reconditioned machinery were imported from Taiwan, Japan, Italy and China at about 49.4, 18.0, 11.5 and 9.4% respectively. According to Gardino (2004), machinery and tools were imported mostly from Taiwan due to their cheapest prices compared with other suppliers. To date, there is no machinery manufacturer in Malaysia. Thus, to keep Malaysia's competitive advantage in supplying furniture, firms should emphasize on quality improvement by cutting the cost of production through investing on the machinery and equipment of the mill. By improving the level of technology, the production can be changed from labour intensive to machine intensive and labour cost can be reduced.

The Ninth Malaysia Plan is also promoting innovation-driven strategies and improving technology to face the increasing competition in the global market. Andersson et al. (2006) warned that all firms and companies operated with labour-intensive and low-tech production processes will face difficulties in adjusting to the productions set if there are any changes in economic conditions. They observed that the Malaysian furniture industry did not have high-value creation through product differentiation, leading-edge technology products, technological innovativeness (usually associated with a greater use of IT) and quality leadership.

Table 3.41: Most Common Machinery and Equipment Used

	Name of new machinery/equipment	Total number of mills	Percent		Name of old/reconditioned machinery/equipment	Total number of mills	Percent
1	Plane	109	28.6		Plane	118	31.0
2	Sander	83	21.8		Drill	61	16.0
3	Band-saw	68	17.8		Sander	59	15.5
4	Drill	68	17.8		Band-saw	54	14.2
5	Moulder	61	16.0		Moulder	42	11.0
6	Boring	59	15.5		Thicknesser	39	10.2
7	Circular saw	56	14.7		Circular saw	36	9.4
8	Air compressor	54	14.2		Boring machine	35	9.2
9	Radial arm saw	50	13.1		Table saw	34	8.9
10	Table saw	49	12.9		Radial arm saw	33	8.7
11	Thicknesser	47	12.3		Tenoner machine	31	8.1
12	Cross-cut machine	35	9.2		Cross-cut machine	30	7.9
13	Spindle moulder	35	9.2		Mortiser	29	7.6
14	Tenoner machine	35	9.2		Air compressor	22	5.8
15	Sharpener	25	6.6		Arm saw	18	4.7

Source: Actual survey, 2007

Table 3.42: Countries of Origin for Machinery and Equipment Used

New machinery/equipment		Old/reconditioned machinery/equipment	
Country	Percent	Country	Percent
Taiwan	43.8	Taiwan	49.4
Austria	14.0	Japan	18.0
Japan	13.6	Italy	11.5
Italy	11.7	China	9.4
Germany	6.8	Germany	6.8
China	5.9	UK	1.8
US	1.7	Korea	1.3
Singapore	0.5	Holland	0.3
UK	0.4	Singapore	0.3
Indonesia	0.3	Belgium	0.2
Korea	0.3	Bulgaria	0.2
Viet Nam	0.3	Denmark	0.2
Denmark	0.2	Europe	0.2
Turkey	0.2	France	0.2
Australia	0.1	Switzerland	0.2
Belgium	0.1	Thailand	0.2
Canada	0.1	US	0.0
Poland	0.1		
Spain	0.1		
Thailand	0.1		
Total	100.0	Total	100.0

Source: Actual survey, 2007

Level of Technology

Table 3.43 summarizes the utilization of numeric control (NC) or computer numeric control (CNC) machinery by ownership in 2006. About 292 mills were not using either NC or CNC for their production, 27 mills used only NC, 40 mills used CNC and about 22 mills used both NC and CNC machinery. Overall, 89 mills (23.4%) can be categorized as fully mechanized/computerized mills, at the second level of technology, while no wooden furniture mills in Malaysia can be categorized as integrated computerized mills, at the first level of technology. On the other hand, 292 mills are still at the third and fourth levels of technology with mechanized/partial manual or backyard set-up. Basically, fully mechanized/computerized technology is more efficient, uses fewer workers and is known as machine-intensive technology.

Table 3.43: Utilization of Numeric Control (NC) or Computer Numeric Control (CNC) Machinery by Ownership

	B	NB	F	B + NB	B + F	NB + F	B + NB + F	Total
No	43	226	7	5	2	5	4	292
Yes, with NC	4	20	1	1	0	0	1	27
Yes, with CNC	2	18	12	2	0	1	5	40
Yes, with both NC & CNC	2	12	3	2	0	3	0	22
Total	51	276	23	10	0	9	10	381

Source: Actual survey, 2007

B = Bumiputra

NB = Non-Bumiputra

F = Foreigner

The utilization of numeric control (NC) or computed numeric control (CNC) machinery by status of the company is shown in Table 3.44. In the survey, about 292 mills do not use either NC or CNC while only 22 mills use both types of machinery. In addition, 27 mills use NC machinery and 40 responded on the use of CNC machinery. The highest responses were obtained from private limited companies (191), individuals (137), partnerships (36) and public limited companies (17).

Table 3.44: Utilization of Numeric Control (NC) or Computer Numeric Control (CNC) Machinery by Status of the Company

Utilization	Individuals	Partnerships	Private limited companies	Public limited companies	Total
No	130	35	124	3	292
Yes, NC machinery used	5	0	20	2	27
Yes, CNC machinery used	0	1	28	11	40
Yes, both NC & CNC machinery used	2	0	19	1	22
Total	137	36	191	17	381

Source: Actual survey, 2007

The utilization of numeric control (NC) or computer numeric control (CNC) machinery by classification of mills is presented in Table 3.45. From the survey, 292 mills do not use either NC or CNC machinery and recorded the highest response.

Table 3.46 summarizes the extent of equipment fabrication for furniture in 2006. Based on the findings, mills which use some local and imported fabricated equipment constitute the highest percentage (58.3%), followed by mills which use only fabricated equipment (24.4%) and mills which use fully imported equipment (12.1%). Others contribute a small percentage in equipment fabrication for furniture.

Table 3.45: Utilization of Numeric Control (NC) or Computer Numeric Control (CNC) Machinery by Classification of Mills

Utilization	Micro-enterprises		Small enterprises		Medium enterprises		Large enterprises		Total
No	75	176	162	93	38	16	17	7	292
Yes, NC machinery used	2	8	10	14	10	2	5	3	27
Yes, CNC machinery used	0	0	4	13	8	8	28	19	40
Yes, both NC & CNC machinery used	0	1	5	9	8	3	9	9	22
	77	185	181	129	64	29	59	38	381

Total workforce (based on SMIDEC classification)

Annual sales turnover (based on SMIDEC classification)

Source: Actual survey, 2007

Table 3.46: Equipment Fabrication for Furniture

Equipment fabrication	Number of mills	Percent
Only fabricated equipment used	93	24.4
Some local & imported fabricated equipment used	222	58.3
Fully imported equipment used	46	12.1
External equipment modification	8	2.1
In-house equipment modification & fabrication in collaboration with suppliers	31	8.1
In-house equipment modification & fabrication only	15	3.9
Joining R&D in design & modification of equipment with equipment manufacture	2	0.5
Others	2	0.5

Source: Actual survey, 2007

Wooden Furniture Industry Productivity

Definition of Productivity

A variety of definitions of productivity are found in the literature and dictionaries. The Business Dictionary defines productivity as a relative measure of the efficiency of a person, machine, factory, system, etc, in converting inputs into useful outputs. Computed by dividing average output per period by the total costs incurred or resources (capital, energy, material, personnel) consumed in that period, productivity is a critical determinant of cost efficiency. Most authors use the term productivity but they do not define it. Tangen (2005) also says that the terms productivity and performance are commonly used within academic and commercial circles but rarely adequately defined or explained. Indeed they are often confused and considered to be interchangeable, along with terms such as efficiency, effectiveness and profitability (Chew 1988; Sink & Tuttle 1989; Koss & Lewis 1993; Summanth 1994; Thomas & Baron 1994; Jackson & Peterson 1999). Saari (2006) defines productivity as a concept in close relation to such concepts as profitability, economic growth, efficiency, surplus value, quality, performance, partial productivity and need. The simplest definition of productivity is total output produced in relation to the input used. No matter how we define it, productivity is one of the key competitive advantages of an enterprise over its competition. It is because productivity is the measurement of how efficiently a firm uses its resources to produce an output.

Productivity can be measured in many different ways and it depends on the purpose of measurement and the most important aspect is the availability of data. Productivity measure can be classified as single-factor productivity measure (relating a measure of output to a single measure of input) or multifactor productivity (MFP) measure (relating a measure of output to a bundle of inputs). Table 3.47 shows the criteria for productivity measurement. Among these measures, value-added based labour productivity is the single most frequently computed productivity statistic, followed by capital-labour MFP and KLEM MFP. Labour productivity is a key determinant of living standards, measured as per capita income, and from this perspective it is of significant policy relevance (OECD 2001).

This report uses the concept of partial productivity as the measurement solutions which do not meet the requirements of total productivity, yet being practicable as indicators of total productivity. In practice, measurement in business means measures of partial productivity and the objects of measurement are components of total productivity, these components being indicative of productivity development (Saari 2006). Partial productivity can be a single-factor productivity, value-added productivity, unit cost accounting, efficiency ratios or managerial control ratio system. However, in this report there are two aspects of partial productivity that can be used, namely single-factor productivity and value-added productivity. Productivity level is an absolute measure and is usually expressed in RM. Comparison of productivity levels is made at a single point of time. It enables us to see whether the amount of output produced by the workers in a

particular industry is better or worse than that of competitors, or some present standard (MPC 2008).

Table 3.47: Overview of Main Productivity Measures

Type of output measure	Type of input measure			
	Labour	Capital	Capital and labour	Capital, labour and intermediate inputs (energy, materials, services)
Gross output	Labour productivity (based on gross output)	Capital productivity (based on gross output)	Capital-labour productivity (based on gross output)	KLEMS multifactor productivity
Value added	Labour productivity (based on value added)	Capital productivity (based on value added)	Capital-labour productivity (based on value added)	-
	Single factor productivity measures		Multifactor productivity (MFP) measures	

Adopted from OECD Manual: Measuring Productivity, 2001

The essential element of productivity reported for this study is measuring labour productivity. Mohd Sahar (2002) also emphasized that labour productivity is an important business strategy in the manufacturing sector. Production processes in manufacturing should be most productive as well as efficient in order to maintain the highest standard of quality. Labour productivity can be written simply as:

$$P = (\text{total output}) / (\text{total labour input})$$

$$= (\text{total income generated}) / (\text{total labour input})$$

Therefore, if i is the wooden furniture manufacturer, then labour productivity can be given by:

$$P_i = \frac{\text{total income generated in manufacturer } i}{\text{total labour input in manufacturer } i}$$

However, Mohd Sahar (2002) also mentioned that most economists and input-output scholars normally adopt an alternative measure of labour productivity, ie labour coefficients. The labour coefficient describes the labour requirement in producing a unit of dollar of output. Labour coefficient is an implicit way of measuring productivity. It is defined as follows:

$$l_j = L_j / X_j$$

where, l_j is the coefficient of labour requirement for the j th sector output
 L_j the labour force employed in manufacturer j
 X_j the gross output of manufacturer j

Labour Coefficients

Referring to Table 3.48, it is obvious that the wooden furniture mill for boats & yachts has the lowest labour coefficient compared with other mills. It shows that this type has better labour productivity, followed by mills producing wooden baby furniture, dining tables & chairs, and wooden office furniture. This means that these four types of wooden furniture manufacturer are able to utilize their workforce more productively in generating gross output. Higher labour productivity would encourage better growth of the industry and it is the essential part of competitiveness. In overall, mean labour coefficient for wooden furniture mills regardless of their type of furniture produced is 0.12323 per thousand RM of output. It indicates that wooden furniture mills can generate a thousand RM of annual sales turnover by using 0.123 total workforce. However, wooden kitchen furniture and door & door frames mills are among mills that are less labour productive and at the same time have mean labour coefficients more than the overall mean. In comparison, the study done by Mohd Sahar (2002) indicates that the labour coefficient of the wood and wood product sector in Malaysia for year 2000 is 0.04116893 per thousand US dollars of output. However, no specific study has been done on labour coefficient of the wooden furniture industry.

A different perspective of how productive the utilization of labour is in each classification of mills is shown clearly in Table 3.49. Large enterprises have the lowest mean labour coefficient compared with medium, small and micro-enterprises which indicates that large and medium enterprises are more productive in terms of labour utilization for both total workforce and annual sales turnover. However, based on total workforce micro-enterprises are more labour productive than small enterprises, while based on annual sales turnover small enterprises are more labour productive than micro-enterprises. At the same time, the lowest productive mills for both criteria of classification have mean labour coefficient less than the overall mean for all mills. Analysis of variance (ANOVA) is used to test the hypothesis that at least one of the classification's means is different from the others. The finding shows that at 99% confidence level there are significant differences in mean labour coefficient by classification of manufacturers because p -value = 0.000 is less than α -value 0.01 (Table 3.50). Malaysia Productivity Corporation (2008) reported that the Wooden & Cane Furniture subsector registered a 6.9% growth in productivity valued at RM28,562 in 2006 and it was attributed to efficiency in management and improvement in the skill of labour.

Table 3.48: Mean Labour Coefficients by Main Type of Furniture Produced

Main type of furniture produced	Minimum	Maximum	Mean	Std. deviation
Dining tables & chairs	0.00090	0.14120	0.02389	0.03341
Living room furniture	0.00270	0.21660	0.07348	0.07645
Occasional furniture	0.00040	0.46750	0.09393	0.14636
Outdoor furniture	0.00830	0.46380	0.07065	0.12836
Upholstered furniture with wooden frames	0.00310	0.20910	0.06061	0.07210
Wooden office furniture	0.00310	0.09410	0.03429	0.03056
Wooden kitchen furniture	0.00320	1.66670	0.16282	0.29025
Wooden bedroom furniture	0.00030	1.11110	0.12178	0.19092
Wooden baby furniture	0.01350	0.01820	0.01586	0.00334
Custom-made furniture	0.00410	0.28300	0.08626	0.10187
Other products	0.00240	0.66180	0.09413	0.18531
Furniture for boats & yachts	0.00230	0.00230	0.00234	na*
Parts & components (including ready-to-assemble [RTA] furniture)	0.00140	0.39100	0.04756	0.83700
Doors & door frames (including doors for cupboards, cabinets, etc)	0.00170	2.22220	0.20038	0.32306
Overall	0.00030	2.22220	0.12323	0.23453

Source: Actual survey, 2007

* not available because only one mill produces furniture for boats & yachts

Table 3.49: Mean Labour Coefficients by Classifications of Mills

Classification of Mills	Minimum	Maximum	Mean	Std. deviation
Micro-enterprises	0.00320	1.11110	0.11754	0.15643
Small enterprises	0.00080	2.22220	0.18191	0.30676
Medium enterprises	0.00030	0.61110	0.05283	0.09674
Large enterprises	0.00170	0.31200	0.02907	0.05547
Micro-enterprises	0.00930	2.22220	0.21996	0.30391
Small enterprises	0.00130	0.31200	0.04154	0.04933
Medium enterprises	0.00080	0.03330	0.01151	0.00754
Large enterprises	0.00030	0.01480	0.00596	0.00427
Overall	0.00030	2.22220	0.12323	0.23453

	Total workforce (based on SMIDEC classification)
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	Annual sales turnover (based on SMIDEC classification)
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Source: Actual survey, 2007

Table 3.50: Analysis of Variance (ANOVA) of Labour Coefficients by Classification of Mills

	Sum of squares	df	Mean square	F	Sig.
Between groups	1.427	3	.476	9.220	.000*
Within groups	18.980	368	.052		
Between groups	3.380	3	1.127	24.351	.000*
Within groups	17.027	368	.046		
Total	20.407	371			

	Total workforce (based on SMIDEC classification)
	Annual sales turnover (based on SMIDEC classification)

Note: * significant at 0.01

Single-factor Productivity

Another aspect of productivity that will be discussed in this report is partial productivity. As mentioned before, there are two types of partial productivity that will be used, namely single-factor productivity and value-added productivity. Single-factor productivity refers to the measurement of productivity that is a ratio of output and one input factor. A most well-known measure of single-factor productivity is the measure of output per work input, describing work productivity.

There are five indicators used to measure single-factor productivity, as follows:

- sales per employee (RM);
- sales per ringgit of fixed assets (RM);
- fixed assets per employee (RM);
- labour cost per employee (RM);
- sales value per labour cost (RM).

Single-factor Productivity Values by Classification of Mills

Table 3.51 shows the single-factor productivity values by classification of manufacturers. Overall, based on annual sales turnover, the large enterprises are more productive than other manufacturers except for labour cost per employee, whereas medium enterprises have lower labour cost compared with large enterprises. On average, total sales per employee for wooden furniture mills is RM82,643.99 and based on annual sales turnover, large and medium enterprises have achieved productivity levels more than the average level of the industry. Malaysia Productivity Corporation (2008) reported that total sales per employee for wooden & cane furniture mills in 2006 is RM116,310. The statistics give a higher figure than the present finding because they include cane manufacturers as well. As we expected, micro-enterprises have the lowest

productivity level in terms of sales per employee. Therefore, large enterprises are able to utilize their labour more productively to generate gross output.

A similar scenario for sales per ringgit of fixed assets is seen whereby large and medium enterprises are more productive in making use of their fixed assets to generate sales more than the overall mean of furniture mills. In terms of investment in machinery and equipment, large enterprises tend to spend more money for investment with RM59,063.65 per employee compared with micro-enterprises at only RM31,906.08 per employee. The performance of wooden furniture mills in this aspect can be enhanced due to continuous investment in machinery and equipment. But for labour cost per employee, medium and large enterprises pay the lowest remunerations to their employees based on classifications 2 and 1 at only RM953.55 and RM975.22 respectively. Table 3.51 also shows that small and micro-enterprises have to pay more to their workforce compared with medium and large enterprises. The last single-factor productivity is sales value per labour cost which indicates how competitive the manufacturer is in terms of labour cost. The findings show that small and micro-enterprises have to pay higher labour costs because sales value per labour cost are only RM63.79 and RM11.65 based on annual sales turnover. This indicates that the labour cost does not commensurate with the sales. Based on total workforce, analysis of variance (ANOVA) shows that there are significant differences between the classifications of manufacturers for four single-factor productivity indicators, namely sales per employee, sales per ringgit of fixed assets, labour cost per employee, and sales value per labour cost at 95 to 99% significance level. Besides, based on annual sales turnover, all single factor productivity indicators are significant between 90 and 99% confidence level (Table 3.52).

Table 3.51: Single-factor Productivity Values by Classification of Mills

		Sales per employee (RM)	Sales per ringgit of fixed assets (RM)	Fixed assets per employee (RM)	Labour cost per employee (RM)	Sales value per labour cost (RM)
Micro-enterprises	Minimum	900.00	0.02	1,250.00	400.00	0.75
	Maximum	311,000.00	28.57	500,000.00	2,500.00	162.13
	Mean	26,559.29	3.17	36,653.91	1,286.03	19.02
	Minimum	450.00	0.01	100.00	277.78	0.64
	Maximum	108,000.00	60.71	500,000.00	4,120.00	50.00
	Mean	13,167.17	2.52	31,906.08	1,173.40	11.65
Small enterprises	Minimum	450.00	0.01	100	277.78	0.64
	Maximum	1,271,666.67	134.57	476190.48	4,120.00	918.67
	Mean	57,562.1396	4.9357	38024.33	1,134.70	53.89
	Minimum	3,205.13	0.09	812.50	368.16	3.34
	Maximum	778400.00	95.71	476,190.48	3275.00	548.17
	Mean	65,415.71	4.54	44,579.26	1077.77	63.79
Medium enterprises	Minimum	1,636.36	0.05	1,694.92	368.16	1.86
	Maximum	3,023,529.41	236.03	312,500.00	1746.43	3,767.12
	Mean	180,000.01	8.1900	44,119.11	953.55	206.26
	Minimum	30,043.42	0.54	206.98	368.37	40.63
	Maximum	1,271,666.67	269.66	266,904.71	1,716.67	918.67
	Mean	205,884.85	20.71	49,403.36	975.22	201.79
Large enterprises	Minimum	3,205.13	0.10	206.98	368.37	3.34
	Maximum	576,704.96	702.49	407,174.89	2,257.58	913.79
	Mean	128,709.06	21.82	46,505.88	981.44	149.63
	Minimum	67,592.59	0.91	304.64	526.49	38.03
	Maximum	3,023,529.41	702.49	407,174.89	2,257.58	3767.12
	Mean	413,784.85	36.63	59,063.65	1,027.09	479.07
Overall	Minimum	450.00	0.01	100	277.78	0.64
	Maximum	3,023,529.41	702.49	500,000.00	4120	3,767.12
	Mean	82,643.99	7.7447	40,078.86	1,111.93	86.99
	Total workforce (based on SMIDEC classification)					
	Annual sales turnover (based on SMIDEC classification)					

Source: Actual survey, 2007

Table 3.52: Analysis of Variance (ANOVA) for Single-factor Productivity by Classification of Mills

		Sum of squares	df	Mean square	F	Sig.
Sales per employee (RM)	Between groups	1,063,018,921,094.68	3	354,339,640,364.89	5.903	0.001***
	Within groups	22,091,115,292,441.75	368	60,030,204,599.03		
	Total	23,154,134,213,536.43	371			
	Between groups	5,084,920,539,015.96	3	1,694,973,513,005.32	34.520	0.000***
	Within groups	18,069,213,674,520.47	368	49,101,124,115.54		
	Total	23,154,134,213,536.43	371			
Sales per ringgit of fixed assets (RM)	Between groups	14,494.90	3	4,831.63	2.761	0.042**
	Within groups	643,913.55	368	1,749.77		
	Total	658,408.44	371			
	Between groups	39,509.80	3	13,169.93	7.831	0.000***
	Within groups	618,898.64	368	1,681.79		
	Total	658,408.44	371			
Fixed assets per employee (RM)	Between groups	5,049,773,663.85	3	1,683,257,887.95	0.435	0.728
	Within groups	1,425,446,792,416.77	368	3,873,496,718.52		
	Total	1,430,496,566,080.62	371			
	Between groups	29,504,561,097.93	3	9,834,853,699.31	2.583	0.053*
	Within groups	1,400,992,004,982.69	368	3,807,043,491.80		
	Total	1430496566080.62	371			
Labour cost per employee (RM)	Between groups	4,967,381.51	3	1,655,793.84	7.164	0.000***
	Within groups	85,060,151.08	368	231,141.72		
	Total	90,027,532.59	371			
	Between groups	1,622,728.94	3	540,909.65	2.252	.082*
	Within groups	88,404,803.66	368	240,230.45		
	Total	90,027,532.60	371			
Sales value per labour cost (RM)	Between groups	1,656,851.55	3	552,283.85	6.807	.000***
	Within groups	2,985,6919.20	368	81,132.93		
	Total	31,513,770.75	371			
	Between groups	6,710,300.65	3	2,236,766.88	33.186	.000***
	Within groups	24,803,470.10	368	67,400.73		
	Total	31,513,770.75	371			
	Total workforce (based on SMIDEC classification)					
	Annual sales turnover (based on SMIDEC classification)					

Note: * significant at 0.1
 ** significant at 0.05
 *** significant at 0.01

Source: Actual survey, 2007

Single-factor Productivity Values by Main Type of Furniture

Table 3.53 shows the single-factor productivity values by main type of furniture produced. The manufacturer producing furniture for boats & yachts is more productive in generating sales per employee and has the highest sales value per labour cost compared with other wooden furniture mills. Mills producing dining tables & chairs, living room furniture and wooden baby furniture are more productive in another three single-factor productivity indicators. On the other hand, wooden kitchen furniture mills as well as doors & door frames mills are among less productive mills with all single-factor productivity values less than the overall mean value. Overall, there are significant differences in four-single factor productivity indicators based on type of furniture produced with 95 to 99% confidence level. Only one indicator that is not significant is sales per ringgit of fixed assets. It indicates that sales generated by mills' investment are not influenced by the type of furniture produced (Table 3.54).

Single-factor Productivity by State

For single-factor productivity by state, we can see the trend whereby mills in Malacca, Selangor, Pahang and Johore are more productive than mills in the other states, especially Kelantan and Sarawak. However, labour cost per employee in Sabah, Kelantan and Terengganu is much lower compared with Selangor, Perak and Penang which have the highest labour costs. This is because the standard of living in Selangor, Perak and Penang is higher than in the other states, especially for industrial areas (Table 3.55). It is proven by analysis of variance (ANOVA) conducted at 99% confidence level: there is significant difference between states in mean labour cost per employee (Table 3.56).

Table 3.53: Single-factor Productivity Values by Main Type of Furniture Produced

		Sales per employee (RM)	Sales per ringgit of fixed assets (RM)	Fixed assets per employee (RM)	Labour cost per employee (RM)	Sales value per labour cost (RM)
Dining tables & chairs	Minimum	7,083.09	0.06	304.64	569.97	7.10
	Maximum	1,071,875.00	702.49	250,000.00	2,257.58	933.94
	Mean	169,953.34	25.70	55,437.43	1,070.08	190.02
Living room furniture	Minimum	4,615.81	0.07	812.50	706.29	5.25
	Maximum	369,506.73	61.54	407,174.89	1,796.88	320.00
	Mean	65,968.88	7.58	99,373.39	1,029.43	59.47
Occasional furniture	Minimum	2,138.89	0.17	2,428.57	495.83	2.75
	Maximum	2,796,610.17	82.50	95,000.00	1,716.67	3,767.12
	Mean	352,135.34	9.25	37,121.52	987.17	390.27
Outdoor furniture	Minimum	2,156.25	0.10	8,097.17	368.16	2.94
	Maximum	119,984.38	10.00	85,714.29	1,015.62	206.36
	Mean	56,040.17	2.52	33,715.60	748.80	77.98
Upholstered furniture with wooden frames	Minimum	4,783.33	0.09	5,882.35	727.68	4.53
	Maximum	322,877.70	35.00	61,607.14	1,423.12	269.23
	Mean	95,646.20	6.66	32,592.23	927.02	97.01
Wooden office furniture	Minimum	10,625.00	0.18	8,998.83	568.53	14.66
	Maximum	320,000.00	12.53	347,826.09	1,920.00	206.53
	Mean	84,319.07	2.46	66,623.33	1,037.77	75.09
Wooden kitchen furniture	Minimum	600.00	0.02	100.00	277.78	0.73
	Maximum	315,789.47	134.57	200,000.00	4,120.00	521.83
	Mean	25,171.50	4.76	24,187.48	1,356.91	25.12
Wooden bedroom furniture	Minimum	900.00	0.02	700.00	451.35	0.75
	Maximum	3,023,529.41	236.03	500,000.00	2,500.00	3,433.53
	Mean	109,512.39	7.38	33,444.18	1,110.41	112.84
Wooden baby furniture	Minimum	54,878.05	1.96	3,811.49	644.35	79.24
	Maximum	74,114.94	19.45	28,048.78	692.56	115.02
	Mean	64,496.50	10.70	15,930.14	668.46	97.13
Custom-made furniture	Minimum	3,533.33	0.50	6,666.67	766.67	4.61
	Maximum	241,600.00	4.17	58,000.00	1,500.00	211.93
	Mean	55,433.04	1.38	28,191.32	1,017.80	51.15
Other products	Minimum	1,511.11	0.04	206.98	368.37	1.01
	Maximum	413,095.24	269.66	476,190.48	1,855.17	519.46
	Mean	80,898.94	14.75	70,637.57	1,035.13	91.29
Furniture for boats & yachts	Minimum					
	Maximum					
	Mean	427,672.96	7.15	59,784.58	1,393.57	954.00
Parts & components ¹	Minimum	2,557.38	0.08	1,736.04	596.32	1.86
	Maximum	740,069.05	95.71	266,904.71	1,793.85	597.75
	Mean	97,723.34	8.99	55,958.94	1,012.36	96.92
Doors & door frames ²	Minimum	450.00	0.01	122.36	400.00	0.64
	Maximum	596,610.17	60.71	250,000.00	3,275.00	550.00
	Mean	28,894.30	3.17	32,589.11	1,124.87	26.88

Note: ¹ including ready-to-assemble (RTA) furniture

² including doors for cupboards, cabinets, etc

Source: Actual survey, 2007

Table 3.54: Analysis of Variance (ANOVA) for Single-factor Productivity by Main Type of Furniture Produced

		Sum of squares	df	Mean square	F	Sig.
Sales per employee (RM)	Between groups	2,033,337,280,479.128	13	156,410,560,036.856	2.651	.001***
	Within groups	21,120,796,933,057.310	358	58,996,639,477.814		
	Total	23,154,134,213,536.438	371			
Sales per ringgit of fixed assets (RM)	Between groups	16,090.261	13	1237.712	.690	.773
	Within groups	642,318.178	358	1794.185		
	Total	658,408.440	371			
Fixed assets per employee (RM)	Between groups	104,360,045,557.823	13	8,027,695,812.140	2.167	.011**
	Within groups	1,326,136,520,522.795	358	3,704,291,956.768		
	Total	1,430,496,566,080.619	371			
Labour cost per employee (RM)	Between groups	7,633,075.099	13	587,159.623	2.551	.002***
	Within groups	82,394,457.495	358	230,152.116		
	Total	90,027,532.594	371			
Sales value per labour cost (RM)	Between groups	2,452,110.211	13	188,623.862	2.324	.006***
	Within groups	29,061,660.535	358	81,177.823		
	Total	31,513,770.745	371			

Note: * significant at 0.1
 ** significant at 0.05
 *** significant at 0.01

Source: Actual survey, 2007

Table 3.55: Single-factor Productivity Values by State

		Sales per employee (RM)	Sales per ringgit of fixed assets (RM)	Fixed assets per employee (RM)	Labour cost per employee (RM)	Sales value per labour cost (RM)
Johore	Minimum	4,615.81	0.17	206.98	368.37	3.88
	Maximum	1,271,666.67	269.66	476,190.48	3,275.00	740.78
	Mean	148,286.49	14.29	36,905.75	1,077.31	144.34
Kedah	Minimum	592.00	0.02	100.00	277.78	0.64
	Maximum	1,071,875.00	27.60	500,000.00	2,683.33	933.94
	Mean	50,371.40	2.87	35,615.90	1,066.77	50.16
Kelantan	Minimum	600.00	0.02	3,000.00	494.44	0.76
	Maximum	73,238.64	5.33	100,000.00	1,933.33	88.14
	Mean	12,370.77	1.15	23,136.04	926.35	15.62
Malacca	Minimum	6,617.65	0.22	12,810.05	602.93	4.47
	Maximum	3,023,529.41	236.03	407,174.89	2,103.33	3,433.53
	Mean	334,159.40	15.85	93,328.08	1,081.30	387.90
Negeri Sembilan	Minimum	8,956.40	0.37	14,285.71	500.00	6.97
	Maximum	181,556.85	4.50	63,775.51	1,777.06	282.92
	Mean	66,336.47	1.78	34,501.87	944.12	84.33
Pahang	Minimum	2,173.91	0.06	2,153.85	596.32	1.26
	Maximum	2,796,610.17	134.57	166,906.80	1,730.43	3,767.12
	Mean	235,142.15	18.36	30,799.00	981.37	285.83
Penang	Minimum	1,636.36	0.05	34,433.42	781.69	2.09
	Maximum	255,970.15	6.24	60,089.13	2,145.90	119.28
	Mean	91,985.05	2.20	45,189.11	1,291.94	46.91
Perak	Minimum	1,520.00	0.01	122.36	536.00	0.92
	Maximum	810,588.24	60.71	347,826.09	2,500.00	918.67
	Mean	45,525.02	4.66	36,482.23	1,288.99	38.94
Selangor	Minimum	7,083.09	0.55	304.64	392.39	7.36
	Maximum	740,069.05	702.49	266,904.71	2,257.58	597.75
	Mean	169,656.62	43.82	48,437.08	1,140.00	170.40
Terengganu	Minimum	3,205.13	0.10	6,705.82	649.49	3.34
	Maximum	72,550.00	3.42	206,896.55	1,566.67	73.93
	Mean	25,175.44	1.17	43,096.36	926.60	29.06
Sabah	Minimum	14,785.71	0.17	11,594.20	368.16	18.56
	Maximum	116,666.67	2.27	85,714.29	910.00	128.21
	Mean	44,948.56	1.16	47,704.10	642.42	66.83
Sarawak	Minimum	450.00	0.01	1,111.11	566.67	0.68
	Maximum	89,741.38	7.00	203,950.00	4,120.00	128.62
	Mean	17,327.28	0.91	40,837.64	1,104.44	18.46

Source: Actual survey, 2007

Table 3.56: Analysis of Variance (ANOVA) for Single-factor Productivity by State

		Sum of squares	df	Mean square	F	Sig.
Sales per employee (RM)	Between groups	2643986804090.568	11	240362436735.506	4.219	0.000***
	Within groups	20510147409445.863	360	56972631692.905		
	Total	23154134213536.430	371			
Sales per ringgit of fixed assets (RM)	Between groups	37932.755	11	3448.432	2.001	0.027**
	Within groups	620475.685	360	1723.544		
	Total	658408.440	371			
Fixed assets per employee (RM)	Between groups	63488878735.085	11	5771716248.644	1.520	0.122
	Within groups	1367007687345.534	360	3797243575.960		
	Total	1430496566080.619	371			
Labour cost per employee (RM)	Between groups	6508746.194	11	591704.199	2.550	0.004***
	Within groups	83518786.400	360	231996.629		
	Total	90027532.594	371			
Sales value per labour cost (RM)	Between groups	3571986.643	11	324726.058	4.184	0.000***
	Within groups	27941784.103	360	77616.067		
	Total	31513770.745	371			

Note: * significant at 0.1
 ** significant at 0.05
 *** significant at 0.01

Source: Actual survey, 2007

Value-added Productivity

The second measurement for partial productivity is value-added productivity. Value added refers to the additional value created at a particular stage of production or through image and marketing. In modern neoclassical economics, especially in macroeconomics, it refers to the contribution of the factors of production, ie land, labour and capital goods, to raising the value of a product and corresponds to the income received by the owners of these factors (MPC 2008).

Value-added Productivity by Classification of Mills

This report will look at four indicators of value-added productivity, namely value added per employee, value added per ringgit of fixed assets, value-added-to-sales ratio, and value added per ringgit of labour cost. Table 3.57 shows value-added productivity by classification of manufacturer. Based on total workforce and annual sales turnover, medium enterprises are more productive in terms of value added per employee. In other words, medium enterprises use their labour

productively to generate value added. At the same time, micro-enterprises have the lowest value for this indicator. However, for value added per ringgit of fixed assets, large enterprises are the most productive in using their capital to generate value added compared with medium, small and micro-enterprises for both classifications. On the other hand, value-added-to-sales ratio for large enterprises has the lowest percentage value. For value added per ringgit of labour cost, large and medium enterprises have mean values more than the mean of all wooden furniture manufacturers regardless of the size of mills. It indicates that micro- and small enterprises have higher labour costs. Overall, we can see that medium enterprises are more productive in terms of value-added productivity indicators. Analysis of variance (ANOVA) shows that there are significant differences in mean value-added productivity between classifications of manufacturers except for value-added-to-sales ratio by total workforce (Table 3.58).

Table 3.57: Value-added Productivity Values by Classification of Mills

		Value added per employee (RM)	Value added per ringgit of fixed assets (RM)	Value-added- to-sales ratio (%)	Value added per ringgit of labour cost (RM)
Micro- enterprises	Minimum	0.00	0.00	0.00	0.00
	Maximum	41,270.00	5.57	0.50	16.51
	Mean	4,530.17	0.56	0.19	3.57
	Minimum	0.00	0.00	0.00	0.00
	Maximum	14,400.00	14.13	0.62	14.43
	Mean	2,645.39	0.48	0.19	2.43
Small enterprises	Minimum	0.00	0.00	0.00	0.00
	Maximum	528,814.05	22.43	0.71	427.12
	Mean	15,580.81	0.91	0.21	14.48
	Minimum	0.00	0.00	0.00	0.00
	Maximum	160,000.00	7.90	0.65	153.60
	Mean	13,923.84	0.77	0.21	14.26
Medium enterprises	Minimum	25.98	0.00	0.00	0.03
	Maximum	364,112.56	28.42	0.63	413.49
	Mean	25,090.73	1.10	0.20	29.34
	Minimum	0.00	0.00	0.00	0.00
	Maximum	528,814.05	37.63	0.71	427.12
	Mean	59,983.27	4.09	0.23	56.35
Large enterprises	Minimum	0.00	0.00	0.00	0.00
	Maximum	72,310.51	142.74	0.68	126.87
	Mean	20,060.69	4.21	0.17	23.40
	Minimum	567.82	0.07	0.01	0.88
	Maximum	364,112.56	142.74	0.54	413.49
	Mean	53,097.21	6.17	0.15	61.73
Overall	Minimum	0.00	0.00	0.00	0.00
	Maximum	528,814.05	142.74	0.71	427.12
	Mean	15576.91	1.3838	0.20	16.09
Total workforce (based on SMIDEC classification)					
Annual sales turnover (based on SMIDEC classification)					

Source: Actual survey, 2007

Table 3.58: Analysis of Variance (ANOVA) for Value-added Productivity by Classification of Mills

		Sum of squares	df	Mean square	F	Sig.
Value added per employee (RM)	Between groups	16,174,188,667.009	3	5,391,396,222.336	2.530	0.057*
	Within groups	784,113,961,076.144	368	2,130,744,459.446		
	Total	800,288,149,743.153	371			
	Between groups	135,831,958,332.313	3	45,277,319,444.104	25.076	0.000***
	Within groups	664,456,191,410.840	368	1,805,587,476.660		
	Total	800,288,149,743.153	371			
Value added per ringgit of fixed assets (RM)	Between groups	559.887	3	186.629	2.940	.033**
	Within groups	23,363.517	368	63.488		
	Total	23,923.404	371			
	Between groups	1,184.192	3	394.731	6.388	.000***
	Within groups	22,739.213	368	61.791		
	Total	23,923.404	371			
Value-added-to-sales ratio (%)	Between groups	.091	3	.030	1.725	0.162
	Within groups	6.438	368	.017		
	Total	6.528	371			
	Between groups	.140	3	.047	2.681	0.047**
	Within groups	6.389	368	.017		
	Total	6.528	371			
Value added per ringgit of labour cost (RM)	Between groups	26,503.387	3	8,834.462	4.241	0.006***
	Within groups	766,501.546	368	2,082.885		
	Total	793,004.933	371			
	Between groups	152,210.034	3	50,736.678	29.137	0.000***
	Within groups	640,794.899	368	1,741.290		
	Total	793,004.933	371			

Total workforce (based on SMIDEC classification)

Annual sales turnover (based on SMIDEC classification)

Note: * significant at 0.1
 ** significant at 0.05
 *** significant at 0.01

Source: Actual survey, 2007

Value-added Productivity by Type of Furniture

Value-added productivity by type of furniture produced is shown in Table 3.59. The study shows that those mills which produce occasional furniture, dining tables & chairs, and parts & components are more productive in all value-added productivity with mean values more than the average value of all mills. On the other hand, those which produce doors & door frames, wooden baby furniture and living room furniture are among the mills which are less productive in generating value added by using their workforce and investments. However, analysis of variance (ANOVA) conducted shows that only two indicators are statistically significantly different between types of furniture produced, ie value added per employee and value added per ringgit of labour cost (Table 3.60).

Value-added Productivity by State

To look at how productively labour is used to generate value added at state level, Malacca, Selangor, Johore and Pahang show higher performance levels compared with other states. Wooden furniture mills located in Malacca are able to generate RM51,945.68 per employee and the average value for all mills is RM15,576.91 per employee. However, mills in Kelantan and Sarawak generate only RM2,351.88 and RM4,616.83 of value added per employee respectively. It shows that there is a big gap between the top and the lowest four states. From a policy perspective, value-added-based-labour productivity is important as a reference statistic in wage bargaining because it shows the productivity level of employees in generating value added. Similar trends are shown in value added per ringgit of fixed assets and value added per ringgit of labour cost where mills in Selangor, Johore, Pahang and Malacca are still among the top four state performers and have labour-cost competitiveness, while mills in Kelantan and Sarawak have shown good achievement in value-added productivity (Table 3.61). Analysis of variance (ANOVA) shows that there are significant differences between states in value-added productivity indicators except for value-added-to-sales ratio (Table 3.62). The performance of wooden furniture mills in value-added productivity can be improved through efficient utilization of resources.

Table 3.59: Value-added Productivity Values by Main Type of Furniture Produced

		Value added per employee (RM)	Value added per ringgit of fixed assets (RM)	Value-added- to-sales ratio (%)	Value added per ringgit of labour cost (RM)
Dining tables & chairs	Minimum	672.29	0.01	0.02	0.75
	Maximum	146,666.67	142.74	0.68	177.98
	Mean	28,855.82	5.88	0.20	34.29
Living room furniture	Minimum	0.00	0.00	0.00	0.00
	Maximum	29,560.54	3.62	0.34	25.60
	Mean	8,826.76	0.55	0.18	8.52
Occasional furniture	Minimum	106.06	0.02	0.03	0.20
	Maximum	344,705.88	7.70	0.58	390.67
	Mean	68,679.32	1.65	0.24	69.54
Outdoor furniture	Minimum	323.44	0.02	0.06	0.44
	Maximum	29,734.38	2.12	0.38	48.23
	Mean	12,474.70	0.59	0.21	17.35
Upholstered furniture with wooden frames	Minimum	675.44	0.02	0.04	0.69
	Maximum	33,382.35	5.68	0.30	43.65
	Mean	11,222.85	0.98	0.15	12.11
Wooden office furniture	Minimum	1,458.33	0.04	0.10	1.73
	Maximum	160,000.00	3.13	0.60	83.33
	Mean	25,741.76	0.65	0.28	20.50
Wooden kitchen furniture	Minimum	0.00	0.00	0.00	0.00
	Maximum	52,631.58	22.43	0.50	86.97
	Mean	5,328.96	0.81	0.19	5.39
Wooden bedroom furniture	Minimum	0.00	0.00	0.00	0.00
	Maximum	364,112.56	28.42	0.63	413.49
	Mean	14,310.26	1.05	0.19	14.75
Wooden baby furniture	Minimum	567.82	0.15	0.01	0.88
	Maximum	12,195.12	0.43	0.22	17.61
	Mean	6,381.47	0.29	0.11	9.25
Custom- made furniture	Minimum	533.33	0.08	0.15	0.70
	Maximum	75,200.00	1.30	0.50	65.96
	Mean	16,323.99	0.38	0.27	15.01
Other products	Minimum	0.08	0.00	0.00	0.00
	Maximum	96,000.00	24.51	0.55	153.60
	Mean	15,339.36	1.63	0.15	18.25
Furniture for boats & yachts	Minimum	na*	na*	na*	na*
	Maximum	na*	na*	na*	na*
	Mean	64,150.94	1.07	0.15	46.03
Parts & components ¹	Minimum	1000.00	0.01	0.01	0.84
	Maximum	528,814.05	7.90	0.71	427.12
	Mean	37,180.90	1.67	0.24	32.41
Doors & door frames ²	Minimum	0.00	0.00	0.00	0.00
	Maximum	54,237.29	14.13	0.65	57.06
	Mean	4,828.13	0.59	0.20	4.83

Note: ¹including ready-to-assemble (RTA) furniture

²including doors for cupboards, cabinets, etc

*na = not available

Source: Actual survey, 2007

Table 3.60: Analysis of Variance (ANOVA) for Value-added Productivity by Main Type of Furniture Produced

		Sum of squares	df	Mean square	F	Sig.
Value added per employee (RM)	Between groups	81,089,715,063.818	13	6,237,670,389.524	3.105	0.000***
	Within groups	719,198,434,679.336	358	2,008,934,175.082		
	Total	800,288,149,743.153	371			
Value added per ringgit of fixed assets(RM)	Between groups	832.038	13	64.003	.992	0.458
	Within groups	23,091.366	358	64.501		
	Total	23,923.404	371			
Value-added-to-sales ratio (%)	Between groups	.285	13	.022	1.256	0.238
	Within groups	6.244	358	.017		
	Total	6.528	371			
Value added per ringgit of labour cost (RM)	Between groups	81,785.910	13	6,291.224	3.167	0.000***
	Within groups	711,219.023	358	1,986.645		
	Total	793004.933	371			

Note: * significant at 0.1
 ** significant at 0.05
 *** significant at 0.01

Source: Actual survey, 2007

Table 3.61: Value-added Productivity Values by State

		Value added per employee (RM)	Value added per ringgit of fixed assets (RM)	Value-added- to-sales ratio (%)	Value added per ringgit of labour cost (RM)
Johore	Minimum	0.08	0.00	0.00	0.00
	Maximum	338,333.33	37.63	0.68	197.09
	Mean	28,016.15	2.57	0.18	26.58
Kedah	Minimum	0.00	0.00	0.00	0.00
	Maximum	104,687.50	4.32	0.65	153.60
	Mean	9,270.05	0.59	0.21	9.90
Kelantan	Minimum	75.56	0.00	0.04	0.11
	Maximum	11,610.06	1.33	0.53	18.15
	Mean	2,351.88	0.21	0.17	3.13
Malacca	Minimum	1,005.88	0.01	0.01	0.56
	Maximum	364,112.56	28.42	0.63	413.49
	Mean	51,945.68	2.02	0.21	55.66
Negeri Sembilan	Minimum	911.60	0.04	0.06	1.11
	Maximum	42,782.65	1.38	0.54	48.85
	Mean	15,625.50	0.42	0.21	18.70
Pahang	Minimum	567.82	0.02	0.01	0.36
	Maximum	254,237.29	22.43	0.50	342.47
	Mean	26,600.69	2.17	0.20	33.20
Penang	Minimum	272.73	0.01	0.10	0.35
	Maximum	25,000.00	0.61	0.17	11.65
	Mean	9,035.86	0.22	0.12	4.64
Perak	Minimum	95.00	0.00	0.02	0.06
	Maximum	344,705.88	14.13	0.62	390.67
	Mean	9,872.47	0.85	0.18	9.17
Selangor	Minimum	672.29	0.05	0.03	0.75
	Maximum	528,814.05	142.74	0.71	427.12
	Mean	51,173.00	9.19	0.22	49.19
Terengganu	Minimum	330.00	0.02	0.03	0.27
	Maximum	18,730.00	1.12	0.44	24.97
	Mean	5,408.92	0.29	0.21	6.62
Sabah	Minimum	1,818.18	0.02	0.09	2.42
	Maximum	17,757.01	0.66	0.30	24.52
	Mean	8,371.23	0.24	0.19	12.45
Sarawak	Minimum	80.00	0.00	0.03	0.12
	Maximum	35,583.33	2.04	0.60	53.64
	Mean	4,616.83	0.24	0.23	5.30

Source: Actual survey, 2007

Table 3.62: Analysis of Variance (ANOVA) for Value-added Productivity by State

		Sum of squares	df	Mean square	F	Sig.
Value added per employee (RM)	Between groups	76872787055.292	11	6988435186.845	3.478	0.000***
	Within groups	723415362687.862	360	2009487118.577		
	Total	800288149743.153	371			
Value added per ringgit of fixed assets (RM)	Between groups	1460.088	11	132.735	2.127	0.018**
	Within groups	22463.317	360	62.398		
	Total	23923.404	371			
Value-added-to-sales ratio (%)	Between groups	0.204	11	0.019	1.058	0.395
	Within groups	6.324	360	0.018		
	Total	6.528	371			
Value added per ringgit of labour cost (RM)	Between groups	80599.860	11	7327.260	3.703	0.000***
	Within groups	712405.073	360	1978.903		
	Total	793004.933	371			

Note: * significant at 0.1
 ** significant at 0.05
 *** significant at 0.01

Source: Actual survey, 2007

Since the productivity is the relationship between at least two variables, which are output and input, for wooden furniture mills to increase productivity, they need to increase the output if the input is constant. But if the output is maintained or has achieved maximum level of production, the mills need to find a solution to utilize less input. On the other hand, if both output and input increase, the mills have to make sure that rate of increase in output is higher than the rate of increase in input as suggested by Mohd Sahar (2002). Another approach can be used to improve the productivity of the manufacturers as follows:

- improvement through research and development (long term);
- improvement through providing new plant, equipment and machinery (long term);
- product simplification (medium term);
- improvement of existing methods and procedures (short term);
- improvement in planning of work and the use of manpower (short term);
- increased effectiveness of employees (short term).

Cost of Production

Cost of Production for Selected Products

Table 3.63 shows the mean percentages of cost of production for ten selected products. From the table we can see clearly that most of the production cost goes to raw material cost which accounted on average for about 52.3% of the cost for all wooden furniture mills. Mills producing dining tables & chairs have the highest proportion of raw material cost at 59.5% compared with those producing wooden bedroom and doors & door frames at only 48.7%. Hence, the mills have to find a way to reduce their raw material cost to remain competitive.

In terms of labour cost, mills of upholstered furniture with wooden frames are more labour intensive at 21.2% of the production cost and more than the average cost of all mills regardless of the type of furniture produced. Mills producing doors & door frames also have high labour cost, which is 18.4% of the production cost, while those producing living room furniture have the lowest labour cost, followed by those producing wooden office furniture at only 10.3 and 11.3% respectively. However, for operational cost including power, water, fuel and lubricants, upholstered furniture mills have the lowest proportion of cost but, on the other hand, living room furniture mills have the highest cost. In other words, we can say that mills which are more labour intensive have lower operational costs while capital-intensive mills take up more operational costs.

Mills which produce doors & door frames and kitchen furniture spent less on marketing cost compared with outdoor furniture mills. It is because 75% of outdoor furniture mills produce their furniture totally for the export market, while 90.3% of doors & door frames mills produce 100% for the local market. This indicates that marketing plays an important role in exploring and gaining a place in the international market. Hence, wooden furniture mills need to spend more on the marketing aspect to further enhance their competitive advantage in the global market.

Wooden kitchen furniture mills are able to generate the highest manufacturing profit margin at 14.7% compared with parts & components mills at only 6.8%. On average, the manufacturing profit margin for wooden furniture mills is about 11.2%. For comparison, Tachibana (2000) reported that the average production cost for mobile sawmills accounted for 81% of the average price with net earning at 19%, while the cost of raw materials amounted to 56% and labour cost to 6.8% for plywood mills.

Cost of Production by Classification of Mills

The mean percentages of cost of production by classification of mills are shown clearly in Table 3.64. Overall, the findings show that there is not much difference between the mean percentages of cost of production based either on total workforce or annual sales turnover and the trends in both classifications are also quite similar. The results show that the manufacturing profit margin for micro-enterprises is the highest among the enterprises. Large enterprises might have low manufacturing profit margin but they are able to produce in mass and generate a higher value of sales compared with micro-enterprises which produce on small scale but must have high profit margin to generate revenue. However, based on personal communication with Mr Benny L.B. Poh, Managing Director of SJI Industries Sdn Bhd, the percentages of profit margin as reported are quite low and the industry might have difficulties with these figures. Probably the respondents did not reveal the actual figures for personal reasons. However, a quick study done by Rohana et al. (2008) reported mean net profit margins for main and second board furniture companies at 4 and -8% in 2006 respectively, while Gardino (2004) reported that public-listed furniture companies for the financial year 2002/03 generated returns on earnings of 0.5 to 17.5%.

Table 3.63: Mean Percentages of Cost of Production for Selected Products (%)

	Dining tables & chairs	Living room furniture	Occasional furniture	Outdoor furniture	Upholstered furniture with wooden frames	Wooden office furniture	Wooden kitchen furniture	Wooden bedroom furniture	Parts & components	Doors & door frames	Mean overall
1. Raw material:											
(i) Round logs	2.8	0.0	0.0	11.1	0.0	0.0	0.0	0.0	4.4	2.0	1.8
(ii) Sawn timber	41.4	21.3	26.7	35.5	11.8	0.0	16.0	23.3	44.6	35.8	27.2
(iii) Veneer	3.4	1.7	0.0	0.0	1.2	4.8	1.8	2.2	3.9	0.4	1.7
(iv) Plywood	3.3	8.9	8.9	0.0	8.2	4.7	22.1	15.4	0.7	7.5	6.9
(v) Laminated boards	3.9	14.2	12.3	0.0	1.2	45.3	10.3	4.1	0.4	1.2	9.2
(vi) Finishing material	4.7	8.7	4.9	3.2	30.6	0.2	1.0	3.7	4.7	1.8	5.4
<i>Subtotal</i>	59.5	54.7	52.7	49.9	53.0	55.0	51.2	48.7	58.7	48.7	52.3
2. Labour cost (wages)	13.1	10.3	12.1	12.3	21.2	11.3	17.6	16.5	16.9	18.4	17.1
3. Operational cost:											
(i) Power	3	3.3	3.6	2.1	3.5	6.0	3.8	3.8	3.2	4.9	3.7
(ii) Water	1.7	2.0	0.9	0.6	1.6	0.9	1.5	1.8	1.4	1.6	1.3
(iii) Fuel, lubricants	1.9	1.6	1.8	1.8	0.5	0.7	2.0	1.6	1.8	2.7	1.5
(iv) Others	0.6	3.8	2.1	2.3	0.0	0.4	0.3	1.2	0.0	0.1	0.8
<i>Subtotal</i>	7.2	10.6	8.4	6.7	5.7	8.0	7.5	8.3	6.4	9.4	7.3
4. Marketing cost											
(i) Packing material	3.8	4.2	2.6	3.6	5.1	3.6	2.2	2.9	3.2	1.7	3.2
(ii) Packing cost (wage)	1.9	2.2	2.3	3.0	2.5	1.8	1.4	1.5	1.5	1.0	1.6
(iii) Others	0.3	0.6	2.1	5.8	0.0	2.0	0.8	2.3	0.8	1.5	1.5
<i>Subtotal</i>	6.1	7.1	7.0	12.4	7.6	7.4	4.3	6.7	5.5	4.2	6.3
5. Mill overheads	5.6	5.9	6.5	8.4	4.4	7.6	4.6	6.6	5.7	5.8	5.8
6. Manufacturing profit	8.5	11.5	13.3	10.3	8.2	10.7	14.7	13.2	6.8	13.4	11.2
Total:	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.00

Source: Actual survey, 2

Table 3.64: Mean Percentages of Cost of Production by Classification of Mills

	Micro-enterprises		Small enterprises		Medium enterprises		Large enterprises	
1. Raw material:								
(i) Round logs	0	1.0	0.8	2.7	4.3	2.1	2.1	0.8
(ii) Sawn timber	30.0	29.0	30.2	29.0	28.9	29.5	26.8	29.4
(iii) Veneer	0.7	0.6	1.0	1.3	2.1	2.4	3.3	5.1
(iv) Plywood	17.6	16.6	12.4	6.1	6.1	2.1	3.1	6.2
(v) Laminated boards	1.3	1.4	3.9	7.2	8.0	15.9	12.9	10.5
(vi) Finishing material	1.1	1.2	1.9	4.5	4.2	3.0	8.1	8.2
<i>Subtotal</i>	50.7	49.7	50.2	50.8	53.6	55.1	56.4	60.2
2. Labour cost (wages)	15.8	17.8	16.8	15.6	16.2	16.5	14.8	12.8
3. Operational cost:								
(i) Power	3.6	4.0	4.5	4.6	4.2	2.8	2.7	2.8
(ii) Water	1.6	1.7	1.8	1.8	1.4	1.0	1.0	0.8
(iii) Fuel, lubricants	1.0	2.2	2.6	2.2	1.9	1.2	1.0	1.1
(iv) Others	0.0	0.1	0.5	0.7	0.0	2.0	1.7	0.9
<i>Subtotal</i>	6.2	8.0	9.4	9.3	7.5	7.0	6.5	5.6
4. Marketing cost								
(i) Packing material	1.7	1.8	2.1	3.2	3.8	3.4	4.1	4.2
(ii) Packing cost (wage)	1.1	1.0	1.2	1.9	2.0	2.0	2.1	1.8
(iii) Others	1.6	1.0	1.2	2.1	2.7	1.7	1.4	1.1
<i>Subtotal</i>	4.3	3.8	4.5	7.3	8.4	7.1	7.6	7.1
5. Mill overheads	7.0	6.0	5.5	5.6	5.8	6.8	6.8	6.9
6. Manufacturing profit	16.0	14.7	13.6	11.4	8.4	7.6	7.9	7.4
Total:	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total workforce (based on SMIDEC classification)								
Annual sales turnover (based on SMIDEC classification)								

Source: Actual survey, 2007

Conclusion

Conclusion on the wooden furniture industry is based on the survey findings of 381 wooden furniture mills in Malaysia. The findings show that most wooden furniture mills in Malaysia are micro- and small enterprises based on either total workforce or annual sales turnover. Based on total workforce, about 67.7% of the wooden furniture mills in Malaysia are micro- and small enterprises. However, based on annual sales turnover, practically 82% are micro- and small enterprises. Overall as many as 77.7% of the wooden furniture mills in Malaysia are located in Peninsular Malaysia, and mainly in Perak, Sarawak, Johore and Kedah.

We may note that, as many as 143 mills (37.5%) succeeded to be formed during the Industrial Master Plan (IMP) and have been sustained until today. This was in line with the IMP objective to transform the wood-based industry into a major resource-based industry. The IMP was accomplished through the establishment of a large production base. The increasing number of wooden furniture mills established from before 1966 to 1996 reflects the success of the IMP in promoting the government policy of encouraging the growth of resource-based industries.

There are different types of furniture produced by the wooden furniture industry in Malaysia and categorized into 14 types such as dining tables & chairs, living room furniture, wooden kitchen furniture, wooden bedroom furniture, parts & components and doors & door frames. More than 50% of wooden furniture mills in Malaysia produce more than one type of furniture. Out of the 95 mills producing doors & door frames as their main product, 89.5 and 94.8% are from micro- and small enterprises based on total employees and total annual sales turnover respectively and these mills produce 100% for the local market. On the other hand, 57.1% of the mills for dining tables & chairs are large enterprises based on total workforce and 45.7% based on annual sales turnover; 77.1% of dining tables & chairs mills produce for the export market and most of the dining tables & chairs are exported to the US, Japan, the UK, Australia and other markets.

This study found that 56.3% of medium enterprises have export proportion of more 50% based on total workforce, however, based on annual sales turnover, 86.2% of medium enterprises achieved this proportion. As we expected, all micro-enterprises (100%) are local oriented companies. Hence, if wooden furniture mills want to increase their performance and annual sales turnover, they must strive to explore the global market. The survey found that 38 out of 105 export-oriented manufacturers (36.2%) have foreign investment. On the other hand, 96.1% of the mills owned by Bumiputras and 78.3% owned by non-Bumiputras are local-oriented manufacturers. Most of the large enterprises specialize in producing only one type of furniture. In other words, we can say that product specialization strategy is one of the approaches to enhance productivity of the manufacturer to fulfill demand for a specific type of furniture, so the manufacturer would be able to become a large enterprise.

Most of the Malaysian wooden furniture mills (67%) are categorized as original equipment manufacturing (OEM) regardless of their size and relying heavily on

designs supplied by buyers and imported technology. Even though the number of designers is crucial for wooden furniture mills, only 26.2% of the wooden furniture mills in Malaysia have their own in-house designers. Besides, it is important for wooden furniture mills to have their own R&D teams to enhance their capability and product marketability. However, 83.7% of the mills (319 out of 381 mills) do not have an R&D team for their product development. Availability of R&D team is important because of the competitive environment in the furniture industry.

The study also found that the wooden furniture mills in Malaysia are relying on foreign workers where 54.2% of the total workforce are foreign (17,655 workers). Selangor recorded the highest percentage of foreign workers (as many as 75.3%), followed by Malacca (about 73.3%), Negeri Sembilan (62.8%) and Johore (60.2%). This trend is related with the establishment of most of the medium and large enterprises in these states. Indirectly we can conclude that there is a relationship between the size of manufacturer and the proportion of foreign workers. Hence, larger enterprises are more dependent on foreign workers than micro- and small enterprises.

The present study reveals that awareness of the importance of training of workers/employees increases as the enterprise becomes larger. The percentage of large enterprises implementing on-the-job training is higher than the percentages of medium, small and micro-enterprises for both classifications. Additionally, large enterprises spend more on training expenditure compared with micro-, small and medium enterprises. On average, large enterprises spend about RM44,705.08 and RM35,667.78 per year on training based on annual sales turnover and total workforce respectively, while small enterprises spend only RM1,452.83 on average based on annual sales turnover.

In terms of technology, 23.4% of wooden furniture mills can be categorized as fully mechanized/computerized mills, at the second level of technology. However, no single wooden furniture mill in Malaysia can be categorized as integrated computerized manufacturer, at the first level of technology. On the other hand, 292 mills are still at the third and fourth levels of technology with mechanized/partial manual or backyard set-up. To maintain Malaysia's competitive advantage in supplying the furniture, firms should emphasize on quality improvement by improving the level of technology and change from labour intensive to machine intensive. The Ninth Malaysia Plan is also promoting innovation-driven strategies and improved technology to face the increasing competition in the global market.

This report used the concept of partial productivity, the essential element of productivity is measuring labour productivity. Mohd Sahar (2002) also emphasized that labour productivity is an important business strategy in the manufacturing sector. Production processes in manufacturing should be most productive as well as efficient in order to maintain the highest standard of quality. Based on labour coefficient, manufacturer of wooden furniture for boats & yachts, wooden baby furniture, dining tables & chairs, and wooden office furniture are able to utilize their workforce more productively in generating gross output compared with those of wooden kitchen furniture and doors & door frames. Higher labour productivity

would encourage better growth of the industry and it is the essential component of competitiveness. Overall, wooden furniture mills can generate a thousand RM of annual sales turnover by using 0.123 total workforce.

Large and medium enterprises are more productive in terms of labour utilization for both classifications based on total workforce and annual sales turnover. The finding shows that at 99% confidence level there are significant differences between means of labour coefficient by classification of manufacturers. The average total sales per employee for wooden furniture mills is RM82,643.99 and based on annual sales turnover, large and medium enterprises have achieved productivity levels higher than the average level of the industry. That means, large enterprises are able to utilize their labour to generate gross output more productively than micro-enterprises.

The performance of wooden furniture mills in this indicator can be enhanced through continuous investment in machinery and equipment as large enterprises tend to spend more money for investment compared with micro-enterprises. For single-factor productivity by state, we can see the trend where mills in Malacca, Selangor, Pahang and Johore are more productive compared with mills in the other states, especially in Kelantan and Sarawak. However, labour costs per employee in Sabah, Kelantan and Terengganu are much lower than in Selangor, Perak and Penang which have the highest labour costs. This is because the standard of living in Selangor, Perak and Penang is higher than in other states, especially for industrial areas. It is proven by analysis of variance (ANOVA) conducted at 99% confidence level that there is significant difference between states in mean labour cost per employee.

To look at how productively labour is used to generate value added at state level, Malacca, Selangor, Johore and Pahang show the higher performance level compared with the other states. From a policy perspective, value-added-based-labour productivity is important as a reference statistic in wage bargaining because it shows the productivity level of employees in generating value added. The performance of the wooden furniture mills in value-added productivity can be improved through efficient utilization of resources. Since productivity is the relationship between at least two variables, which are output and input, for wooden furniture manufacturers to increase productivity, they need to increase the output if the input is constant. But if the output is maintained or has achieved maximum level of production, the manufacturers need to find a solution to utilize less input. On the other hand, if both output and input increase, the mills have to make sure that rate of increase in output is higher than the rate of increase in input as suggested by Mohd Sahar (2002). Another approach can be used to improve the productivity of the manufacturers as follows:

- improvement through research and development (long term);
- improvement through providing new plant, equipment and machinery (long term);
- product simplification (medium term);
- improvement of existing methods and procedures (short term);

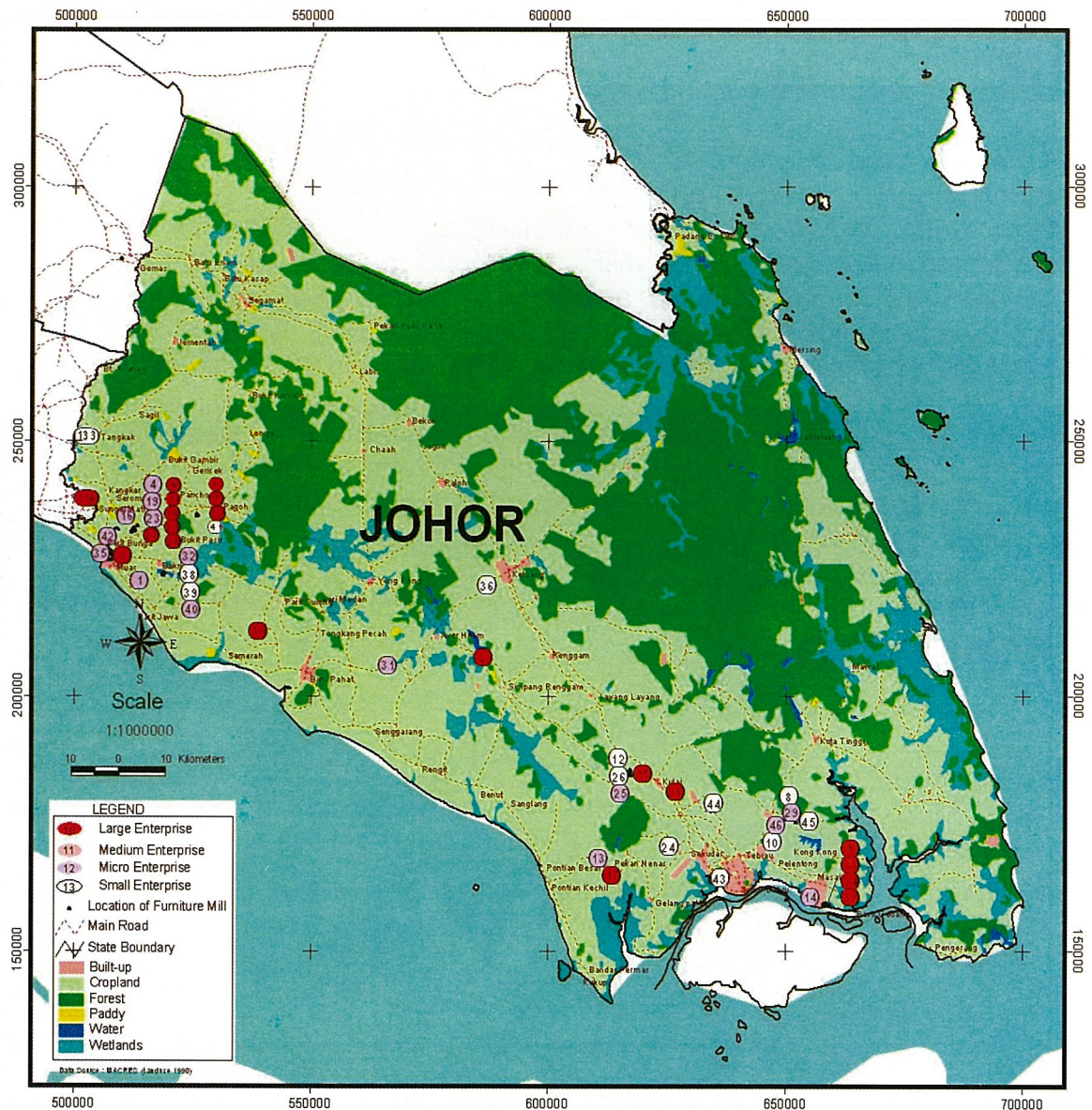
- improvement in planning of work and the use of manpower (short term);
- increased effectiveness of employees (short term).

Another aspect of wooden furniture mills that we looked into is production cost. The findings show that most of the production cost goes to raw material cost which accounted on average for about 52.3% of the cost for all wooden furniture mills. Hence, wooden furniture mills have to find a way to reduce their raw material cost to remain competitive. In terms of labour cost, mills of upholstered furniture with wooden frames are more labour intensive, taking up 21.2% of the production cost.

Mills which produce doors & door frames and kitchen furniture spend less on marketing compared with outdoor furniture mills. It is because 75% of outdoor furniture mills are producing their furniture totally for the export market, while 90.3% of doors & door frames mills are producing 100% for the local market. It indicates that marketing plays an important role in entering the international market. Hence, wooden furniture mills need to spend more on the marketing aspect to further enhance their competitive advantage in the global market.

Wooden kitchen furniture mills are able to generate the highest manufacturing profit margin of 14.7%, while parts & components mills register a profit margin of only 6.8%, the lowest. On average, the manufacturing profit margin for wooden furniture mills is about 11.2%. Overall, the findings show that there is not much difference between the mean percentages of cost of production based either on total workforce or annual sales turnover and the trends in both classifications are also quite similar.

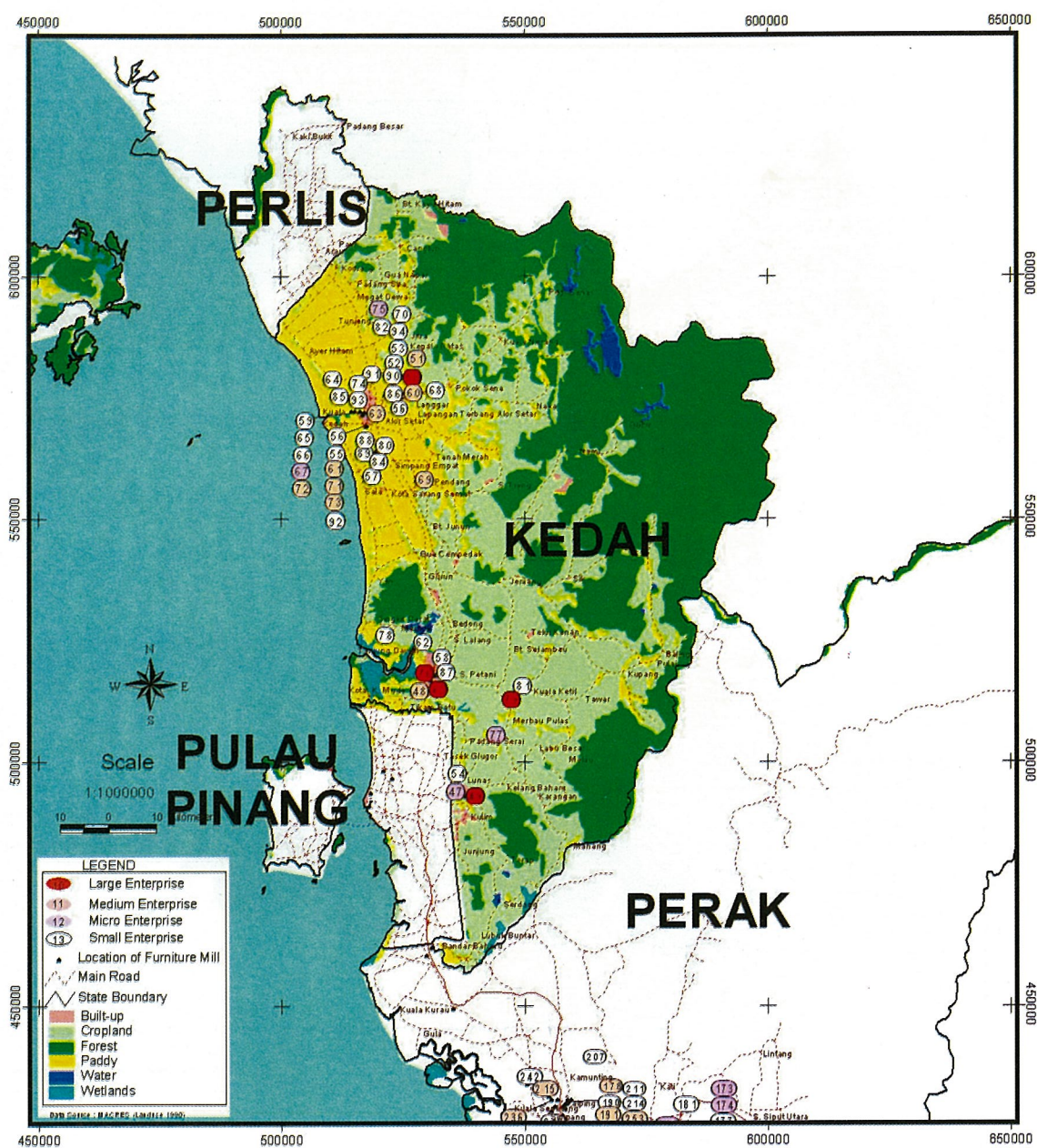
Locations of Wooden Furniture Mills in Johore



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES (landuse 1990)

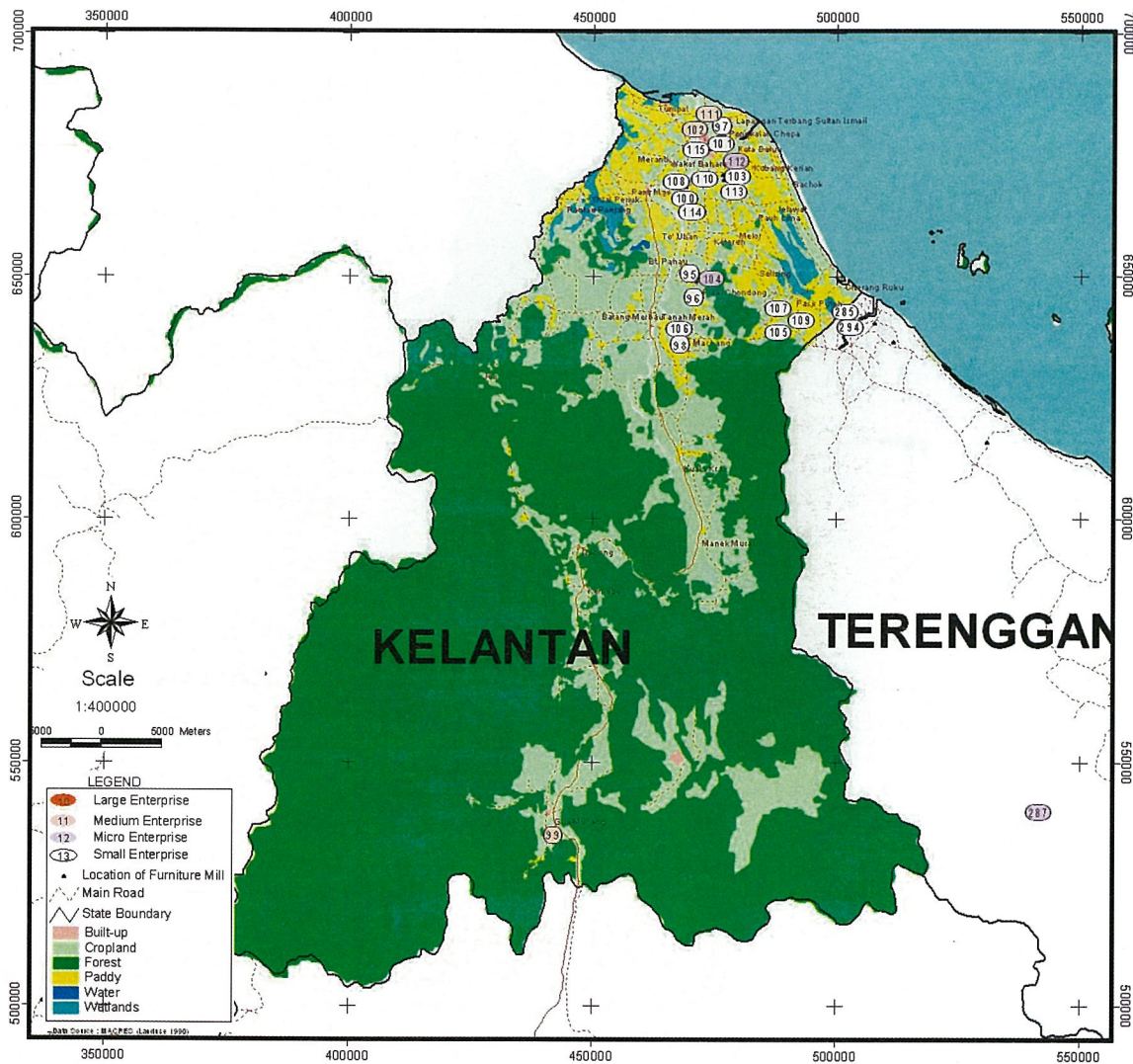
Locations of Wooden Furniture Mills in Kedah



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES (landuse 1990)

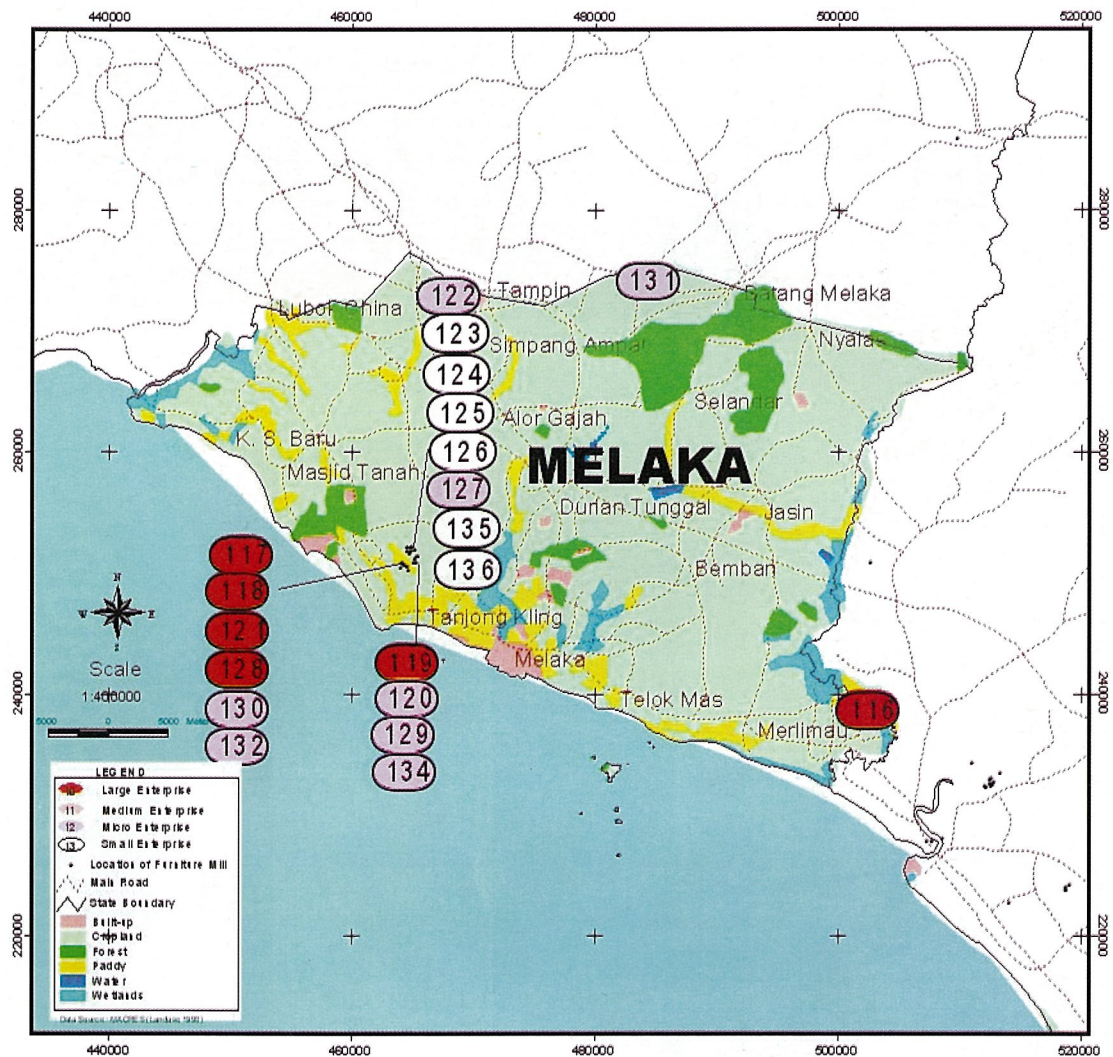
Locations of Wooden Furniture Mills in Kelantan



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES (landuse 1990)

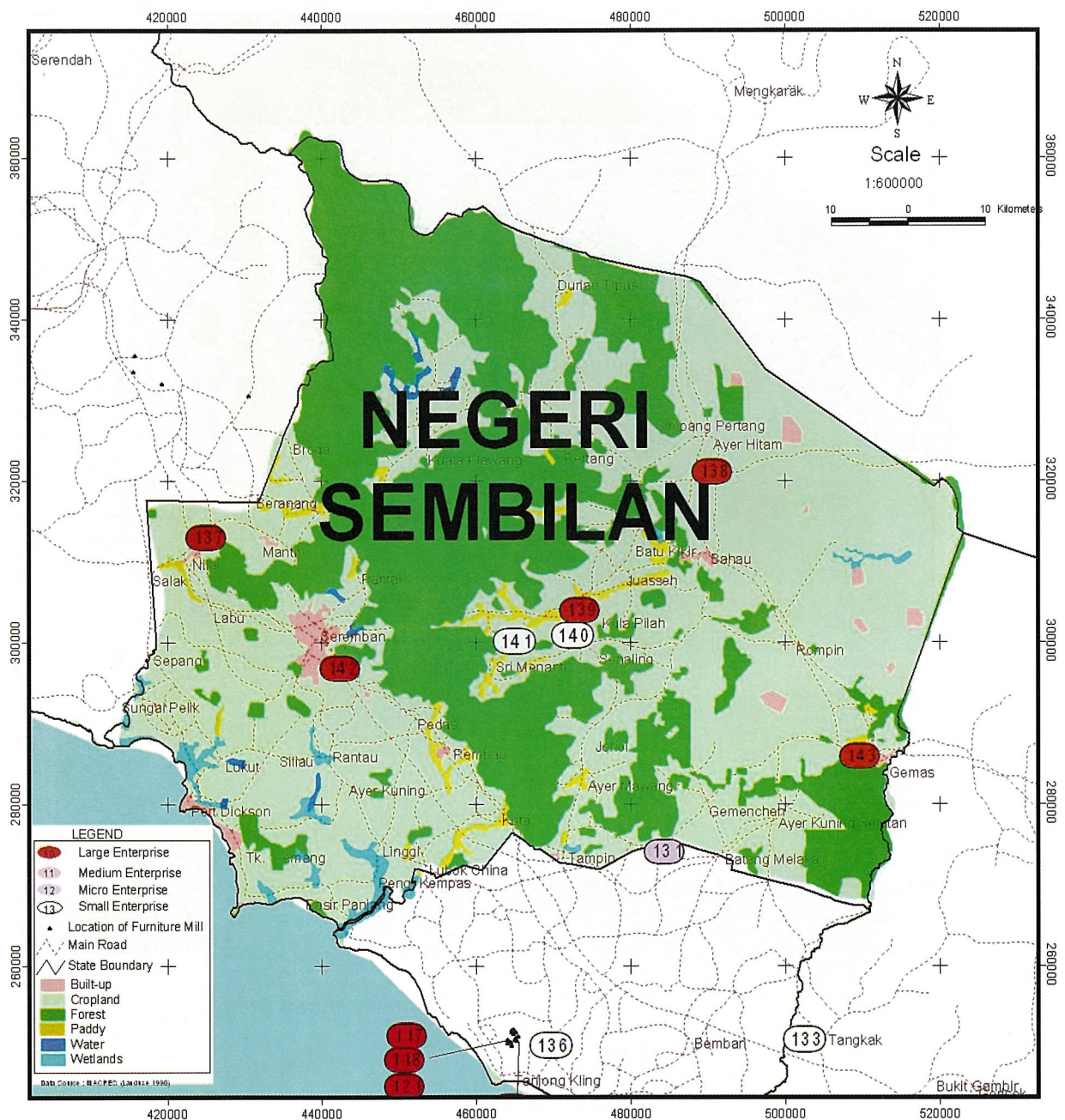
Locations of Wooden Furniture Mills in Malacca



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES
(landuse 1990)

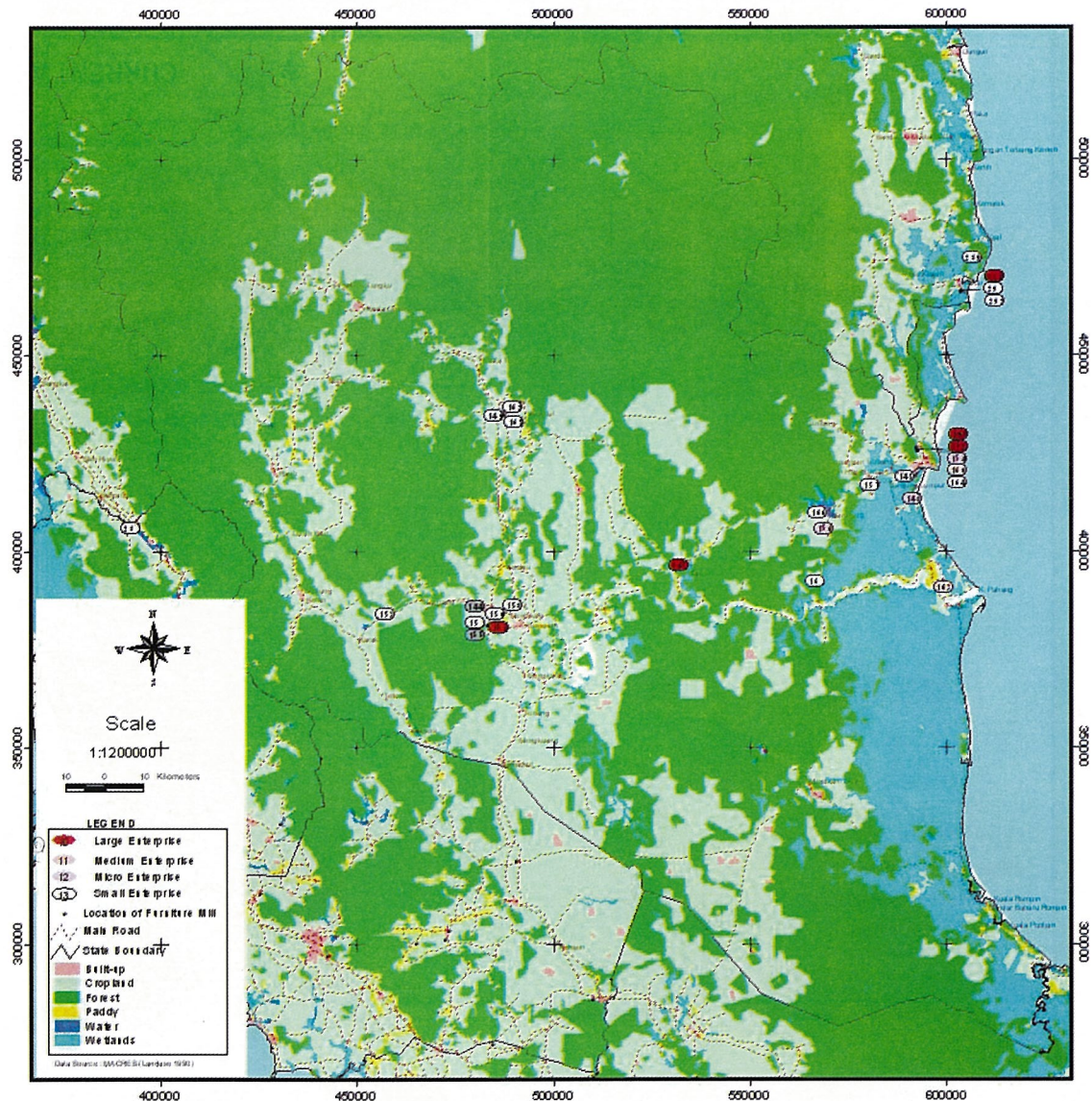
Locations of Wooden Furniture Mills in Negeri Sembilan



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES
(landuse 1990)

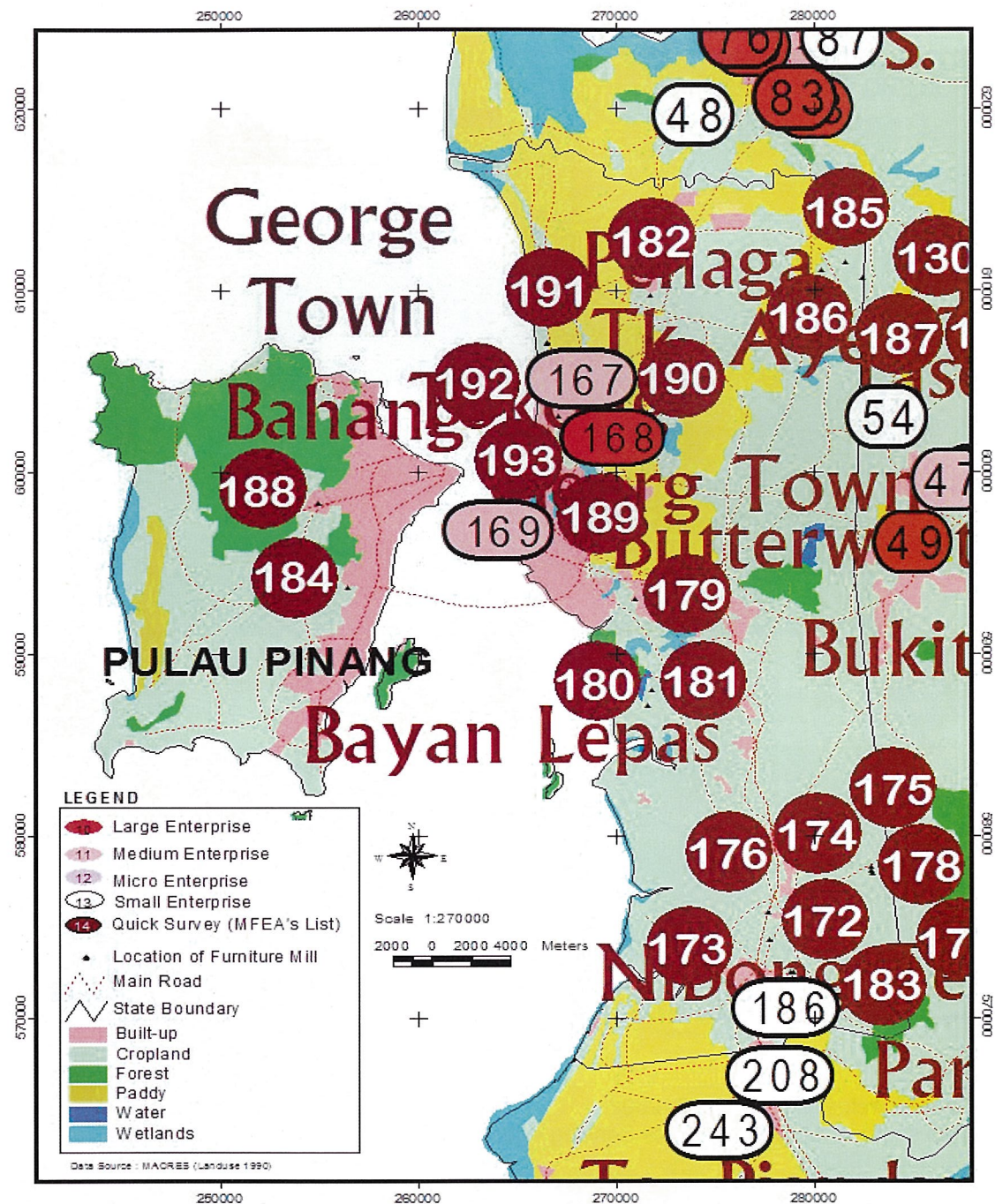
Locations of Wooden Furniture Mills in Pahang



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES
(landuse 1990)

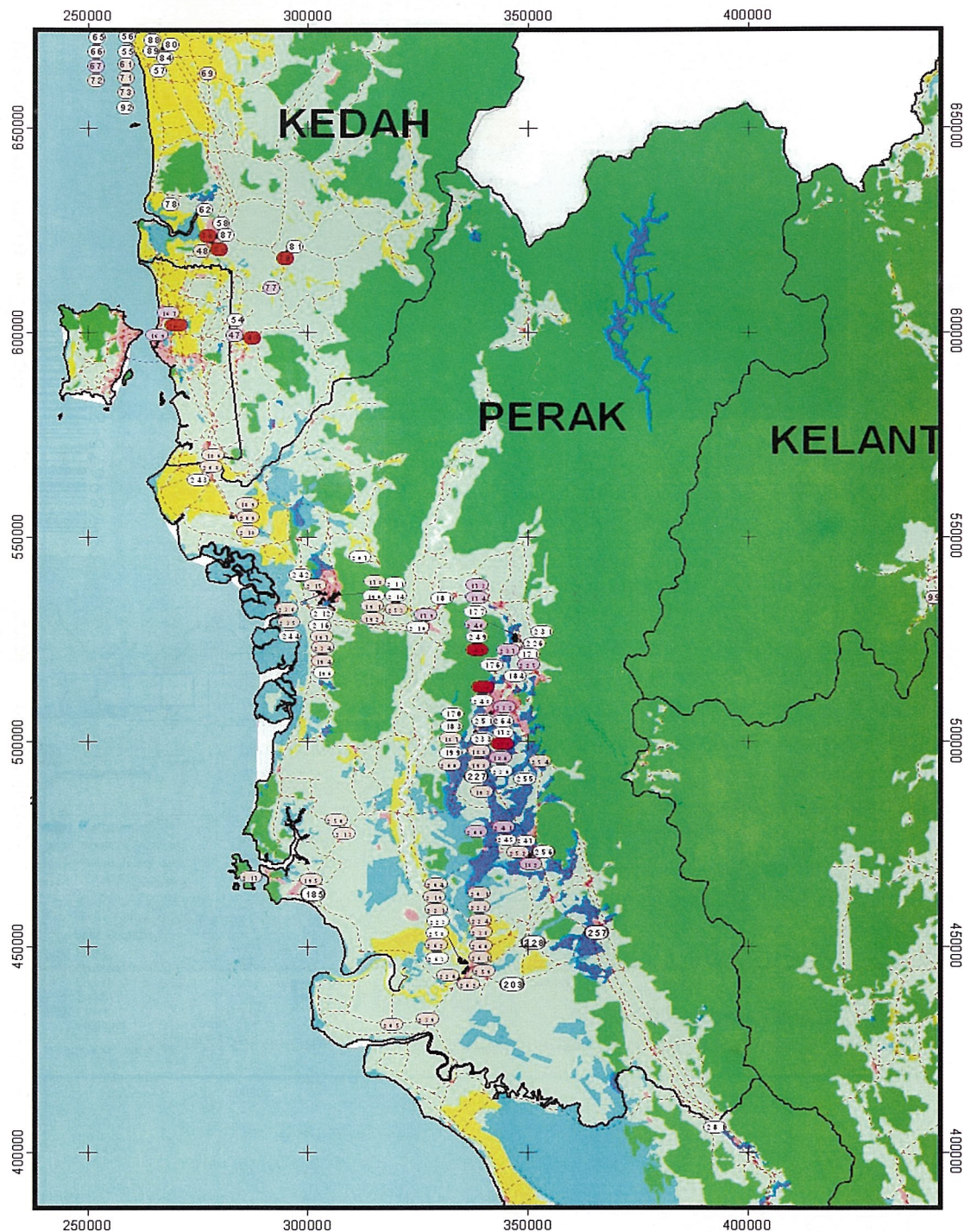
Locations of Wooden Furniture Mills in Penang



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES (landuse 1990)

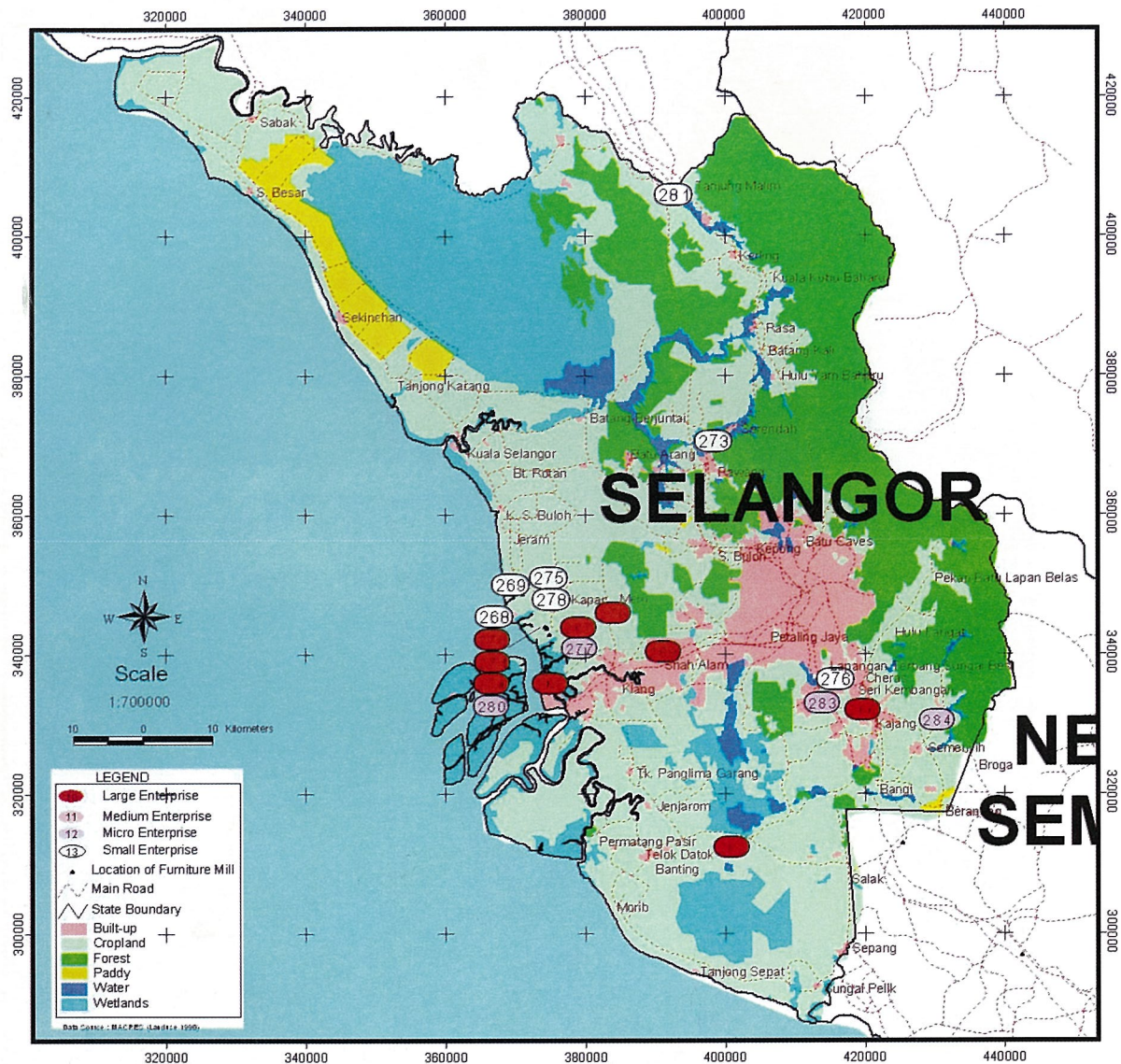
Locations of Wooden Furniture Mills in Perak



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES
(landuse 1990)

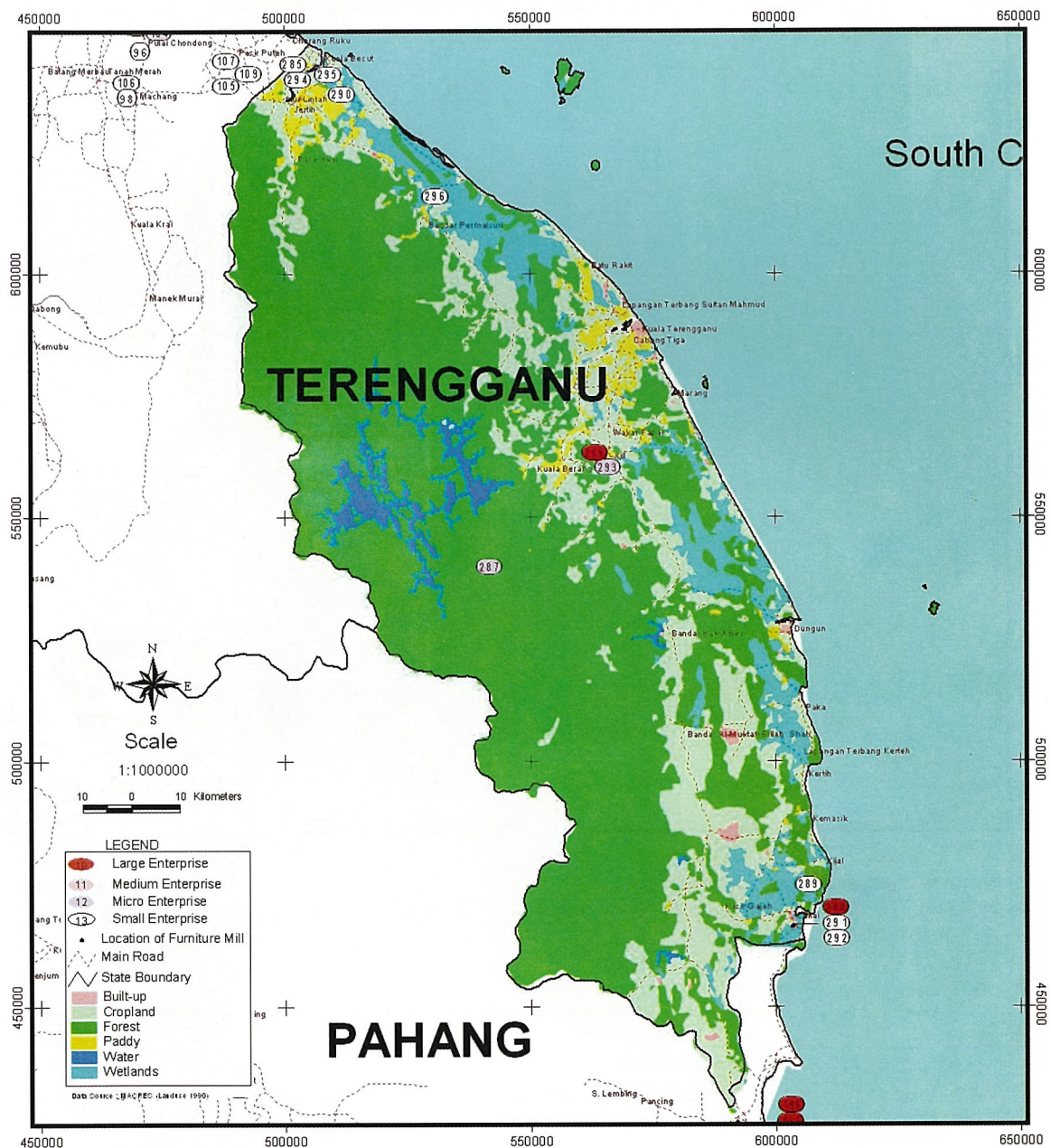
Locations of Wooden Furniture Mills in Selangor



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES
(landuse 1990)

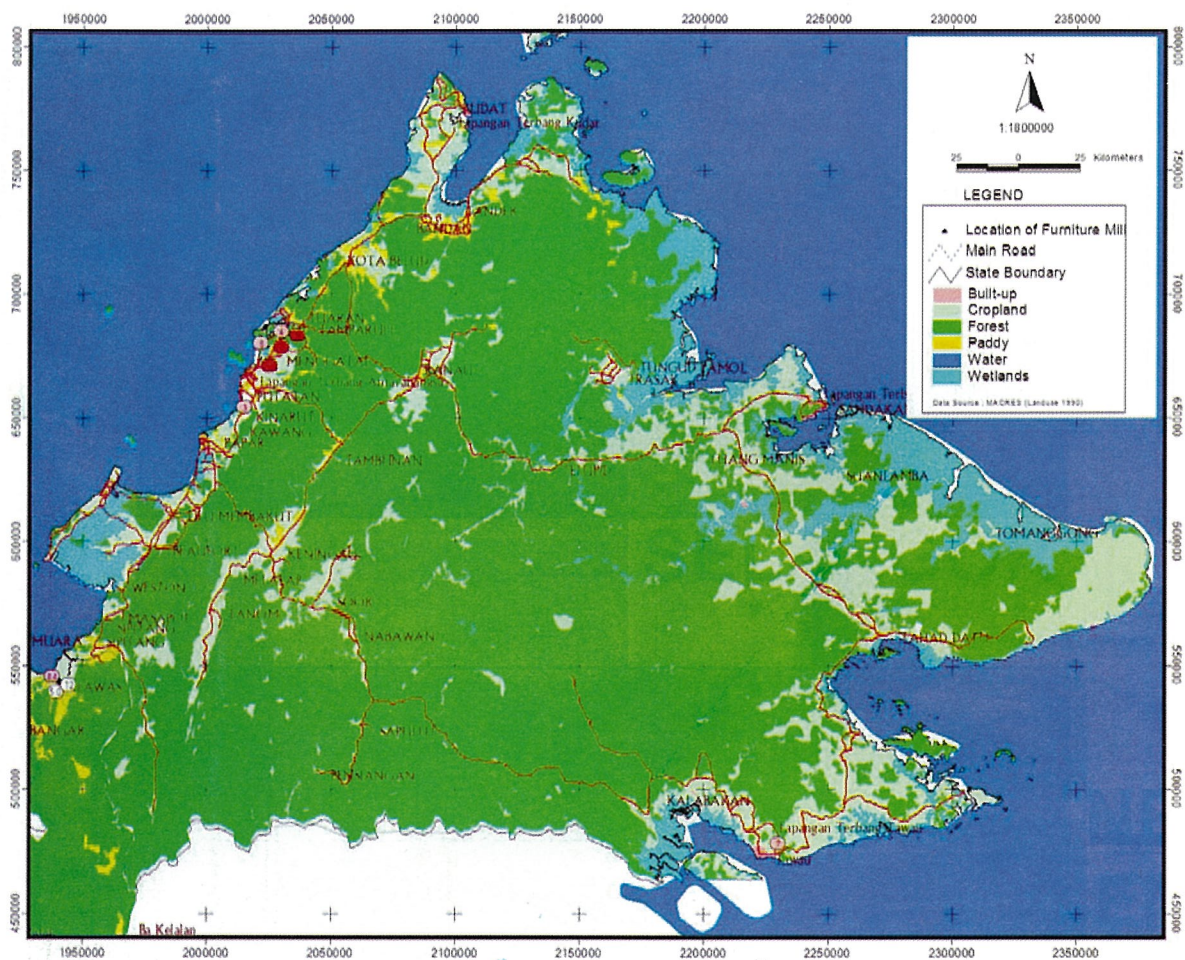
Locations of Wooden Furniture Mills in Terengganu



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES
(landuse 1990)

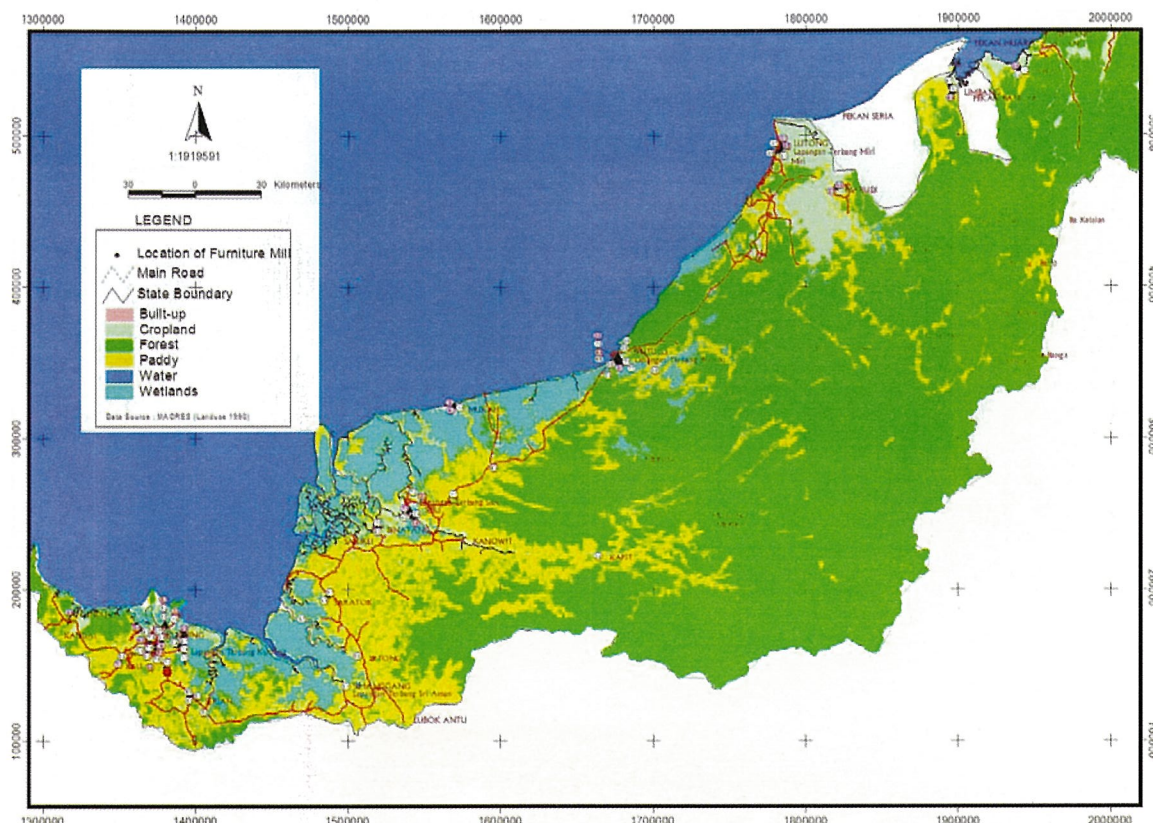
Locations of Wooden Furniture Mills in Sabah



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES (landuse 1990)

Locations of Wooden Furniture Mills in Sarawak



Source: Actual Survey, 2007–2008

Map source: Malaysian Remote Sensing Agency, formerly known as MACRES (landuse 1990)

CHAPTER 4

PRIMARY INPUT CONTENT

Introduction

The primary input content of the furniture industry can be explained by using *input-output analysis*. Among various concepts to measure economic performance, the input-output system is one of the most suitable economic tools to use due its capability to link one sector to another in the whole economy. In fact, it has been well known across the globe since it was introduced by Wassily Leontief in his doctorate work in 1928 in Germany (Landefeld & Stephanie 1999). Input-output analysis is concerned with studying the interdependence of the producing and consuming units in modern economy. The main concern of this study is to show the interrelations among different sectors in the furniture industry which purchase as primary inputs goods and services from other sectors, and which in turn produce goods and services which are then sold to other sectors. The interrelationship among different sectors is the strength of the input-output analysis. Normally, the various economic flows are set out in an input-output table which is specially designed to provide a concise and systematic arrangement of all economic activities within a state or region. It is good to note that the Manufacture of Furniture sector in the Malaysian Input-Output Table consists of the manufacturing of furniture and fixtures excluding primarily of metal. It implies that the main component of raw materials in making furniture is from wood but not all the raw materials are wood. This chapter attempts to examine the primary input content used by the furniture industry.

A Brief Overview of Input-Output Analysis

Basically, an input-output table is in the form of a matrix which accounts for all non-financial transactions within the economy. It is essential for social accounting purposes to distinguish between those transactions which are the end-results of economic activity and those which are intermediate in economic activity, or which represent inputs absorbed by other sectors in the production process. This distinction is important in the understanding of the input-output tables in a system of national accounting, and in the nature of economic interdependence (O'Connor & Henry 1975; Miller & Blair 1985). In order to understand the function of an input-output table, it is important to know the four quadrants in the input-output table (Figure 4.1). These quadrants are:

- intermediate quadrant;
- final demand quadrant;
- primary input quadrant;
- primary input to final demand quadrant.

Figure 4.1: Schematic Input–Output Table

Intermediate I	Final demand II
Primary input III	Primary inpt to final demand IV

The Intermediate Quadrant

The intermediate quadrant is also termed the ‘intermediate’ or ‘processing’ quadrant, or simply the inter-industry matrix. It is the heart of the input–output table in that it expresses the essential features of the input–output concept and provides the core of analytical work involving input–output. The role of the intermediate quadrant is its representation of economic interdependence among the producing sectors of the economy.

The Final Demand Quadrant

The final demand quadrant actually records the disposal of outputs of each sector to destinations other than as inputs to other sectors in the economy, which are the final goods and services as far as this economy is concerned. Input–output tables normally show a number of categories of final demand, corresponding to the expenditure side of the national account. This quadrant therefore provides a matrix of categories of final demand by sector of origin providing both the disposal pattern of sector output in the final demand rows and the use of each category of final demand in the columns. Normally there are five categories in the final demand, namely household consumption, export, capital formation, government expenditure and net increases in stock or net inventory accumulation by the firm in each sector. The final demand sectors have special significance in the input–output table. The level of activity of these sectors is considered to be exogenous, autonomous or independent of the production system (the intermediate sectors).

The Primary Input Quadrant

The primary input quadrant lists inputs into each intermediate sector which originate outside the production system, ie they are not purchased from the firms within the local economy. Sometimes termed the payment sector, this quadrant is normally represented by a number of rows which are conceptually the same as the income-earned side of the national accounts. In other words, the role of the primary input quadrant is twofold—within each column it illustrates the source of primary inputs by sector, and within each row the

income earned by each primary factor of production from each production sector.

The Primary Input to Final Demand Quadrant

The primary input to final demand quadrant shows those transactions which directly link the primary input to the final demand without transmission through the production system or intermediate quadrant.

The four quadrants of an input-output table make, therefore, a vital distinction between four types of transaction that are exogenously determined by economic forces external to the economy represented by the table (final demand), and show the linkages or inter-industry reaction paths of the production system (the intermediate quadrant). Together they provide a classification of transactions which is logical in economic terms, consistent with national account, and provides a basis for powerful analysis of the economy through input-output analysis. Based on the Input-Output table, there are three types of economic impact which can be examined for the Malaysian economy for each of the sectors. The three economic impacts are as follows:

Direct Effects

Direct effects are those brought about directly in those subsectors that are subjected to the change in final demand. Therefore, a change in the level of activity of the wood products industry will be directly felt by those manufacturing industries that are involved directly in the production of those products.

Indirect Effects

When there is a change in final demand for a subsector's output, the subsector which produces that output will have input demands of its own. For instance, the electrical machinery industry may need to purchase additional transport services, other financial services from industries within their own sector and supporting services related to, say, energy services.

Induced Effects

Whenever a good or service is produced, some income is accrued as wage, salary, profit, rent or interest (or some combination of these). Therefore, in the direct and indirect effects income is accrued as a result of the initial change in the final demand. When that income is re-spent, it triggers another round of economic activity. This additional round of economic activity generates output, income and employment and other multipliers. The economic effects that are the result of the re-spending of accrued income are known as the induced effects. The multiplier ratios allow the determination of the full effects resulting from any change in the final demand. Depending upon the multiplier, these full effects may be the direct plus indirect effects, or the direct plus indirect plus induced effects.

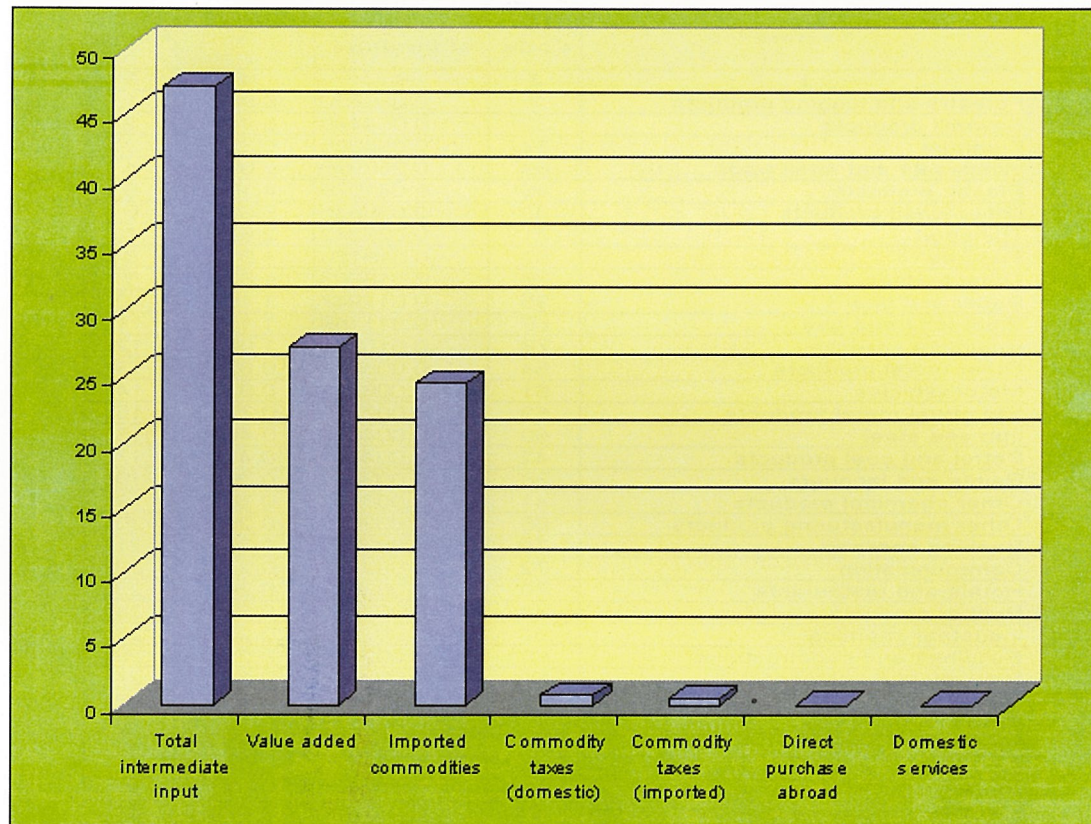
Inputs Used by the Furniture Industry

This analysis uses the Malaysian Input–Output Table 2000 which is the latest input–output table available for Malaysia. It means a seven-year gap to the current period, which is acceptable for input–output analysis because the technology change for Malaysian economy is slow and it takes time to attain the results (Ahmad Fauzi 2005). There are 92 sectors available in the Malaysian Input–Output Table 2000 and the details for each of the sectors are as shown in Appendix 4.1.

The column from the Input–Output table for furniture consists of i) intermediate inputs and ii) primary inputs. However, the primary inputs could be subdivided into six components, namely a) imported commodities, b) commodities taxes (domestic), c) commodities taxes (imported), d) direct purchases abroad, e) value added (gross domestic products) and f) domestic services (Figure 4.2).

Taking the Furniture Industry or sometimes also called Sector column from the Malaysian Input–Output Table 2000 and dividing by its Grand Total column should produce the proportions of inputs used by the furniture industry as shown in Table 4.1. Based on these figures, the proportions of inputs used for the furniture industry can be clearly seen. Table 4.1 shows that the Forestry and Logging Products sector uses 6.94% of its input materials used by the furniture industry, followed by the Sawmill Products sector which consumes about 5.44% of the input materials, the Furniture sector which consumes about 5.33% of the input materials, the Wholesale and Retail Trade sector which consumes 5.10%, the Plastic Products sector which consumes 4.10%, the Other Wood Products sector which consumes 3.66% and so on up to the Other Public Administration sector. The rest of the sectors are used as minimally as shown in Table 4.1. All these sectors are from the intermediate or technical coefficient quadrant of the Malaysian Input–Output Table 2000. The total input of materials used from local resources in Malaysia for the furniture industry is estimated at 47.16% of the total output, which represents the subtotal of 'intermediate quadrant' of the Input–Output Table 2000.

Figure 4.2: Proportions of Inputs Used for the Furniture Sector



The Furniture sector also imports about 24.53% from abroad or outside the country for its raw materials. Other than that, it also has to pay the domestic commodities taxes and the import commodities taxes of about 0.64 and 0.40% respectively. These taxes are the government revenue for the country. The balance of the inputs used is actually the value added or profit to the country, which is estimated at about 27.25% from the total. It is a quite clear that Furniture sector uses a substantial amount of imported materials, which is close to the total amount for value added or income generated from this sector (Figure 4.2).

Table 4.1: Proportions of Inputs Used by the Furniture Sector

Sectors	IO Code	Manufacture of furniture	%	Ranks
1	2	3	4	5
Forestry and logging products	7	0.069400	6.94000	1
Sawmill products	32	0.054479	5.44790	2
Furniture	34	0.053305	5.33050	3
Wholesale and retail trade	69	0.050998	5.09980	4
Plastic products	45	0.041079	4.10790	5
Other wood products	33	0.036645	3.66450	6
Transport	71	0.025342	2.53420	7
Fixtures	52	0.019150	1.91500	8
Other textiles	28	0.016303	1.63030	9
Paper and board	35	0.011947	1.19470	10
Electricity and gas	66	0.011168	1.11680	11
Business services	78	0.010679	1.06790	12
Other metal products	54	0.008315	0.83150	13
Motor vehicles	61	0.008212	0.82120	14
Structural metal products	53	0.007760	0.77600	15
Iron and steel	50	0.004666	0.46660	16
Petrol and coal products	42	0.004381	0.43810	17
Paints and lacquers	38	0.003859	0.38590	18
Other chemical products	41	0.003807	0.38070	19
Other manufacturing products	65	0.002802	0.28020	20
Banking services	73	0.002757	0.27570	21
Communication	72	0.002750	0.27500	22
Hotels and restaurants	70	0.002694	0.26940	23
Rubber products	44	0.002464	0.24640	24
Industrial chemical	37	0.002342	0.23420	25
Buildings and constructions	68	0.002105	0.21050	26
Household machinery	56	0.001871	0.18710	27
Water	67	0.001631	0.16310	28
Yarns and cloth	26	0.001529	0.15290	29
Non-ferrous metal	51	0.001234	0.12340	30
Instruments and clocks	64	0.000778	0.07780	31
China, glass and pottery	46	0.000749	0.07490	32
Electrical appliances and houseware	58	0.000709	0.07090	33
Insurance	75	0.000647	0.06470	34
Other electrical machinery	59	0.000542	0.05420	35
Education	79	0.000500	0.05000	36
Leather products	30	0.000329	0.03290	37
Rubber primary products	2	0.000284	0.02840	38
Wearing apparel	29	0.000204	0.02040	39
Clay products	47	0.000204	0.02040	40
Other non-metal products	49	0.000184	0.01840	41
Livestock etc	6	0.000173	0.01730	42
Industrial machinery	55	0.000152	0.01520	43
Real estate	76	0.000076	0.00760	44
Knitted fabrics	27	0.000070	0.00700	45
Cement, lime and plaster	48	0.000058	0.00580	46
Footwear	31	0.000050	0.00500	47
Radio, TV and communication equipm	57	0.000042	0.00420	48
Drugs and medicines	39	0.000036	0.00360	49
Printed products	36	0.000033	0.00330	50
Soap and cleaning preparations	40	0.000026	0.00260	51
Cycles and motorcycles	62	0.000024	0.00240	52
Recycling	87	0.000019	0.00190	53
Repair of motor vehicles	85	0.000016	0.00160	54
Other financial services	74	0.000011	0.00110	55
Other private services	88	0.000010	0.00100	56
Grain mills products	17	0.000006	0.00060	57
Fish etc	8	0.000004	0.00040	58
Other foods	21	0.000004	0.00040	59
Entertainment	82	0.000004	0.00040	60
Agriculture products, other	1	0.000003	0.00030	61
Meat and meat products	12	0.000002	0.00020	62
Oils and fats	16	0.000001	0.00010	63
Soft drinks	24	0.000001	0.00010	64
Private non-profit services	81	0.000001	0.00010	65
Other public administration	92	0.000001	0.00010	66
Total intermediate input		0.471633	47.16330	
Value Added	99	0.272551	27.25510	1
Imported commodities	98	0.245281	24.52810	2
Commodity taxes (domestic)	96	0.006492	0.64920	3
Commodity taxes (imported)	97	0.004044	0.40440	4
Direct purchase abroad	94	0.000000	0.00000	5
Domestic services	95	0.000000	0.00000	6
Total input		1.000000	100.00000	

The Furniture Primary Input Multipliers

Multiplier coefficients demonstrate the ability of any given sector or subsector to generate the primary input multipliers from any given change in the final demand for its output. The multiplier values can be used to show the impact on the national economy as a result of a given change in any of its final demands for the furniture industry. These impacts can be subdivided further into four categories:

The Imported Commodities Multipliers

The total imported commodities consist of the initial effect, first-round (direct) effect, indirect effect and consumption-induced effect. The initial effect is actually for every RM1 increase in the final demand that stimulates the economic growth. The direct effect is the first-round purchases made by each sector from all other intermediate sectors for every RM1 worth of output. In the case of indirect effect, it is a series of indirect purchases as waves of second, third and subsequent-round effects make their way through the local economy. The ripple effects spread through the domestic economy, at each succeeding round becoming small enough to be of no analytical value (Jensen & West 1986). The flow-on effect is actually the difference between total multiplier for imported commodities and the initial effect. The detailed primary input multipliers for imported commodities are as in Table 4.2.

Table 4.2: The Primary Input Multipliers for Imported Commodities

Sector	IO code	Initial effect	Rank	First round (direct)	Rank	Industrial support (indirect)	Rank	Consumption-induced	Rank	Total multiplier	Rank	Flow-on	Rank
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tea	5	0.097970	71	0.045016	78	0.017485	81	2.535735	1	2.696206	1	2.598236	1
Radio and television broadcasting	83	0.018674	92	0.062194	62	0.060670	10	0.802029	2	0.943567	2	0.924893	2
Household machinery	56	0.687154	1	0.048237	74	0.012379	87	0.014582	79	0.762362	3	0.075208	87
Animal feeds	22	0.596906	2	0.076301	42	0.029360	60	0.012513	83	0.715080	4	0.118174	67
Radio, TV and communication equipment	57	0.587300	3	0.068765	53	0.019163	77	0.013423	81	0.688651	5	0.101351	78
Iron and steel	50	0.501456	5	0.115176	10	0.043136	35	0.022624	57	0.682392	6	0.180936	28
Other repair	86	0.136454	61	0.088214	19	0.033456	53	0.397038	3	0.665162	7	0.528708	3
Non-ferrous metal	51	0.529687	4	0.065243	31	0.029842	59	0.008173	91	0.650945	8	0.121258	66
Repair of motor vehicles	85	0.345160	19	0.056820	69	0.026141	68	0.207604	4	0.635725	9	0.290565	6
Other electrical machinery	59	0.490050	6	0.074084	47	0.025205	69	0.011191	86	0.600530	10	0.110480	73
Structural metal products	53	0.390799	11	0.096811	21	0.036413	44	0.056915	20	0.580938	11	0.190139	22
Instruments and clocks	64	0.469870	7	0.073023	48	0.023788	70	0.010861	87	0.577542	12	0.107672	76
Electrical appliances and houseware	58	0.426365	9	0.078245	40	0.026202	67	0.034908	37	0.565720	13	0.139355	58
Motor vehicles	61	0.379294	13	0.116989	7	0.045414	30	0.018708	69	0.580405	14	0.181111	27
Ships and boats	60	0.410259	10	0.059103	66	0.022139	72	0.060500	18	0.552001	15	0.141742	56
Wearing apparel	29	0.355738	17	0.116299	9	0.046106	27	0.015898	76	0.533981	16	0.178243	31
Fixtures	52	0.362923	16	0.090713	27	0.037809	41	0.035723	35	0.527168	17	0.164245	43
Footwear	31	0.316230	27	0.106537	12	0.046166	26	0.057179	19	0.526112	18	0.209882	14
Knitted fabrics	27	0.385193	12	0.091901	26	0.039732	38	0.007690	89	0.524516	19	0.139323	59
Tobacco	25	0.429004	8	0.054122	71	0.019087	79	0.018175	70	0.520388	20	0.091384	84
Cycles and motorcycles	62	0.223647	45	0.141749	2	0.129549	3	0.025115	51	0.520060	21	0.296413	5
Yarns and cloth	26	0.347839	18	0.101250	16	0.045454	29	0.023945	55	0.518488	22	0.170649	36
Soft drinks	24	0.323298	23	0.119279	6	0.056889	11	0.014822	78	0.516288	23	0.192890	21
Leather products	30	0.245041	42	0.135258	3	0.073418	7	0.062495	15	0.516210	24	0.271169	7
Other textiles	28	0.373320	15	0.084198	33	0.035175	47	0.021659	61	0.514353	25	0.141033	57
Other manufacturing products	65	0.317425	24	0.127835	4	0.045537	28	0.020731	66	0.511528	26	0.194103	20
Other metal products	54	0.333945	20	0.103630	14	0.039061	39	0.021270	64	0.497906	27	0.163961	44
Preserved fruits and vegetables	14	0.332131	21	0.080079	37	0.058173	12	0.027490	45	0.497873	28	0.165742	41
Confectionery	19	0.323822	22	0.096871	20	0.049910	19	0.026681	48	0.497284	29	0.173462	35
Plastic products	45	0.377585	14	0.064329	58	0.029021	62	0.021746	60	0.492681	30	0.115096	70

The Tea sector has the highest total primary input multiplier for imported commodities, which is ranked first in the list. Its total primary input multiplier for imported commodities is RM2.696, which constitutes RM0.097 from the

initial effect, RM0.045 from the direct effect, RM0.017 from the indirect (industrial support) effect and RM2.535 from the consumption-induced effect for every RM1 increase in the final demand. The flow-on effect for the Tea sector is estimated at RM2.598.

The Radio and Television Broadcasting sector is the second highest in total primary input multiplier for imported commodities, followed by the Household Machinery sector, Animal Feeds sector, Radio, TV and Communication Equipment sector, Iron and Steel sector and Other Repairs sector. Table 4.2 gives the top thirty sectors with the highest total primary input multiplier for imported commodities.

The Commodities Taxes (Imported) Multipliers

The commodities taxes (imported) are actually the amounts of money collected in the form of taxes by the government from the imported commodities. In other words, these taxes are the revenue for the government from imported commodities. The Tobacco sector has the highest primary input multiplier for commodities taxes (imported), which is estimated for every RM1 increase in the final demand contributing to the total primary input multiplier for commodities taxes (imported) at about RM0.107. This comes from RM0.101 initial effect, RM0.005 first-round (direct) effect, RM0.0004 industrial support effect and RM0.0002 consumption-induced effect. The amount of flow-on effect that can be collected is estimated at RM0.005.

Table 4.3: The Primary Input Multipliers for Commodities Taxes (Imported)

Sector	I-O code	Initial effect	Rank	First round (direct)	Rank	Industrial support (indirect)	Rank	Consumption Induced	Rank	Total multiplier	Rank	Flow-on	Rank
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tobacco	25	0.101831	1	0.005153	2	0.000439	37	0.000276	70	0.107899	1	0.005868	5
Wine and spirits	23	0.040305	2	0.007276	1	0.001743	2	0.000321	65	0.049645	2	0.009340	3
Tea	5	0.001197	62	0.001062	22	0.000239	73	0.038417	1	0.040815	3	0.039718	1
Repair of motor vehicles	85	0.025618	3	0.000820	48	0.000326	59	0.003145	4	0.029909	4	0.004291	7
Other repairs	86	0.009246	6	0.001245	12	0.000395	45	0.006015	3	0.016901	5	0.007655	4
Fixtures	52	0.013418	4	0.001045	23	0.000407	42	0.000541	35	0.015411	6	0.001993	34
Motor vehicles	61	0.011588	5	0.002576	3	0.000783	7	0.000284	69	0.015231	7	0.003643	8
Radio and television broadcasting	83	0.000327	83	0.000826	46	0.000739	8	0.012151	2	0.014043	8	0.013716	2
Cycles and motorcycles	62	0.003830	26	0.002497	4	0.002195	1	0.000361	51	0.009903	9	0.005073	6
Water	67	0.005462	12	0.001658	5	0.000518	27	0.000923	17	0.009561	10	0.003099	12
Radio, TV and communication equipment	57	0.007342	7	0.000794	53	0.000215	78	0.000204	81	0.008555	11	0.001213	76
Other electrical machinery	59	0.006982	8	0.000797	51	0.000269	70	0.000169	86	0.008217	12	0.001235	75
Electrical appliances and houseware	58	0.006109	10	0.000820	49	0.000269	67	0.000529	37	0.007747	13	0.001638	54
Instruments and clocks	64	0.006478	9	0.000810	50	0.000264	71	0.000165	87	0.007717	14	0.001239	74
Soft drinks	24	0.005292	13	0.001337	11	0.000653	11	0.000225	77	0.007507	15	0.002215	29
Metal ore	10	0.005189	15	0.001175	15	0.000537	24	0.000484	41	0.007385	16	0.002196	30
Footwear	31	0.004708	18	0.001033	25	0.000474	31	0.000866	19	0.007081	17	0.002373	27
Transport	71	0.004502	20	0.001432	7	0.000517	28	0.000608	32	0.007059	18	0.002557	19
Recycling	87	0.005212	14	0.000857	41	0.000447	33	0.000265	74	0.006781	19	0.001569	61
Furniture	34	0.004044	24	0.001420	9	0.000579	17	0.000717	25	0.006760	20	0.002716	15
Other metal products	54	0.004999	16	0.000943	32	0.000362	51	0.000322	64	0.006626	21	0.001627	55
Household machinery	56	0.005723	11	0.000472	75	0.000146	87	0.000221	79	0.006562	22	0.000839	86
Ice	20	0.003191	32	0.000822	47	0.000402	43	0.001997	6	0.006412	23	0.003221	10
Other textiles	28	0.004842	17	0.000794	54	0.000352	56	0.000328	61	0.006316	24	0.001474	66
Stone, clay and sand quarrying	11	0.004412	21	0.000880	39	0.000338	57	0.000360	52	0.006010	25	0.001598	57
Leather products	30	0.003030	34	0.001440	6	0.000560	20	0.000947	15	0.005977	26	0.002947	13
Plastic products	45	0.004636	19	0.000623	66	0.000309	66	0.000329	60	0.005897	27	0.001261	73
Knitted fabrics	27	0.004354	22	0.000921	34	0.000377	48	0.000117	89	0.005769	28	0.001415	68
Other manufacturing products	65	0.003858	25	0.001160	17	0.000436	38	0.000314	66	0.005768	29	0.001910	42
Printed products	36	0.003269	31	0.001162	16	0.000497	30	0.000772	23	0.005700	30	0.002431	25

The second highest commodities taxes (Imported) multiplier is given by the Wine and Spirits sector followed by the Tea sector, Repair of Motor Vehicles

sector, Other Repairs sector, Fixtures sector, Motor Vehicles sector and the Radio and Television Broadcasting sector. Table 4.3 presents the top thirty sectors having the highest to the lowest commodities taxes (imported) multipliers. These are all commodities taxes (imported) which can be collected by the government for every RM1 increase in the final demand.

The Commodities Taxes (Domestic) Multipliers

Input-output analysis is also capable of calculating taxes for all the domestic goods in making furniture using domestic commodities taxes multipliers. The taxes collected from domestic goods are actually another source of revenue for the government. In this analysis, the Tea sector has the highest domestic commodities taxes multiplier. For every RM1 increase in the final demand for the Tea sector, the total effect in the economy is expected to increase by RM0.120. This total effect consists of RM0.0008 initial effect, RM0.0019 first-round (direct) effect, RM0.0008 industrial support (indirect) effect and RM0.1168 consumption-induced effect. Therefore the flow-on effect is RM0.1196, which is actually the difference between the total effect and the initial effect (Table 4.4).

The second highest domestic commodities taxes are given by the Real Estate sector followed by the Radio and Television Broadcasting sector, the Motor Vehicles sector, the Other Repairs sector, etc. The top 30 commodities taxes multipliers are as in Table 4.4.

Table 4.4: The Primary Input Multipliers for Commodities Taxes (Domestic)

Sector	I-O code	Initial effect	Rank	First round (direct)	Rank	Industrial support (indirect)	Rank	Consumption - induced	Rank	Total multiplier	Rank	Flow-on	Rank
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tea	5	0.000870	84	0.001993	43	0.000818	80	0.116869	1	0.120550	1	0.11968	1
Real estate	76	0.071356	1	0.014033	1	0.003817	2	0.001201	50	0.090407	2	0.019051	4
Radio and television broadcasting	83	0.012281	12	0.013302	2	0.003488	4	0.036964	2	0.066035	3	0.053754	2
Motor vehicles	61	0.042470	2	0.008829	4	0.002752	7	0.000862	69	0.054913	4	0.012443	8
Other repairs	86	0.026638	4	0.001840	56	0.001179	53	0.018298	3	0.047955	5	0.021317	3
Entertainment	82	0.023531	5	0.010728	3	0.003562	3	0.001526	40	0.039347	6	0.015816	5
Confectionery	19	0.027499	3	0.004734	9	0.001815	18	0.001230	48	0.035278	7	0.007779	21
Other public administration	92	0.019996	7	0.004132	13	0.001671	25	0.005925	7	0.031724	8	0.011728	9
Processed rubber	43	0.022857	6	0.005348	7	0.002189	9	0.001262	46	0.031656	9	0.008799	16
Public administration	89	0.019087	8	0.005632	6	0.002038	12	0.004681	9	0.031638	10	0.012551	7
Recreation	84	0.019060	9	0.002677	27	0.001271	44	0.002101	28	0.025109	11	0.006049	32
Footwear	31	0.014641	11	0.003256	19	0.001654	27	0.002635	19	0.022186	12	0.007545	22
Other private services	88	0.010590	15	0.006782	5	0.003036	5	0.000828	71	0.021236	13	0.010646	10
Other financial services	74	0.010062	17	0.004993	8	0.001999	13	0.003457	11	0.020511	14	0.010449	11
Private non-profit services	81	0.010995	14	0.004198	12	0.001667	26	0.003447	12	0.020307	15	0.009312	15
Communication	72	0.014700	10	0.003068	23	0.001149	56	0.001072	56	0.019989	16	0.005289	43
Repair of motor vehicles	85	0.004714	40	0.003119	21	0.001325	41	0.009568	4	0.018726	17	0.014012	6
Ice	20	0.009195	19	0.002122	40	0.001268	46	0.006075	6	0.018660	18	0.009465	14
Banking services	73	0.011129	13	0.003593	14	0.001055	63	0.001244	47	0.017021	19	0.005892	35
Public order	90	0.006749	28	0.001861	53	0.000903	71	0.007340	5	0.016853	20	0.010104	13
Printed products	36	0.010034	18	0.002428	30	0.001418	38	0.002346	23	0.016226	21	0.006192	31
Buildings and constructions	68	0.007744	24	0.003290	18	0.001740	21	0.002301	24	0.015075	22	0.007331	23
Rubber products	44	0.010069	16	0.002377	31	0.001180	52	0.000867	68	0.014493	23	0.004424	61
Wholesale and retail trade	69	0.008025	23	0.003180	20	0.001089	61	0.001612	36	0.013906	24	0.005881	36
Other foods	21	0.008141	22	0.002453	29	0.001679	23	0.001203	49	0.013476	25	0.005335	42
Other manufacturing products	65	0.008353	20	0.002309	34	0.001327	40	0.000956	66	0.012945	26	0.004592	54
Furniture	34	0.006492	29	0.002712	26	0.001490	35	0.002181	25	0.012875	27	0.006383	27
Cycles and motorcycles	62	0.002475	65	0.004201	11	0.004757	1	0.001157	51	0.012590	28	0.010115	12
Paints and lacquers	38	0.006172	31	0.003301	17	0.001921	15	0.001147	53	0.012541	29	0.006369	29
Health	80	0.005830	33	0.001888	49	0.000889	73	0.003930	10	0.012537	30	0.006707	26

The Value-added Multipliers

The primary input quadrant has also a value-added component for goods and services produced. The total value added from this primary input quadrant is actually the profit generated in the economy according to the sector. In the furniture industry, the Tea sector has the highest total multiplier (effect), which is RM7.18 for every RM1 increase of the final demand. This total effect consists of RM0.733 initial effect, RM0.062 first-round (direct) effect, RM0.036 industrial-support (indirect) effect and RM6.34 consumption-induced effect. Therefore, the flow-on effect is RM6.448, which is the profit expected to be generated in the furniture industry.

There are 12 sectors in the Malaysian economy with total value-added multipliers greater than one, able to generate economic activities for the country, especially the Tea and Radio and Television Broadcasting sectors. These two sectors have multipliers greater than two, and the other ten sectors have multipliers greater than one, while the rest of the sectors are less than one in total value-added multipliers.

Table 4.5: Value-added Multipliers

Sector	I-O code	Initial effect	Rank	First round (direct)	Rank	Industrial support (indirect)	Rank	Consumption - induced	Rank	Total multiplier	Rank	Flow-on	Rank
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tea	5	0.733793	9	0.062918	9	0.036642	84	6.348477	1	7.181830	1	6.448037	1
Radio and television broadcasting	83	0.336245	44	0.356428	44	0.132812	14	2.007912	2	2.835397	2	2.497152	2
Other repairs	86	0.509333	27	0.123386	27	0.058616	68	0.994008	3	1.685343	3	1.176010	3
Public order	90	0.745526	6	0.080483	6	0.045257	76	0.398728	5	1.269994	4	0.524468	13
Education	79	0.761945	4	0.065271	4	0.033090	86	0.319454	8	1.179760	5	0.417815	26
Ice	20	0.487987	30	0.227418	30	0.092033	34	0.330034	6	1.137472	6	0.649485	7
Other public administration	92	0.547901	22	0.142944	22	0.061510	64	0.321843	7	1.074198	7	0.526297	12
Repair of motor vehicles	85	0.337174	45	0.137572	45	0.061211	85	0.519747	4	1.055704	8	0.718530	4
Coconut	4	0.948172	1	0.010851	1	0.007457	91	0.086863	38	1.053143	9	0.104971	91
Other financial services	74	0.590125	17	0.191022	17	0.066221	59	0.187820	11	1.035188	10	0.445063	18
Oil palm primary products	3	0.743589	7	0.068193	7	0.054950	69	0.155791	16	1.022503	11	0.278934	59
Public administration	89	0.516587	25	0.153983	25	0.070453	53	0.265143	9	1.006066	12	0.489479	14
Ownership of dwellings	77	0.946000	2	0.004781	2	0.004102	92	0.001888	92	0.956771	13	0.010771	92
Banking services	73	0.788838	3	0.072850	3	0.024002	89	0.067587	47	0.953277	14	0.164439	85
Agriculture products, other	1	0.711352	11	0.095376	11	0.045035	77	0.100095	33	0.951858	15	0.240506	75
Insurance	75	0.636768	12	0.150536	12	0.051892	70	0.104885	30	0.944081	16	0.307313	55
Wholesale and retail trade	69	0.728674	10	0.077008	10	0.037856	82	0.087591	36	0.931129	17	0.202455	81
Private non-profit services	81	0.527741	24	0.147718	24	0.067543	55	0.187254	12	0.930256	18	0.402515	30
Water	67	0.501305	28	0.183903	28	0.086061	38	0.152528	17	0.923697	19	0.422392	24
Recreation	84	0.591884	16	0.143985	16	0.066469	58	0.114142	28	0.916380	20	0.324496	50
Entertainment	82	0.485357	31	0.236154	31	0.092530	33	0.082875	40	0.896916	21	0.411559	28
Fishery, etc.	8	0.567855	19	0.160039	19	0.120530	20	0.042943	75	0.891367	22	0.323512	51
Rubber primary products	2	0.611765	15	0.140122	15	0.060968	66	0.071141	43	0.883996	23	0.272231	61
Forestry and logging products	7	0.737443	8	0.065073	8	0.035138	85	0.030970	84	0.868624	24	0.131181	89
Crude petrol, natural gas and coal	9	0.751190	5	0.071560	5	0.022211	90	0.023511	88	0.868472	25	0.117282	90
Health	80	0.515909	26	0.097183	26	0.039605	80	0.213447	10	0.866144	26	0.350235	44
Real estate	76	0.544911	23	0.173548	23	0.080076	42	0.065221	50	0.863756	27	0.318845	53
Electricity and gas	66	0.634282	13	0.121732	13	0.065042	60	0.037268	77	0.858324	28	0.224042	78
Sawmill products	32	0.325272	46	0.365832	46	0.089532	35	0.075626	42	0.856262	29	0.530990	10
Oils and fats	16	0.224882	72	0.237410	72	0.326481	1	0.060938	54	0.849711	30	0.624829	9

Analysis of Results for the Furniture Primary Input Content

This analysis shows the economic impact resulting from the use of rubberwood to support the furniture industry in Malaysia. It is very clear that the Furniture sector needs to import other than rubberwood in order to make furniture. At the same time the Furniture sector has to pay taxes for importing

and domestic uses. According to our survey in 2007, Malaysia is able to produce 432,022.73 m³ of rubberwood which is equivalent to RM625,611,218.73. Most of the rubberwood is being used for furniture in Malaysia. From these survey data, the analysis was carried out using the I-O table to study the impact of the primary inputs in making furniture on the Malaysian economy.

Results of the Total Primary Inputs Used

The analysis indicates that the production of rubberwood is mainly to supply raw material for the furniture industry. In order to make a complete set of furniture, it is necessary to use materials from other sectors in the industry such as special glues, metals and screws.

The Imported Commodities

The Malaysian furniture industry has to import RM24.3 billion of total import commodities for the local consumption in the economy. The Tea sector has the highest contribution among the imported commodities because the furniture industry provides a good place for drinking. It has created a total import of about RM1.68 billion. This is followed by the Radio and Television Broadcasting (590 million), Household Machinery (RM476 million), Animal Feeds (RM447 million), and Radio, TV and Communication Equipment (RM430 million) sectors (Table 4.6).

The furniture industry has created import of goods worth RM13.2 billion initial effect, RM4.3 billion first-round (direct) effect, RM2.2 billion industrial support (indirect) effect and RM4.9 billion consumption-induced effect. The actual imported commodities impact is estimated at RM11.1 billion, which is normally called the flow-on effect.

Table 4.6: The Imported Commodities (RM)

Sector	IO Code	Initial Effect	First Round (Direct)	Industrial Support (Indirect)	Consumption - Induced	Total Multiplier	Rank	Flow-on
1	2	3	5	7	9	11	12	13
Tea	5	61,291,131	28,162,515	10,938,812	1,586,384,264	1,686,776,722	1	1,625,485,591
Radio and television broadcasting	83	11,682,664	38,909,264	37,955,833	501,758,340	590,306,101	2	578,623,437
Household machinery	56	429,891,251	30,177,608	7,744,441	9,126,919	476,942,220	3	47,050,969
Animal feeds	22	373,431,090	47,734,762	18,367,945	7,826,273	447,362,070	4	73,930,960
Radio, tv and communication equipment	57	367,421,469	43,020,155	11,988,588	8,397,579	430,827,791	5	63,406,323
Iron and steel	50	313,716,499	72,055,398	26,986,366	14,153,828	426,912,091	6	113,195,591
Other repair	86	85,367,153	61,443,780	20,930,449	248,391,427	416,132,609	7	330,765,656
Non-ferrous metal	51	331,378,130	53,328,977	18,669,490	3,861,898	407,238,495	8	75,860,365
Repair motor vehicles	85	215,935,968	35,547,229	16,354,103	129,879,391	397,716,692	9	181,780,724
Other electrical machinery	59	306,580,778	46,347,782	15,768,531	7,001,215	375,698,305	10	69,117,527
Structural metal products	53	244,488,239	60,566,048	22,780,381	35,606,663	363,441,330	11	118,953,092
Instruments and clocks	64	293,955,943	45,684,008	14,862,040	6,794,763	361,316,754	12	67,360,811
Electrical appliances and houseware	58	266,738,727	48,950,950	16,392,265	21,838,836	353,920,779	13	87,182,051
Motor vehicles	61	237,290,582	73,189,631	28,411,508	11,703,935	350,695,655	14	113,305,073
Ships and boats	80	256,662,633	36,975,500	13,850,407	37,849,479	345,338,018	15	88,675,365
Wearing apparel	29	222,553,684	72,757,959	28,844,431	9,908,430	334,064,504	16	111,510,620
Fixture	52	227,048,700	56,751,070	23,653,735	22,348,710	329,802,215	17	102,753,615
Footwear	31	197,837,036	86,650,742	28,881,968	35,771,824	329,141,570	18	131,304,534
Knitted fabrics	27	240,981,062	57,494,297	24,856,785	4,810,950	328,143,094	19	87,162,032
Tobacco	25	268,389,715	33,859,330	11,941,041	11,370,484	325,560,571	20	57,170,666
Cycles and motorcycles	62	139,916,072	88,679,765	81,047,308	15,712,226	325,365,370	21	185,439,298
Yarns and cloth	26	217,611,981	63,343,136	28,436,532	14,980,261	324,371,910	22	106,759,929
Soft drinks	24	202,268,866	74,622,281	36,841,619	9,272,809	322,995,665	23	120,736,709
Leather products	30	153,300,399	84,617,671	45,931,124	39,097,573	322,946,767	24	169,646,369
Other textiles	28	233,553,180	52,675,213	22,006,500	13,550,113	321,785,007	25	88,231,827
Other manufacturing products	65	198,584,641	79,975,010	28,488,458	12,969,546	320,017,655	26	121,433,014
Other metal products	54	208,919,738	64,832,091	24,437,000	13,306,751	311,495,579	27	102,575,841
Preserved fruits and vegetables	14	207,784,880	50,098,321	36,393,681	17,198,052	311,474,934	28	103,690,055
Confectionery	19	202,586,676	60,603,584	31,224,256	16,691,933	311,106,449	29	108,519,773
Plastic products	45	226,221,412	40,244,944	18,155,863	13,604,542	308,226,761	30	72,005,349
Others		6,295,392,439	2,664,256,714	1,543,387,266	1,607,945,954	12,110,982,363		5,815,589,924
Total		13,248,772,728	4,333,555,735	2,296,548,716	4,489,118,970	24,367,996,149		11,119,223,420

The Commodities Taxes (Imported)

The primary quadrant can also determine the total amount of taxes that can be collected from the imported goods. Based on the analysis, the government is expected to collect taxes from imported goods at about RM403 million. The Tobacco sector is seen to be the highest tax payer to the government revenue, which amounts to RM67.3 million. It is followed by the Wine and Spirits sector (RM31.0 million), the Tea sector (RM25.5 million), the Repair of Motor Vehicles sector (RM18.7), the Other Repairs sector (RM10.5), the Motor Vehicles sector (RM9.5) and the rest of the top 30 sectors as in Table 4.7. These sectors are important in generating revenue for the Malaysian Government.

The total initial effect is estimated at RM254.3 billion, the total first-round (direct) effect at RM55.3 million, the total industrial support (indirect) effect at RM255.59 million and the consumption-induced effect at RM68.0 million. The total flow-on effect of the commodities taxes (imported) is estimated at about RM148.8 million.

Table 4.7: The Commodities Taxes (Imported), RM

Sector	I-O code	Initial effect	First round (direct)	Industrial support (indirect)	Consumption-induced	Total effect	Rank	Flow-on
1	2	3	4	5	6	7	8	9
Tobacco	25	63,706,616	3,223,775	274,643	172,669	67,377,703	1	3,671,087
Wine and spirits	23	25,215,260	4,551,947	1,090,440	200,821	31,058,469	2	5,843,209
Tea	5	748,857	664,399	149,521	24,034,106	25,596,883	3	24,848,026
Repair of motor vehicles	85	16,026,908	513,001	203,949	1,967,547	18,711,406	4	2,684,498
Other repairs	86	5,784,401	778,886	247,116	3,763,051	10,573,455	5	4,789,054
Fixtures	52	8,394,451	653,764	254,624	338,456	9,641,294	6	1,246,843
Motor vehicles	61	7,249,583	1,611,574	489,854	177,674	9,528,684	7	2,279,102
Radio and television broadcasting	83	204,575	516,755	462,327	7,601,802	8,785,458	8	8,580,883
Cycles and motorcycles	62	2,396,091	1,562,151	1,373,217	238,358	5,569,817	9	3,173,726
Water	67	3,417,088	1,037,263	324,067	577,439	5,355,858	10	1,938,769
Radio, TV and communication equipment	57	4,593,238	496,735	134,506	127,625	5,352,104	11	758,866
Other electrical machinery	59	4,368,018	498,612	168,289	105,728	5,140,647	12	772,630
Electrical appliances and houseware	58	3,821,859	513,001	180,802	330,948	4,846,610	13	1,024,751
Instruments and clocks	64	4,052,709	506,745	165,161	103,226	4,827,842	14	775,132
Soft drinks	24	3,310,735	836,442	408,524	140,763	4,696,463	15	1,385,729
Metal ore	10	3,246,297	735,093	335,953	302,796	4,620,139	16	1,373,842
Footwear	31	2,945,378	646,256	296,540	541,779	4,429,953	17	1,484,575
Transport	71	2,816,502	895,875	323,441	380,372	4,416,190	18	1,599,688
Recycling	87	3,260,686	536,149	279,648	165,787	4,242,270	19	961,584
Furniture	34	2,529,972	888,368	362,229	448,563	4,229,132	20	1,699,160
Other metal products	54	3,127,430	589,951	226,471	201,447	4,145,300	21	1,017,869
Household machinery	56	3,580,373	295,288	91,339	138,260	4,105,261	22	524,888
Ice	20	1,996,325	514,252	251,496	1,249,346	4,011,419	23	2,015,094
Other textiles	28	3,029,210	496,735	220,215	205,200	3,951,360	24	922,151
Stone, clay and sand quarrying	11	2,760,197	550,538	211,457	237,732	3,759,923	25	999,727
Leather products	30	1,895,602	900,880	350,342	592,454	3,739,278	26	1,843,676
Plastic products	45	2,900,334	389,756	193,314	205,826	3,689,229	27	788,896
Knitted fabrics	27	2,723,911	576,188	235,855	73,197	3,609,151	28	885,240
Other manufacturing products	65	2,413,608	725,709	272,766	196,442	3,608,526	29	1,194,917
Printed products	36	2,045,123	726,960	310,929	482,972	3,565,984	30	1,520,861
Others		59,751,502	27,927,910	15,708,472	22,707,185	126,095,069		66,343,567

The Commodities Taxes (Domestic)

The government could also collect taxes from the local (domestic) commodities due to an increase in furniture production. The analysis shows that a total of RM845 million of revenue could be collected by the government. The Tea sector is the highest tax payer among the domestic commodities,

contributing the equivalent of RM75.4 million. It is followed by the Real Estate sector (RM55.5 million), the Radio, TV and Communication Equipment sector (RM41.3 million), Motor Vehicles sector (RM34.3 million), the Other Repairs sector (RM30.0 million), the Entertainment sector (RM24.6 million) and the rest of the first 30 sectors as given in Table 4.8.

The total initial effect of the commodities taxes (domestic) is estimated at about RM406.0 million; it is RM151.0 million for the total first-round (direct) effect, RM81.8 million for the total industrial support (indirect) effect and RM206.8 million for the total consumption-induced effect. The total flow-on effect of the commodities taxes (domestic) is estimated at about RM439.8 million. This implies that the government is earning more than double through the domestic commodities taxes as compared with the imported commodities taxes.

Table 4.8: The Commodities Taxes (Domestic), RM

Sector	I.O code	Initial effect	First round (direct)	Industrial support (indirect)	Consumption induced	Total effect	Rank	Flow-on
1	2	3	4	5	6	7	8	9
Tea	5	544,282	1,246,843	511,750	73,114,558	75,417,432	1	74,873,151
Real estate	76	44,841,114	8,779,202	2,387,958	751,359	56,559,633	2	11,918,519
Radio and television broadcasting	83	7,683,131	8,321,880	2,182,132	23,125,093	41,312,237	3	33,629,105
Motor vehicles	61	26,569,708	5,523,521	1,721,682	539,277	34,354,189	4	7,784,480
Other repairs	86	16,665,032	1,151,125	737,596	11,447,434	30,001,186	5	13,336,154
Entertainment	82	14,721,258	6,711,557	2,228,427	954,683	24,615,925	6	9,894,667
Confectionery	19	17,203,683	2,961,644	1,135,484	769,502	22,070,313	7	4,866,630
Other public administration	92	12,509,722	2,585,026	1,045,396	3,706,746	19,846,890	8	7,337,168
Processed rubber	43	14,299,596	3,345,769	1,369,463	789,521	19,804,349	9	5,504,753
Public administration	89	11,941,041	3,523,442	1,274,996	3,053,608	19,793,088	10	7,862,046
Recreation	84	11,924,150	1,674,761	795,152	1,314,409	15,708,472	11	3,784,322
Footwear	31	9,159,574	2,036,990	1,034,761	1,648,486	13,879,810	12	4,720,237
Other private services	88	6,625,223	4,242,895	1,899,356	518,006	13,285,480	13	6,660,257
Other financial services	74	6,294,900	3,123,677	1,250,597	2,162,738	12,831,912	14	6,537,012
Private non-profit services	81	6,878,595	2,626,316	1,042,894	2,156,482	12,704,287	15	5,825,692
Communication	72	9,196,485	1,919,375	718,827	670,655	12,505,343	16	3,308,858
Repair of motor vehicles	85	2,949,131	1,951,281	828,935	5,985,848	11,715,196	17	8,766,064
Ice	20	5,752,495	1,327,547	793,275	3,800,588	11,673,905	18	5,921,410
Banking services	73	6,962,427	2,247,821	660,020	778,260	10,648,529	19	3,686,101
Public order	90	4,222,250	1,164,262	564,927	4,591,986	10,543,426	20	6,321,176
Printed products	36	6,277,393	1,518,984	887,117	1,467,684	10,151,188	21	3,873,785
Buildings and constructions	68	4,844,733	2,058,261	1,088,564	1,439,531	9,431,089	22	4,586,356
Rubber products	44	6,299,279	1,487,078	738,221	542,405	9,066,983	23	2,767,704
Wholesale and retail trade	69	5,020,530	1,989,444	681,291	1,008,485	8,699,750	24	3,679,220
Other foods	21	5,093,101	1,534,624	1,050,401	752,610	8,430,737	25	3,337,636
Other manufacturing products	65	5,225,731	1,444,536	830,186	598,084	8,098,537	26	2,872,807
Furniture	34	4,061,468	1,696,658	932,161	1,364,458	8,054,744	27	3,993,276
Cycles and motorcycles	62	1,546,388	2,628,193	2,976,033	723,832	7,876,445	28	6,328,057
Paints and lacquers	38	3,861,272	2,065,143	1,201,799	717,576	7,845,790	29	3,984,518
Health	80	3,647,313	1,181,154	556,168	2,458,652	7,843,288	30	4,195,974
Others		123,424,961	67,029,863	46,701,877	53,942,076	291,098,777		167,673,816
Total		406,047,957	151,098,873	81,827,445	206,894,635	845,868,909		439,820,953

The Total Value Added

With the same primary quadrant, we can also estimate the total amount of value added that could be earned from the furniture industry using rubberwood as raw material. From the analysis, the Malaysian Government is expected to generate the total value added estimated at about RM47.94 billion. The Tea sector seems to be the highest value-added contributor to the government revenue, which amounts to RM4.49 billion. It is followed by the

Radio and Television Broadcasting sector (RM1.77 billion), the Other Repairs sector (RM1.0 billion), the Public Order sector (RM794.5 million), the Education sector (RM738.0 million), the Ice sector (RM711.6 million) and the rest of the top 30 sectors as in Table 4.9. These sectors are important in generating revenue for the Malaysian Government, ranking from top to bottom.

The total initial effect of the value added is estimated at about RM22.4 billion; it is RM9.2 billion for the total first-round (direct) effect, RM4.99 billion for the total industrial support (indirect) effect and RM11.23 billion for the total consumption-induced effect. The total flow-on effect of the value added is about RM26.5 billion. Comparing with the information from Table 4.6, this implies that for every RM1 the government pays for the imported commodities for the furniture industry, the government is expected to earn back RM1.96. Using this crude analysis by considering the taxes collected from the (imported and domestic) commodities, the furniture industry is generating good revenue for the Malaysian Government.

Table 4.9: The Total Value Added (RM)

Sector	I-O code	Initial effect	First round (direct)	Industrial support (indirect)	Consumption - induced	Total effect	Rank	Flow-on
1	2	3	4	5	6	7	8	9
Tea	5	459,069,133	39,362,207	22,923,646	3,971,678,433	4,493,033,419	1	4,033,964,286
Radio and television broadcasting	83	211,609,867	222,985,365	83,088,677	1,256,172,273	1,773,856,173	2	1,562,246,306
Other repairs	86	318,644,439	77,191,666	36,670,827	621,862,556	1,054,369,488	3	735,725,049
Public order	90	466,409,429	60,351,068	28,313,287	249,448,710	794,522,494	4	326,113,065
Education	79	476,681,340	40,834,270	20,701,475	199,854,006	738,071,091	5	261,389,751
Ice	20	305,290,142	142,275,252	57,576,877	206,472,973	711,615,244	6	406,325,102
Other public administration	92	342,773,012	89,427,370	38,481,346	201,348,691	672,030,320	7	329,257,308
Repair of motor vehicles	85	210,939,837	86,066,587	38,294,288	325,159,554	660,460,266	8	449,520,429
Coconut	4	593,187,040	6,786,507	4,665,183	54,217,345	658,858,076	9	65,671,035
Other financial services	74	369,188,820	119,505,506	41,428,601	117,502,299	647,625,226	10	278,436,406
Oil palm primary products	3	465,185,108	42,662,306	34,377,336	97,464,597	639,689,348	11	174,504,240
Public administration	89	323,182,623	95,270,931	44,076,187	165,876,435	629,406,176	12	306,223,554
Ownership of dwellings	77	591,826,213	2,991,047	2,566,257	1,181,154	598,566,671	13	6,738,458
Banking services	73	493,505,903	45,575,777	15,015,920	42,283,185	596,380,786	14	102,874,883
Agriculture products, other	1	445,029,792	59,668,296	28,174,401	62,620,555	595,493,043	15	150,463,252
Insurance	75	398,369,205	94,177,010	32,464,217	65,617,233	590,627,665	16	192,258,460
Wholesale and retail trade	69	455,866,629	48,177,069	23,683,138	54,797,912	582,524,748	17	126,868,119
Private non-profit services	81	330,160,690	92,414,038	42,255,659	117,148,203	581,978,590	18	251,817,900
Water	67	313,622,032	114,989,219	53,840,727	95,423,228	577,875,205	19	264,253,174
Recreation	84	370,289,271	90,016,070	41,583,752	71,408,516	573,297,609	20	203,006,338
Entertainment	82	303,644,784	147,740,592	57,887,806	51,847,530	561,120,712	21	257,475,928
Fishery, etc.	8	355,256,459	100,122,194	75,404,920	26,865,623	557,649,195	22	202,392,737
Rubber primary products	2	382,727,047	87,661,895	38,142,265	44,506,608	553,037,815	23	170,310,768
Forestry and logging products	7	461,352,614	40,710,399	21,982,727	19,375,179	543,420,919	24	82,068,305
Crude petrol, natural gas and coal	9	469,952,891	44,768,739	13,895,451	14,708,745	543,325,826	25	73,372,935
Health	80	322,758,458	60,798,775	24,777,332	133,534,838	541,869,403	26	219,110,945
Real estate	76	340,902,435	108,573,576	50,096,444	40,802,989	540,375,444	27	199,473,009
Electricity and gas	66	396,813,935	76,156,905	40,691,005	23,315,279	536,977,124	28	140,163,189
Sawmill products	32	203,493,812	228,868,603	56,012,224	47,312,474	535,687,113	29	332,193,301
Oils and fats	16	140,688,702	148,526,359	204,250,176	38,123,496	531,588,734	30	390,900,032
Others		10,947,449,348	6,542,032,780	3,647,608,068	2,746,789,849	23,883,880,045		12,936,430,697
Total		11,117,960,311	6,867,286,279	3,720,447,357	2,820,909,763	24,326,605,710		13,208,645,399

Summary of Total Primary Inputs for the Furniture Industry

From the analysis of total primary inputs, rubberwood is a very important raw material in making furniture. However, making a complete set of furniture requires other raw materials as well such as glues, resins, hardeners, fiberglass, steel and screws. Some of the raw materials are not available in the local market and therefore the furniture industry needs to import from abroad. Table 4.10 gives the total initial effect of imported commodities in the

furniture sector estimated at RM13.2 billion, the total first-round (direct) effect at RM4.3 billion, the total industrial support (indirect) effect at RM2.2 billion and the total consumption-induced effect at RM4.4 billion. The total primary input for the furniture sector from the import commodities is valued at RM24.4 billion; however, if this total primary input value is less the total initial effect value, it is equal to the total value of the total flow-on effect for importing goods (Table 4.10).

Based on the total value of the imported commodities, the government has imposed taxes which provide revenue. The government is expected to collect taxes of about RM403.2 million through all goods imported for making furniture. This amount of taxes actually comes from the total initial effect of RM254.3 million, the total first-round effect of RM55.3 million, the total industrial support effect of RM25.5 million and the total consumption-induced effect of RM68.0 million. The total flow-on effect for the imported commodities is estimated at RM148.9 million (Table 4.10).

The government is collecting taxes not only from the total imported commodities but from the domestic commodities as well. In the Furniture sector, the government is expected to collect taxes on the domestic commodities estimated at RM845.9 million, which is over twofold compared with the imported commodities. Out of this total collected, RM406.0 million comes from the total initial effect, RM151.0 million from the total first-round (direct) effect, RM81.8 million from the total industrial support effect and RM206.8 million from the total consumption-induced effect, while the total flow-on effect is estimated RM439.8 million (Table 4.10).

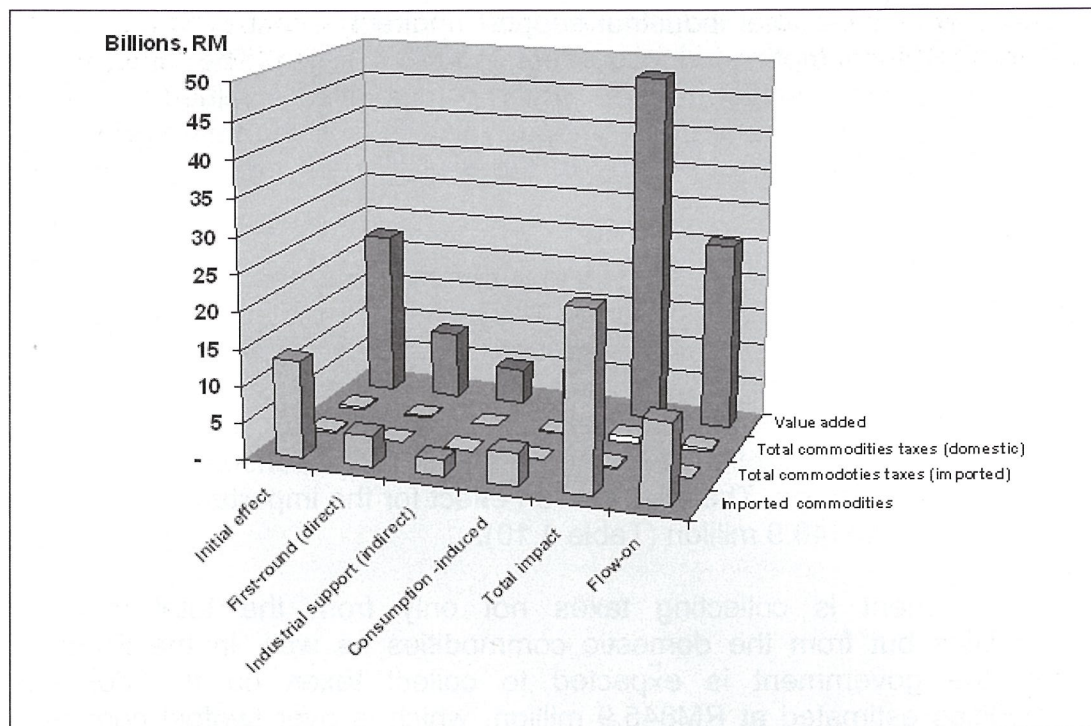
The total flow-on effect of the imported commodities taxes (RM149.0 million) plus the domestic commodities taxes (RM439.8 million) amount to RM588.8 million. These taxes are revenue for the government.

Table 4.10: Summary of the Total Primary Inputs for the Furniture Sector

Sector	Initial effect	First-round (direct)	Industrial support (indirect)	Consumption - induced	Total impact	Flow-on
1	2	3	4	5	6	7
Imported commodities	13,248,772,728	4,333,555,735	2,296,548,716	4,489,118,970	24,367,996,149	11,119,223,420
Total commodities taxes (imported)	254,312,837	55,360,962	25,597,509	68,009,570	403,280,878	148,968,041
Total commodities taxes (domestic)	406,047,957	151,098,873	81,827,445	206,894,635	845,868,909	439,820,953
Value added	22,436,383,974	9,272,945,867	4,993,769,510	11,238,840,285	47,941,939,637	25,505,555,663

It is good to note that the total value added is actually revenue for the government. The Furniture sector is expected to generate about RM47.9 billion for the Malaysian economy whereby RM22.4 billion is from the total initial effect, RM9.3 billion from the total first-round (direct) effect, RM5.0 billion from the total industrial effect and RM11.2 billion from the total consumption-induced effect. The total flow-on effect is estimated at RM25.5 billion (Table 4.10 and Figure 4.3).

Figure 4.3: Summary of Primary Inputs for Furniture



Generally, for every RM1 tax the furniture sector pays, it is getting back RM1.96 in the form of value added, which implies that the furniture sector is very viable and is good business. On top of that, the government is expected to earn extra revenue through the imported and domestic commodities taxes amounting to RM1,249.2 million (imported commodities taxes RM403.3 million and domestic commodities taxes RM845.9 million). The total value added plus all taxes is estimated at about RM48.82 billion, which is the total government revenue from this sector. If the total government revenue is less than the total amount of the taxes from imported commodities comes to RM24.46 billion, implying that the furniture industry generates economic growth for Malaysia.

Conclusion

The primary input quadrant in the input-output analysis actually lists the inputs into each intermediate sector which originate outside the production system, ie they are not purchased from firms within the local economy. Sometimes termed the payment sector, it is normally represented by a number of rows which are conceptually the same as the income-earned side of the national accounts. In other words, the role of the primary inputs is twofold—within each column it illustrates the source of primary inputs by sector, and within each row the income earned by each primary factor of production from each production sector.

The analysis shows that rubberwood is the intermediate input of raw material supply for the furniture industry. This industry creates RM24.5 billion of total imported commodities and generates government total revenue through taxes

of RM403 million and RM846 million for imported and domestic commodities respectively. Other than that, it also generates total value added for the industry of RM47.9 billion which boosts the economic growth of Malaysia.

Description of Commodities in the Malaysian Economy

Row / column number	Malaysian Input–Output Table (92 sectors)
1	Agriculture products and others
2	Rubber primary products
3	Oil palm primary products
4	Coconut
5	Tea estates
6	Livestock, etc
7	Forestry & logging products
8	Fishery, etc
9	Crude petrol, natural gas & coal
10	Metal ore
11	Stone, clay & sand
12	Meat & meat products
13	Dairy products
14	Preserved fruit & vegetable
15	Preserved seafood
16	Oils and fats
17	Grain mill products
18	Bakery products
19	Confectionery
20	Ice
21	Other foods
22	Animal feeds
23	Wine and spirits
24	Beer, soft drinks
25	Tobacco
26	Yarn, cloth
27	Knitted fabrics
28	Other textiles
29	Wearing apparel
30	Leather industries
31	Footwear
32	Sawmill products
33	Other wooden products
34	Furniture & fixtures
35	Paper & board
36	Printing products
37	Industrial chemicals
38	Paints and lacquers
39	Drugs and medicines
40	Soap & cleaning preparation
41	Other chemical products

(Continued)

42	Petrol and coal products
43	Processed rubber
44	Rubber products
45	Plastic products
46	China and glass industries
47	Clay products
48	Cement, lime & plaster
49	Other non-metallic products
50	Iron and steel
51	Non-ferrous metal
52	Metal furniture and fixtures
53	Structural metal products
54	Other metal products
55	Industrial machinery
56	Household machinery
57	Radio, TV & com. equipment
58	Electrical appliances & houseware
59	Other electrical machinery
60	Ships and boats
61	Motor vehicles
62	Cycles, motorcycles
63	Other transport equipment
64	Instruments & clocks
65	Other products
66	Electricity and gas
67	Water
68	Buildings & constructions
69	Wholesale & retail trade
70	Hotels & restaurants
71	Transport
72	Communication
73	Banking services
74	Other financial services
75	Insurance
76	Real estate
77	Ownerships of dwellings
78	Business services
79	Education
80	Health
81	Private non-profit services
82	Entertainment
83	Radio & TV
84	Recreation
85	Repair of motor vehicles
86	Other repairs
87	Laundry & cleaning
88	Other private services

(Continued)

89	Public administration
90	Public order
91	Defense
92	Other public administration

Note: 92 sectors are from Malaysian Input–Output Table 1991 and 77 sectors are for this study.
Source: Department of Statistics, Malaysia (2002)

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

Introduction

The last four chapters enlightened readers about the cost of production for selected products, productivity and primary input content of the WFI. In Chapter 1, readers were made aware of reasons why an in-depth study with regard to productivity and cost of production of selected products is needed. As stressed in Technical Report I and again in this report, besides putting on record the remarkable performance of the WFI, the purpose of engaging in this small project was to build a comprehensive information system for sustainability of the WFI in Malaysia. To build a comprehensive data base, one needs to understand both the supply and the demand sides of the industry. In addition, it is necessary to understand the so-called 'behaviour' of the industry before better strategies or policies can be formulated.

Chapter 2 of this report discussed in detail the methodology used in collecting information on the WFI. Next, Chapter 3 revealed the findings from the various analyses conducted with information from a survey that was carried out through face-to-face interviews with wooden furniture manufacturers. Analyses were conducted on production and marketing, human resources, machinery and equipment, productivity and cost of production of selected furniture products. Using Input–Output tables for the year 2000, primary input content of the furniture industry was analysed in Chapter 4. The intention of that chapter was to disclose the importance of imported commodities in the production of furniture. Although the importation value of commodities of more than RM24.3 billion in 2000 was for the total furniture industry (ie the value included wooden and non-wooden furniture), the fact that furniture production involved substantial imported commodities should be of concern to us all.

Recall that Technical Report I was focused on the supply of and demand for rubberwood logs. Two approaches were used to estimate the future supply of and demand for rubberwood logs, namely conventional and econometric. For the conventional approach, data on areas replanted and newly planted under rubber together with estimation of volume per hectare of green rubberwood from the various field measurements were utilized. On the other hand, the econometric model developed for the study made use of time-series data to project both the supply of and demand for rubberwood logs. Information gathered through field measurements together with data on areas replanted and newly planted under rubber helped the team of researchers develop the Rubberwood Information System (RRIS).

Information collected on the WFI through the survey was used to develop another software called the Wooden Furniture Information System (WFIS). The third software program, a combination of RRIS and WFIS, formed the Comprehensive Information System (CIS). In addition, users' manuals were prepared for use with the three software programs. Having said that, to better appreciate the development of those systems and to understand the challenges and concerns related to the WFI, readers should read both technical reports concurrently.

Major Findings

The major findings derived from the various analyses conducted on production and marketing, human resources, machinery and equipment, productivity and cost of production of selected furniture products are highlighted in this section. Outcomes from the primary input content analyses emphasizing furniture and fixtures as an industry also are highlighted.

Before summarizing the major findings from the survey of 384 mills, let us look briefly at the classification of the industry and some important background information on mills, to better appreciate the findings from the analyses of the wooden furniture manufacturers.

Classification and Mill Background

Classification of the Industry

Based on the total workforce, of the 381 wooden furniture mills analysed, 258 (67.7%) were categorized as micro- and small enterprises. Micro- and small enterprises in this context refer to wooden furniture mills with fewer than 5 and between 5 and 50 employees respectively. Such a high percentage of micro- and small enterprises indirectly indicated the manufacturers' targeted market, productivity of labour and other related indicators of interest. At this juncture, it is important to note that 1,578 wooden furniture manufacturers or mills were visited. Of those 1,578 mills, only 643 were found to be still active in production.

From the perspective of annual sales turnover, it was found that micro- and small enterprises constituted 82.4% of the total population. In other words, from whatever perspective the WFI is considered, a majority of manufacturers still are categorized as micro- and small enterprises. Clearly, this finding is in line with the classifications made by Norchahaya (1998), Ratnasingam (2002) and Aseanresources.com (2008), although none all of the authors or sources really stated the criteria and classification used.

Company Background

With better infrastructure and support facilities, it is of no surprise that a majority of the wooden furniture mills were found in the Peninsula, instead of Sabah or Sarawak. It was also found that of the 381 mills analysed, 276 (72.4%) were owned by non-Bumiputras; 51 (13.4%) were owned by Bumiputras, and 23 (6%) were owned by foreigners. The low participation of Bumiputras in the WFI should be of interest to policy-makers when one considers that Bumiputras' having 30% equity in all business ventures is a target set under the Malaysian New Economic Policy (MNEP). Obviously, the 13.4% figure is way below the target of 30% for Bumiputras participation. Another interesting observation is with regard to the number of workers employed by wooden furniture mills. It was discovered that micro-enterprises seemed to employ the most Bumiputra workers, as compared with small enterprises. This finding could be another area of interest to policy-makers when one relates it to the issue of identification of jobs according to race.

Production and Marketing

Types of Furniture

The survey revealed that local manufacturers currently were producing 14 types of furniture, namely dining tables and chairs, living room furniture, wooden kitchen furniture, wooden bedroom furniture, parts and components, doors and door frames, and others. Of the 381 mills analysed, 171 (almost 45%) produced doors and door frames, which included doors for cupboards, cabinets and others. This was closely followed by wooden bedroom furniture (147 mills, equivalent to 38.6%) and wooden kitchen furniture (121 mills, equivalent to 31.8%). If one compared data on world import of wooden furniture by product group (1996–2001) published by the International Trade Centre UNCTAD/WTO and ITTO (2005), one would realize that wooden bedroom furniture was one of the most popular products demanded. Analyses conducted on the 381 mills also indicated that a majority of manufacturers (177 mills, equivalent to 46.5%) produced a single type of product for the market, whereas another 127 mills (33.3%) and 59 mills (15.5%) produced two and three types of furniture respectively.

Distribution of Types of Furniture by State

Distribution of types of furniture by state is of immense importance to most buyers. For instance, where can overseas buyers find out who are the producers of wooden bedroom furniture in Malaysia? A summary of the distribution of wooden furniture manufacturers by product, given in Table 3.12, would be useful information for overseas buyers. This particular table reveals that 21 and 16 mills in the states of Perak and Kedah are engaged in the production of wooden bedroom furniture. To get detailed information as to who those producers are and where they are located, buyers should refer to the Directory of Wooden Furniture

Manufacturers, Malaysia (2008), published as one of the outputs from the small project.

Market Orientation

Types of Market Orientation

Speaking of market orientation, analyses of the survey data reflected that 259 manufacturers made 100% of their products for the local market, whereas another 65 manufacturers produced 100% of their products for the export market (Table 5.1).

Table 5.1: Market Orientations by Number of Mills

Classification of main product	100% local market	Percentage over total number of mills surveyed	100% export market	Percentage over total number of mills surveyed
Dining tables and chairs	8	2.10	20	5.25
Living room furniture	5	1.31	2	0.52
Occasional furniture	12	3.15	0	0.00
Outdoor furniture	2	0.52	12	3.15
Upholstered furniture with wooden frames	2	0.52	2	0.52
Wooden office furniture	7	1.84	2	0.52
Wooden kitchen furniture	58	15.22	3	0.79
Wooden bedroom furniture	49	12.86	11	2.89
Wooden baby furniture	0	0.00	0	0.00
Custom-made furniture	7	1.84		0.00
Other products	11	2.89	6	1.57
Furniture for boats & yachts	0	0.00	1	0.26
Parts and components, (including ready-to-assemble [RTA] furniture)	12	3.15	4	1.05
Doors & door frames (including doors for cupboards, cabinet & others)	86	22.57	2	0.52
Total	259	67.98	65	17.06

Source: Actual survey, 2007

The 259 local and 65 export-oriented mills represented 67.98 and 17.06% of the total 381 mills surveyed in the small project. Table 3.14 in Chapter 3 also reveals that another 17 and 37 mills were local and export oriented. The term *oriented* means that the manufacturers sold more than 50% of whatever they produced to the particular market. Another three mills were found to have a mixed type of market. The small percentage of manufacturers exporting their wooden furniture overseas indirectly indicated to us that there is still room for other local producers to jump onto the bandwagon and venture into the international market. The next question of interest for policy-makers to consider is how to encourage local producers to also sell their products overseas.

Niche Market

Looking at the types of product from a different angle, one can see that the four groups of enterprises had their own niches. For instance, it was observed that, from the point of view of annual sales turnover, a majority of the medium-sized enterprises were engaged in producing other products, outdoor furniture, and dining tables and chairs (Table 3.13). On the other hand, the micro-enterprises were more involved in the production of wooden kitchen furniture, wooden bedroom furniture, and doors and door frames. The 37 larger enterprises, with sales of more than RM25 million, focused their production on wooden baby furniture, dining tables and chairs, and occasional furniture. There was one large enterprise in the survey, which produced furniture solely for boats and yachts. Table 5.2 indicates that a majority of the wooden furniture mills surveyed were engaged in producing doors and door frames (including doors for cupboards, cabinets and others). Ranking second and third were the mills engaged in producing wooden kitchen furniture and wooden bedroom furniture. Analyses based on market orientation disclosed that, of the 65 mills, 31 non-Bumiputra and 15 foreign-owned mills exported 100% of their products overseas. Only one Bumiputra manufacturer exported 100% of his products overseas. Because only one Bumiputra mill was involved with the export market, one can safely conclude that the Bumiputra manufacturers have a long way to go to catch up with the performance of non-Bumiputra manufacturers.

Table 5.2: Numbers of Mills Engaged in Producing Various Types of Wooden Furniture Products, Malaysia, 2007

Classification of main product	No. of mills engaged with such product	Percentage of total number of mills surveyed
Dining tables and chairs	35	9.2
Living room furniture	9	2.4
Occasional furniture	17	4.5
Outdoor furniture	16	4.2
Upholstered furniture with wooden frames	7	1.8
Wooden office furniture	14	3.7
Wooden kitchen furniture	66	17.3
Wooden bedroom furniture	65	17.1
Wooden baby furniture	2	0.5
Custom-made furniture	7	1.8
Other products	23	6.0
Furniture for boats & yachts	1	0.3
Parts and components (including ready-to assemble [RTA] furniture)	24	6.3
Doors & door frames (including doors for cupboards, cabinets & others)	95	24.9
Total	381	100.0

Source: Actual survey, 2007

Market Strategy

As pointed out in Chapter 3 of this report, the wooden furniture manufacturers had adopted four types of market strategy, namely product specialization, market specialization, full market coverage, and product and market specialization.

Analyses revealed that of the 381 mills, 165 adopted the market-specialization strategy, whereas another 122 mills applied the product-and-market-specialization strategy to capture their market share of the wooden furniture business. Market specialization refers to specialization in a single product, whereas product and market specialization refers to specialization in a particular product as well as a targeted market. Another 55 and 39 mills adopted the product-specialization and full-market-coverage strategies respectively. Articulating from the product-specialization point of view, it was discovered that dining tables and chairs, outdoor furniture, and furniture parts and components were the focus of the 55 manufacturers who had adopted this strategy.

Of the 55 manufacturers with a product-specialization strategy, 19 were large enterprises, another 19 were small enterprises, 16 were medium-sized enterprises, and 1 mill was a micro-enterprise. This categorization was based on annual sales turnover (Table 3.21). The different market strategies adopted by the various types of enterprises could be used as guidelines to formulate better policies and strategies for sustainable development of the WFI at both the national and international levels.

Product Design and Technology

As mentioned in Technical Report I, a majority of the wooden furniture mills surveyed indicated that they relied heavily on designs supplied by buyers and imported technology or fell under original equipment manufacturing (OEM). Of the 381 mills surveyed, 255 and 77 mills were categorized as OEM and own design manufacturing (ODM) respectively. Eight mills had their own brand manufacturing (OBM). The rest of the wooden furniture mills were equipped with mixed-design manufacturing. Clearly, to be on par with other successful world producers, local manufacturers have no choice but to switch to production lines based on OBM.

From the classification-of-mills point of view, analyses of the 381 mills revealed that 144 of the 255 mills relying on OEM were micro-enterprises, whereas 84, 14, and 13 mills were small, medium, and large enterprises respectively. Again this classification was based on annual sales turnover. In short, if the focus of the Government of Malaysia (GoM) is to push for OBM, micro- and small enterprises should be their main target.

With a substantial number of the wooden furniture manufacturers relying on OEM, it is not surprising that designs followed either a contract or buyers' desire or followed the market with the manufacturers' own designs. Analyses revealed that about 21.0% (80 mills) followed the market with their own designs and 37.3% (142 mills) followed the designs given by buyers or contracts. To capture the niche market, our concern should be with these 142 mills. The 142 mills that followed the designs given by buyers or contracts obviously had no designers attached to their production lines. Besides having no designers, half of the micro-enterprises in the study did not have a research and development team attached to the mills.

Human Resources

A total of 32,671 workers were engaged with the 381 mills analysed in this project. Of these workers, 23,192 (almost 71%) were direct labour force comprising both skilled and unskilled employees. Such a substantial number of labourers engaged on the production line indirectly indicates that the existing wooden furniture production is indeed labour intensive. Not only was the WFI found to be labour intensive, it was also found to employ many more foreign than

local workers on the production lines. A total of 17,655 foreigners compared with 15,016 locals were employed by the 381 mills analysed.

It was also observed that 290 of the mills' owners prepared their workforce through on-the-job training. The number of manufacturers who used an industrial training institute to train their workforce was minimal. Little is known about why manufacturers did not take advantage of the opportunity to send their workers to be trained at an industrial training institute.

Machinery and Equipment

Analyses indicated that a majority of machinery and equipment, especially new apparatus, came from Taiwan (43.8%), Japan (13.3%), Italy (11.7%) and Germany (6.8%). Old and reconditioned machinery and equipment came mainly from Japan (49.4%), Italy (11.5%) and China (9.4%). In this context, knowing the countries from which machinery and equipment were imported is not sufficient; types of machinery and equipment imported are equally important. In other words, future research on the WFI should also consider the types of machinery and equipment imported so as to help policy-makers devise policies that will support indigenous technology.

Of the 381 mills analysed, 292 (76.6%) did not use numeric control (NC) or computer numeric control (CNC) in their production. A majority of the 292 mills were micro- and small enterprises. Twenty-seven wooden furniture manufacturers had NC, 40 had CNC, and 22 had both NC and CNC. Based on the status of machinery used, the micro- and small enterprises are the ones that the GoM should focus on when considering modernization of production lines. Not using NC also means that most of the micro- and small enterprises were labour intensive.

Productivity

Productivity was another area of focus in this small project. As stressed in Chapter 3, depending on the purpose of measurement, productivity may be calculated in many different ways. In an effort to measure productivity, researchers involved with the small project used the following indicators:

Labour Coefficient

On the basis of the element of labour, the manufacturer of furniture for boats and yachts was found to have the lowest mean labour coefficient of 0.00234 per thousand ringgit Malaysia (RM) of output as compared with other wooden furniture manufacturers. This means that this particular manufacturer can generate RM1,000 of annual sales turnover by using 0.002 total labour or workforce. Nonetheless, the manufacturer of furniture for boats and yachts is not a good example to quote because only one such mill was covered in the survey.

The labour productivity coefficient is an alternative measure of labour productivity.

Excluding the manufacturer of furniture for boats and yachts left the wooden baby furniture manufacturers as the most efficient in utilization of labour in production (mean coefficient = 0.01586). In other words, the wooden baby furniture manufacturers used less workforce to come out with RM1,000 worth of annual sales turnover, or one might say that these manufacturers were able to use their workforce more productively in generating gross output. Following closely were the manufacturers of dining tables and chairs, and wooden office furniture. Manufacturers that were inefficient in utilization of labour were those involved in making doors and door frames, with a coefficient of 0.20038, and wooden kitchen furniture, with a coefficient of 0.16282. The overall mean labour coefficient, regardless of type of furniture, was 0.12323 (Table 3.48, Chapter 3).

From the perspective of classification of manufacturers and based on the total workforce, the large enterprises were found to be the most productive in comparison with the rest of the enterprises. The mean coefficient of labour recorded for the large enterprises was 0.02907, followed by the medium enterprises (coefficient of labour = 0.05282), micro-enterprises (coefficient of labour = 0.11754) and small enterprises (coefficient of labour = 0.18191). When the assessment was based on annual sales, the large enterprises still led the other three groups of enterprises in terms of coefficient of labour.

Partial Productivity Based on Single-factor Productivity

Results on partial productivity, namely, on single-factor productivity, are as follows:

a) Sales Per Employee

Table 5.3 indicates that, from the perspective of annual sales turnover, the large enterprises were the most efficient in terms of mean sales per employee (RM413,785) as compared with the other three sizes of enterprises. In other words, the large enterprises could generate a handsome profit for every employee hired. Following were the medium, small and micro-enterprises, in that order. Assessment of mean sales per employee based on the total workforce revealed that the medium enterprises were more productive than the large enterprises (Table 5.3)—that is, sales of RM189,000 for the medium enterprises compared with RM128,709 for the large enterprises. Both the small and micro-enterprises seemed to be generating lower mean sales per employee than the overall mean sales for the entire industry.

b) Sales Per Ringgit of Fixed Assets

On the basis of mean sales per ringgit of fixed assets, the large enterprises again recorded the highest value (RM36.63) as compared with the overall average of all classes of enterprises (RM7.74). This value was based on annual sales turnover. The least productive were the micro-enterprises, with a mean value of sales per ringgit of fixed assets of RM2.52 (Table 5.3).

Table 5.3: Mean Single-factor Productivity Values by Classification of Mills

Classification	Mean sales per employee (RM)	Mean sales per ringgit of fixed assets (RM)	Mean fixed assets per employee (RM)	Mean labour cost per employee (RM)	Mean sales value per labour (RM)
Micro-enterprises	26,559	3.17	36,654	1,286	19.02
	13,167	2.52	31,906	1,173	11.65
Small enterprises	57,562	4.94	38,024	1,135	53.89
	65,416	4.45	44,579	1,078	63.79
Medium enterprises	189,000	8.19	44,119	953	206.26
	205,885	20.71	49,403	975	201.79
Large enterprises	128,709	21.82	46,506	981	149.63
	413,785	36.63	59,064	1,027	479.07
Overall mean	82,644	7.74	40,079	1,112	86.99

Note: Figures in *italics* are based on total workforce (SMIDEC classification)

Figures in "shade" are based on annual sales turnover (SMIDEC classification)

Source: Actual survey, 2007

When looking at the same single-factor productivity from the workforce point of view, the large enterprises still dominated first place, with mean sales per ringgit of fixed assets of RM21.82 as compared with RM8.19, RM4.94 and RM3.17 for the medium, small and micro-enterprises correspondingly. The overall mean for all size classes was RM7.74.

c) Fixed Assets Per Employee

Analysis conducted on the means for fixed assets per employee, also based on annual sales turnover, indicated that the large enterprises still led the way. On the basis of total workforce, the productivities of fixed assets per employee for the large and medium enterprises were reasonably close (RM46,506 versus RM44,119). In short, both types of enterprises were productive in comparison with the small and micro-enterprises.

d) Labour Cost Per Employee

Table 5.3 indicates that the medium enterprises incurred the cheapest labour cost per employee, with a mean of RM975, as compared with the large enterprises (mean = RM1,027). These results were based on annual sales turnover. When analysing labour cost from the total workforce point of view, the medium enterprises again registered a much lower mean cost (RM954) than did the large enterprises, with a mean value of RM981. To put it simply, the medium enterprises were more competitive than the large enterprises in using their employees. The most inefficient in terms of labour cost per employee among the four classes were the micro-enterprises, which registered mean labour cost per employee of RM1,173 and RM1,286 based on annual sales and total workforce respectively. The mean for all four classes was RM1,112.

e) Sales Value Per Employee

Analysis of sales value per employee again indicated that the large enterprises realized the most sales, with a mean value of RM479, compared with an overall mean for the four classes of wooden furniture manufacturers of almost RM87. In other words, sales value per employee of the larger enterprises was 5.5 times higher than the overall mean for the four classes. The figure of RM87 was based on annual sales turnover. Recall that a majority of the large enterprises produced mainly dining tables and chairs (Table 3.13). Clearly, focusing on a few specialized products will ensure not only efficiency but also better sales in the long run. The medium and small enterprises individually registered means for sales value per employee of RM202 and RM64 respectively. On the other hand, analysis based on total workforce indicated that the medium enterprises generated the most sales value per employee. The mean sales value per employee for the medium enterprises was RM206 as compared with almost RM150 for the large enterprises. Following were the small and micro-enterprises, with mean sales values per employee of almost RM54 and RM19 respectively.

Single-factor Productivity by Main Type of Furniture Produced

Another interesting observation regarding the wooden furniture manufacturers is single-factor productivity by main type of furniture produced. Five of the indicators, namely (a) sales per employee, (b) sales per ringgit of fixed assets, (c) fixed assets per employee, (d) labour cost per employee and (e) sales value per labour cost, were assessed. For the purposes of this chapter, only sales per employee, labour cost per employee and sales value per labour cost will be highlighted. Readers interested in finding out more about the single-factor productivity for other types of furniture produced should read Chapter 3 of this technical report.

a) Sales Per Employee

Analysis based on sales per employee indicated that the manufacturer of furniture for boats and yachts recorded the highest mean sales per employee (RM427,672). This was followed closely by the manufacturers of occasional furniture (RM352,135), dining tables and chairs (RM169,953) and wooden bedroom furniture (RM109,512). The two types of furniture that generated the lowest sales per employee were doors and door frames (including doors for cupboards, cabinets, etc) and wooden kitchen furniture, with sales values of RM28,894 and RM25,171 respectively (Table 5.4). Obviously, manufacturers producing specialized products, such as furniture for boats and yachts, will generate better sales. Speaking of specialized furniture products, not many manufacturers are able to penetrate such a niche market. The only company manufacturing furniture for boats and yachts covered in the survey was owned by Americans. Results also indicated that producing furniture parts is not an attractive option from the standpoint of sales per employee.

b) Labour Cost Per Employee

The manufacturer of furniture for boats and yachts incurred the highest mean labour cost per employee as compared with the rest of the wooden furniture manufacturers (Table 5.4). This manufacturer not only was making a huge amount of sales but also had to pay a slightly higher cost for labour. A much higher labour cost per employee for specialized furniture for boats and yachts is to be expected as the workforce engaged in such an activity is considered highly skilled. Nonetheless, those manufacturers who were paying more or less equivalent mean labour cost per employee, although sales were low, definitely need to revisit the cost of labour incurred. All in all, the mean labour cost per employee ranged from a low of RM668 to a high of RM1,393. Table 5.4 also reveals that of the 14 types of manufacturers (classes of products), 10 were actually paying more than RM1,000 in cost of labour per employee.

Table 5.4: Selected Single-factor Productivity Values By Main Type of Furniture Produced

Classification of main product	Mean sales per employee (RM)	Mean labour cost per employee (RM)	Mean sales value per labour (RM)
Dining tables and chairs	169,953	1,070	190
Living room furniture	65,969	1,029	59
Occasional furniture	352,135	987	390
Outdoor furniture	56,040	749	78
Upholstered furniture with wooden frames	96,646	927	97
Wooden office furniture	84,319	1,038	75
Wooden kitchen furniture	25,172	1,357	25
Wooden bedroom furniture	109,512	1,110	113
Wooden baby furniture	64,497	668	97
Custom-made furniture	55,433	1,018	51
Other products	80,899	1,035	91
Furniture for boats & yachts	427,673	1,393	954
Parts and components (including ready-to assemble [RTA] furniture)	97,723	1,012	97
Doors & door frames (including doors for cupboards, cabinets & others)	28,894	1,125	27

Source: Actual survey, 2007

c) Sales Value Per Labour Cost

Both the manufacturers of furniture for boats and yachts and occasional furniture seemed to generate higher mean sales value per labour cost (Table 5.4) than did manufacturers of other types of furniture. Table 5.4 also reveals which types of furniture products generated the most sales per employee and the most costly product based on payment to labour. In other words, Table 5.4 indicates whether payment to labour or labour cost per employee was commensurate with sales generated by products marketed. For example, manufacturers of doors and door frames had to pay a mean cost of labour of RM1,125, whereas at the same time they had a mean sales value per employee cost of only RM27. In this context, can the manufacturers of doors and door frames sustain their business when in reality they are collecting the lowest amount of mean sales value as compared with the rest of the wooden furniture manufacturers?

Partial Productivity Based on Value added

The following sections reveal results from the analyses of partial productivity based on value added per employee, value added per ringgit of fixed assets, value-added-to-sales ratio, and value added per ringgit of labour cost.

a) Value Added Per Employee

Analysis revealed that the medium enterprises were more productive than other manufacturers in terms of total workforce (RM25,090) and annual sales turnover (RM59,983) (Table 5.5). Because value added per employee represents the total sales divided by the number of employees, the higher the value added, the more productive is the enterprise. The least productive among the four classes were the micro-enterprises, with a mean value added per employee lower than the overall average of RM15,577 for both total workforce and annual sales turnover.

b) Value Added Per Ringgit Of Fixed Assets

From the perspective of fixed assets, the large enterprises registered the highest means for both total workforce and annual sales turnover (Table 5.5). To say it differently, the large enterprises were efficient in using their fixed assets or capital to generate higher value added.

Table 5.5: Value-added Productivity Values by Classification of Mills

Classification	Mean value added per employee (RM)	Mean value added per ringgit of fixed assets (RM)	Mean value-added-to-sales ratio (%)	Mean value added per ringgit of labour cost (RM)
Micro-enterprises	<i>4,530</i>	<i>0.56</i>	<i>0.19</i>	<i>3.57</i>
	2,645	0.48	0.19	2.43
Small enterprises	<i>15,581</i>	<i>0.91</i>	<i>0.21</i>	<i>14.48</i>
	13,924	0.77	0.21	14.26
Medium enterprises	<i>25,090</i>	<i>1.10</i>	<i>0.20</i>	<i>29.34</i>
	59,983	4.09	0.23	56.35
Large enterprises	<i>20,061</i>	<i>4.21</i>	<i>0.17</i>	<i>23.40</i>
	53,097	6.17	0.15	61.73
Overall mean	15,577	1.38	0.2	16.09

Note: Figures in *italics* are based on total workforce (SMIDEC classification)

Figures in "shade" are based on annual sales turnover (SMIDEC classification)

Source: Actual survey, 2007

c) Value-Added-To-Sales Ratio And Value Added Per Ringgit of Labour Cost

A different situation exists when one looks at the mean value-added-to-sales ratio. Table 5.5 indicates that the large enterprises had the lowest percentage—much lower than the overall mean average of 20%. For the mean of value added per ringgit of labour cost, both the large and medium enterprises registered higher values than the overall mean average. On the other hand, both the micro- and small enterprises registered lower means of value added per ringgit of labour cost. What this indicates is that the means of value added generated were lower for every ringgit paid for the cost of labour.

Partial Productivity Based on Value Added by Main Type of Furniture Produced

Another way of looking at partial productivity based on value added is with regard to the type of furniture product produced. In this context, three out of four measurements of partial productivity, ie (a) value added per employee, (b) value-added-to-sales ratio and (c) value added per ringgit of labour cost, are emphasized.

a) Value Added Per Employee

Clearly, manufacturers producing occasional furniture and furniture for boats and yachts managed to generate higher means of value added (RM68,679 and RM64,151 respectively) per employee (Table 5.6). This indicates that manufacturers of those two products were more productive and efficient than others. In other words, if one wants to get more value added for every employee, occasional furniture and furniture for boats and yachts should be the targeted products. Occasional furniture and furniture for boats and yachts are rarely demanded and are produced especially for a niche market. This is followed by parts and components and dining tables and chairs. The lowest mean value added generated per employee was associated with the production of doors and door frames.

b) Value-Added to-Sales Ratio

Analysis based on mean value-added-to-sales ratio indicated that the figures for wooden office furniture, custom-made furniture, occasional furniture, parts and components, outdoor furniture, doors and door frames, and dining tables and chairs ranged from a low of 20% to a high of 28%. The mean value-added-to-sales ratios for seven products were on a par with the overall mean for the four classes of enterprises, also at 20%.

c) Value Added Per Ringgit of Labour Cost

Manufacturers of occasional furniture and furniture for boats and yachts seemed to be generating a more attractive mean value added for every ringgit spent on labour cost. The least attractive products in this regard were doors and door frames, wooden kitchen furniture and living room furniture, with mean value added per ringgit of labour cost of RM4.83, RM5.39 and RM8.52 respectively.

Table 5.6: Mean Value-added Productivity Values by Main Type of Furniture Produced

Classification of main product	Mean value added per employee (RM)	Mean value-added-to-sales ratio (%)	Mean value added per ringgit of labour cost (RM)
Dining tables and chairs	28,855	0.20	34.29
Living room furniture	8,827	0.18	8.52
Occasional furniture	68,679	0.24	69.54
Outdoor furniture	12,475	0.21	17.35
Upholstered furniture with wooden frames	11,223	0.15	12.11
Wooden office furniture	25,742	0.28	20.50
Wooden kitchen furniture	5,329	0.19	5.39
Wooden bedroom furniture	14,310	0.19	14.75
Wooden baby furniture	6,381	0.11	9.25
Custom-made furniture	16,324	0.27	15.01
Other products	15,339	0.15	18.25
Furniture for boats & yachts	64,151	0.15	46.03
Parts and components (including ready-to assemble [RTA] furniture)	37,180	0.24	32.41
Doors & door frames (including doors for cupboards, cabinet & others)	4,828	0.20	4.83

Source: Actual survey, 2007

Costs of Production for Selected Products

Analysis conducted on selected products revealed that wooden kitchen furniture generated the highest manufacturing profit (14.7%) as compared with the other 11 products. Following closely were doors and door frames, occasional furniture, and wooden bedroom furniture, with manufacturing profits of 13.4, 13.3 and 13.2% respectively (Table 5.7). Furniture for boats and yachts, wooden baby furniture and other furniture were not chosen for the cost-of-production analysis

because too few wooden furniture mills were engaged in making such products, and manufacturers of these products did not provide complete information. Considering the manufacturing profit made by all of the wooden furniture manufacturers, which ranged from a low of 6.8% to a high of 14.7% (Table 3.63 in Chapter 3), it is hard to believe that they were not making a sufficient profit from the products they produced.

It is generally understood that any business needs to make at least a 30% profit margin to survive. On one hand, the close range of manufacturing profit percentages for selected products might, in fact, reflect the real situation faced by the manufacturers. On the other hand, if the reported low profit margins are accurate, then the wooden furniture manufacturers might have problems sustaining their businesses. As stated in Chapter 3, the low manufacturing profits or profit margins for most manufacturers in this small study were quite close to those in studies by Gardino (2004) and Rohana et al. (2008), in which profit margins for publicly-listed companies were reported to be between 4 and 8% and 0.5 and 17.5% respectively.

Table 5.7: Mean Costs of Production for Top Five Selected Products (in %)

Fixed / variable cost	Occasional furniture	Upholstered furniture with frame	Wooden kitchen furniture	Wooden bedroom furniture	Doors and door frames
Raw material	52.7	53.0	55.0	48.7	48.7
Labour	12.1	21.2	11.3	16.5	18.4
Operational	8.4	5.7	8.0	8.3	9.4
Marketing	7.0	7.6	4.3	6.7	4.2
Mill overhead	6.5	4.4	4.6	6.6	5.8
Manufacturing Profit	13.3	8.2	14.7	13.2	13.4
Total	100.0	100.0	100.0	100.0	100.0

Source: Actual survey, 2007

Raw Materials

Between 50 and 55% of the total cost of production of the top five selected products was spent on raw materials, which included round logs, sawn timber, veneer, plywood, laminated boards and other finishing materials. To say it differently, raw materials in whatever means they come must be made available for the production of the various products listed.

Table 3.63 in Chapter 3 also reveals that among the various raw materials listed above, sawn timber was a major component, followed by laminated boards and plywood. Finishing materials seem to be an important component in the production of upholstered furniture with wooden frames registering 30.6% of the total raw material consumed.

Labour Cost

The percentage cost of labour to total cost of production for the top five products ranged from a low of 11.3% (wooden kitchen furniture) to a high of 21.2% (upholstered furniture with wooden frame). On average, the cost of labour registered by the 11 products was 17.1%. Table 5.7 also indicates that the cost of labour was next to manufacturing profit when looking at the overall cost of production for the top five products listed above. Because of the high percentage cost of labour, every effort must be made to use this input of production more efficiently.

Operational Cost

In general, operational cost made up between 5.7 and 9.4% of the total cost of production for the top five furniture products (Table 5.7). Important inputs under operational cost include power, water, and fuel and lubricants. All in all, for the 11 products analysed in Chapter 3, operational cost for power contributed 3.7% to the total cost, whereas fuel and lubricants, and water made up 1.5 and 1.3% of the total cost individually.

Marketing Cost

Marketing cost for the top five products ranged from a low of 4.3% to a high of 7.6% of the total cost of production (Table 5.7). Marketing cost in this context refers to packaging material and labour cost involved in packing the end-products. As stated in Chapter 3, the marketing cost for outdoor furniture was 12.4% of the total cost—higher than for the other selected products. The higher marketing cost for outdoor furniture is justified as the target market is, in fact, international.

Mill Overhead

Regardless of products produced, the mill overhead is also an important component in the cost of production. For the top five products listed above, the mill overhead was reasonably high, accounting for between 4.4 and 6.6% of the total cost of production. On average, for the 11 products analysed, mill overhead was 5.8% of the total cost of production.

Costs of Production by Classification of Mills

There were no substantial differences when manufacturing profit by classification of manufacturers was analysed based on total workforce and annual sales (Tables 5.8 and 5.9). The manufacturing profit based on total workforce ranged from 8.4 to 16.0%, whereas based on annual sales turnover the percentage ranged from 7.4 to 14.7%. Raw materials still constituted more than 50% of the total cost of production for all four classes of manufacturers. In fact, the large and

medium enterprises seemed to have a slightly higher percentage (over 50%) as compared with the micro- and small enterprises.

The mean percentage cost of labour was slightly lower for the large enterprises than for the other three classes based on total workforce (14.8%) and annual sales (12.8%). Based on total workforce, the small enterprises had the highest mean percentage cost of labour but based on annual sales they had the lowest mill overhead while registering the highest operational cost. The medium and large enterprises registered much higher marketing costs compared with the other two classes of manufacturers based on the total workforce. However, looking at the marketing cost from the standpoint of annual sales turnover, the micro- enterprises showed such cost that was vastly less than the rest.

Table 5.8: Mean Percentage Costs of Production by Classification of Mills Based on Total Workforce

Fixed/variable cost	Micro-enterprises	Small enterprises	Medium enterprises	Large enterprises
Raw material	50.7	50.2	53.6	56.4
Labour	15.8	16.8	16.2	14.8
Operational	6.2	9.4	7.5	6.5
Marketing	4.3	4.5	8.4	7.6
Mill overhead	7.0	5.5	5.8	6.8
Manufacturing profit	16.0	13.6	8.4	7.9
Total	100.0	100.0	100.0	100.0

Source: Actual survey, 2007

Table 5.9: Mean Percentage Costs of Production by Classification of Mills Based on Annual Sales

Fixed/variable cost	Micro-enterprises	Small enterprises	Medium enterprises	Large enterprises
Raw material	49.7	50.8	55.1	60.2
Labour	17.8	15.6	16.5	12.8
Operational	8.0	9.3	7.0	5.6
Marketing	3.8	7.3	7.1	7.1
Mill overhead	6.0	5.6	6.8	6.9
Manufacturing profit	14.7	11.4	7.6	7.4
Total	100.0	100.0	100.0	100.0

Source: Actual survey, 2007

Primary Input Content

Analyses based on input–output (I–O) model 2000 also indicated that the furniture industry imported a substantial amount of inputs to support its production. A total of RM24.5 billion worth of imported commodities or inputs was used by the furniture and fixtures industry in 2000. One of the imported inputs was machinery and equipment. To prevent the outflow of cash to foreign countries, an effort should be made to encourage the development of Malaysia's own indigenous technology.

Major findings discussed above were based entirely on results from a survey conducted on the various wooden furniture mills in the Peninsula, Sabah and Sarawak, as well as secondary Input–Output data prepared by the DoS. But before recommending any policy or strategy for sustainability of the WFI in Malaysia based on these findings, let us first look at the industry's strengths, weaknesses, opportunities and threats as useful guidance.

Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis

This section is dedicated to analysing the strengths, weaknesses, opportunities and threats (SWOT) related to the WFI. SWOT analysis is a general tool that was developed to assist decision-makers in carrying out strategic planning in various types of application (Johnson et al. 1989). In other words, identifying all four crucial elements is a prerequisite to devising strategies that build on strengths, resolve weaknesses, exploit opportunities and avoid threats (PlaneWare 2006). Table 5.10 provides the details of the analysis for the WFI.

Table 5.10: SWOT Analysis for the WFI, Malaysia

Strengths • Vast industry experience in original equipment manufacturing (OEM) • Skilled and knowledgeable workers at the managerial and supervisory levels • Medium level of manufacturing technology (fully mechanized & computerized equipment) • Quality processes and products for export-oriented companies • Good track record and reputation in international trade • Excellent networking with regional and international buyers • Rich non-timber resources as alternatives (eg OPT) • Strong R&D backup on alternative species or plantation timber (eg rubberwood & OPT) • Well-established government incentives to attract investors	Weaknesses • Lack of R&D on new and innovative products at the manufacturing level (eg R&D team, in-house designer) • High dependence on foreign workers • Dependence on imported equipment & machinery • Price taker (ie no bargaining power) • Lack of knowledge and understanding regarding consumers' requirements • Insufficient updated and reliable data on the WFI • No brand names or undifferentiated products • Insufficient channels of distribution in consumer countries • Insufficient supply of rubberwood
Opportunities • Government initiative to promote brand names (OEM to ODM & OBM) • Mergers, joint ventures, and strategic alliances to increase competitiveness (including establish Malaysians' own franchise companies) • New market segments (non-traditional markets) • Substitutes or combined with non-timber produce (eg glass, OPT) • Change of taste (consumers' preferences)	Threats • Trade barriers, including both tariff and non-tariff, eg chain of custody, AFTA, regulatory, eco-labelling, FLEGT, subsidies, etc • Competition from low-cost producing countries like China, Indonesia, Viet-Nam and others: cheaper products and processing technologies • Rapid product development by other producers • High production capacity of resource-rich countries

Strengths

Let us first look at the element called strengths. Nine points are listed under this element. It is important to note here that this listing of the nine points does not mean that there are no other strengths related to the WFI. The nine points merely represent some of the strengths of the WFI. A similar note also is applicable to the other three elements. In considering the element of strengths, the discussion will be focused on selected points.

The wooden furniture manufacturers have had vast experience in original equipment manufacturing (OEM). This is one of the findings highlighted in Chapter 4 of this report. Thus, considering the manufacturers' extensive experience in OEM and supported by the GoM's interest in advancing the industry, switching to original design manufacturing (ODM) and ultimately to original brand manufacturing (OBM) should not be a problem. From the perspective of the GoM, existing vehicles, namely research institutes such as the Forest Research Institute Malaysia (FRIM), also could be used as centres for developing furniture designs. At this juncture, more funding needs to be allocated for such an activity. Allocation of funding is necessary to upgrade existing facilities, buy new equipment and machinery and most important of all, hire new staff to be engaged in designing furniture.

The second strength is with regard to workers. Malaysia is known to have skilled and knowledgeable workers at the managerial and supervisory levels. These two levels of workers are essential for a successful production line. Other levels of workers also can easily be trained as their educational backgrounds enable them to participate in various levels of training, whether it be on-the-job training or practical courses.

Strong research and development (R&D) and well-established government incentives are two additional strengths enabling the industry to move forward. As a research institution with more than 100 years of experience, FRIM has the ability to recommend alternative species from forest plantations or natural forests for the industry's use (eg rubberwood and oil palm trunk [OPT]). Incentives provided by the GOM also are viewed as important catalysts to further stimulate the development of the WFI. Capital investment of more than RM1.88 million over a five-year period for approval of projects under furniture and fixtures (Table 2.4, Technical Report I), as reported by the Malaysian Industry Development Authority (MIDA), is evidence of growing investment over the years.

Weaknesses

Nine points also were registered as weaknesses of the WFI. First is the lack of R&D on new and innovative products at the manufacturing level. R&D teams and in-house designers sometimes are not available at the firm level. Looking at the issue from a different angle, a large, well-established company might have an R&D team and designers, whereas small operators do not.

Second is the issue of overdependence on foreign workers, not only by the furniture sector but also by other manufacturing sectors. Overdependence on foreign workers is a long-standing problem, which needs attention from all stakeholders.

Third is manufacturers' dependence on imported equipment and machinery. As pointed out in the introduction, the value of imported commodities for the furniture industry was RM24.3 billion in 2000. Nevertheless, little is known about the components of the imported commodities. Of course, one of the components for the furniture industry is equipment and machinery. To better understand the imported-commodities structure, it is suggested that a quick study be conducted. To find a substitute for imported machinery and equipment, perhaps a policy should be devised to encourage further development of indigenous technology. Such a policy would not only save foreign exchange earnings but would also help develop local industry involved with indigenous technology.

Looking at the list of weaknesses in Table 5.10, it is evident that most of them can be overcome. For instance, insufficient supply of rubberwood, listed as the ninth weakness of the WFI, can be overcome by recommending either alternative or substitute species with similar physical and mechanical properties or encouraging the planting of rubber as a forest plantation species (Technical Report I, p. 123). On the other hand, the price-taker issue is something that is related to own designs and quality of product. Malaysian producers would not be price takers if our furniture products were from our own designs and of a high standard.

The issue of insufficient channels, listed as weakness number eight, can be resolved by setting up more of our own retail outlets, as recommended in Technical Report I (p. 124).

Opportunities

Opportunities are another element that we can exploit to further enhance the WFI's performance in local and international markets. As tabulated in Table 5.10, there are five types of opportunity to be explored further. First is the government initiative to promote brand names and designs (OEM to ODM, and OBM). From observations made during the survey of the WFI, it is safe to say that a majority

of the manufacturers are still in the OEM stage. With government initiative towards ODM and OBM, opportunities for manufacturers are wide open.

Seizing a larger share of the market through mergers and joint ventures of companies or even through strategic alliances is viewed as a second opportunity for local wooden furniture manufacturers. Such an approach undoubtedly would enhance small companies' competitiveness.

Third is to expand exports of wooden furniture into new or non-traditional markets. One such non-traditional market is Middle Eastern countries. The United Arab Emirates (UAE) is a Middle Eastern country that has been importing Malaysian wooden furniture for years. Statistics from the MTIB website indicate an importation value of more than RM130 million in 2002 and more than RM186 million in 2005 (Anonymous 2006b). Such an increase in the value of exports should be an eye opener for Malaysian wooden furniture manufacturers to explore further the opportunity to export more of their products to other Arab nations.

Besides timber, Malaysia is blessed with non-timber produce, such as OPT, rattan and bamboo. Their presence in substantial quantities can be viewed as the fourth opportunity for local furniture manufacturers. Through R&D and industrial applications, the use of OPT, oil palm residues, and other timber and non-timber residues in the production of wood composite products and as an alternative to timber is possible (Norini 2005). In fact, the survey of wooden furniture manufacturers revealed that wood composite products now form parts of furniture either because this is the trend or because solid timber is too expensive to use.

The fifth opportunity is with regard to consumers' preferences. As changes occur in consumers' tastes or preferences, furniture production also must be tailored to accommodate those demands. Changes in consumers' preferences also help in the diversification of products.

Threats

To stay in business, manufacturers must avoid threats or handle them in such a way that they are not stumbling blocks to sustaining or expanding their businesses.

The first threat is with regard to tariff and non-tariff trade barriers. Examples of non-tariff barriers are chain of custody, AFTA, regulations, eco-labelling, FLEGT, subsidies, and so on. As a majority of the non-tariff barriers are requirements by buyers, Malaysian wooden furniture manufacturers as sellers have no choice but to comply with such requests. Fulfilling such requirements is not so much related to profit but rather the corporate social responsibility to have an increasing

awareness of the world community with regard to sustainability and legality of timber and timber products.

The second threat is competition from low-cost producing countries like China, Indonesia, Viet Nam and emerging exporters. Again, competition is a healthy situation as it helps to create better products because buyers ensure that such products meet certain standards. It might not be possible to compete in terms of cost of production of Malaysian wooden furniture. However, local producers may compete with respect to quality and probably design once that is established.

The third threat is related to cheaper products and processing technologies by other producers. Lower cost of production is associated with cheaper products and processing technologies. In this context, Malaysian producers have to pursue high-end or even niche markets to be able to stay in business.

The fourth and fifth threats are rapid development by other producers and high production capacity of resource-rich countries respectively. To be on par with other producers, Malaysia's wooden furniture products must also undergo rapid product development. And the threat associated with high production capacity can be overcome by using other species or wood composites as alternatives. With the substantial amount of residues left from rubberwood logs after conversion into sawn timber, as described in Technical Report I, the opportunity to use such residues in the production of wood composite is a great possibility.

Conclusion and Recommendations

Results of the various analyses of production and marketing, human resources, machinery and equipment, productivity and cost of production of selected products helped in formulating the policies recommended in the next few sections. The SWOT analysis conducted for this study assisted in devising strategies that build on the four crucial elements under the SWOT tool.

In terms of industrial growth for the manufacturing industries, one cannot deny that Malaysia already has formulated policies to support such development. Even though the policies formulated were meant for the manufacturing industries, the WFI together with other forest-based industries (FBIs) may adopt them wherever applicable. As Gaya Tunas (2007) put it, to date there is no specific policy for developing the timber industry. The closest is the policy for small and medium enterprises (SME).

Policies recommended usually fall into two broad categories, namely fiscal (related more to incentives) and monetary (finance facilities and grants). Incentives available include the Income Tax Act 1967, Income Tax Act 1975, Custom Act 1967, Sales Tax Act 1972, Excise Act 1976, Promotion of Investment Act 1986 and Free Trade Zone 1990. Detailed information on the

various incentives is available from the Malaysian Industrial Development Authority (MIDA). Finance facilities and grants under the monetary category include credits, guarantee scheme or insurance, and grants.

Policies directions put forward for further consideration are divided into the following categories: (i) resource supply, (ii) industry productivity, (iii) marketing and promotion, (iv) human resources, (v) research and development (R&D) and (vi) other general policy directions.

Resource Supply

Resource supply had been an issue for some time. Starting with the expected timber supply from the natural forests back in the 1990s, efforts have been geared to planting fast-growing species under forest plantations through an activity called the Compensatory Forest Plantation Project (CFPP). A specific study related to the resource-supply problem was conducted by Thang (1985), who forecasted that Peninsular Malaysia would experience timber shortages of about 1.0 million m³ from 1996 to 2000 and almost 4.0 million m³ from 2006 to 2010.

Technical Report 1 of the same project--PD 192/03 Rev.3(M)--revealed that there will be a shortage of rubberwood logs in the next eight years (2008–2015). On the basis of estimations using the conventional approach, the gap between supply of and demand for rubberwood is expected to range from 500 thousand m³ to 1.33 million m³. The conventional approach also revealed that there will be substantial leftovers or residues after rubberwood logs are converted into sawn timber. The volume of residues will range from 2.58 million to 7.13 million m³ between 2008 and 2015.

Estimations based on the conventional approach, ie multiplying the volume per hectare by the total area replanted and newly planted with rubber, gave the total availability of green rubberwood logs. Other estimations using an econometric approach demonstrated that the supply of rubberwood logs cannot meet the demand of industries. The forecasted volume of supply ranged from a low of 1.05 million m³ in 2015 to a high of 1.22 million m³ in 2008.

To overcome the resource-supply problem, appropriate policy directions are recommended:

- Ensure continuous supply of timber from natural and plantation forests.
- Encourage the use of rubberwood residues for more production of composite timber products.
- Enforce the use of large-diameter logs for the production of wooden furniture and small branches for reconstituted products (such as MDF, particleboard, block board and other composite products).
- Encourage the development of new innovative materials.

- Regulate or, if need be, enforce a total ban on the export of rubberwood sawn timber to stimulate the growth of an export-oriented WFI.
- Improve the existing databases on the furniture industry (ie include supply, demand, markets, products and standards/certification).

To ensure continuous production of timber, not only do the natural forests need to be managed on a sustainable basis, but the way we currently are managing our forests also needs to be changed. For instance, we can introduce intensive management by doing more planting of commercial timbers on a piece of forest land. By doing so, not only can we get the commercial species we want, but we can increase the volume that may be extracted.

As mentioned above, Malaysia has engaged in forest plantation projects since the 1980s. To date, the total area under forest plantations in Peninsular Malaysia alone is 56,827 hectares (Forest Department Peninsular Malaysia 2006). To support further development of forest plantations in the country, in 2006 the Government of Malaysia allocated an initial RM200 million. A total area of 375,000 hectares was identified for planting in Sabah, Sarawak and Peninsular Malaysia. This effort is viewed as providing an immediate boost to the development of forest plantations in the country.

Reasons for enforcing the use of large-diameter logs in the production of wooden furniture and small branches in making reconstituted products, as well as other policies recommended regarding resource supply, are explained in detail in Technical Report I of this study.

Industry Productivity

As discussed in depth at the beginning of this chapter, productivity of the WFI needs special attention. Analyses conducted on productivity, based either on labour coefficient or partial productivity on a single factor, indicated that not all of the four classes or categories of manufacturers were efficient in their use of labour. The coefficient of labour was found to be higher for specialized products such as furniture for boats and yachts. This was followed by wooden baby furniture, another specialized product. The two types of manufacturers just mentioned were categorized as large and medium enterprises respectively. This situation held true, whether analyses were based on total workforce or annual sales.

Analyses of partial productivity based on a single factor indicated that the large enterprises were the most efficient in generating sales per employee. Similar results were noted for sales per ringgit for fixed assets, sales value per employee and fixed assets per employee, but not for labour cost per employee. Analyses of partial productivity based on value added and partial productivity by main type of products produced yielded similar results. All in all, the larger enterprises were more productive and efficient than the micro- or small enterprises. On the basis

of results of productivity analyses, clearly large enterprises, producing ready-to-assemble and specialized products are the way forward to ensure the sustainability of the local WFI. In other words, all WFI should try to produce the aforementioned products. Even though larger enterprises had to pay a little extra cost for labour, the fact that sales generated per employee, sales value per employee and fixed assets per employee were higher in most of the analyses should recommend policy directions that address the small and micro-enterprises.

Of the 381 mills analysed, 292 or 76.6% were found not to have numeric control (NC) or computer numeric control (CNC) for production. A majority of the 292 were micro- and small enterprises. From the perspective of product design and technology, of the 381 mills surveyed, only eight mills had their own brand name manufacturing (OBM). The need to have more of the manufacturers switch to OBM is indeed timely.

The following policy directions are recommended for further advancement of the WFI:

- Encourage mergers, joint ventures and strategic alliances, especially of small and micro- enterprises, for better efficiency and market penetration.
- Enhance the level of manufacturing technology (fully mechanized and computerized equipment).
- Steer more of the medium and small wooden-furniture manufacturers into the export-oriented market.
- Encourage manufacturers to send workers for training in all aspects of quality processing or manufacturing systems in order to improve productivity.
- Enhance networking with regional and international buyers, especially in new and emerging markets.

Marketing and Promotion

Analysis of marketing strategy revealed that 165 and 122 manufacturers used a market-specialization strategy, ie producing a single product and using product and market specialization respectively. Further analysis indicated that of the 381 wooden furniture mills surveyed, 259 and 65 mills intended 100% of their products for the local and overseas markets respectively (Table 3.14). To improve existing business opportunities, manufacturers currently producing for the local market have no choice but to venture into the international market.

As pointed out in Technical Report I of this small project, to date certification for wooden furniture is not fully enforced. With the growing demand for standards, again the wooden furniture manufacturers have no choice but to create products that fulfill the market requirements. Below are some suggested policy directions:

- Encourage the production of certified wooden furniture products.

- Encourage small and micro-enterprises to engage in further value-added processing activities and to produce specialized products for the export market.
- Encourage the use of locally produced wooden furniture products.
- Promote Malaysian brand names, designs and quality end-products.
- Promote more Bumiputra wooden furniture companies to export their products overseas.
- Encourage the establishment of more own distribution channels or retail outlets.
- Continuously carry out aggressive trade promotional activities, especially in new and emerging markets.

Human Resources

The high percentage (54.0%) of foreign labourers indirectly indicated how dependent the wooden furniture mills are on foreigners. The following policies may in a way reduce the high dependency of the industry on foreign labourers. Analyses of human resources in Chapter 3 also indicated that about 290 of the 381 mills surveyed provided on-the-job training for staff. Obviously, to be able to meet the changing demands of consumers, workers need to learn new skills. Here are some of the policy directions that the GoM might wish to consider with regard to human resources:

- Ensure that manufacturers provide more favourable and attractive workplaces to attract local workers (ie from the aspects of cleanliness, safety and health).
- Apply the policy of "local first" in hiring both skilled and unskilled workers/labourers.
- Encourage manufacturers to make use of training incentives provided by the Ministry of Human Resource Development or other training centres such as the Wood Industry Skills Development Centre (WISDEC).
- Incorporate the industry's training needs into technical/vocational curricula at the college and university levels.

Research and Development (R&D)

As pointed out in Technical Report I of this project, R&D is an integral aspect of continuous progress. Below are some recommended policy directions:

- Allocate more public funding for R&D to be conducted by research institutes and universities, or as a joint effort with the industry.
- Encourage manufacturers to establish their own R&D teams for design, product development and quality products.
- Establish attractive incentives to nurture innovative products, including manufacturing systems of production.

Other General Policy Directions

The following suggested policy directions are meant to cover those not included in the five areas discussed above:

- Reduce the importation of foreign machinery and equipment and encourage the development of indigenous technology.
- Continuously promote foreign investment wherever possible with the thought of better market penetration and new-product development.
- Continuously create awareness of existing government incentives for wooden furniture manufacturers.
- Continuously support the development of Bumiputra participation in the WFI, eg revive the concept of Umbrella for Bumiputra wooden furniture entrepreneurs.
- Revive public investment in the establishment of industrial estates (eg furniture complexes), well-equipped with infrastructure and support services.

The above suggested policy directions are some options available for the GoM to ensure sustainability of the WFI in Malaysia. Above all, the SWOT analysis conducted on the WFI in this chapter will guide us, the stakeholders, to further develop strategies for building up our strengths, taking advantage of our opportunities, overcoming our weaknesses and preventing threats.

Technical Report I and this report, which are two main outputs from the project PD 192/03 REV.3 (M), aim to enlighten readers about the supply of and demand for rubberwood and the WFI in Malaysia. Furthermore, through this small project, interested stakeholders including policy-makers are exposed to an in-depth analysis of the WFI from the perspective of production and marketing, human resources, machinery and equipment, productivity and cost of production of selected products. Together with the two technical reports, software and associated manuals, namely the Rubberwood Resource Information System (RRIS), Wooden Furniture Information System (WFIS) and Comprehensive Information System (CIS), are also developed. Obviously, with full knowledge of the industry, strategies that are formulated will not only be more applicable but will also be helpful in sustaining the performance of the WFI—a rising star of the FBIs in Malaysia.

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ISBN 978-967-5221-14-9



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